

**DESIGNING AN ANALYTICAL FRAMEWORK FOR MEASURING  
KNOWLEDGE MOBILIZATION EFFECTIVENESS IN HIGHER  
EDUCATION INSTITUTIONS IN THE PHILIPPINES**



**BANGKOK  
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INSTITUTIONS IN THE PHILIPPINES



A Dissertation Presented to  
The Institute for Knowledge and Innovations Southeast Asia (IKI-SEA)  
Graduate School of Bangkok University

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of the Requirements for the Degree  
Doctor of Philosophy in Knowledge and Innovation Management

John P. Natividad

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## **DECLARATION**

In accordance with the Bangkok University Honor Code, I certify that my submitted work here is my own work, and I have appropriately acknowledged all external sources that were used in this work.

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### **ABSTRACT**

The study aimed to design an analytical framework for measuring knowledge mobilization in higher education institutions in the Philippines. The exploratory sequential mixed methods design was used to collect and analyze qualitative data to develop a quantitative study. For qualitative data, a mini knowledge audit was employed to develop open-ended questions. This instrument was given to 14 respondents who were either research directors or project research leaders of the selected seven (7) higher education institutions via online in observance of the health and safety protocols due to the corona virus pandemic.

A content analysis of the qualitative data gathered guided the researcher in designing the draft of the conceptual model. From this model, the researcher constructed internal and external survey questionnaires which were distributed to the internal and external stakeholders of the same seven (7) HEIs composed of another group of researchers by seniority levels. The quantitative data gathered was treated using multiple regression analysis to observe the direct relationships between the variables. The results of multiple regression analysis were used in designing the initial analytical framework for measuring the knowledge mobilization in higher education institutions. The interviews revealed that HEIs had undertaken projects and activities that fall under the specific knowledge domain mandated by the law that created them that are mostly under science and technology, specifically on the national harmonized agenda of the Department of Science and Technology (DOST), industrial technology, sustainability of technologies such as food technology but also includes education in general, teacher education and teacher technical education and skills development

(TESD) in particular; and professional, business and entrepreneurial technology. Also, HEIs used different strategies to measure the effectiveness of the mobilization of their research results such as commercialization of the value of technology transfer or knowledge transfer, collaboration with industry, private organizations, local government units, and/or communities, impact on policy and decision making, public engagement and extension services, and social and economic impact of the research.

The results of the survey questionnaires showed that External Knowledge mobilization (EKMb) was largely influenced by the dissemination of research outputs (DRO) and external services (ES) while Dissemination of Research Outputs (DRO), Monitoring and Evaluation of Research Outputs (MERO), Utilization of Research Outputs (URO), and Research Integrity (RI) were significant variables in Internal Knowledge mobilization. Implementing an analytical framework for assessing the effectiveness of knowledge mobilization in Higher Education Institutions could be easily applied as most guidelines were already in place based on the interviews conducted. Further, stakeholders needed to be involved at every stage of the process to ensure their viewpoints were heard and to promote collaborative approach to knowledge mobilization. Among the instruments and strategies that HEIs used to assess the effectiveness of the Knowledge Mobilization of their research results were survey and interviews, impact assessments, feedback and evaluation from their clients, and government directives.

The study showed that effective external knowledge mobilization promotes and strengthens social progress, innovation, and productivity with a collaborative community whose dynamic participation can efficiently synthesize the different sources of knowledge made available and accessible to them. But institutions have to put in place a mechanism that will integrate across their operations and strategies a system of recognizing and acquiring external knowledge such as collaborating with other academic institutions and professional organizations, forming consortia or partnership with industries and other universities, and using modern technology such as digital platforms, online communities, and social media to make it easier for individuals and institutions to connect, share, and access external knowledge and to accelerate external knowledge mobilization. Adding Artificial Intelligence (AI)

capability to the system and applying it in practical settings will also significantly enhance the effectiveness of HEIs' research and knowledge mobilization capabilities.

*Keywords: Exploratory Sequential Mixed Methods, Analytical Framework, Knowledge Mobilization, Measuring, Science and Technology*



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## **CHAPTER 1**

### **INTRODUCTION**

The United Nations Educational Scientific, and Cultural Organization (UNESCO) World Declaration on Higher Education for the 21st century acknowledges that schools of higher learning are the moving force behind a knowledge-based society and are among the important institutions entrusted to create, communicate, distribute, and utilize knowledge (UNESCO Asia and Pacific Regional Bureau for Education, 2002). This acknowledgement on the role of higher education institutions has posed a challenge to Philippine universities, whose primary functions in research is to be at the forefront of “technology-directed and innovative/creative research that is locally responsive and globally competitive” (Republic of Philippines Office of the President, 2009, p. 1).

In support of developing a knowledge-based economy, the Commission on Higher Education (CHED), the government agency created to supervise all higher education institutions (HEIs) in the country through the passage of Republic Act 7722, introduced the following improvements: (1) Identification of several intervention measures to increase the quality and quantity of research outputs of Higher Education Institutions (HEIs); (2) Development of the National Higher Education Research Agenda (NHERA), which provides the policies, directions, priorities, and thrusts of Philippine higher education research in the medium and long term; and (3) Establishing more partner institutions/agencies that will provide training for research capability.

Despite the above actions taken by the CHED, the research initiatives of Philippine universities have failed to show much improvement. The Congressional Commission on Education (Congressional Commission Education (EDCOM) (1993) noted that their research outputs were “repetitive and stereotyped, of poor quality, and strongly inclined toward the field of education and related disciplines. The said report also deplored the dearth of “studies dealing with the development of unifying theories and models or new programs and strategies” (Meek & Suwanwela, 2007, p. 21). Commission on Higher Education: CHED (1997) attributed the dismal performance in research of our universities to the following factors:

“Inadequate public education, information and campaign on research results; low rate of public investment in research and development; inadequate allocation or lack of research facilities and library resources and other logistics to support research; and the conduct of research by students merely to comply with school requirements” (Commission on Higher Education, 1997, p. 2).

CHED acknowledges that “a knowledge society or knowledge economy characterizes the university not just a generator of knowledge. An educator of young minds and a transmitter of culture but also a major agent of economic growth, a Research and Development laboratory and a mechanism through which the nation builds its human capital to enable it to participate in the global economy” (Republic of Philippines Office of the President, 2016, p. 1). As such, the university does not only create knowledge, but also promotes economic growth as an important vehicle for research and development, innovation, and extension (Republic of Philippines Office of the President, 2016) toward a comprehensive plan for social and economic development. The Commission expressed the urgent need to address the following concerns substantially:

- 1) Enhance the research competence of university-based faculty, research staff, and students;
- 2) Inculcate research as a culture and life’s work among faculty and students;
- 3) Strengthen retraining and retaining a continuous stream of a new generation of researchers; and
- 4) Intensify research effectiveness and advancing research standard and influence (Republic of Philippines Office of the President, 2016, p. 2).

It is evident that the problem of research in higher education in the Philippines revolves mainly around the research capability of the institutions. They need to cope with the changes brought about by recent advancements in technological forces in our socio-economic environment. They also have to be equipped with the necessary tools to empower them to be involved in national transformation through knowledge generation and transmission, an essential requirement if the country needs

to reap the benefits in the knowledge-based global economy (Republic of Philippines Office of the President, 2016).

Salazar-Clemena (2006) blamed the poor research capability of our universities to inadequate university infrastructure, facilities, technical and logistical support and research training, and failure of management policies to support the university's research initiatives. There is also the observation that the outputs produced by our university's research centers have very minimal impact on society and has negligible contribution to building a coherent body of knowledge because the outputs of higher education research are mostly applicable to local institutions. Furthermore, the study of Quimbo and Sulabo (2013) recommended giving support to faculty and staff of universities to present their research results in academic fora and allot enough funds for research dissemination. The study revealed the general observation that faculty respondents were quite active during the actual conduct of the research but performed quite poorly in research dissemination (Quimbo & Sulabo, 2013). There is information coming from the CHED of sufficient funding for research provided to higher education institutions in the Philippines (Republic of Philippines Office of the President, 2016).

The Commission on Higher Education (CHED) is mandated to encourage universities in producing high quality academic investigations that will promote the generation of learning and national development and the international comparability of the Philippine higher education system. In line with this, CHED developed the National Higher Education Research Agenda (NHERA) with a two-fold objective: First, NHERA I provides the "directions, priorities and thrusts of Philippine education research in the medium to long term through partnership/collaboration with other research institutions, both local and foreign" (NHERA I) aside from the private sector to conduct application of research outputs. Second, NHERA I seek to boost the research capability and productivity among higher education institutions and facilitate the dissemination and use of their outputs for the stakeholders' advancement. To achieve these, CHED created an Integrated Utilization Program in 2005 as part of NHERA to give financial support for technology transfer and utilization / commercialization of technologies developed by universities.

The NHERA I project was funded by the Philippine government for ten years in the amount of 374 M. Towards the 10<sup>th</sup> year, CHED created a Technical Working Group to review the agenda. The group reported that there is a need to improve productivity of research results funded by CHED (Alcala, Padua, & Lachica, n.d.) and directed its successor, NHERA-2, to consider the rising demands and opportunities relevant to ICT, and the development of new fields like nanotechnology, globalization, and the knowledge-based economy. NHERA-2 will continue the initiatives outlined in NHERA I and deal with new challenges to enable higher education research to create appreciable impacts not only across all disciplines of higher education but also in the real-world socio-economic and cultural milieu (Republic of Philippines Office of the President, 2009).

Following efforts made by CHED to develop the research agenda for Higher Education Institutions, the Department of Science and Technology (DOST), an arm of the Philippine government, in consultation with various sectors dealing with research and development prepared the Harmonized National Research and Development Agenda (HNRDA) - 2017-2022 to make sure that outputs of Science and Technology (S&T) are designed and used for the utmost benefits of the people.

In a policy statement, the DOST spell out the basic principles that underpin the creation of the HNDRA:

The HNDRA is geared toward AmBisyon Natin 2040 (AMBISYON in English means DREAM): matatag, maginhawa, at panatag na buhay para sa lahat (stable, comfortable, and secure life for all) and is founded on the three pillars: strengthening the sense of community (malasakit), decreasing discrimination (pagbabago), and expanding possible advancement (kaunlaran). The three pillars lay the groundwork for more comprehensive expansion, a confident and strong community, and a “globally competitive knowledge economy.” The HNDRA is classified into five sectors:

- 1) National Integrated Basic Agenda (NIBRA);
- 2) Health;
- 3) Agriculture, Aquatic and Natural Resources (AANR);
- 4) Industry, Energy and Emerging Technology (IEET); and

## 5) Disaster Risk Reduction and Climate Change Adaptation (DRR & CCA).

The research results of higher education institutions (HEIs) are not just about disseminating information, sharing or publishing, or creating one-way information flows and storing information, but rather about engagement, participation and care to impact, which refers to the influence on the community who are willingly committed to practice whatever changes are brought about by the research results through the lens of knowledge mobilization (KMb).

Scholars regard research emanating from the universities as one of modern civilization's significant and sophisticated accomplishments, where the technical knowledge and skills that industry requires are honed. Nazem and Mozaiini (2014) describe universities as "social systems at the center of knowledge and information, as well as thinking bases for leading societies" (Nazem & Mozaiini, 2014). HEIs are organizations staffed with experts in different fields who contribute their expertise and experience to the endeavor of producing and preserving knowledge (Pircher & Pausits, 2011). Furthermore, HEIs are recognized as knowledge centers of higher education that lead research with the aim of advancing world knowledge (Santos-Rodrigues, Gupta, & Carlson, 2015). They are comprised of people with technical knowledge, competence, skills, and expertise in all fields with experience to advance the knowledge economy and develop new ideas, inventions, and innovations for advancing the knowledge society.

Through research and development, HEIs are expected to produce knowledge resources to contribute to the economic growth of a country (Santos-Rodrigues et al., 2015). The knowledge resources created, developed, and produced by Philippine HEIs need to be effectively and efficiently mobilized to serve the organization, the community, and the country and ensure that "knowledge [is] put into action; action without knowledge is dangerous" (Bennet & Bennet, 2007).

Knowledge is considered the "capacity (potential or actual) to take effective action in varied and uncertain situations" (Bennet & Bennet, 2007). Knowledge mobilization (KMb) goes far beyond the dissemination of knowledge; rather it brings knowledge, people, and action together to create value (Bennet & Bennet, 2007).

In Philippine Higher Education Institutions (HEIs) and specifically in universities, human capital is a dynamic tool to produce knowledge through research and development. Looking through the lens of knowledge mobilization, this research attempted to identify the current pattern and potential of HEIs in assessing the productivity of research results in Philippine Higher Education Institutions.

### **1.1 Statement of the Problem**

Undoubtedly, the Commission on Higher Education (CHED) and the Department of Science and Technology (DOST) have tirelessly worked together to allocate funding and promote a culture of research in Philippine HEIs, and connect them with industry partners to solve specific problem in the community. However, it is difficult to determine the effectiveness of this effort because there are no significant measuring tools that can assess knowledge mobilization of universities in the Philippines. Yet it is critical to understand the current process of knowledge mobilization and the effectiveness of this process to ensure research results are utilized effectively and HEIs are locally responsive and globally competitive. To support this need, this study focused on designing an analytical framework for measuring knowledge mobilization (KMb) in Higher Education Institutions. Philippine higher education institutions, particularly the universities, are offering attractive platforms in research, innovation, and extension' that will allow students to participate in the process of investigating concepts and finding ways to apply them, to transmit research results, advise the community of relevant government policies, and contribute toward the country's overall competitiveness in the knowledge-driven global economy (Republic of Philippines Office of the President, 2016).

### **1.2 Research Questions**

This study aimed to design an analytical framework to be used in assessing the effectiveness of knowledge mobilization in Higher Education Institutions. This research answered the primary question:

How can the effectiveness of the knowledge mobilization (KMb) of research results in Higher Education Institutions (HEIs) be assessed?

The following secondary questions supported the discovery of the solution set for the primary question:

SQ1: What is the current state of knowledge mobilization of research results in Philippine Higher Education Institutions (HEIs)?

SQ2: How can the effectiveness mobilization of research results in Higher Education Institutions (HEIs) are measured?

SQ3: What analytical framework can be designed to assess the effectiveness of KMb research results in HEIs?

SQ4: How can the HEI implement the analytical framework for assessing the effectiveness of KMb?

### **1.3 Significance of the Study**

Although there are various methods and techniques on how higher education research results are disseminated through varied activities, this research designed a clear and concrete knowledge mobilization analytical framework for assessing the effectiveness of knowledge mobilization in Higher Education Institutions. This analytical framework for assessing the effectiveness of KMb tool could underpin the research results of universities to ensure that knowledge is put into action, thereby increasing the mobilization of research results and to secure the effective sharing, assimilating, creating and leveraging of knowledge in the organization, community and country. A knowledge audit is a KMb tool used to identify the organization's knowledge, which has it, and how knowledge is thoroughly disseminated to the organizations (Bennet & Bennet, 2003; Tiwana, 2000). Another KMb tool is knowledge mapping. It is a process of locating, identifying, and illustrating knowledge within the organization (Davenport & Prusak, 2000; Tiwana, 2000; Zack, 1999). These KMb tools are applied in this study to know, identify, locate, and illustrate knowledge to ensure knowledge is mobilized to the stakeholders. This analytical framework served as a guide on the different ways to mobilize research results in the HIEs effectively. In addition, it will prepare future researchers to align their research proposals to meet and serve the needs of the university, community, and society. Specifically, the KMb analytical framework outcomes are the following:

1) Improve research competence. The design of the KMb analytical framework will serve as a guide to researchers in enhancing their research capabilities.

2) Value the culture of research. The research will help researchers realize the value of developing a research habit not only to advance his/her career but a challenge to provide a solution to existing problems.

3) Support funding for research infrastructure. The design KMb analytical framework will assist the policymakers in formulating guidelines on allocating significant resources for research infrastructure.

4) Maintain the continuity of research. The design KMb analytical framework will show how to sustain the continuity of research to foster the culture of research in the university.

5) create a framework designed for usability and leveling up of research results. The design KMb analytical framework will lead to better dissemination and implementation of the research results in the HEIs which will facilitate interaction among stakeholders and may further lead to developing a feedback mechanism that may be useful for further studies.

#### **1.4 Participants in the Study**

The participants in the research were drawn from seven (7) Philippine Higher Education Institutions (HEIs) located in the National Capital Region (NCR). The researcher generated research data from university officials, research directors, and senior level researchers who are Full Professors, Senior Researchers, Principal Investigators, Associate Professors, Researchers, Investigators, Assistant Professors, Post-doctoral fellow, M.A./Ph.D. Students, Junior Researchers (without a Ph.D.), faculty researchers, and graduate students who were involved in research activities from the seven selected universities.

Research interviews are necessary tools for data gathering because being “construction sites for knowledge,” there exists an “inter-change of views between two persons conversing about a theme of mutual interest” during interviews (Kvale, 1996, p. 14). The interviews focused on determining the current state of knowledge mobilization in Higher Education Institutions (HEIs) and establishing the

effectiveness of assessment practices used in the knowledge mobilization (KMb) of research results in HEIs. Participants were specifically asked about their current knowledge on mobilization processes and practices, the measurement tool appropriate in measuring the mobilization of research results (current and potential), and the analytical framework used, adapted, and/or designed to improve the dissemination of research results in Philippine Higher Education Institutions. Industry practices are really an application of principles, beliefs, ideas, and methods learned. Through the use of knowledge, best practices flourish. Best practices are situations-dependent and context-sensitive (Bennet & Bennet, 2007). They are the things that a person always does with outcomes that provide benefits to the stakeholders and emulated by the others.

### **1.5 Definition of Terms**

**Commission on Higher Education (CHED)** - A commission created on May 18, 1994 through the passage of Republic Act No. 7722 or the Higher Education Act of 1994. It is an attached agency to the Office of the President for administrative purposes, and is headed by a chair and four commissioners, each having a term of office of four years. The Commission en banc acts as a collegial body in formulating plans, policies, and strategies relating to higher education and its operation. The Congressional Commission on Education to Review and Assess Philippine Education (EDCOM). A commission created by a Joint Resolution of the Eight Philippine Congress on June 17, 1990. It was composed of five (5) members of Congress and five (5) from the Senate, with a Chair headed by the Senate President and a Co-Chair from the House of Representatives.

#### **Higher Education Institution (HEI)**

A tertiary level of institution tasked to conduct research and development that offers degree programs for bachelors, masters and doctorate for advancement of individual knowledge.

#### **Human Capital**

The organization's human element such as employees, contractors, or suppliers with skills, know-how, talent, capacity, competence, attitude, intellectual

agility, and individual abilities. It represents the individual's talents to solve problems (Edvinsson & Sullivan, 1996; Santos-Rodrigues et al., 2015).

#### Intellectual Capital (IC)

Abstract assets and actions that “allow an organization to transform a bundle of material, financial and human resources in a system capable of creating stakeholder value” (European Commission: Directorate-General for Research and Innovation, 2006, p. 126).

#### Knowledge Mobilization (KMb)

The means of creating “value or a value stream through the creation, assimilation, leveraging, sharing and application of focused knowledge to a bounded community” (Bennet & Bennet, 2007). It refers to the co- production and uptake of knowledge created by academic, industry, governmental, non- governmental organizations, and community actors working in partnership with one another.

#### Metric

A tool to measure the performance, skills, or behavior within the organization (own definition).

#### Potential players

They are the stakeholders or actors who are impacted by the development and completion of projects such as university, researcher, community, industry, organizations and non-government agencies.

#### Research Results/Result Outputs

A product of the human brain in higher education institutions to solve a specific problem of the community or organization (operational definition). It is a result of knowledge production that should be disseminated to the beneficiaries or potential players to convert it into something useful or positive, thereby improving the lives of the beneficiaries.

#### Research utilization

The practical application of knowledge created by HEIs for its beneficiaries like industry, community, university, and the rest of the potential players. In addition, HEIs monitor and evaluate its implementation to identify the degree of its impact to beneficiaries and to describe the influence of evidence-based practice to the

community and its sustainability not only in the academe but even to the rest of the potential players.

United Nations Educational, Scientific and Cultural Organization (UNESCO)

The United Nations organization established in 1946 to "contribute to peace and security by promoting collaboration among nations through education, science and culture in order to further universal respect for justice, for the rule of law and for the human rights and fundamental freedoms which are affirmed for the peoples of the world, without distinction of race, sex, language or religion, by the Charter of the United Nations" (UNESCO, 2007, para. 1).



## **CHAPTER 2**

### **LITERATURE REVIEW**

This section gives an overview of previously published scholarly articles on: 2.1 Knowledge; 2.2 Knowledge Economy and Knowledge Societies; 2.3 Higher Education and the Philippine Normal University; 2.4 Knowledge mobilization (KMb); 2.5 Knowledge mobilization processes and application; 2.6 Knowledge mobilization assessment tools; 2.7 Knowledge mobilization in Higher Education; 2.8 Measuring knowledge mobilization in Higher Education Institutions; 2.9 Knowledge mobilization in Philippine Normal University; and 2.10 Theoretical framework. The literature review is followed by the construction of the research model.

#### **2.1 Knowledge**

In an organization, it is essential to recognize knowledge resources within the company, which are tangible and intangible assets affecting the success of the organization. It is imperative to be able to identify these knowledge assets to mobilize its use effectively.

One scholar suggests “knowledge” is an organized combination of data, which is obtained through rules, processes, and performances (Arvin, Akbari, & Moghimnejad, 2014). According to Drucker (1995), knowledge is the only meaningful resource today to create value and wealth in the organization. The traditional factors of production – land (i.e., natural resources), labor and capital – have not disappeared, but they have become secondary. They can be obtained and obtained easily, provided there is knowledge. In this new sense, knowledge is a utility and a means to obtain social and economic results (Drucker, 1995). For purposes of this paper, knowledge is considered a product of human thinking that needs to be articulated through research and development to create value to the potential players such as policy-makers, decision-makers, and practitioners. Moreover, knowledge is the utmost asset of an organization, a component of intellectual capital, and the product of processing information (Bratianu, 2009).

Today, organizations consider intellectual capital as a competitive edge because it has worth when altered (Edvinsson & Sullivan, 1996). It is the amount of individual or collective knowledge that can be used to create other forms of capital or increase their value (Brenca & Gravite, 2013). It can be defined as the combination of intangible resources and activities that “allows an organization to transform a bundle of material, financial and human resources in a system capable of creating stakeholder value” (European Commission: Directorate-General for Research and Innovation, 2006, p. 4).

Simchon (2005) looked at intellectual capital as the non-tangible or non-physical assets and resources of a firm. Dean and Kretschmer (2007) elaborated that it is how each facet related to intellectual capital distributes and accrues information and knowledge in their own way through channels such as organizational procedures and structures, information technology systems, individuals and networks, and organizational scientific knowledge. Stewart (1997) defined it as a packaged valuable knowledge while Sullivan and Sullivan (2000) distinguished it as knowledge that can be converted into profit. Briefly, Roos, Roos, Dragonetti and Edvinsson (1997) summarized the concept as the sum of knowledge embedded in brands, trademarks, and processes.

In organizational management, intellectual capital is recognized as challenging responsibility. Knowledge management classifies intellectual capital into three components: Human Capital, Structural Capital, and Social/Relational Capital. These components are relevant in understanding fully the physical assets and non-tangible resources the organization will store, market, and distribute through its employees and policies (Verma & Dhar, 2016). From the perspective of institutions of higher learning, “human capital is the knowledge within the individual” the sum total of an organization’s performance capability (Edvinsson & Malone, 1997, p. 34). In an organization, human capital is the highest capital to generate competitive advantage. Individuals have unique traits from past to present which they acquire from education, expertise, and experiences. Structural capital comprises the governance principles, the organizational routines, procedures, systems, university culture, databases, publications, intellectual property, etc. of a university. Relation capital refers to the various types of relations among stakeholders, and the interaction between them. For

example, relation capital covers the undertakings and connections between the university and its non-academic stakeholders from private agencies, non-governmental organizations, government officials, and society as a whole (Leitner, 2015).

In the 21<sup>st</sup> century, we see institutions of higher learning actively engaged in a process of change to enable them to become more adaptable, transparent, competitive, and comparable. As such, they have to deliberately control the process creating their knowledge assets and recognize the value of intellectual capital to their continuing role in society (Secundo, Margherita, Elia, & Passiante, 2010). Aided by an educated workforce and enhanced entrepreneurship, higher education institutions are especially empowered to face the challenges posed by today's financial difficulties and participate in the creation of new knowledge.

#### 2.1.1 Knowledge Audit

Knowledge audit is an investigation of an institution conducted to find out the nature of information an institution has, the identity of the person/s who discovered it, and the manner in which the institution disseminates, stores, or uses it. It goes beyond mapping of available information as it is planned to fulfill the needs of a particular institution; thus, it also includes an evaluation of the level or status of technology of the specific institution, the manner in which the institution generates, uses, and supports efficient sharing of information, and the work ethic and culture of the employees in the workplace. A completed evaluation of an institution's system to generate, use, and share information will support a new system that will bring about improvements and desired changes in the workplace, be it in the institution itself or in the attitude of the employees. It can also capacitate technologies and business processes when institutions are able to develop and implement initiatives that are relevant to their vision and mission (Bennet & Bennet, 2003; Tiwana, 2000). A formal probe of the information gathered by an institution begins by conducting a survey or taking an inventory of vital information the institution maintains (Davenport & Prusak, 2000; Tiwana, 2000; Zack, 1999).

Tiwana (2000) enumerates the six steps for multifaceted groups of individuals who will compose the audit team tasked to record the institution's "knowledge assets."

2.1.1.1 Clarify the tasks to be performed – this includes focusing on definite or identified objectives and determining the limitations;

2.1.1.2 Identify the most appropriate goal. This does have need to be very specific;

2.1.1.3 Choose the approach to be used – The approach should be one which is convenient to the institution. For instance, an online survey process may work for a group of employees who have mobility problem but this method will not be effective for groups of employees who are not computer savvy;

2.1.1.4 Carry out the audit and document assets – This will become the institution's in-house standard in assessing the efficiency of information management strategies;

2.1.1.5 Pursue the gradual development of knowledge – As the most appropriate goal of the team changes, the needs of the institution also undergo changes. An investigation of the institution's knowledge resources will help establish the course that the institution is taking and presents the possible course of action for purposive adjustments;

2.1.1.6 Establish the institution's projected situation within its basic technology structure. As the "knowledge audit" reveals information that can grow the information system, the parameter in which knowledge management and information technology operate should be clearly defined.

## 2.1.2 Knowledge Mapping

Knowledge mapping is a course of action when an inventory of vital information gathered by an institution is taken. A knowledge map is an information guide that serves as a pictorial travel assistant to help people gain access to knowledge and proficiency needed to perform their tasks. Knowledge mapping is an important action in any strategy involving knowledge management and the first step in conducting a knowledge probe (Davenport & Prusak, 2000; Tiwana, 2000; Zack, 1999).

Davenport and Prusak (2000), characterize knowledge mapping as establishing the location of vital information within the institution and then disseminating a list or pictures that reveal to users the location of the information. Thus, the knowledge map is a blueprint that reveals to the workers in an institution where to go when they need to hone their proficiency. The knowledge map links people to information and data center (both in hard and soft copies), giving a complete record of the nature of information found in the institution and its location (Davenport & Prusak, 2000). On the other hand, Tiwana (2000), uses the term “knowledge directories” to characterize knowledge maps that show users where to access information or competence about particular topics which may refer to people (Tiwana, 2000). Zack (1999) concentrates on planned setting of information. This approach charts or delineates the institution’s knowledge together with two schemes: the extent in which it is willing to help the institution’s policy and its high position comparable to opposing institutions. Strategic knowledge planning has three focus areas:

- 1) What the institution has to recognize to implement its plan of action;
- 2) What information the institution has knowledge of; and
- 3) What the institution’s associates (or rivals) understand or are competent with (Competence Identifier), an institution for storing files securely, a description of action, merchants, inflexible initiatives, techniques, and others (Zack, 1999).

The fundamental principles of the knowledge map are explained in the following groups:

- 1) Place, possession, territory, task-urgency, archive resource, applies figures, and gain access to systems utilized;
- 2) Records, ledgers, networks, initiatives, catalogues, proficiencies, the government, and official orders; and
- 3) Clear and implicit information which is closely related to important objectives, official orders, necessary results, and prescribed programs.

The design standard includes the following steps:

- 1) Put in place the requirements, objectives, paradigm, and standard of accomplishments;
- 2) determine the applicability of the information to the needed accomplishment result;
- 3) identify the sponsor/benefactor of the procedure;
- 4) build the foundation to nurture knowledge mapping and the ways to implement its development;
- 5) Establish desirable stimulus to stimulate the advancement of information guides by acquiring related implied information;
- 6) Connect results of knowledge mapping to employment adaptation; and
- 7) In general, transmit the benefits and outcomes of the knowledge mapping strategies

Information and data may be collected in several ways. Among them are the following:

- 1) Hold interviews and raise calculated questions;
- 2) Monitor the work in process;
- 3) Investigate the conventional and distinctive record organization;
- 4) Collect contracts, diagram of the structure of the organization, and detailed description of how employees execute a process;
- 5) Focus on traditional and casual assemblies, discussion, and engagements;
- 6) Proceed along diverse class or grouping (individual, group, organization); and
- 7) Collect information from inside and outside sources (Davenport & Prusak, 2000; Tiwana, 2000; Zack, 1999).

## 2.2 Knowledge Economy and Knowledge Societies

Knowledge economy can be defined as services created through knowledge - rigorous events that contribute to an accelerated pace of technical and scientific advancements as well as rapid obsolescence (Powell & Snellman, 2004). The critical sections of the knowledge economy have a greater reliance on intellectual capabilities than tangible inputs or natural resources. Key sectors of the economy are increasingly dependent on knowledge generation and dispersal today, much more than they were in the past. In advanced countries, the leading edge is technology-driven based on knowledge and information production and distribution. The emergence of technologies in the late 1950s increased with the creation of the personal computer and the general use of email, with the Internet offering significant potential to reshape the nature of work and the economy (Powell & Snellman, 2004).

A knowledge economy is a system of utilization and creation that is based on intellectual capital, with the ability to capitalize on scientific discoveries and basic and applied research (Agarwal & Sheery, 2001; Hayes, 2021). It has become an enormous element in all economic activities in most developed nations. In a knowledge economy, a significant component of value may consist of intangible assets; for instance, the importance of a worker's knowledge or intellectual property (Hayes, 2021). Intangible assets are defined as assets that are not physical. Generosity, brand acknowledgment, and licensed innovation (such as licenses, trademarks, and copyrights) are all intangible assets. Intangible assets exist in opposition to tangible assets, which would include land, vehicles, equipment, and inventory (Kenton, 2023).

Knowledge economy refers to how education and knowledge, such as human capital, fill in as a gainful resource or business product to be sold and traded to return benefits for people, organizations, and the economy. This element of the economy depends significantly on intellectual capabilities (intangible assets) rather than natural resources or physical contributions (tangible assets). In knowledge economy, products and services that rely on intellectual capability advance technical and scientific fields, thereby empowering development and economy (Hayes, 2021).

In 2001, the Organization for Economic Cooperation and Development (OECD) described how a pattern of knowledge-based economies developed, highlighted by movement of laborers/students and the quick spread of information especially through the Web. Telecommunications, finance, insurance, education, and health industries were especially regarded as strong knowledge-based segments of the economy, as investment in any these fields was developing faster than investment in fixed capital (Organisation for Economic Co-operation and Development, 2009). The World Bank (2002) emphasized that these emerging features of knowledge economy for nations transitioning in the Knowledge for Development Program (K4D) are anchored on the following principles:

- 1) An economic and established regime that encourages the productive utilization of current and new knowledge in developing business.
- 2) An educated and skilled workforce that can generate, distribute, and utilize knowledge well.
- 3) A productive system of firms, research centers, universities/colleges, think tanks, experts, and associations who can aggressively undertake innovations on the growing stock of global knowledge and adjust it to cope with the urgent needs of society and produce new learning.
- 4) Information and Communication Technologies (ICT) that can assist the successful flow of communication and effective delivery and processing of information.

Academic institutions, organizations taking part in innovative work, software engineers creating new programming, and internet searchers for information, and wellbeing laborers utilizing advanced information to improve medicines are altogether components of knowledge economy (Hayes, 2021).

In contemporary society of knowledge-based economies, the powerful collaborative relationships between academia, industry, and government as presented in the Triple Helix Model of Innovation boost innovation and promote economic and social development (Etzkowitz & Leydesdorff, 1995).

Knowledge society is defined as a society where organizations enable the creation, dissemination, and use of knowledge as it becomes the primary social and economic activity (Lytras & De Pablos-Ordenez, 2009). A knowledge society makes

knowledge accessible to all for the advancement of human life (Castelfranchi, 2007). It is an expression to describe communities that are economically and socially reliant on their capacities to generate scientific and technological knowledge (Stehr & Ruser, 2017). Because of advancement in data-processing technologies, knowledge is being deliberately used as a weapon in the economic rivalry among organizations in a country or among nations. Consequently, innovative work (Research and Development) is unequivocally compromised.

The essential principles that characterize a knowledge-based society are networking, knowledge making, and adequacy in applying, controlling, and assessing (Hazelkorn, 2004). To recognize quality standards in knowledge institutions, there is a growing interest in ranking educational endeavors. Since the economic wellbeing of the people is entirely subject to the level of their educational accomplishment, educational institutions support student learning of new knowledge. Thus, educational outcomes should be anchored on the principle that students have to be taught a new set of skills that are different from those developed during the previous periods to enable them to create a new knowledge that will translate to a higher level of creation.

Individuals may find it difficult to adapt easily to changes brought about by high-speed communication; however, educational programs and techniques can make them adjust to these changes smoothly, no matter how complex these changes are. As they realize the advantage of being able to access information easily and disseminate it to more people at lightning speed, they will also become aware that new knowledge will enable them to meet the demands of an evolving economy. From the individualization of instruction to globalization of dispersing knowledge, educators remain as significant transformative agents of change (Castells, 2010; Rooney, Hearn, & Ninan, 2005; Stehr, 1994).

### **2.3 Higher Education Institution and the Philippine Normal University**

#### **Mandates**

UNESCO states that higher education includes all types of studies, training or training for research at the post-secondary level, provided by universities or other educational establishments that are approved as institutions of higher education by competent state authorities (UNESCO, 1998). Higher Education Institution (HEI) is

“a level of education that is provided by universities, vocational universities, community colleges, liberal arts colleges, institutes of technology and other collegiate level institutions, such as vocational schools, trade schools and career colleges, that award academic degrees or professional certifications” (Higher Education Institution, 2017).

Higher Education includes teaching, research, exacting applied work (e.g., in medical schools and dental schools), and social services activities of universities. Within the realm of teaching, it includes both the undergraduate and graduate-levels (and beyond that the postgraduate level).

There are three components of Higher Education Institutions, namely: education, research, and contribution to society (Jongbloed, Enders, & Salerno, 2008). The components of research and education are like two different sides of a coin - that is, research takes a more significant level of training; in like manner, education builds up human resources to do research. On the other hand, an interest and a commitment to both education and research, both ongoing components of the higher education institutions, to create a knowledge society are expanding. This implies that higher education institutions need to instate programs and activities that ensure knowledge gathered goes straightforward back to society, and they do not become “ivory towers” (Higher Education Institution, 2017).

The Higher Education model based on the knowledge society context was developed with the influence of Western university model (Hayhoe, 1989). But the environment that surrounds higher education is changing quickly. The growth of a knowledge-based society due to social, economic, and information globalization factors has intensified the demand for higher education. The changing political, economic, and social environments of countries are all connected and have a significant influence on higher education (Japan International Cooperation Agency, 2004). At the end of the twentieth century, a transformation that impacted on economic growth brought about unprecedented changes from the mass production industry which relied heavily on the use of technology to knowledge-based development such that the creation of knowledge has a higher economic value.

To contribute to a knowledge-based economy, a social infrastructure is needed. Security of access to information at the national level, the promotion of information disclosure, and security and proper handling of information such as copyrights and patents are necessary. Since Higher Education Institutions need to sustain their position as locations to produce knowledge, they need to be connected securely to society to make sure that the latest technologies created can be implemented for economic growth (Japan International Cooperation Agency, 2004).

The creation of an all-around framework for research and knowledge generation has become one of the most convincing arguments to encourage the public to support universities (Dill, 2014). This viewpoint is fast gaining ground even among communities with rising knowledge-based economy as it does not allow a community to have exclusive right in the creation of new knowledge. Nonetheless, new knowledge created can grow better when they can easily be accessed for evaluation and improvements in an open and collegial atmosphere (Krikorian & Kapczynski, 2010). Public support of knowledge creation is vital particularly in developing countries. Essential, nonproprietary research can be conducted by any organizations (national laboratories or privately supported foundations), although universities and other higher education institutions are more capable to handle it (Task Force on Higher Education and Society, 2000).

The Philippine Constitution mandated higher educational institutions whether government-run or privately-owned, to work within an atmosphere of laws and policies to protect the right to education of all citizens by guaranteeing that institutions of learning promote access, equity, quality, and relevance as they practice their institutional academic freedom. The Commission on Higher Education (CHED) was established on May 18, 1994 through Republic Act 7722 to oversee the management and supervision of all public and private higher education institutions offering tertiary education. Expansive plans for changes in the education sector came about as a result of the study conducted by the Congressional Commission on Education to Review and Assess Instruction (EDCOM). The report led to the restructuring of the Department of Education, Culture and Sports (DECS) into three – the Department of Education (DepEd) for basic education, the Technical Education and Skills Development Authority (TESDA) for technical-vocational education, and

the Commission on Higher Education (CHED) for tertiary and graduate education (Carillo, 2017).

Higher Education institutions in the Philippines is composed of universities and colleges numbering 1,871. The private-sector institutions run almost 88% of the universities and colleges. The Bachelor degree programs offered four-year courses while other disciplines like engineering, law, and medicine, required five-years. The period required to complete academic programs was revised with the passage of the Enhanced Basic Education Act of 2013 (Sergio, 2011). Graduate degrees like the master's diploma and other doctoral programs are also offered. Under the Higher Education Act of 1994, the Commission on Higher Education oversees the supervision and management of tertiary and graduate education. Among its functions is to ensure that higher education institutions maintain internal quality assurance (Hayden, & Martin, 2014). Therefore, universities that adhere to the highest standards and ideals of integrity, dedication to excellence, and have a functioning sustainability and capability (Carter, Funnell, & Rogers, 2012) are awarded autonomous status (Carillo, 2017; Hartlep, 2012).

The phrase "normal school," is traceable to the French words "ecole normale" that refer to the institution for higher learning in France in the 18th century. The Philippine Normal University was formerly known as the Philippine Normal School (PNS), the earliest institution of higher learning started during the American occupation. Founded by Republic Act No. 74 of the Philippine Commission, it offered teacher education training to the Filipinos. The PNS started on September 1, 1901 with its first superintendent Mr. Elmer B. Bryan, followed by seven other Americans who succeeded him before the designation of the first Filipino superintendent, Mr. Manuel A. Escanilla, in 1939. With the signing of Republic Act No. 416 on June 18, 1949 during the time of President Elpidio Quirino, PNS was converted into the Philippines Normal College. The passage of Republic Act 6515 authorized it not only to offer undergraduate and graduate degrees in education but also doctorate and other academic programs significant to the training of teachers. On December 6, 1991, during the term of President Corazon C. Aquino, the Philippine Normal Colleges was elevated to Philippine Normal University.

In recognition of its leadership in teacher education, Republic Act 9647 was passed on June 30, 2009 declaring the Philippine Normal University the National Center for Teacher Education. The university's main campus is in the City of Manila, with four other campuses located in (1) PNU Prosperidad, Agusan del Sur; (2) PNU Alicia, Isabela; (3) PNU Cadiz City, Negros Occidental; and (4) PNU Lopez, Quezon. The Philippine Normal University proudly states its vision as follows:

“PNU shall become an internationally recognized and nationally responsive teacher education university. As the established producer of knowledge workers in the field of education, it shall be the primary source of high-quality teachers and education managers that can directly inspire and shape quality Filipino students and graduates in the country and the world” (Philippine Normal University, 2015, p.2).

To support this vision, the university is expected to produce knowledge and maintain a mantra of quality education. As introduced earlier, in the knowledge economy the role of a higher education institution is to create, generate, and translate knowledge. Consequently, it is imperative for Philippine Normal University as the premier research university specializing in teacher education to tactically prove it is indeed worthy of its position as the National Center for Teacher Education (NCTE).

As a Higher Education Institution with the mandate to contribute to the body of knowledge through research and development, PNU developed its University Research Agenda (URA) in 2004 after consultations with stakeholders on the topic “Networking: The Continuing Search for Useful Knowledge”. Contributors in these meetings composed of PNU stakeholders were officials from government agencies and public and private educational institutions. The output was classified into five dimensions, namely: “(1) Context; (2) Input; (3) Process; (4) Effect; and (5) Impact” (Philippine Normal University, 2013, p. 3). The University Research Agenda was examined thoroughly in 2008 resulting in the addition of topics covering “policy research on teacher education and higher education development research;” a short explanation for each research topic was inserted for clearness (Philippine Normal University, 2013, p. 3). Improvement on the URA was circulated widely to the PNU stakeholders for their comments and recommendations which were later incorporated

into the URA (Philippine Normal University, 2013). The URA copy was finalized and published in the Revised Research Manual in June 2009. The passage of Republic Act No. 9647, otherwise known as the “Philippine Normal University Modernization Act of 2009” made the University examine the URA to make it more receptive to fulfill its mandate as the NCTE, especially in managing research, action research, and other applicable research strategies to improve syllabi and matrix for pedagogical training and continuing learning opportunities for faculty as well as administrators. As authorized by the law, research themes were all focused toward the University as center of innovation in research for teacher education. As provided for in the PNU Research Agenda, the Education Policy Research and Development Office were created with the following functions:

- 1) Initiate and sustain a system of electronic information system listing education policies and important issues confronting our education system, as well as the education systems of other countries, especially in the Asia Pacific Region;
- 2) Design and assess different models of teacher education, tackle the essential characteristics of successful teacher education programs, and establish the model that would best meet the country’s education objectives;
- 3) Establish an organized system of disseminating research outputs on teacher education so they are readily accessible to end-users such as teachers and academic supervisors;
- 4) Participate in collegial sharing of research expertise and competence in education research with other Teacher Education Institutions throughout the country, provided that the research funding of other state universities and colleges shall in no way be affected by the provisions of the Republic Act No. 9647;
- 5) Counsel the country’s policy makers and decision-makers in designing, implementing, and evaluating reforms in teacher education including the licensing of professional teachers;
- 6) Aid in the assessment of government programs on education.

In view of the foregoing, any agency may require the PNU to give its feedback on issues affecting education and conduct studies in aid of crafting relevant plans and proposals on education (Philippine Normal University, 2016).

The Commission on Higher Education created in 1994 is in-charge of the creation, as well as the supervision in the execution of plans, proposals, and guidelines, management of tertiary and graduate education, as well as protection to function autonomously. The program offerings by institutions of higher education are recognized by the Federation of Accrediting Agencies of the Philippines (FAAP), a CHED-accredited agency which is composed of the Association of Christian Schools, Colleges and Universities Accrediting Agency Inc. (ACSCU-AAI), and the Philippine Accrediting Association of Schools, Colleges and Universities (PAASCU)—and the National of Quality Accrediting Agencies (NQAA)—which consists of the Accrediting Agency of Chartered Colleges and Universities of the Philippines (AACUP) and the Association of Local Colleges and Universities Commission on Accreditation (ALCUCA). These organizations, accredited by the Commission on Higher Education, are also responsible for assessing the performance of public and private Higher Institutions in the Philippines (Hayden and Martin, 2013).

#### **2.4 Knowledge Mobilization**

Knowledge mobilization (KMb) includes all the activities and products created that help ensure research is useful and used. It is an emerging field of work which leaves room for multiple definitions and perspectives, and is multi-faceted with various roots and assorted branches these mixed branches go to the idea of knowledge mobilization as knowledge translation and exchange, implementation of science, integrated knowledge translation and exchange, extension and mobilization. Thus, the roots of knowledge mobilization draw from many disciplines and perceptions such as participatory action research, communications, sociology, knowledge theory, usability, education, and psychology (Gatsby, 2016).

Knowledge mobilization conveys existing knowledge into effective use (La Velle & Flores, 2018). Some scholars define knowledge mobilization as a developing field of study that seeks to fortify networks concerning research, policy, and practice throughout sectors, disciplines, and states (Campbell, Pollock, Briscoe,

Carr-Harris, & Tuters, 2017). It includes efforts to narrow the differences between policy research and practice to improve results. It also contains knowledge sharing amongst research producers such as university researchers and research users, including professionals and communities or others whose work can use from research findings and the assistance of third parties or mediators. Knowledge mobilization has been used to assess contributions in terms of the findings and implications of empirical work conducted by Canadian scholars relative to education and other fields (Cooper & Levin, 2010).

Another way to look at knowledge mobilization is as “the process of creating value or a value stream through the creation, assimilation, leveraging, sharing and application of focused knowledge to a bounded community” (Bennet & Bennet, 2007). Thus, knowledge mobilization is not only knowledge transfer to the stakeholders, but it also embeds knowledge generation and knowledge use within the core structure of communities and organizations (Bennet & Bennet, 2007). Specific to research, Levin (2008a) formally defines knowledge mobilization as “the reciprocal and complementary flow and uptake of research knowledge between researchers, knowledge brokers, and knowledge users both within and beyond academia in such a way that may benefit users and create positive impacts within Canada and/or internationally.” As can be seen, knowledge mobilization goes far beyond the source to beneficiaries, researchers to community. While knowledge dissemination is limited only to sharing of knowledge produced by HEIs from the researchers to stakeholders such as the community, as well as to the policy and decision makers, industry, government and private organizations, even to non-academic audiences or non-researcher, knowledge mobilization is what happens after dissemination (Bennet & Bennet, 2007; Levin & Cooper, 2011). Thus, for purposes of this research, KMB is considered as a living schema that creates lifeblood to socio-economy in order to create value for the societies.

In an organization like a university, research grants in education compel that research results be disseminated effectively to earn value and impact of these results on the knowledge economy. It is essential to know its scope, depth, and impact to society, and the effective process in the exchange of information to increase the impact of research results. Specifically, it is important to know how research is

generated by a university and mobilized among the educators, policy-makers, decision-makers, industry, private and public sectors and communities? Even though there are educational conversations and research policies, these apprehensions are circulating in other countries like the UK and Europe, Canada, the USA, Australia, and other parts of the world. Researchers and universities are clearly focused to prioritize research design in knowledge exchange or mobilization (Fenwick & Farrell, 2011).

The barriers to more effective knowledge mobilization is multiple and real. They include “lack of good evidence, poor availability of evidence when it does exist, lack of interest among users in evidence, low trust in the evidence, lack of skill in finding and interpreting evidence, lack of infrastructure support research use, strong inertia forces around existing practices, and pressures of various kinds pushing in directions contrary to the evidence” (Levin, 2008a, p. 9). Thus, knowledge produced and utilization and policy impact are necessary to measure in order to strengthen knowledge mobilization to other educational institutions, researchers, and industry and partner stakeholders to ensure that knowledge is put into practice.

The Philippine government acknowledged that innovation is a substantial vehicle to maintain the growth and development of the country, as well as a strategy to finding solutions to socioeconomic and environmental challenges, such as generating new employments for a continuously increasing population and promoting energy efficiency. Innovation is the use of an innovative or remarkably upgraded product (good or service) or process, a different approach to conduct business, or a creative strategy in overseeing business operations, work environment, or external interactions (OECD Eurostat, 2005, p. 46). According to OECD Eurostat (2005), innovation has four components, namely;

1) Product innovation: the presentation of a good or service that is substantially improved as for its qualities or the purpose of uses;

2) Process innovation: the usage of new or significantly improved creation or delivery approach. These entail essential changes in method, equipment, and computer programs;

3) Marketing innovation: the usage of a new marketing approach concerning critical changes in product design or packaging, product placement, product advertising or costing; and

4) Organizational innovation: the usage of a new organizational method in the enterprise practices, working environment or external relations (OECD Eurostat, 2005).

In this study, innovation is considered a result of new ideas that generate products (goods or services) through research and development to respond to the needs and demands of stakeholders to create value. In Higher Education Institutions, this includes textbooks, syllabi, educational materials, e-learning services, pedagogical training, using ICT in communicating to parents and students, and a new approach in promoting the education programs that need to be mobilized to stakeholders in order that knowledge generated will be put into action.

Thus, the Philippine Development Plan 2017-2022 was laid out with the aims of developing a solid base for distributing economic growth fairly, for maintaining a society where the behavior of its citizens is predictable, and for having an economy that can maintain its productivity in the global market competitive economy. The Philippine Development Plan states its vision as: “By 2040, the Philippines shall be a prosperous, predominantly middle-class society where no one is poor. Our peoples will enjoy long and healthy lives, are smart and innovative, and will live in a high-trust society” (Albert et al., 2017).

In response to the Philippine Government Plan, Higher Education Institutions such as universities play a big role in improving research impacts through knowledge mobilization. The research conducted in Higher Education Institutions in the Philippines concluded that there is a need to strengthen the scheme of effective communication or diffusion of research outputs in research (Fetalver, 2010). For research utilization, there is a call for mechanisms to monitor and evaluate this utilization (Fetalver, 2010). Likewise, this was echoed in an article by Leon (2011 as cited in Lacanilao, 2024) of the Business Mirror, entitled the “Philippine Education Ranked Poor,” where Guillermo M. Luz, Co-Chair of the National Competitiveness Council (NCC), was quoted to have said that “in research and development there is a noticeable low partnership between the industries and the universities.” He said that

schools are not too open in giving their research results to the private sector, while industries, on the other hand, are not putting enough money into academic research. As he opined, “Right now, the research being done in schools is merely for thesis purposes. The output of the research should be given to the industries so they can be converted into something that is useful. The private sector will then give royalties to the school. We have to create business value for the research” (Leon, 2011 as cited in Lacanilao, 2024). On these observations, it is relevant to measure consumer impact of knowledge research outputs of the university to know the influence of evidence-based practice to the community and sustain academe.

Research ventures in education remain small and weak, particularly in relation to the size of the sector. The Organization for Economic Cooperation and Development: Organisation for Economic Co-operation and Development (2017) reports that most education delivery organizations have very poor capacity to discover, share, understand, and apply research since the systems for taking research evidence to application is still below par. In other words, many research institutions such as universities have rather weak knowledge mobilization efforts (Levin & Cooper, 2011).

In the 21<sup>st</sup> century, institutions of higher learning are intensely involved in a process of change that will allow them more flexibility, transparency, competitiveness, and comparability. To enable them to meet this challenge, institutions of higher learning must consciously manage the process of creating their knowledge assets and recognize the value of intellectual capital to their continuing role in society. They are especially relevant in today’s socioeconomic structure because of their educated workforce and enhanced entrepreneurship (Ramirez & Gordillo, 2014).

In organizations, there is increasing evidence of a powerful correlation concerning human capital and business results. Recall that human capital is defined as the capabilities and knowledge dwelling inside individuals and the workforce of the organization (Ravichandran, Sivasubramanian, & Anbumathi, 2008). In Higher Education Institutions (HEIs), i.e., at the university level, human capital refers to the knowledge and skills not only of professors but of also of the staffs. Higher Education is comprised of highly competent skilled employees who support the vision and

mission of the university, especially in the field of research to generate a competent workforce for the fourth industrial revolution (4IR) - the merging of mechanization to industrialization world with the increasing utilization of technology such as robotics, artificial intelligence, internet, digitization, and automation. (“Preparing tomorrow’s workforce for the fourth industrial revolution”, 2018).

HEIs around the globe need to respond to the enormous and demand and challenge of globalization at all levels, including monetary, political, geological, instructive and social. In the event that the Establishments are to react to these demands, an orderly change in instruction, particularly in instructor training, is direly required. Alongside the weights of globalization, there are various human qualities and rules that are believed to be basic components for endurance in a globalized world (Al Barwani, Al Mekhlafi, & Neisler, 2010). In addition, universities are organized systems, thus becoming knowledge and information hubs as well as the bedrock of thinking to lead communities. Higher education systems are significant and complex products of human success (Kromydas, 2017). In particular, universities are expected to meet the demands of society. Because of intense changes that affect today’s world, universities are required to transform these new mandates into knowledge and skill sets that respond to the demands of society as well as to their responsibilities in guidance and leadership ( Nazem, Madankar, & Hosseinzadeh, 2014; Pinheiro, Wangenge-Ouma, Balbachevsky, & Cai, 2015).

In Higher Education Institutions (HEIs), the practice of supporting individuals to try new things and learn from mistakes (Bontis, 1998) as well as facilitating the exchange of knowledge are great contributions of structural capital to human capital development (Carson, Carson, Gill, & Baucom, 2004). Structural capital was described in section 2.1 above. HEIs are made capable by structural capital (such as laboratories, databases, learning materials, manuals, media materials, equipment and infrastructure) in assisting their own students to develop and communicate their own stored knowledge by accessing and using information from others. Here, the strategic role function of the structural capital is enabling the students’ knowledge and information to be communicated to other individuals; to be reinterpreted, synthesized and improved further in order to be understood by others; and then to be utilized for other meaningful contributions to society.

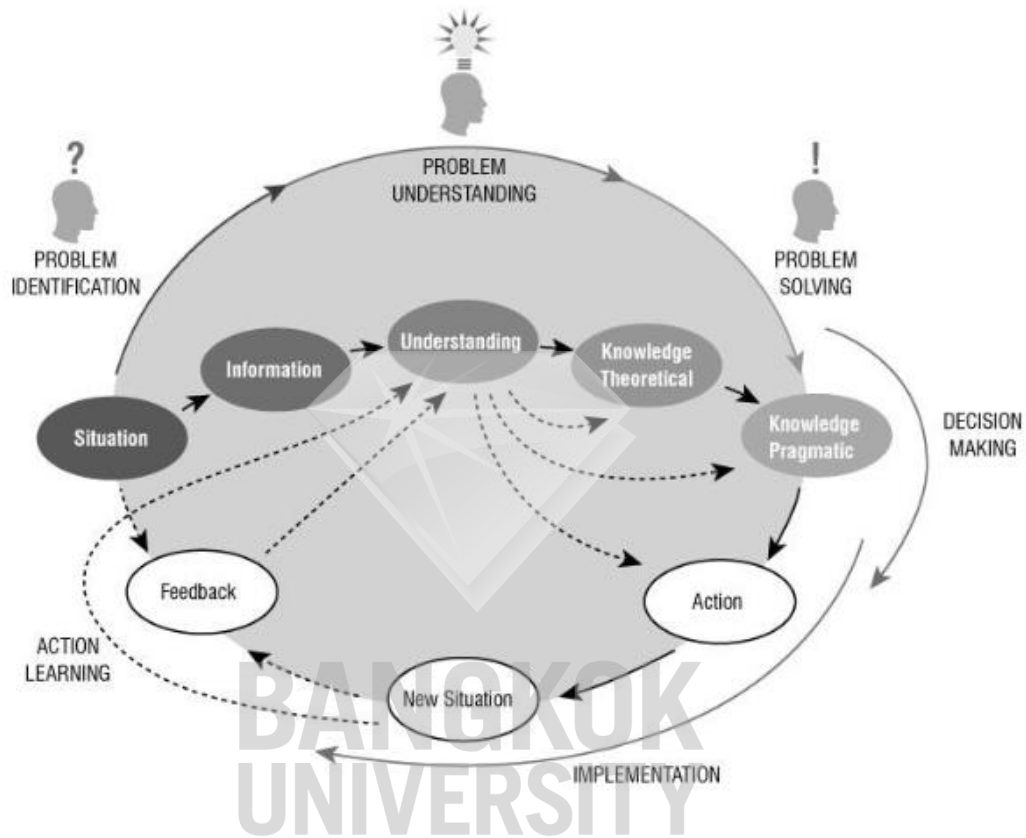
## 2.5 Knowledge Mobilization Processes and Application

The processes of knowledge mobilization are the combination of research and education with their stakeholders as partners bound by a mutual objective. This process may apply in a specific condition of the knowledge mobilization program that involves several specific steps, each created to generate value by transporting the knowledge of an expert to a local situation (Bennet & Bennet, 2007). The KMb program is composed of structural resources, relationships, communication patterns, and knowledge systems supporting knowledge mobilization processes to ensure the efficiency, consistency, and usefulness of the process to improve the welfare of the community. While knowledge mobilization programs develop the community's capacity to instantaneously execute multiple knowledge mobilization processes, knowledge mobilization, on the other hand, generates value. To ensure efficient knowledge mobilization, various knowledge mobilization processes must be applied to each specific situation using the appropriate approach to generate value. Several KMb models that focus around KMb process are presented in this study.

### 2.5.1 Generic KMb Process Model

Bennet and Bennet (2007), enumerated the eight generic processes of the knowledge mobilization process as follows:

- 1) Identify the situation (problem, issue, opportunity).
- 2) Gather information about the situation and its context.
- 3) Understand the situation using information, experience, and related sources.
- 4) Consider theoretical knowledge in the context of the situation.
- 5) Apply practical knowledge learned from experiences or related situations.
- 6) Pursue a set of actions.
- 7) Be conscious of new situation that may emerge from the actions.
- 8) Provide feedback to assess the effectiveness of actions made in achieving the desired goal, and the opportunity to change or supplement those actions as needed.

**Figure 2.1***Eight Steps of the Generic Knowledge Mobilization Processes*

Source: Bennet, A., & Bennet, D. (2007). Context: The shared knowledge enigma. *Vine*, 37(1), 27–40.

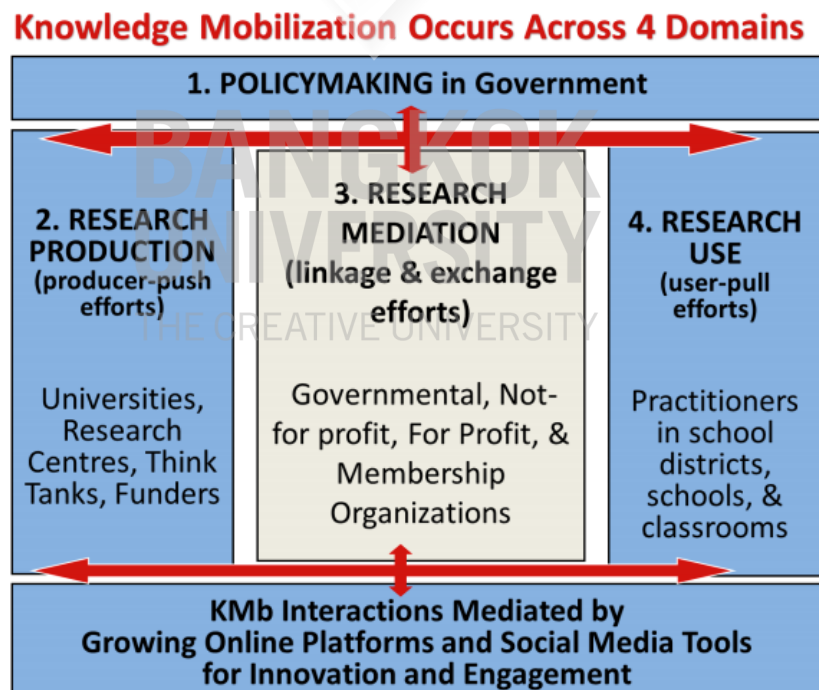
As shown in Figure 2.1, the eight steps involved in the knowledge mobilization process run via the concentration of identifying the problem, understanding, problem solving, making decisions, implementing, and action learning. The figure guides us from identifying the problem leading up to identifying opportunities. While going through these steps, the research may discover a particular situation, resulting in arriving at another theoretical and pragmatic knowledge by community stakeholders. The knowledge mobilization process can be driven and implemented by three essential factors: (1) people; (2) knowledge; and (3) action. This process takes a specific knowledge and applies it locally, generating local value to improve the welfare of local stakeholders (Bennet & Bennet, 2007).

### 2.5.2 Kmb Knowledge from a Mobilization Whole-System Perspective

Another model for conceptualizing knowledge mobilization from a Whole System Perspective is “knowledge mobilization from a Whole-System Perspective” (Kmb/WSP) as shown in Figure 2.2, which is tailored from Levin (2004). This model intensifies the use of research in policy and practice, and includes several types of educational institutions. The Whole-System Perspective is comprised of (1) policymaking; (2) research production; (3) research mediation; and (4) research use of online programs, social media platforms, and internet engines for innovation and engagement.

**Figure 2.2**

*Knowledge Mobilization from a Whole System Perspective*

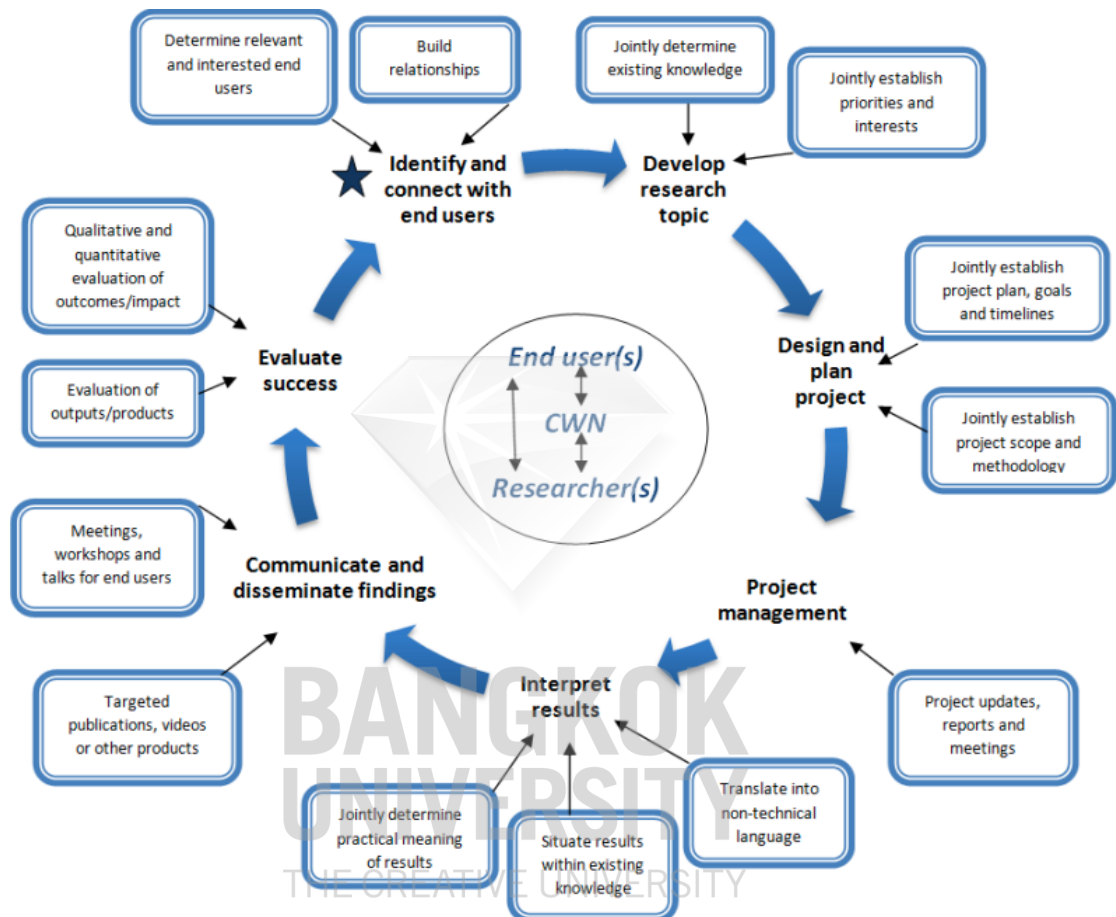


Source: Levin, B. (2004). Making research matter more. *Education Policy Analysis Archives*, 12(56), 1-20.

On the other hand, this model isolates the policy-making context from the practitioner context to address the altogether different purposes, kinds of work, and time periods in the decision making of the two groups, which often need information and training. The KMb/WPS model in Figure 2.2 incorporates the Lavis (2006) research models with Levin's (2004) model, articulating the research production domains as "producer-push efforts," the research use domain as "user-pull efforts" and the research mediation domain as "linkage and exchange efforts" (Cooper, 2016).

### 2.5.3 Knowledge Mobilization Strategy

In this model, knowledge mobilization refers to a process helpful in analyzing research-informed decision-making. KMb techniques, as shown in Figure 2.3, were applied in analyzing the situation of Canadian Water Network (CWN) to understand what the end-users need before making informed decisions and to provide researchers with the tools to respond to those needs.

**Figure 2.3***Knowledge Mobilization Strategy*

Source: Networks of Centres of Excellence of Canada. (2015). *Knowledge mobilization toolkits: Developing a KM strategy*. Retrieved January 15, 2024, from [https://www.nce-rce.gc.ca/AnnualMeeting-ReunionAnnuelle/2015/Presentations-Presentations/NCEKM-RCEMC\\_eng.pdf](https://www.nce-rce.gc.ca/AnnualMeeting-ReunionAnnuelle/2015/Presentations-Presentations/NCEKM-RCEMC_eng.pdf).

The KMb toolkit shares best practices for knowledge mobilization during the research process, from developing a team and project plan to communicating and evaluating success (Networks of Centres of Excellence of Canada, 2015).

When developing a knowledge mobilization plan, a series of questions are asked. The KMb toolkit diagram, regardless of what stage you are in of the research process, generates an effective knowledge mobilization strategy. In this model, the KMb strategy is composed of seven components: (1) identify and connect with end-users, (2) develop research topic, (3) design and plan project, (4) manage project, (5) interpret results, (6) communicate and disseminate findings, and (7) evaluate success. Each component is described below:

#### 2.5.3.1 Identifying and connecting with end-users

An element significant to the success of a knowledge mobilization plan is developing and maintaining a robust and long-term relationship with the end-user-oriented researcher. This is essential as it enables managing of real-world end-user issues and helps provides challenging research questions which need to be addressed. Having a stable relationship assists with evading struggle, and generate trust, and is incorporated to the co-creation of knowledge.

#### 2.5.3.2 Developing the Research Topic

It is important to prioritize the concerns of all interested parties involved, including the end-users, to ensure that potential research topics will satisfy their requirements. In this stage, it may be helpful to identify prior knowledge and proposed research fills.

#### 2.5.3.3 Designing and planning the project

After determining the client's concerns and priorities and establishing ways to meet their needs based on the proposed research topics, there is a need to establish a project plan and discuss its details such as the scope of work, duration, and responsibilities of individuals concerned, allocating funding and resources, and generating a timetable.

#### 2.5.3.4 Managing the project

In this stage, the end-users have to receive regular communication about the project and updates on the progress of the research. Any project changes must be discussed with the partners to ensure that all their goals and needs have been met and to avoid potential conflict in the future.

#### 2.5.3.5 Interpreting results

After data gathering, results have to be interpreted to be aware of the situation and how it matches the context of existing knowledge and resolve the findings of the research.

#### 2.5.3.6 Communicating and disseminating the findings

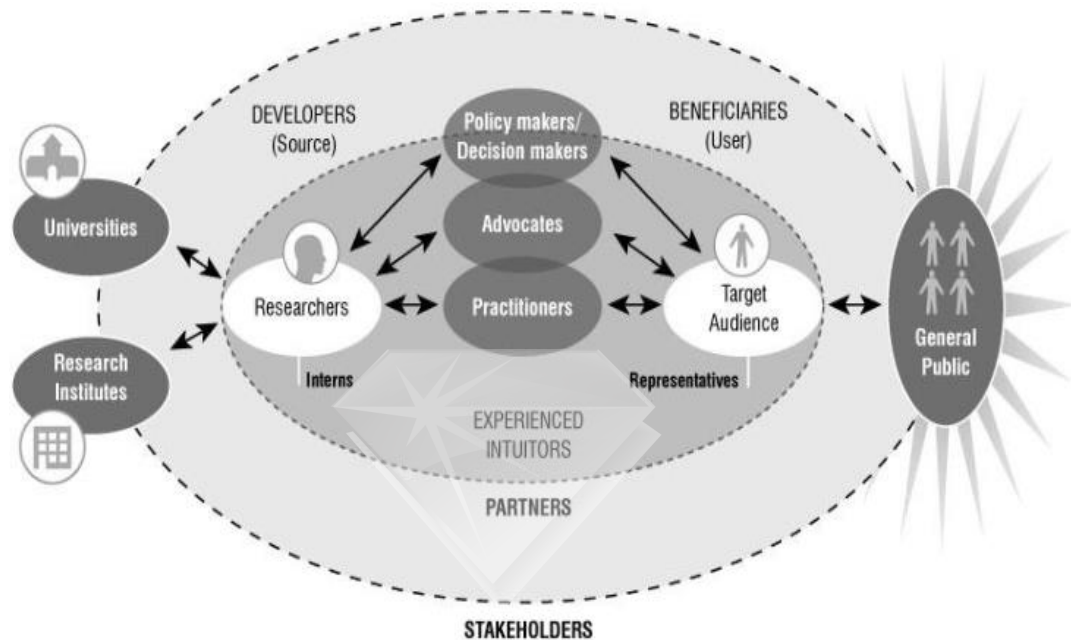
End-users must be consulted, beforehand, to develop a communication system early-on, tailored to their preference in receiving research results. In this way, results can be communicated to them promptly in a manner that they deem best.

#### 2.5.3.7 Evaluating the success of the project

It is essential to evaluate both the scientific and practical impact of the knowledge mobilization project. The focus of evaluation is on project outputs and products as well as succeeding outcomes resulting from knowledge. The outputs are the outcomes that are created to share knowledge (Networks of Centres of Excellence of Canada, 2015).

### 2.5.4 Potential Players

Since knowledge is “context-sensitive and situation dependent” (Bennet & Bennet, 2007), knowledge mobilization is interdisciplinary in various organizations, depending on how it touches the situation or what the stakeholder requirements are. Stakeholders are the actors who have concerns on the project while decision-makers influence the implementation process (Varvasovszky & Brugha, 2000). They include organizations and individuals, as well as different individuals within the organizations. Furthermore, stakeholder-actors, whether experts or with understanding of the problem area, can provide insight in the process (Fournier, 2012). As seen in Figure 2.4, the Potential Players model includes the main participants of the process. The figure shows that although each of the participants has to perform a role distinct from each other, they are still connected as shown by the arrowheads.

**Figure 2.4***Potential Players*

Source: Bennet, A., & Bennet, D. (2007). Context: The shared knowledge enigma. *Vine*, 37(1), 27–40.

In this model, the practitioners, advocates, and policy maker/decision makers are shown at the center between the researchers and the target audience to signify the central role they perform as partners. As such, different levels of interaction and engagement take place between the partners to exchange knowledge - the group of practitioners, advocates, and policy maker/decision makers on one hand and the target audience on the other hand (Bennet & Bennet, 2007). Working with other stakeholders, university- based or research institute-based researchers prepare the basic research that underpins the needs of the community. The general public is referred to in the model as the beneficiaries or users of the knowledge mobilization research result who, while thought of as generally peripheral to the process, play an important part because their receptivity to the research determines the success of the project. A wide-perspective developer generates the research and knowledge necessary to determine the best method in resolving the beneficiary's requirements

with all the stakeholders as part of the knowledge mobilization process. As a whole, all bubbles presented refer to the stakeholders at varying degrees of rank; with the three groups of bubbles representing the three main groups of the knowledge process.

The function performed by the participants is artificially bounded in the knowledge mobilization process, where there are continuous loops among stakeholders. The researchers who are shown on the left side of Figure 2.4 are generally from institutions of higher learning and research-based institutes or organizations. Their principal role is to grasp basic theories, concepts, relationships as well as facets of reality in particular domains, and conduct the research. Their basic knowledge allows them to write about their insightful understanding and conceptual grounding of the KMb process that depends on the researcher's feedback, which either strengthens or adjusts previous research findings. The bottom line of this KMb model is collaborative entanglement, which means "to purposely and consistently develop and support approaches and processes that combine the sources of knowledge and the beneficiaries of that knowledge to move toward a common direction such as meeting an identified community need" (Bennet & Bennet, 2005, p. 48). These include actions and decisions that create value for all the partners and potential partners, whether they are a small group of individuals, a community, or a country.

To cite an example, in the public health organization, the use of knowledge mobilization in action in clinical and policy settings is translating research into practice. The perceptions employed in evidence-based practice include the aspects of diverse cultures and environments of practice in different populations. The application of these ideas usually involves the community and practitioners as an important basis to evaluate their needs, resources, and environments, which can be helped with program planning frameworks and use of local assessment and surveillance data. The results of translating research emphasize the concepts of knowledge production, utilization, transfer, and implementation (Green, Ottoson, García, & Hiatt, 2009).

In academia, knowledge mobilization is a catalyst to improve the educational system. For example, in recent years Poland made significant improvement in the quality of education. Along with this improvement, knowledge mobilization was integrated into the Polish education system to improve innovation in education policies. Embedding KMb in the Polish educational system revealed that there were

remaining substantial weaknesses in such areas as quality teacher training, a focus on past achievements, and a reactive approach. It also enabled the system to better understand when and where knowledge resources were, and that these resources were not consistently distributed and available. It was substantial to be able to assess knowledge disseminated within the organization on various applications such as manuals, pamphlets, books, journals, and publications to make it accessible and create value to the organizations when needed. For the Polish educational system, knowledge mobilization became part of an effective solution to the ailments of the system (Fazlagić & Erkol, 2015).

## **2.6 Knowledge Mobilization Assessment Tools**

The model differs from most other models in giving equal attention to the three contexts or functions that are part of knowledge mobilization. The model also sees research use more as a function of systems and processes than of individuals. Different approaches to understanding research use are often described in terms of a science push model (producers of research try to circulate the results more effectively), a demand pull model (consumers look for research that may be useful), a dissemination model (research is selected because of the wide presence of different formats), and an interaction model (research is used due to chaotic collaboration between groups, therefore both groups influence the use, or lack of use, of research result) (Levin & Copper, 2011; Landry, Amara, & Lamari, 2001).

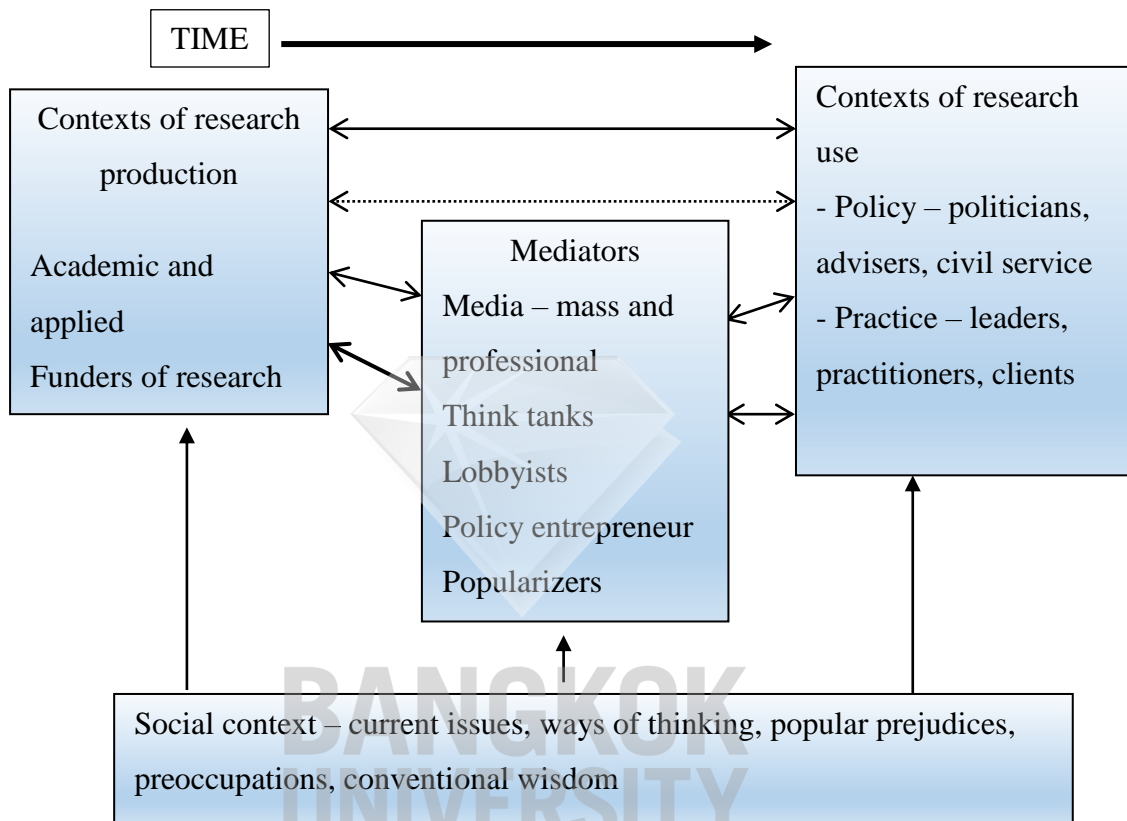
According to Meriam Webster, assessment is “the action or instance of making judgment about something” (“Merriam-Webster Dictionary,” n.d.). Bennet and Bennet (2007) defined assessment as “a process of using measures or indicators to judge progress toward achieving predetermined goals, including efficiency, quality, outcomes, and the effectiveness of specific actions and activities in terms of their contribution to the overall objective. Assessment measures may be thought of in terms of formative and summative (process and outcome); these concepts apply only to the specific project underway, which in a complex setting is only one point of change in a larger journey toward long term community goals.” Aside from effectiveness, other issues that assessment measures addressed are the efficiency and sustainability of research findings implementation.

In the investigation, knowledge mobilization looks at the varied impressions on the nature and function of knowledge mobilization, both of which have numerous real implications. Much argument has been written concerning these various thoughts regarding knowledge and its application. Evidence serves as a helpful qualification. Scientific evidence includes research on effectiveness, implementation, organizational capacity, forecasting, and economic/finance, while colloquial evidence considers expert conclusion, political judgment, qualities, propensities and customs, as well as the specific pragmatics and possibilities of the circumstances. In embracing this center, we perceive that numerous different sorts of knowledge are additionally applicable to policy and practice, and that research findings alone don't give answers to all inquiries regarding practice. Also, the compelling utilization of research can improve proficient status and judgment due to the discoveries that research must be applied in specific settings. That being said, it cannot be denied that a more noteworthy utilization of research knowledge in education can possibly improve educational results in significant manners (Qi & Levin, 2013). Similarly, more empirical knowledge has prompted significant enhancements in different areas; for example, in the field of health. Knowledge mobilization is not identical with research dissemination. Mobilization is beyond dissemination. KMb occurs after dissemination (Levin & Cooper, 2011; Lomas, Culyer, McCutcheon, McAuley, & Law, 2005).

Several KMb models which can help support assessment are introduced here.

#### 2.6.1 Research Impact Mode

A paper for SSHRC (Levin, 2004) built up a model of knowledge mobilization featuring three areas where this work happens. Even after six years, the model is still regarded as sensibly pragmatic as it has been utilized or referred to by a significant number of other researchers, including Nutley, Walter, and Davies (2009) and the European Commission (Levin, 2008b). See Figure 2.5.

**Figure 2.5***A Model of Research Impact*

Source: Levin, B. (2004). Making research matter more. *Education Policy Analysis Archives*, 12(56), 1-20.

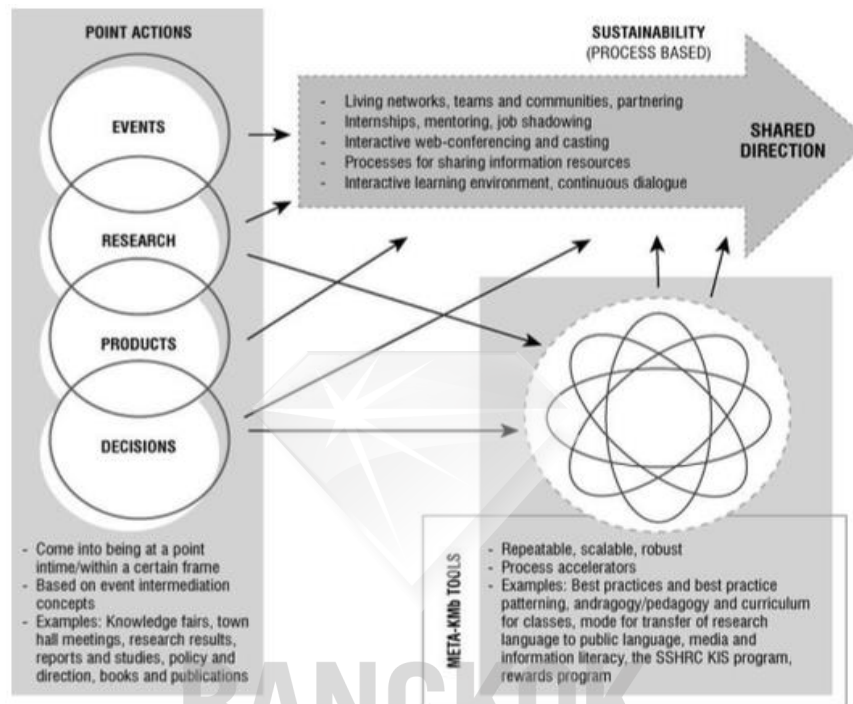
In this model, the contexts of research production and use are overlapping, not separate. Similarly, the boxes in the diagram can also represent functions and processes, not necessarily structures. Arrows represent connections and the varying strength of relationships (as indicated by the two-way arrows of different thickness). Knowledge mobilization occurs when two or more of these contexts or functions interact as seen how people or organizations work in two or even all three of the contexts.

Although some researchers were disappointed and unhappy that their work was not adopted, others have long discarded the idea that their work had direct effects on policy and practice (Lavis et al., 2005). However, several other ideas have become

increasingly well supported by different sources for the last few years. For example, in the International Conference held in Singapore, one of the papers outlined how knowledge is mobilized (e.g., produced, mediated, and applied) to improve policies and practices in education in Singapore. It gives explicit attention to the distinctive institutional connections that link the National Institute of Education (NIE), the Ministry of Education (MOE), and Singapore's school system and their corresponding roles in the increase of a unique connection between research, policy, and practice in Singapore's education system (Teh, Hogan, & Dimmock, 2013, p. 1).

### 2.6.2 KMb Program Activity Model

Bennet and Bennet (2007) described the three categories of knowledge mobilization shown in Figure 2.6 as “events occurring at a specific point in time (point of events), meta-tools, and sustainability.” Points of events are dependent on situations, conscious of the circumstances, and result-based. Some examples of points of events are research, products, and decisions because they take place at a particular moment within a structure. Specific examples are findings of a research, exposition and scholarly treatise, information sheet, blueprint, books and write-ups, knowledge fairs, town halls, symposia, and conferences. KMb meta-tools mirror set design philosophy and potential for resilience because of their ease of use in varied situations and circumstances. To achieve the desired results, a variety of tools used either singly or with others are available. Contractors who were required to create a flexible subsystem to enable them to calibrate their specifications introduced the “set design” strategy in the automobile industry in the 1980s (The Offshoring of Engineering, 2008). A manufacturer might make tradeoffs within specific flexible parameter in designing a product such as making it heavier but smaller, or with greater volume but less power. Meta-tools can speed up the steps or action and they are replicable, upgradable, and powerful. Best practices in using patterning, instruction and curriculum for classes or a model for the transfer of research language are shared.

**Figure 2.6***Knowledge Mobilization Program Activity Model*

Source: Bennet, A., & Bennet, D. (2007). Context: The shared knowledge enigma. *Vine*, 37(1), 27–40.

The continuous use of knowledge mobilization is based on establishing a living network that is fixed on integration and open opportunities on the circulation of ideas, and sharing agreement by way of having a reliable relationship. Examples include iterative education, reciprocal learning environments, and webinar presentations. Groups formed for coaching and work shadowing reinforce continuous sharing of information and resources to be considered part of the sustainability processes.

Each of the three categories in the KMB Activity Model is further explained below:

#### 2.6.2.1 Point of Actions

Point of action as a tool provides a place and space where knowledge can grow. KMB Activity Model, Point Action has six categories:

1) Events refer to face-to-face activities of stakeholder interaction. They are designed significantly to promote the creation of diverse sensory reactions that have more probability of establishing a linking to prolonged recollection; thus, creating more significance. It denotes organizing and setting aside time to develop awareness of unforgettable periods in the form of stories, announcements, awards, demonstrations, humor, etc.

2) Event intermediation refers to the shift from intention to reality of a planned, collaborative event. An intercessor joins pursuers of learning with initiators of learning by presenting, investigating, verifying, redesigning, and transporting information. It is an instrument used to plan and support communities and events as well as facilitates exchange of learning anytime.

3) The KMb Center is a gathering place where project goals are continuously being accomplished and current strategies and ideas are constantly evolving. For example, it can be a workspace which includes a library where partners are welcome to stop anytime, where up-to-date learning resources are kept, and where experiences and best practices are shared in the form of narratives that connect their lives and their world with each other.

4) Published products such as journals, case study, books etc.

At present, there is a proliferation of e-learning professional journals that have become more popular to knowledge seekers because they are more accessible and convenient to use. There is also the current direction toward sharing of copyright with the original contributor upon reuse of the data. The new developments have allowed more extensive use and distribution of research.

#### 2.6.2.2 Meta-Tools

Meta-tools are essential devices or operation used to implement KMb. Generic meta-tools include devices designed especially for the use of KMb which is the topic of several fora and coaching sessions. Meta-devices comprise:

1) Translation. Decision-makers of research projects that could learn from scholarly studies are not usually served by professional journals. Being non-experts and with a focus that is non-scholarly related, they find it a challenge to locate materials in formats that are accessible to them and that could influence them in making informed decisions and actions (Pawson, Greenhalgh, Harvey, & Walshe,

2005). At present, the possibility of research being applied to practice relies heavily on the ability of local stakeholders to grasp easily-understandable research findings.

2) Consulting Services. Offering consulting services is one way in which researchers can connect with local stakeholders and form reciprocal relationships. An instance of this is when university-based researchers engage in designing and developing community projects and initiatives or resolving crises. Indeed, university-based researchers can offer consulting services, especially to implementers of research. Similarly, local stakeholders may reciprocate by offering their services as consultants.

3) Media Production. At present, content-based audio/visual presentations of television or movie programs have become accessible to users who are visually-challenged or hearing-impaired through translation of emotive indicators into animated captions and other technologies that can now be easily accessed.

#### 2.6.2.3 Sustainability Tools

Sustainability tools are in the leading position to over time collect and distribute data that promote the programs and operations needed to apply findings of the research. For instance, IT-based tools that allows sharing of data among partners aid sustainability. These materials help develop confidence and high regard among partners by supporting the formation and development of neighborhood societies based on common goals, ideas, and habits. If KMB is first designed through sustainable relationships, it becomes an influential factor in supporting continuous top-level achievement. Sustainability tools address the following areas:

1) The Living Networks brings knowledge sources and knowledge users together in a shared exchange of plans and beliefs in cyber space. It means repetitive and collaborative discussion composed of varying themes, and individuals but with a determined function and capacity. It can alter the group's number, structure, and system of conveying information, being versatile and resilient to the demands of its members and community. The environment is usually relaxed and casual and is guided by the members' welfare, expectations, and collaboration. Its life span, therefore, depends on the loyalty of its members, as it may even become inactive temporarily but can easily become accessible when a member needs its help. Its purpose is to enable trusted colleagues to provide its members with current

valuable and useful knowledge, ideas, opinions, and suggestions.

2) The repository refers to a network of electronic storage systems full of focused data, research results, and a multitude of relevant materials that cover critical issues such as the kind of information included, the way the context of said information is ensured, the nature, and the manner of the connection. Although the relationship of knowledge-to- people ensures continuity, records found within repositories are also linked to people, whether as authors, proponents, implementers, or intermediaries; thus, connections to them are secured completely in the existing repository.

3) The Living Document. Documents must be able to communicate its trustworthiness and sense of legitimacy. It means the researcher has the responsibility to provide context, identify the suitability of the source, and ensure information is correct and up-to-date. Thus, the following questions may be asked about a document: Is it intelligible? Straight forward? Is it on hand? Can it be implemented? Are new resources or schooling needed to use this material? Is it applicable to the issues? Are there other concerns that need to be addressed?

4) Media and Web Communications. Several years ago, the term “media” referred to learning resources in hard copies. Later, mass media was included. Nowadays, the term refers to information “in the entry or storage of data in a computer, or in the recording of results from a computer” (Llingworth & Daintith, 2001, p. 128). These are collectively described as “output media, input media, and storage media,” even though the difference in the terms may cut across each other in the case of both CDs and DVDs that could perform all three uses.

## **2.7 Knowledge Mobilization in Higher Education Institutions (HEIs)**

As introduced at the beginning of this chapter, the functions of institutions of higher learning in societal knowledge mobilization are critical to “knowledge creation as they remain at the center of the knowledge production system in most societies” (Levin & Qi, 2013). Institutions of higher learning are instruments of crucial importance in providing benefits to society because of the use of conceptual learning (Newson, 1994).

Institutions of higher learning stand between the communities of practice they serve and the national or local governments which provide the funds (Godin & Gingras, 2000). Usually, these universities, together with other relevant organizations, comprise the biggest sole creator of academic investigation.

Academic investigation conducted by higher learning institutions is one of the most powerful arguments to gain the interest of the public. A fully responsive and organized system for conducting academic investigation and producing knowledge offers high value to the name of the institution or country it represents. It is of growing consequence within the emerging knowledge-based society to enable a country not only to create new knowledge, but also to participate in academic and scientific collaboration with other nations (Iesc, 2018). Task Force on Higher Education and Society (2000) explained that “Privately produced and held knowledge, whether based on military secrecy or commercial investment, has a role to play in society. However, basic research and fundamental knowledge generation thrive where new findings are widely shared and are available for testing and refinement within an open forum. Public support of knowledge generation is essential in developing countries. Basic, non-proprietary research can be in any number of institutions (national laboratories, government agencies, and private sector research institutes), but is especially well suited to universities and other higher education bodies. Research universities, most commonly public institutions at least in principle, integrate a number of practices that are highly conducive to knowledge generation. These include ideological neutrality in the selection of research topics, peer review and scholarly publication, close links between research and teaching, and the synergies that result from collecting the full range of disciplines in one institution or integrated system of institutions.”

International links become possible when there exists a secure and robust system of conducting academic investigations on the national level. This will pave the way for the public to enjoy considerable benefits offered by the international community in the form of more windows of opportunities for expertise and reciprocation, aside from protection against bigotry. Furthermore, wide-ranging economic, intellectual, technical, and social possibilities become accessible to many. Universities, particularly those actively engaged in research, are in the position to

promote the smooth circulation of new learning and transmit it in the community once it is introduced. Collaboration between both the faculty and advanced students, and their involvement in international fora and scholarly investigations, must be promoted. Leaders have to take the initiative to eliminate unlawful impediments that hinder the growth of academics, as well as make sure there is a sufficient fund available for their work. Publicly-funded knowledge exchange increases the impact of a country's international status. (Task Force on Higher Education and Society, 2000).

## **2.8 Measuring the effectiveness of Knowledge Mobilization in Higher Education Institutions**

As defined by Bennet and Bennet (2007) in the introduction to 2.6, assessment is the “process of using measures or indicators to judge progress toward achieving predetermined goals, including efficiency, quality, outcomes and the effectiveness of specific actions and activities in terms of their contribution to the overall objective.” In the implementation of research results in the social sciences discipline, research findings can also be validated using assessment measures. Thus, the outcome of implementation may be significantly affected by the design, process, and application of assessment measures. This shows that the concept of assessment can be far more effective than the concept of evaluation since evaluation involves forming an opinion or perception and making decisions, while assessment “is the process of defining, selecting, designing, collecting, analyzing, interpreting, and using information to increase students' learning and development” (Westminster College, n.d.). In the case of formative and summative (process and outcome) assessments, they apply only to the specific project underway, which in a complex setting is only one point of change in a larger journey toward long-term community goals.

Bennet and Bennet (2007) further clarified that “assessment measures are considered standards used to measure success in achieving an identified objective where applicable; they describe the metric that is expected to qualitatively or quantitatively, explicitly or implicitly, indicate progress towards achieving the objective.” Badawy, El-Aziz and Hefny (2018) defined assessment as “a diagnostic tool used in measuring the success of the institution in fulfilling its educational goals that improve student performance.” Assessment measures are applied in research

findings to determine their effectiveness (in terms of input, output, systems, and outcomes), efficiency, and sustainability. “Effectiveness is doing the right or best things while efficiency is doing things the right way by employing the right or best use of available resources; it is the state or quality of being efficient, or able to accomplish something with the least waste of time and effort; competency in performance” (“Efficiency definition & usage examples,” 2020).

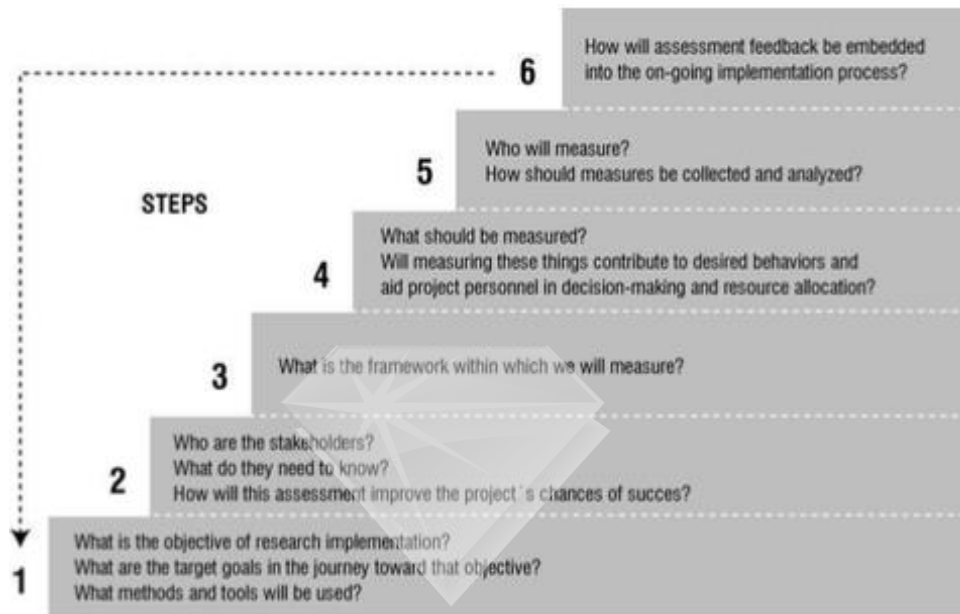
In a nutshell, Bennet and Bennet (2007) described the value of information gathered during the assessment process:

“The process of collecting information that can be used to assess value is inherent in the participatory action research approach. This information may take a variety of forms; for example, observation, level of participation and anecdotes. Both structured and unstructured feedback from the target audience is a source for continuous assessment. A feedback loop can serve as a source of quality control, and can help build understanding of the value of KMb approaches. Virtual resources such as discussion forums and blogs provide on-going opportunities for assessing stakeholder perceptions” (p. 106).

#### 2.8.1 The Assessment Process

**Figure 2.7**

*Representative Questions in the Assessment Process*



Source: Bennet, A., & Bennet, D. (2007). Context: The shared knowledge enigma. *Vine*, 37(1), 27–40.

To begin the assessment process, set clearly the scope and delimitations of the assessment, choose the method of assessment, and use the appropriate assessment measures. One approach forwarded by Bennet and Bennet (2007) is to use a series of questions for each step to guide one during the assessment process.

Figure 2.7 above provides an overview of the types of questions that might be asked at each step during the assessment process.

#### 2.8.1.1 Step One

This step involves identifying the KMb project objectives and target goals along the implementation journey and the methods and tools to be used. This step provides the direction and thrust of the assessment.

#### 2.8.1.2. Step Two

This step calls for identifying the stakeholders – in broad terms, the knowledge developers and the beneficiaries of knowledge; in specific terms, the researchers (in universities, research institutes, etc.), practitioners, advocates, the target audience (the community or a segment of the public), and policy-makers. This step is necessary because this will determine the information the stakeholders need and the project's chance of success.

#### 2.8.1.3 Step Three

This step is about clarifying the framework to be used in the assessment process because this shows that actions to be taken affect the realization of the project's objectives as well as bring about benefits to the stakeholders.

#### 2.8.1.4 Step Four

This step involves identifying the purpose of the assessment and the project personnel's extent of involvement in decision making and revenue allocation. Developing strategies that clearly identify the purpose of the assessment and delineate the roles and responsibilities of all those who are involved in the project translates to having a smooth working relationship and maintain everyone's high morale.

#### 2.8.1.5 Step Five

This step focuses on the project personnel tasked to perform the assessment process from data collection to analysis, and the methodology to be used by the assigned personnel in the analysis and interpretation of data. It implies that expert and qualified practitioners must be assigned in each step of the assessment process to ensure the validity, reliability, and accuracy of the results of the assessment.

#### 2.8.1.6. Step Six

The last step emphasizes the importance of feedback in the assessment process. Insightful critiques that explore the why's and how's of the results are beneficial to the research project and the stakeholders. Thus, assessment feedback should be made an integral of the research implementation assessment process (Bennet & Bennet, 2007).

### 2.8.2 Measuring in Higher Education Institutions (HEIs)

Before the movement of knowledge and its consequent use can be assessed, it is important to first understand that knowledge is being produced in HEIs. There are some existing assessment tools to measure the knowledge produced or the performance of educational institutions.

In almost all HEIs, peer review and accreditation are used to measure their performance (Hazelkor, 2015). Nevertheless, a layperson may find it difficult to understand the result of these tools, thus causing a breakdown of trust with stakeholders (Hilman & Abubakar, 2017).

Another yardstick used by various HEIs to measure and assess performance is quality management practices (Widrick, Mergen, & Grant, 2002). In this regard, there are varying perceptions concerning performance measurement. Several scholars believed that the performance evaluation should reflect a student's related academic achievement only (Cavilla, 2017). However, a larger number of scholars have the opinion that a student's relevant academic achievement is as important as a non-student's relevant achievement (Abubakar, 2017; Ball & Wilkinson, 1994; Higgins, 1989; Hilman & Johns & Taylor, 1990). Examples of non-students include administrators, school personnel, utility personnel, parents or guardians of the students, and non-governmental agencies.

In another research, universities consider teaching assignments and research conducted in performance assessment (Asif, Raouf, & Searcy, 2013; Asif & Searcy, 2014; Abubakar, Hilman, & Kaliappen, 2018; Lukman, Krajnc, & Glavič, 2010). Community service is also seen as a performance indicator to measure university output (Abubakar et al., 2018; Badri & Abdulla, 2004; Nedwek & Neal, 1994). Other common performance indicators identified in other studies are the number of publications, number of citations, impact factor, research funding, degree of co-authorship, h-index, and financial behavior in dealing with revenues generated from consultancies and research projects (Asif et al., 2013; Asif & Searcy, 2014; Kells, 1992; Nedwek & Neal, 1994).

Instruments used in ranking new associations and national universities are now used to regulate the performance of universities to boost their world university ranking (Hilman & Abubakar, 2017). The Times Higher Education World University

Ranking 2016, Quacquarelli Symonds World University Rankings 2016, Academic Ranking of Worldwide University 2016, and Ranking Web of Universities (Aguillo, 2024) are popular organizations that measure and rank the overall performance of universities (Altbach, 2013, pp. 81-82); Hilman & Abubakar, 2017).

There is a metric tool that can also be used to measure the performance of organizations. The Key Performance Indicators (KPIs) refers to a set of quantifiable measurements used to gauge a company's overall long-term performance. KPIs specifically help determine a company's strategic, financial, and operational achievements, viz a viz with other businesses in the same sector (Twin, 2024). According to Badawy et al. (2018), KPIs may also be used to measure academia's performance in recognizing opportunities for improvement and quality costing and comparing the internal and external standards against process control and improvement in benchmarking. Furthermore, to achieve the institution's effectiveness, metric tools like KPIs must be explored to ensure the objectives of the institutions are met (Badawy et al., 2018). In measuring an institution's performance, various indicators are discussed in the study.

To assess the extent of productivity of 59 State Universities and Colleges (SUCs) or Higher Education Institutions (HEIs) in the Philippines from 1999-2003, data envelopment analysis (DEA) – Malmquist Productivity Model and Multi-stage model were used. The study found it disturbing to note that “only six (6) out of 59 SUCs exhibited technological progress while the rest showed technical decline. This made the SUCs or HEIs consider technical progress, improvement of current programs and course wares, and advancement of more technology-oriented structures and procedures to enable them to pursue modernization efforts aggressively and successfully. The inadequacy of innovations in Philippine HEIs implies that the government should provide financial assistance and opportunities to universities to enable them to acquire modern teaching and learning facilities to improve their deteriorating technological performance. Hopefully, the results of this research may motivate the CHED, legislators, and university administrators to adopt measures that will provide more benefits to HEIs in terms of effectiveness and efficiency (Castaño & Cabanda, 2011). A study to assess the efficiency of Philippines SUCs 2007-2009 using data envelopment analysis (DEA) on 78 SUCs has presented scientific evidence

on the inefficiency of the majority of SUCs in the country. As revealed by their efficiency rating, only very few SUCs were found to be effective. The study noted a downward spiral in the number of efficient SUCs between 2007 and 2009. Moreover, the year-on-year average efficiency score of all SUCs is considerably low, which implies that a considerable number of resources could have been retained if only the SUCs had worked efficiently. Furthermore, the productivity gains of SUCs are credited more on technological change than efficiency change, which, unfortunately, has been found to be at a minimum level (Cuenca, 2011).

## **2.9 KMB in Philippine HEIs and PNU and Measuring Tools in HEIs**

The conduct of scholarly investigations in higher education institutions across all fields of study sustains the advancement of the education sector (Commission on Higher Education, 2009). In this light, Republic Act 9647 was passed on June 30, 2009 which declared the Philippine Normal University as a National Center for Teacher Education (NCTE).

As explained in Republic of Philippines (2009), the salient provisions of the said law mandate PNU to:

- 1) Oversee the direction of “researches, case studies, and other methodologies” to strengthen the program of studies for “teacher training, teacher education, and continuing professional education of teachers and academic supervisors,”
- 2) Assist lawmakers in crafting and analyzing legislative proposals regarding “teacher training, teacher education, continuing professional education of teachers and academic supervisors, teacher education curricula, and other issues affecting teacher education,”
- 3) set up an Education Policy Research and Development Office that will (a) lend its research expertise and competence in education research with other Teacher Education Institutions throughout the country, (b) guide government officials in charge of crafting policies and decisions in designing, applying, and assessing reforms in teacher education including the licensing of professional teachers;” (c) provide assistance in evaluating government programs on

education in the form of feedback or recommendations to the government office concerned concerning the different policies and programs on education”

#### 2.9.1 The PNU Research Framework

The Philippine Normal University as a Higher Education Institution is committed to contribute in creating new ideas through Research and Development (R&D) that create an impact on societies. The university has an office of Vice President for Research, Planning, and Quality Assurance, the over-all in-charge of the university's research activities. Under this office is the Research Center for Teacher Quality and Educational Policy Research and Development Center in-charge of managing the University's research. The key result areas to be delivered by offices in knowledge creation and competitiveness are shown in Figure 2.8. The PNU Research Framework is discussed below:

##### 2.9.1.1 Research Advancement and Promotion

This refers to managing all areas related to research development, research grants and contracts, research compliance, technology transfer, and liaison with government, industry, and other partners in support of the University's research production.

##### 2.9.1.2 Innovative Education Research

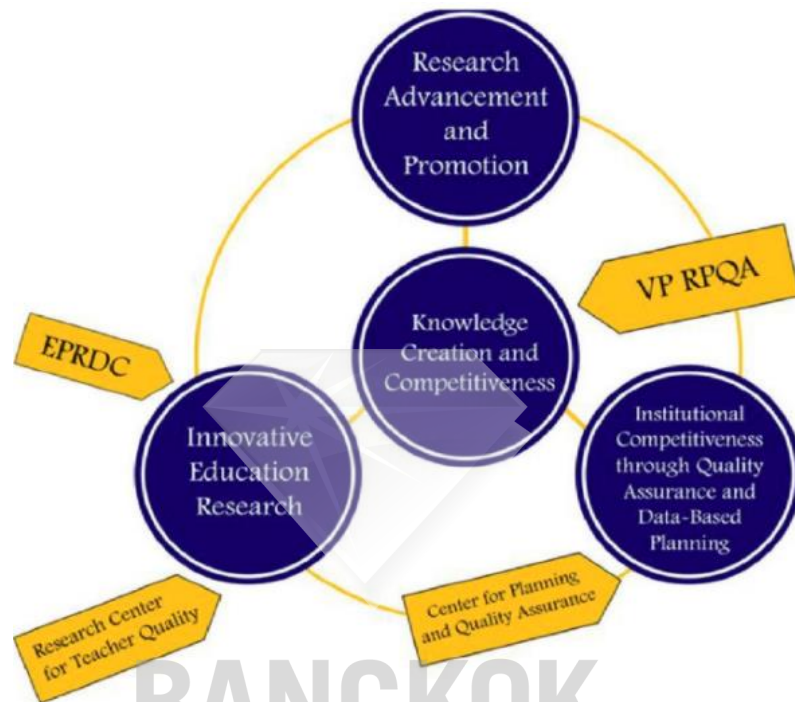
This refers to cutting edge research in teacher education that will define its autonomy, push the frontiers of knowledge, and translate knowledge into policies shaping teacher education in the Philippines and beyond.

##### 2.9.1.3 Institutional Competitiveness

Competitiveness is explored through quality assurance and data-based planning of education policies to serve as a resource to the country's policy makers.

**Figure 2.8**

*Philippine Normal University Research Framework*



Source: Philippine Normal University. (2011). *The PNU's strategic development plan for 2012-2022*. Author.

### 2.9.2 The PNU's Strategic Development Plan for 2012-2022

This plan sets out the University Research Agenda, with the following objectives:

2.9.2.1 Manage challenging academic investigation that will advance the standard of education, especially teacher education in the country and the world.

2.9.2.2 Generate novel concept in education that will earn PNU global recognition.

2.9.2.3 Lend skill and proficiency in educational research to other learners and/or scholars.

2.9.2.4 Furnish the Department of Education (DepEd) and the Commission on Higher Education (CHED) with the necessary data in developing "curricular programs" in basic education and teacher education.

2.9.2.5 Equip government officials tasked to craft educational policies with scientific data to support their preparation of the country's "legislative agenda" in education.

2.9.2.6 Communicate to all its stakeholders all relevant research inputs efficiently in all formats (print, non-print).

2.9.2.7 Create and manage a database of national and international policies and other important information relevant to education in the Philippines, the Asia Pacific region, and beyond (Philippine Normal University, 2011).

As shown in Figure 2.8, of the PNU Research Framework, the Key Results Areas to be delivered by offices in knowledge creation and competitiveness are the following:

1) Research Advancement and Promotion. This refers to managing all areas related to research development, research grants and contracts, research compliance, technology transfer, and liaison with government and industry and other partners in support of the University's research production.

2) Innovative Education Research. This refers to cutting edge research in teacher education that will define its autonomy, push the frontiers of knowledge, and translate knowledge into policies shaping teacher education in the Philippines and beyond; and Institutional Competitiveness through Quality Assurance and Data-Based Planning in implementing and evaluating reforms in teacher education.

In Appendix A, PNU updates the research agenda of the university from PNU-URA (2013-2015) to PNU-URA (2016-2018) to align it with the PNU Strategic Development Plan 2012-2022. Its objective is to update the university research agenda by generating challenging academic investigations to improve the standard of educational system in the country and the world. The PNU-URA (2016-2018) program needs to respond to the new mandates of PNU as the National Center for Teacher Education as provided for in Republic Act 9647 Section 3 C & D and Section 5 D & F. The primary consideration of the new university research agenda is to ensure the responsiveness of its research efforts in harmonization with the university instruction and extension function, and provide clear direction to the goals and objective of the university research.

### 2.9.3 PNU Research Agenda 2016-2018

As shown in Figure 2.8, the PNU research agenda framework emphasizes that research undertakings show vigorous activity and coordination in all areas while operating their services to promote progress in society. In addition, the framework conveys the university's preparedness to be a research-based teacher education university in the 21<sup>st</sup> century. It has a strong work force capable of meeting all challenges, particularly in terms of mobilization of research outputs for discovering knowledge and facilitating innovation.

Based on the PNU's Research University Agenda, the research thrust of the following sectors such as the Philippine Development Plan (PDP), Millennium Development Goal (MDG), Higher Education Research Agenda 2, National Higher Education Research Agenda 2 (NHERA) and PNU's Strategic Development Plan 2012-2022 have been drawn based on the directions of the Commission on Higher Education (CHED) using inputs to instruction, policy impact, research publication, and consumer use.

Republic of Philippines Office of the President (2009) discussed the state policies that support the function of institutions of higher learning to conduct research through the UNESCO World Declaration on Higher Education for the Twenty-first Century which acknowledged higher education institutions as the moving force behind knowledge-based society and are among the important institutions entrusted to create, communicate, distribute, and utilize knowledge. Thus, they play a major role in the country's research and innovation system. Moreover, from the standpoint of education, a strong and top-notch quality research program maintains and sustains a high level of learning environments, especially for graduate and post-graduate programs since it allows the inquiring, analytical, and objective program that improves intellectual capability and promotes knowledge and understanding.

CHED is authorized by law to encourage, manage, and assist institutions of higher education in carrying out their research and instruction duties. Consequently, CHED and partner institutions/agencies established the National Higher Education Research Agenda to empower colleges and universities to generate up-to-par academic investigations that will facilitate the acquisition of knowledge, and promote

national development, as well as provide international comparability of the Philippine higher education system.

The NHERA lays down the plans, guidance, priorities and thrust of Philippine higher education research in the medium to long term. Basically, it strengthens collaboration among HEIs, with members being steered towards a theme they are or can be good at. It encourages alliances of HEIs with other research institutions, both local and foreign, as well as with industry and private laboratories, for the management of research and utilization of research outputs. NHERA also incorporates an honor and award mechanism as motivation for outstanding performance in terms of: (1) Generating state-of-the-art learning; (2) Implementing that learning; and (3) Communicating that learning to stakeholders. The NHERA I covered the period 1998-2008 including extension, while NHERA-2 was for 2009-2018. Programs and strategies under NHERA-1 to boost research capability and productivity among HEIs were continued and new challenges were managed under NHERA 2 so that research outputs of higher education could generate substantial effect not only beyond all fields of higher education but also in the more real-world where socio-economic and cultural factors have an impact on the environment.

These principles are necessary to encourage and mobilize all stakeholders to work toward the accomplishment of their research results. Research results create value for the beneficiaries once new knowledge has been created. However, despite the vigorous efforts of the Philippine Normal University to develop a Research Agenda that will promote the university's research capabilities and fulfill its mandate, there is still no precise mechanism, policy, and assessment tool on how knowledge can be mobilized or research results can be communicated efficiently and effectively to all stakeholders. Hence, an assessment tool is needed to measure improvements of research results of higher education institutions through the lens of knowledge mobilization.

#### 2.9.4 Measuring Tool in Philippine HEIs

In the Philippines, one of the concerns is quality standards for all institutions of education. HEIs need to ensure they adhere to quality education to produce human resources who will respond confidently to the demands of the industry. The current practice to measure the performance of higher education institutions is through the

accreditation process. Accreditation is defined as “a status that shows the public that a school has met and maintains a high level of standards set by an accrediting agency” (“Understanding Accreditation”, n.d.). Furthermore, it is a process of measuring, evaluating, and raising the educational standard of higher education institutions and programs through individual evaluation and colleague judgment (Glavin, n.d.). The following accrediting agencies recognized by the Commission on Higher Education have the mandate to accredit the performance of the HEIs in the private sector:

- 1) Philippine Accrediting Association of Schools, Colleges, and Universities (PAASCU)
- 2) Philippine Association of Colleges and Universities’ Commission on Accreditation (PACUCOA)
- 3) Association of Christian Schools, Colleges, and Universities Accrediting Association Inc. (ACSCU-AAI).

There are four levels of program accreditation in the accreditation process with Level IV as the highest. The accrediting agencies in charge of government HEIs in the Philippines are the Accrediting Agency of Chartered Colleges and Universities in the Philippines (2018) (AACCCUP), and the Association of Local Colleges and Universities on Accreditation (ALCUCOA). There is no standard process in ranking the HEIs in the Philippines; the only factors considered are accreditation, autonomy, and centers of excellence awarded by the CHED. Sometimes the ranking of universities is based on the board examination results from the Professional Regulation Commission (PRC), the governing body that regulates all licensure examinations in the Philippines. PRC ranking on HEIs in the Philippines is based on the number of graduates who passed the exams in their area of discipline (Glavin, n.d.).

According to Conchada and Tiongco (2015), “there is a need to further look into the system of accreditation, its objective, and end goals.” CHED Memorandum Order (CMO) No. 1 (2005) recognizes “the use of voluntary, non-governmental accreditation systems and policies in support of the accrediting agency towards formulating a regulation.” There are four levels of HEI accreditations:

#### 2.9.4.1 Level I

In Level I, the interested universities/institutions need to apply to the accrediting agency. The accrediting agency conducts an on-site visit of the institutions seeking accreditation. If the universities/institutions receive positive feedback, they are granted a Level I accreditation. The findings of the accrediting agency will be endorsed to CHED. Level I accreditation is good for two years.

#### 2.9.4.2 Level II

In Level II, the method of accreditation is similar to Level I, but it is good for three years.

#### 2.9.4.3 Level III

In Level III, the accreditors will look at the outstanding performance of graduates in licensure examinations of the interested institutions, their research outputs, strong network with other schools and agencies, efficient library, community extension program, publications, and an impressive faculty development program.

#### 2.9.4.4 Level IV

In Level IV, the accreditors will examine the peer-reviewed articles and journal publications of the faculty, their internationally acknowledged best practices in teaching and learning methodologies, international linkages, and benefactors and recipients of scholarship privileges both regional and national. Level IV accreditation is comparable to the level of excellence granted to foreign universities (Conchada & Tiongco, 2015).

The accreditation practice of HEIs in the Philippines is based on merit autonomy, with a self-study board appointed by the accreditation agency. The board is asked to fill out a survey form which is based on the framework of the interested HEIs. An on-site assessment by a representative of the accrediting agency is scheduled. During the on-site assessment, five (5) accreditors-representatives will meet initially with the members of the self-study board. These representatives can go around the campus and conduct interviews (based on the survey form) with any member of the institution, e.g., faculty members, students, and employees. After the on-site assessment, the accreditors will meet to discuss their report. The applicant HEI is given a maximum of two years to comply with the recommendations of the accrediting agency until it is awarded the accreditation certificate. The process of

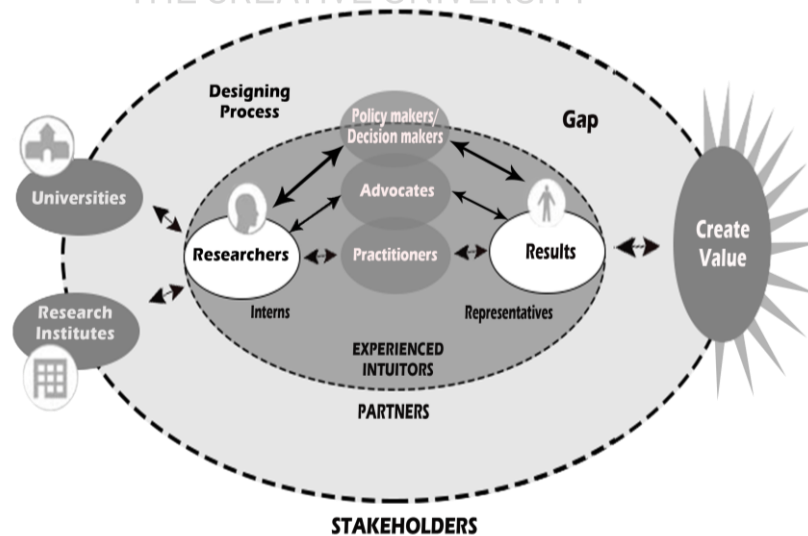
accreditation for Levels II-IV is the same as in Level 1 (Arcelo, 2003). However, based on the interviews with university officials and researchers, there is no standard measuring instrument to correlate the peer-reviewed articles and journal publications of the faculty as well as the research outputs of the HEI to the high level of performance of the HEI.

## 2.10 Theoretical Framework for Research

The development of a conceptual framework inspired by the KMb Generic Model created by Bennet and Bennet (2007) with modifications (used with permission) is a starting point for developing a KMb conceptual model for this study specifically focused on KMb in HEIs. The conceptual framework of the study, which will be developed following interviews with university research personnel (see Chapter 3) will be used as a guide in designing an analytical framework for measuring the effectiveness of knowledge mobilization in higher education institutions. See Figure 2.9.

**Figure 2.9**

*Conceptual Framework*



Source: Bennet, A., & Bennet, D. (2007). Context: The shared knowledge enigma. *Vine*, 37(1), 27–40.

The functions of universities in the knowledge mobilization are essential. As introduced in 2.7, universities play a critical role in creating new knowledge as they are in the enviable position to be at the center of society's knowledge production (Qi & Levin, 2013). This will be considered in the designing process of the analytical framework to examine the current state of knowledge mobilization of research results in higher education institutions. Decision making on the policy impact of research results is essential to improve KMb in educational institutions, obtain research funding, and ensure that industry and other partner stakeholders are able to achieve the benefit of putting that research into practice (Fetalver, 2010; Hénault, 1992; Levin, 2008a). Research output of universities should be disseminated to the consumers to convert it into something useful, thereby creating business value from the research (Leon, 2011 as cited in Lacanilao, 2024; Task Force on Higher Education and Society, 2000). Furthermore, the research output of the university must be published for knowledge to be circulated in the international arena and benefit other researchers (Asif et al., 2013; Asif & Searcy, 2014; Kells, 1992; Nedwek & Neal, 1994). The KMb conceptual framework also acknowledged that bridging the gap on how research results are disseminated to the HEIs provide results that will help solve problems and create value to the stakeholders.

Knowledge mobilization includes all the activities and products created that help ensure research is useful and used. Knowledge mobilization draws from many disciplines and perceptions such as participatory action research, communication, sociology, knowledge theory, usability, education, and psychology (Gatsby, 2016). Knowledge mobilization is to convey existing knowledge into effective use (La Velle & Flores, 2018). Knowledge mobilization strengthens networks concerning research, policy, and practice throughout sectors, discipline, and states (Campbell et al., 2017). It includes efforts to narrow the differences between policy research and practice to improve results. It also contains knowledge sharing amongst research producers such as university, researchers, industry, policy maker, organization, non-government agency and research users, including professionals and communities or others whose work can use from research findings and the assistance of third parties or mediators.

Knowledge mobilization has been used to assess contributions in terms of the findings and implications of empirical work relative to education and other fields (Cooper & Levin, 2010).

The generic KMb conceptual framework will be explored in the areas of potential players (stakeholders), knowledge production, research output, and research utilization.

#### 2.10.1 Potential Players (Stakeholders)

Potential players play a vital role in knowledge mobilization as they are the main participants of the process. Knowledge is context-sensitive and situation dependent. Knowledge mobilization is interdisciplinary in various organizations depending on how it touches the situation or what the stakeholder requirements are. Potential players or stakeholders are the actors who have concerns on the projects. In this study, the potential players are identified such as, university, researcher, community, industry, organizations and non-government agency (Fournier, 2012; Varvasovsky & Brugha, 2000; Bennet & Bennet, 2007).

#### 2.10.2 Knowledge Production

Research production as essential component in this study, creates new knowledge through research as they are in the enviable position to be at the center of society's knowledge production (Qi & Levin, 2013). Research production can be strengthened through the support of the potential players to produce quality research (Philippine Normal University, 2011). Higher education institutions are expected to produce knowledge resources to contribute to the economic growth of the country. The knowledge resources created, developed, and produced by the higher education institutions need to be mobilized and put into action (Bennet & Bennet, 2007; Santos-Rodrigues et al., 2015).

As part of knowledge production, three areas are discussed below: capability building, potential research proposal, and research agenda.

##### 2.10.2.1 Capability Building

To obtain quality research outputs, individuals and organizations must have good education and research capability. It is important that researchers and organizations have competencies to conduct research. Research capability building initiatives develop the skills of individuals and organizations through training,

seminars and workshops, and conferences. Also, it builds up human research to do research activities to produce, create, and generate quality knowledge resources. Capability building strengthens the retraining and retaining of a continuous stream of a new generation of researchers. (Republic of Philippines Office of the President, 2016; Higher Education Institution, 2017).

#### 2.10.2.2 Potential Research Proposals

Potential research proposals prepare future researchers to meet and serve the requirements of the potential players such as university, researcher, community, industry, organizations and non-government agencies. It also strengthens the research program of universities to ensure that knowledge resources will not be wasted but will create value to the stakeholders (Gatsby, 2016; Bennet & Bennet, 2007).

#### 2.10.2.3 Research Agenda

In higher education institutions, it is important to have a plan for research priorities for knowledge production based on the needs of the stakeholders. The university research agenda ensures that the designed research will be of utmost benefit to the potential players (Philippine Normal University, 2011).

#### 2.10.3 Research Output

The research output of universities is a product of knowledge that should be disseminated to the beneficiaries or potential players to convert it into something useful, thereby creating business value from the research (Hénault, 1992; Fetalver, 2010; Levin, 2008a). As part of research output, the following areas are discussed below: formulating policies and guidelines, creating program, and communicating efficiently and effectively.

##### 2.10.3.1 Formulating Policies and Guidelines

Formulating policies and guidelines is an important aspect in research output. Policies and guidelines provide sustainability, priorities, and direction in the dissemination of research output to potential players. Policies and guidelines fortify the implementation of research output to ensure that knowledge generated will be implemented and become meaningful to the beneficiaries (Republic of Philippines Office of the President Commission on Higher Educational, 2005; Republic of Philippines Office of the President, 2009).

### 2.10.3.2 Creating Program

Developing a research program is needed to inform potential players of the research output. Through seminars, workshops, and conferences research outputs create awareness to the potential players on the research outputs being developed by the researchers such as unifying theories and models and new program strategies. Creating a program ensures that research outputs go straightforward back to the society, and they do not become ivory towers (Meek & Suwanwela, 2007; Higher Education Institution, 2017).

### 2.10.3.3 Communicating Efficiently and Effectively

Efficiency and effectiveness are both important elements in communicating research outputs to make sure their benefits and impact are disseminated to potential players (Bennet & Bennet, 2007; “Efficiency definition & usage examples,” 2020).

### 2.10.4 Research Utilization

In this component, the research output is translated to its usefulness for its beneficiaries like industry, community, university, and the rest of the potential players. In addition, monitoring and evaluating its implementation are observed to identify the degree of its impact to consumers and to describe the influence of evidence-based practice to the community and its sustainability not only in the academe but even to the rest of the potential players (Leon, 2011 as cited in Lacanilao, 2024; Levin & Copper, 2011; Landry et al., 2001).

As part of research utilization, the following areas are discussed below: commercialization, extension programs, and monitoring and evaluation.

#### 2.10.4.1 Commercialization

Commercialization in research utilization refers to the transformation of the products for consumer use such as introducing new products or services to the market. Here the generated products and services have value in business and contributes profits (Republic of Philippines Office of the President, 2009; Task Force on Higher Education and Society, 2000).

#### 2.10.4.2 Extension Programs

The extension program in research utilization provides solution to the problems in the community while assessing the implication of the extension program

on the clientele's quality of life or work. It is the institution's way of putting into an evidence-based system all of its extension-related activities to assure the continuous implementation of its extension programs (Accrediting Agency of Chartered Colleges and Universities in the Philippines, 2020).

#### 2.10.4.3 Monitoring and Evaluation

Monitoring and evaluation are important activities in research utilization. It is the best way to ensure that knowledge mobilization is increasing effectively while advancing research standard and influence in higher education institutions (Republic of Philippines Office of the President, 2016; La Velle & Flores, 2018).

#### Statement of Hypotheses

H<sub>1</sub> Research production affects knowledge mobilization

H<sub>2</sub> Research output affects knowledge mobilization

H<sub>3</sub> Research utilization affects knowledge mobilization

H<sub>4</sub> There is a significant relationship between knowledge production, research output, and research utilization

Table 2.1 below presents the summary of the variables in the conceptual model.

**Table 2.1**

*Summary of Conceptual Model*

Variables	Descriptions	References
Knowledge mobilization	1) includes all the activities and products created that help ensure research is useful and used. Draws from many disciplines and perceptions such as participatory action research, communication, sociology, knowledge theory, usability, education, and psychology.	Gatsby (2016) Campbell et al. (2017) Dixon (2002)

**Table 2.1** (Continued)*Summary of Conceptual Model*

Variables	Descriptions	References
	<p>2) Strengthens networks concerning research, policy, and practice throughout sectors, discipline and states.</p> <p>3) Includes efforts to narrow the differences between policy research and practice to improve results.</p>	
Potential Players (Stakeholders)	<p>1) Play a vital role in knowledge mobilization as they are the main participants of the process.</p> <p>2) Refer to the actors who have concerns on the projects.</p> <p>3) Identified such as university, researcher, community, industry, organizations, and non-government agencies.</p>	<p>Fournier (2012)</p> <p>Varvasovsky &amp; Brugha (2000)</p> <p>Bennet &amp; Bennet (2007)</p>
Knowledge Production	<p>1) As essential component in this study, creates new knowledge through research as it is in the enviable position to be at the center of society's knowledge production.</p> <p>2) Can be strengthened through the support of potential players to produce quality research.</p> <p>3) Refers to the knowledge resources created, developed, and produced by higher education institutions that have to be mobilized and put into action.</p>	<p>Qi and Levin (2013)</p> <p>Philippine Normal University (2011)</p> <p>Santos-Rodrigues et al., (2015)</p> <p>Bennet &amp; Bennet (2007)</p>

**Table 2.1** (Continued)*Summary of Conceptual Model*

Variables	Descriptions	References
Capability Building	<p>1) Develops the skills of individuals and organizations through training, seminars, workshops, and conferences.</p> <p>2) Builds up human research to do research activities to produce, create and generate quality knowledge resources.</p> <p>3) strengthen retraining and retaining a continuous stream of a new generation of researchers.</p>	<p>Republic of Philippines Office of the President (2016)</p> <p>IGI Globa (n.a.).</p>
Potential Research Proposal	<p>1) prepares future researchers to meet and serve the requirements of potential players.</p> <p>2) ensures that knowledge resources will not be wasted but will create value to the stakeholders.</p>	<p>Gatsby (2016)</p> <p>Bennet &amp; Bennet (2007)</p>
Research Agenda	<p>1) a plan for research priorities for the knowledge production of research based on the needs of stakeholders.</p> <p>2) ensures that the designed and used of research will utmost benefits of the people.</p>	<p>Philippine Normal University (2011)</p>
Research Output	<p>a product of knowledge that should be disseminated to beneficiaries or potential players to convert it into something useful, thereby creating business value from the research.</p>	<p>Levin (2008a)</p> <p>Hénault (1992)</p> <p>Fetalver (2010)</p>

**Table 2.1** (Continued)*Summary of Conceptual Model*

Variables	Descriptions	References
Policies and guidelines	provide sustainability, priorities, and direction in dissemination of research output to potential players. They fortify the implementation of research output to ensure that knowledge generated will be implemented and make meaningful changes to beneficiaries.	Republic of Philippines Office of the President Commission on Higher Educational (2005) Republic of Philippines Office of the President (2009)
Creating Program	<ol style="list-style-type: none"> <li>1) Informs potential players through seminars, workshops, and conferences.</li> <li>2) creates awareness to potential players on the research outputs being developed by researchers such as unifying theories and models and new program strategies.</li> <li>3) Ensures that research outputs go straightforward back to the society, and they do not become ivory towers.</li> </ol>	Meek & Suwanwela (2007) Higher Education Institution (2017).
Efficient and Effective Communication	The best way to disseminate research outputs while employing available resources in the fastest way to potential players.	Bennet & Bennet (2007) “Efficiency Definition & Usage Examples   Dictionary.com,” (2020)

**Table 2.1** (Continued)*Summary of Conceptual Model*

Variables	Descriptions	References
Research Utilization	Translates research output to its usefulness for its beneficiaries like industry, community, university, and the rest of the potential players.	Leon (2011 as cited in Lacanilao, 2024) Levin & Copper (2011) Landry et al. (2001)
Commercialization	Transforms the products for consumer use thus, bringing new products or services to the market. The generated products and services have value in business and contributes profits.	Republic of Philippines Office of the President (2009) Task Force on Higher Education and Society (2000)
Extension Programs	Provides solution to the problems in the community while assessing the implication of the extension program on the clientele's quality of life or work. It is the institution's way of putting into an evidence-based system all of its extension-related activities to assure the continuous implementation of its extension programs.	Accrediting Agency of Chartered Colleges and Universities in the Philippines (2020)
Monitoring and Evaluation	Ensures that knowledge mobilization is increasing effectively while advancing research standard and influence in higher education institutions.	Accrediting Agency of Chartered Colleges and Universities in the Philippines (2016) La Valle & Flores (2018)

### 2.11 KMb as a Value Chain

The value chain is a significant frame of reference to describe the series of actions that business companies engage in to produce and convey a product or service to the market. First introduced by Michael Porter in his book *Competitive Advantage: Creating and Sustaining Superior Performance* (Porter, 1985), the idea helps institutions identify how their resources can be turned into something tangible and valuable and recognize opportunities for competitive edge.

Knowledge mobilization can be established as a value chain by understanding the different phases and tasks involved in the course of delivering knowledge from research or university setting to actual implementation or practical application. The different stages of knowledge mobilization can be classified into the following categories to be regarded as a value chain:

- 1) Knowledge generation – this is the first stage of knowledge production and may include such activities as conducting studies, needs assessment, or interviews to gather information and insights.
- 2) Knowledge packaging – once data has been gathered, it has to be written and presented in a language and format that can be readily understood by stakeholders. Aside from writing the formal research paper, this may include creating a short video or infographics.
- 3) Knowledge dissemination – To reach a wider range of stakeholders, knowledge has to be disseminated or shared to the intended audience. This can be done in various ways such as in conferences, seminars, journals, and social media platforms.
- 4) Knowledge translation and application - To make knowledge useful and relevant, it has to be applied. This may include implementing new practices, policies, or solutions to solve existing problems or improve processes based on the research findings.
- 5) Knowledge evaluation – An essential component of knowledge mobilization is determining the effectiveness of the knowledge mobilization efforts. This may be done by monitoring and evaluating the outcomes of the knowledge mobilization such as conducting impact assessment or customer satisfaction survey.

Identifying the different steps of knowledge mobilization as a value chain adds worth and practicality to each step and makes it easier to formulate plans and strategies to ensure the successful and effective dissemination, application, and implementation of the knowledge created.



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## **CHAPTER 3**

### **METHODOLOGY**

This study presents the design of an analytical framework for assessing knowledge mobilization in higher education institutions in the Philippines. This section describes the philosophical worldviews that informed the research design and data collection and analyzes the strategies used in order to attain the objectives set for the investigation.

#### **3.1 Philosophical Worldviews**

Pragmatism with elements of social constructivism was used as the basis in creating the analytical framework to assess the mobilization of research results of higher education institutions (HEIs). In research design, pragmatism is a philosophical movement that believes in the practical application of an idea; that is, an idea is satisfactory if it is found useful. Thus, researchers who adhere to this school of thought strive to create knowledge that aims to improve existing practices or conditions or provide practical solutions to common everyday problems or questions. It aims to reduce the gap between theory and practice by coming up with knowledge that focuses on exploration of real-world challenges and problems. It acknowledges the significant roles played by both qualitative and quantitative research methods and mixed methods approaches in conducting researches as they bring out invaluable awareness and perception as well as a more thorough understanding of the research topic which lead to research findings that are practical and useful. Pragmatists-researchers are aware that the practical implications and probable impact of their research on prospective clients take precedence over other elements of their researches; thus, they endeavor to formulate recommendations that are functional and can be applied and accomplished in real-world settings shortly. Also, pragmatism motivates researchers to use the inquiry approach in their research. This entails identifying a specific problem or research question, conducting a thorough literature review, determining the appropriate research methods, and selecting and interpreting the data in regard to the practical implications. Pragmatism also emphasizes the value of actively engaging and collaborating with stakeholders such as practitioners,

community members, and policymakers throughout the research process to ensure the relevance of the research to their needs, the successful implementation of the findings, and its positive impact and clear benefit to their lives (Creswell & Plano Clark, 2018).

Social constructivists believe that individuals seek to understand the world in which they live and work (Creswell, 2014). This perception explains how individuals create knowledge based on differences in cultural backgrounds, experiences, social interactions, and the complexity of nature. Furthermore, individual knowledge creation takes place as that individual interacts in the ecosystem of which he or she is a part.

Following this view, this research was intended to support an analytical framework design that could lead to identifying the current patterns and the potential of HEIs in terms of mobilizing research to achieve effective and sustainable change in society. Knowledge mobilization is necessary as HEIs have a mandate to nurture new knowledge through research and development in order to solve specific issues and address the concerns of the community of which they are a part (Republic of Philippines Office of the President, 2016), adding value where knowledge is situation-dependent and context-sensitive (Bennet, 2019). At present, there are no significant measuring tools to assess the mobilization of research results of universities in the Philippines to determine if they are locally responsive and globally competitive. Thus, this study is of value in providing an assessment measure using an analytical framework.

### **3.2 Research Design**

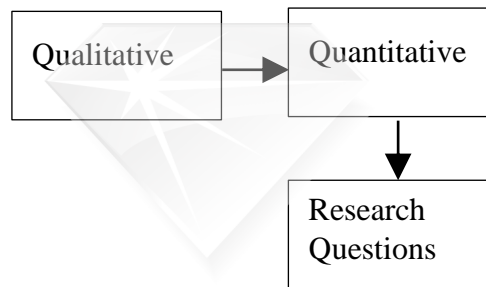
This study employed a mixed-methods research approach to get the feedback from both qualitative and quantitative assumptions when engaged in the study (Creswell, 2014). Building on a literature review of the values added by research results in improving the quality of life, an overview of KMb and various KMb tools, this study was primarily qualitative as it explored what actual researchers and university innovation officials from sampled HEIs had stated about how their research outputs were used and by whom in formulating policies, programs, and other activities to not only improve the quality of education but also had a positive effect on the everyday lives of people, their environments and the economy, and how the

research helped raise the awareness of knowledge mobilization to the stakeholders. The study was also quantitative as the researcher sought to learn the effectiveness of different KMB approaches across different stakeholder groups.

In this study, the exploratory sequential mixed methods approach was applied. See Figure 3.1 below.

**Figure 3.1**

*Exploratory Sequential Mixed Methods*



Source: Creswell, C. (2014). *Research design: Qualitative, quantitative and mixed method approaches* (4<sup>th</sup> ed.). Sage.

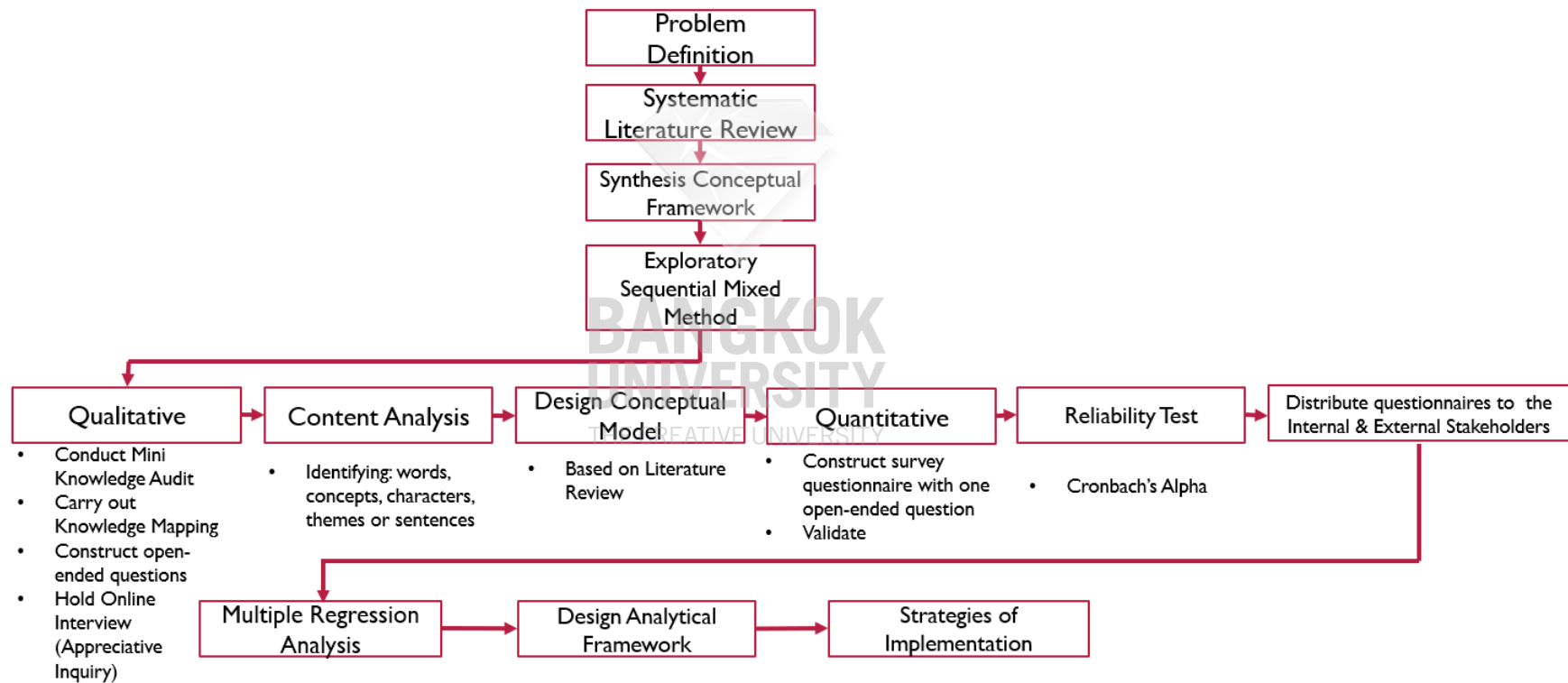
The exploratory sequential mixed methods design started from collecting and analyzing qualitative data to develop a quantitative study. For example, based on the results of the final analysis of the interviews, a questionnaire was developed. In analyzing the results of both instruments together and separately, the qualitative and quantitative data was combined to provide better insight into the research problem (Berman, 2017; Creswell, 2014).

In the figure 3.2 shown an initial step in this study was an expansion of the literature review to include a mini knowledge audit. Since the University had produced a substantial body of research, the researcher performed a “mini knowledge audit” to identify the fields of knowledge of these researches and build an understanding of their potential users or target audience, to help define the larger stakeholder community and current KMB processes to engage them in use of the research.

The next step was to interview core university stakeholders who were involved in the KMb process from selected seven (7) higher education institutions in the National Capital Region. The researcher composed open-ended questions for the interview based on the research focus, the literature review, and the results of the mini knowledge audit conducted. The open-ended questions supported the interaction with the respondents during the interview process, both enabling the participants to follow their thoughts while serving to keep their focus on KMb and the subject of this research. Interviews were facilitated via available online communication platforms like Bluejeans and Skype.

The gathered qualitative data was subjected to content analysis. The results of the content analysis laid the foundation for designing a conceptual model for the KMb analytical framework. This conceptual model was, in turn, the basis for developing a questionnaire for the larger survey process, which reached out to both internal.

**Figure 3.2**  
*Research Process*



University researchers and the larger stakeholder community identified through the mini knowledge audit and the interviews. Survey questionnaires were validated by both content and language experts. The validated survey questionnaires were subjected to a reliability test, with the results of the reliability test treated using Cronbach's Alpha. The quantitative survey questionnaires were distributed to the same seven (7) higher education institutions in the National Capital Regions, Philippines through Internet platform via email, messenger, and other safe means of sending communication in the current environment of the corona virus pandemic. The quantitative data gathered through the survey process employed regression analysis to show the significant relationships of the independent variables to the dependent variables. The results of the regression analysis guided the researcher in designing the initial analytical framework for knowledge mobilization.

### **3.3 Participants**

There were three groups of participants in this study. The respondents of the first interview group were composed of seven (7) research directors from seven (7) higher education institutions (HEIs) or state universities selected to participate in this study. The role of the Research Director was to provide research-based policy recommendations to policymakers. The second groups of interviewees were composed of 14 project research leaders from the same higher education institutions (HEIs) whose research projects in their respective HEIs were either completed or nearly completed. These individuals were all research specialists and part of the university knowledge mobilization process. As introduced in the overview of the process above, this group was asked to answer open-ended questions via online communication due to the corona virus pandemic.

The third group who were asked to answer a survey questionnaire includes both internal (in terms of university personnel) and external stakeholders. The participants for external stakeholders for the survey questionnaire were selected based on their seniority levels. These levels with the corresponding classifications were:

A - Director of Research or Full Professor. This is the single highest grade/post at which research is normally conducted.

B - Senior Researcher or Principal Investigator or Associate Professor. These researchers are working in positions that are not considered as senior or top position (A) but they are still more senior in rank and status than the newly qualified graduates of doctoral programs.

C - Researcher or Investigator or Assistant Professor or Assistant Professor or Post-doctoral fellow. This is the first/post into which a newly qualified doctoral graduate would normally be recruited.

D - M.A./Ph.D. Students or Junior Researchers (without a Ph.D.) These are either students who are pursuing their master's or doctorate degree or those engaged as researchers or researchers working in posts that do not normally require a doctorate degree (UNESCO Institute for Statistics, 2023)

The instrument was made available on the Internet, and an invitation to participate was sent via email, messenger, and other similar means of sending communication following health and safety protocols due to the corona virus pandemic. These participants represented the faculty members and graduate students who were conducting their research in their respective HEIs in the National Capital Region in the Philippines. The criteria in selecting these respondents included their research accomplishments and academic ranking.

The participants engaged in the interview process and the survey process were representatives from seven (7) higher education institutions/state universities and organizations namely: Eulogio "Amang" Rodriguez Institute of Science and Technology (EARIST), Marikina Polytechnic College (MPC), Philippine Normal University (PNU), Philippine State College of Aeronautics (PHILSCA), Polytechnic University of the Philippines (PUP), Rizal Technological University (RTU), and Technological University of the Philippines (TUP). These state universities/higher education institutions are all located in the National Capital Region (NCR). Four (4) of these HEIs are in Manila (EARIST, PNU, PUP, & TUP), the capital city of the Philippines, while the other HEIs are from the neighboring cities (PHILSCA, RTU, & MPC) which are still part of the National Capital Region.

### **3.4 Data Collecting Procedure, Supporting Instruments and Data Analysis**

This study underwent three stages of data collection, namely, the pre-data collection stage, actual data collection stage, and post-data collection stage. The pre-data collection stage included literature review and a mini knowledge audit as the basis for construction of open-ended questions instruments that were used in the interview to generate information on the HEIs perception, knowledge, and practices on the use of research studies.

#### **3.4.1 Pre-data Collection**

Building on the literature review, and expanding it as necessary, the researcher observed the following additional steps in the pre-data collection:

##### **3.4.1.1 Conduct a mini knowledge audit in the HEIs.**

A knowledge audit is defined as an investigation conducted to find out the nature of information an institution has, the identity of the person/s who discovered it, and the manner in which the institution disseminates or uses it. It goes beyond mapping of available information as it is planned to fulfill the needs of an institution; thus, it also includes an evaluation of an institution's level of technology, the manner in which the institution generates and supports efficient sharing of information, and the work ethic and culture of the employees in the workplace (Bennet & Bennet, 2003; Tiwana, 2000). To Davenport and Prusak (2000), a formal probe of knowledge gathered by an institution begins by conducting a survey, which is actually a system that involves pinpointing and clarifying the status of the information in an institution (Davenport & Prusak, 2000; Tiwana, 2000; Zack, 1999).

As part of this study, the data collected from the mini knowledge audit was used to (1) develop an understanding of the knowledge domains of research generated by the universities, (2) identify potential end users of this research, that is, the larger stakeholder group, (3) identify current uses of this research, if available, and (4) explore current KMB processes related to specific identified research.

##### **3.4.1.2 Construct the open-ended questions for the interviews.**

The open-ended questions were based on the research focus, the literature review, and the results of the mini knowledge audit conducted. As noted above, these open-ended questions supported interaction with the respondents during the interview process, both enabling the participants to follow their thoughts while

serving to keep a focus on KMb and the subject of this research.

### 3.4.2 Actual Data Collection

The actual data collection phase included both an interview process (qualitative in nature) and a survey process (primarily quantitative in nature).

#### 3.4.2.1 The Interview Process

The interview is one of the means to capture the views of the respondents, thus allowing an in-depth analysis from a respondent's perspective (Young et al., 2018). In addition, an Appreciative Inquiry approach was engaged throughout the process. According to Hammon (1996), Appreciative Inquiry uncovers the best in people and those around them, a point of view that develops a positive perspective of thinking, seeing, and acting to bring about resolutely a transformation. This approach is significant to and appropriate for this study as the researcher searched for what works in the KMb process and, valuing differences, explored participant views of how to improve the process.

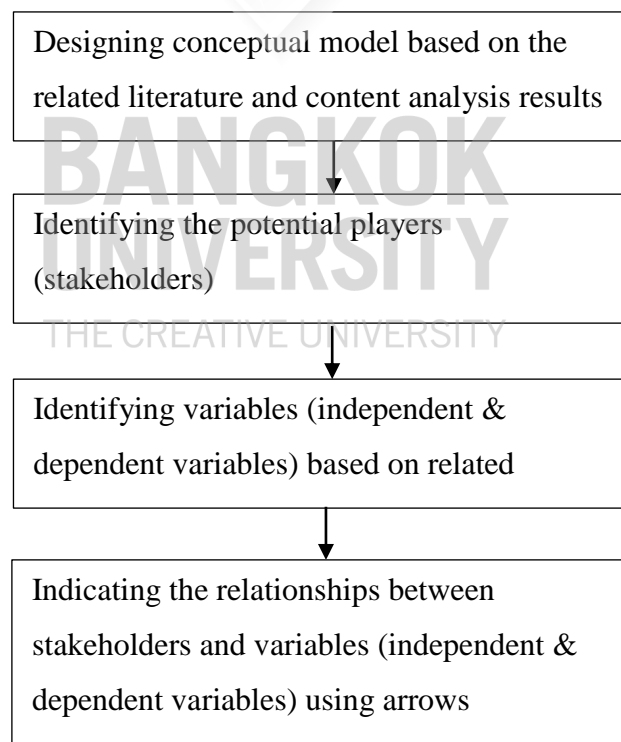
The open-ended questions were distributed during the pre-interview of the 14 HEIs-respondents via online platforms due to health and safety concerns from the corona virus pandemic, and participation releases were collected prior to the interviews. The interviews were facilitated via available online communications platforms like Bluejeans and Skype to gather information about what the respondents' perception on the current KMb process was how research results were being used by the larger stakeholder group, and how knowledge mobilization research results could be assessed.

The qualitative data gathered via online was treated using content analysis. The collection of data gathered from interviews was examined analytically and consistently through content analysis. According to Haggarty (1996), content analysis is a research method which allows the qualitative data collected in research to be analyzed systematically and reliably so that generalizations can be made from them about the categories of interest to the researcher. Content analysis is also used to discover ideas and structures in the study which have been recorded in texts, media, and physical objects (Stroud, Pennington, Cleaver, Collins, & Terry, 2017). In addition, content analysis is an observational research method that enables the researcher to examine the vast amount of word-based information and analytically

identify its properties, such as the presence of certain words, concepts, characters, themes, or sentences. Furthermore, to employ content analysis on a text, the text is coded into categories and then analyzed using the conceptual analysis or relational analysis. If the analysis establishes the existence and frequency of concepts in a text, it is conceptual but if analysis is done by examining the relationship among context in a text, it is relational analysis (Sekaran & Bougie, 2016). In qualitative data analysis, the researcher applied both conceptual and relational analysis. The gathered qualitative data guided the researcher in designing a conceptual model of knowledge mobilization as shown in Figure 3.3 below.

**Figure 3.3**

*Guide in Designing the Conceptual Model*



#### 3.4.2.2 The Survey Process

Creswell (2014, p. 201) notes the importance of the survey process as it “provides a quantitative or numeric description of trends, attitudes, or opinions of a population by studying a sample of that population” to enable the researcher to form

generalizations or draw inferences to the population.

In this study, following an analysis of the interviews and after designing the conceptual model, the researcher constructed a survey questionnaire. The questionnaire was primarily quantitative in nature, using a five-point Likert scale, and included one open-ended question to find out if the design of the conceptual model was appropriate and effective for assessing KMb in HEIs.

The survey questionnaire was validated by one content expert and one language expert whose competence in the field of knowledge mobilization and languages, respectively, was recognized. The validated survey questionnaire was subjected to reliability tests before using it for data collection. To test the reliability of the internal consistency of the survey questionnaire, Cronbach was utilized. Cronbach's alpha "is a measure of internal consistency, that is, how closely related a set of items are as a group" ("What does cronbach's alpha mean?", n.d.).

The survey questionnaire was distributed to both internal and external KMb stakeholders. Participants included respondents from each of the same seven (7) HEIs according to their seniority levels who were not be part of the interview process.

In this study, the statistical tool used was Regression Analysis for the quantitative data gathered, while for the qualitative data which was three (3) open ended question, content analysis was used. Regression analysis "is used in a situation where one or more metric independent variable(s) is (are) hypothesized to affect a metric dependent variable" (Sekaran & Bougie, 2016, p. 312), Thus, regression analysis is a measurable technique that allows us to look at the connection between two or more variables which have an impact on a topic of concern. There are two types of regression analysis; namely, (1) linear regression, which represents the equation in a straight line and (2) multiple regression, the extension of linear regression where there is one or more independent variable to explain the difference in the dependent variables (Sekaran & Bougie, 2016). In this research, multiple regression analysis was utilized because more or one independent variable had an effect on the dependent variable, as shown in Figure 3.4. In addition, it was observed that there were direct relationships between the independent variables to the dependent variables. It meant that changes that took place in the independent variables (whether positive or negative) had an impact on the dependent variable.

The results of the multiple regression analysis together with the results of the open-ended question treated through content analysis guided the researcher in designing the initial analytical framework for measuring KMb in higher education institutions.

#### 3.4.3 Post-Data Collection

Post-Data Collection included designing the initial analytical framework. The design process of both the conceptual framework and the initial analytical framework is discussed in 3.5 below.

The initial Model created was based on the consolidation of the results of the qualitative interview process and the quantitative survey questionnaire process as well as the review of related literature.

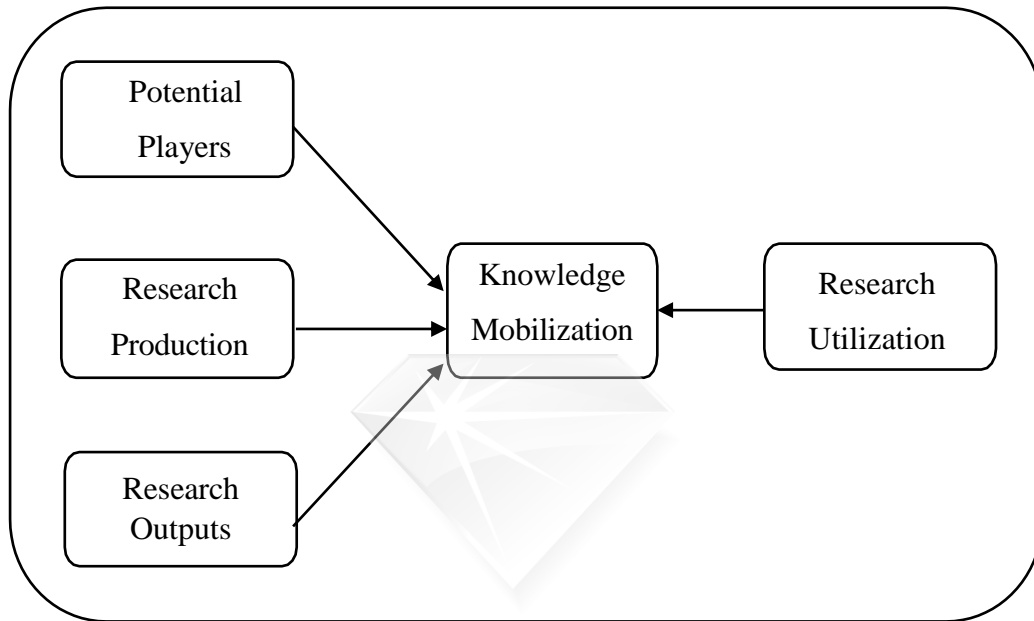
A conceptual model of KMb was developed following the interview process as explained above. The initial analytical framework was designed following the survey process. Each of these is detailed below.

### **3.5 Design of the Conceptual Model for KMb**

A conceptual model of KMb was developed following the interview process as explained above. The initial analytical framework was designed following the survey process. Each of these is detailed below.

#### 3.5.1 Design of a Conceptual Model for KMb

A conceptual model, as presented in Figure 3.4, helps to identify the variables and clarify the connections and relationships among them, and thus provides a clear understanding of the structure of the ideas. It helped the researcher to organize and explain the ideas discussed in the literature review.

**Figure 3.4***Initial Conceptual Model of Knowledge Mobilization*

It simplifies the theorized connections between the concepts in the model, helps the readers visualize the concepts easily, as well as provides a quick idea on the different ways available to solve the problems (Sekaran & Bougie, 2016). The model illustrates the main participants (potential players), the components of knowledge mobilization, and the relationships of the variables and ideas explored and analyzed in the study. It illustrates that the independent variables, namely: potential players, research production, research outputs, and research utilization influence the dependent variable, which is knowledge mobilization. Some variables interact with each other to show that knowledge mobilization is a collaborative entanglement.

This initial conceptual framework, which emerged from the literature review, was revised as appropriate from what was learned during the interview process, and that revised model was used to help develop the survey questions.

### 3.5.2 Initial Design of the Analytical Framework

A theoretical (analytical) framework illustrates the researcher's view on "how certain phenomena (variables or concepts) are related to each other (model) and an explanation of why the researcher believes that this variable is associated with each

other (a theory) with both the model and the theory moving logically from the documentation of previous research in the problem area” (Sekaran & Bougie, 2016, p. 72). There are three processes involved in developing the theoretical framework:

- 1) Introduce the definitions of the ideas or variables in the model.
- 2) Provide a descriptive representation of the theory in the developed conceptual model.
- 3) Establish the connection between the concepts or variables in the model into theory (Sekaran & Bougie, 2016).

In the theoretical framework, testable hypotheses can be established to examine whether the theory is valid or not. A variable refers to a thing that has different values that may also be varied at different times for the same object or person. The dependent variable is the main interest to the researcher. It is examined as a workable factor. Dependent variable can be analyzed, quantified, and measured. Independent variable is one that affects the dependent variable either in a positive or negative way. When an independent variable exists, the dependent also exists. There are always connections between the independent variable and dependent variable. Anything that occurs in the independent variable causes changes in the dependent variable with the essential requirements enumerated as follow: (1) the dependent and independent variable are correlated to each other; (2) the independent variable is the reason for the dependent variable to undergo changes; (3) only the independent variable affects the dependent variable; (4) a theory is a requirement and it discusses why the independent variable affects the dependent variable (Sekaran & Bougie, 2016).

Designing an analytical framework to assess research mobilization in Philippine HEIs was conducted on different levels. It started by presenting the definition of the variables in the model; then, designing a conceptual model to have a descriptive representation of the logical explanation; and lastly building up a theory that delivered discussion for connections between the variables in the model.

A review backed up probable data gathered from all stakeholders of the HEIs according to their first-hand knowledge, realization, and experiences in conducting research. The analytical framework established the significant groups and probable secondary groups that were used in the application of the research results subject to

sources the literature revealed. Analytical frameworks are intended to develop a systematic investigation and aid objective reasoning. They are models that are meant to direct and give meaning to experience and perception in visual productions. An analytical framework is essential because it considers what the groups presented objectively - classifying the indicators, sources, units of analysis, and data collection techniques (“What is analytical framework”, n.d.). It is used to establish, sustain, and assist in the classification, investigation, and accumulation of information by determining the critical diagnostic outputs and features at each step of the inquiry. It also offers a data collection and classification strategy and functions as an instrument and vehicle of communication for cooperation between actors. It can be utilized to benchmark data gathered throughout the process, determining which can be used or discarded (Chataigner, 2017).

Five stages in framework analysis were used in creating an analytical framework design for KMb - familiarization, identifying the thematic framework, indexing, charting, and mapping and interpretation.

3.5.2.1 During the familiarization stage, the researcher became acquainted with the data and early concerns and issues. This enabled the researcher to recognize the individual differences that might be intrinsic in notes and recordings taken but could sometimes get missing when encoding of the data began. The “process of sensitization” to these individual differences also allowed the researcher to recognize better the differences “within- and between-differences.”

3.5.2.2 Identifying the thematic framework is commonly referred to as ‘coding’ in other qualitative methodologies. This mainly involves identifying the essential ideas, issues, or discussion points established in the notes or recordings. It is a designation that best satisfies the nature of the idea or issue being explored.

3.5.2.3 Indexing refers to the step of numerically clarifying notes and recordings taken to identify commonalities among them in order to develop later the coding framework. To tweak this step, all the word codes (as opposed to numerical) that had been collected during stage 2 were listed separately with codes that shared uniformities classified together under a suitable name.

3.5.2.4 Charting is the process of reorganizing the data collected and the thematic framework to provide organization and structure, very much like the “iterative principle of grounded theory.” The purpose of charting stage is to systematize the data into a more as format to facilitate data analysis in the next state of framework analysis. It includes summarizing the indexed data for each category, and organizing the summaries in chart form.

3.5.2.5 Mapping and interpreting refer to reporting in pictures or graph forms all the ideas collected and examining how each of the ideas links to each other. This comprehensive investigation of the “iteratively developed and revised thematic framework” provides a more coherent perception and interpretation of the overall view.

### **3.6 Scope and Delimitations**

At present, Higher education institutions (HEIs) in the Philippines number 1,943 comprising of 233 state universities, colleges and polytechnics managed by either the national or local governments-and 1,710 private universities. However, in this study, the HEIs which were selected as subjects of the study are all managed by the national government and located in the National Capital Region (NCR), the most urbanized region in the country. With the exception of one HEI, the rest are mandated as science and technology institutions. Dr. Ronald Vatananan-Thesenvitz

### **3.7 Ethical Consideration**

The respondents from both interviews and questionnaire survey in the selected higher education institutions from whom data was collected were all assured of anonymity following the provisions of the Data Privacy Act 2012 of the Philippines. They were told they were free not to answer the data collection activities if they did not conform to the interview and survey questionnaire.

## **CHAPTER 4**

### **DATA COLLECTION AND ANALYSIS**

#### **4.1 Introduction**

This chapter describes the actual processes undertaken by the researcher to collect data from the participants and the findings of the research based on the methodologies applied to gather information. Two sets of interviews were conducted for this study. The first interview was of the seven (7) research directors (RD) of seven (7) Higher Education Institutions (HEIs) to obtain a mini knowledge audit. The second interview was of the 14 project research leaders (PRL) from the same HEIs whose research projects were either completed or nearly completed to conduct knowledge mapping. The mini knowledge audit was used to identify the knowledge domains in the study, determine the end-users of the universities' research outputs, establish the current users of the research, and determine the current processes on knowledge mobilization of the subject universities and colleges. Additionally, a knowledge mapping tool was utilized to make an inventory of the information the institution had.

The researcher developed open-ended questions to explore how researchers and university officials had actually utilized the research outputs of their institutions for the benefit of their stakeholders. The insights of the participants, aside from pragmatism worldviews as discussed in Chapter 3, led to the development of open-ended questions for the qualitative data. The qualitative data gathered was also used as a guide to develop external and internal knowledge mobilization conceptual model designs. From these models, the researcher constructed internal and external survey questionnaires which were distributed to the internal and external stakeholders of the same seven (7) HEIs composed of another group of researchers by seniority levels who are Full Professors, Senior Researchers, Principal Investigators, Associate Professors, Researchers, Investigators, Assistant Professors, Post-doctoral fellow, M.A./Ph.D. Students, Junior Researchers (without a Ph.D.), faculty researchers, and graduate students conducting research.

This valuable information from various sources and participants enabled the researcher to design a framework for measuring knowledge mobilization effectiveness in higher education institutions in the Philippines.

#### **4.2 Directors of Research Institutions' Interviews**

As detailed in the research design, the interviews were conducted in two phases. At the start of the process, the researcher sent letters to the Presidents of seven (7) Higher Education Institutions (HEIs) located in the National Capital Region (NCR) requesting permission to conduct an interview via online platforms like Zoom with the research director of the institution. These HEIs are Eulogio “Amang” Rodriguez Institute of Science and Technology (EARIST), Marikina Polytechnic College (MPC), Philippine Normal University (PNU), Polytechnic University of the Philippines (PUP), Rizal Technological University of the Philippines (RTU), Philippine State College of Aeronautics (PHILSCA), and Technological University of the Philippines (TUP). The objective of these interviews was to help identify, in conjunction with the mini knowledge audit, what knowledge was produced by the institution through research, who originated it (contact points for follow-on interviews), and from their viewpoint how and to whom it was distributed and shared, and who made use of it, pertaining to both the private and public sectors in academe and businesses. Knowledge mapping, as described in the literature review, is a strategy taken when making a record of critical information produced by an institution.

The researcher requested thirty (30) minutes for each of the participants during the interview process, which time allotment proved appropriate. Below is Table 4.1 showing the period spent in interviewing each of the directors of the research institutions:

**Table 4.1***Summary of Interview Time with Directors of Research*

Director of Research Institutions	Period of Interview (min:sec)
Eulogio “Amang” Rodriguez Institute of Science and Technology (EARIST)	15:06
Marikina Polytechnic College (MPC)	14:48
Philippine Normal University (PNU)	26:24
Polytechnic University of the Philippines (PUP)	30:29
Rizal Technological University of the Philippines (RTU)	23:58
Philippine State College of Aeronautics (PHILSCA)	16:20
Technological University of the Philippines` (TUP)	26:56

The Research Directors of the seven (7) HEIs (herein referred to as RD1 through RD7) suggested that their function included, but was not limited to, managing, monitoring, and disseminating the research projects and research results of their respective universities to their internal and external stakeholders. RD1 provides another facet to the functions of a university research director when s/he admits revising his/her university’s research policies to increase its research outputs. On the other hand, RD5 shares that “We are in the process of reviewing them [past researches] to determine how we can enhance them to share the results with the community so they can be utilized.”

#### 4.2.1 Specific Knowledge Domains of HEIs Research Outputs

All seven (7) Research Directors (100% of interviewees) emphasize that the knowledge/research results produced by their respective HEIs focused on the mandates of their universities. The areas of these mandates are clarified through the knowledge audit (see 4.3 below).

Among the specific knowledge domains that have been the focus of the HEIs are science and technology, specifically on the national harmonized agenda of the Department of Science and Technology (DOST), industrial technology, knowledge that would further develop and enhance technologies such as the application of the

Internet of Things (IoT), and the sustainability of technologies such as food technology. Other knowledges produced are basically in the aviation field; education in general; teacher education and teacher technical education and skills development (TESD) in particular; and professional, scientific, technological, and special instructions in the field of engineering and technology, education, sports, business and entrepreneurial technology, and liberal arts and social sciences.

#### 4.2.2 Distribution of Research Outputs

The following offices receive the HEIs' research outputs as enumerated by all seven (100%) of the interviewees: (1) Office of the University President; (2) Research and Extension Office of the university; (3) Commission on Higher Education (CHED); (4) Department of Education (DepEd); (5) Congress of the Philippines; (6) Philippine Senate; (7) Department of Budget and Management (DBM); (8) Department of Science and Technology (DOST); and (9) National Library of the Philippines.

Several interviewees cited additional distribution. For example, RD1 stated that his/her office was required to submit their university's accomplishments, projects completed, and research papers published to the Department of Budget and Management (DBM) and the Philippine Senate. RD4 shared that all research outputs of his/her university—whether these were research completed, publications, or policy briefs—were sent to high government officials like those in the Senate Committee on Education, Congress (House) Committee on Education, CHED, and DepEd through email and print copies through a courier service, Luzon Brokerage Company (LBC) express, because these are the government institutions that will find the university's researches to have implications to policy about education in general and teacher education in particular.

RD6 confirmed his/her office had compiled a list of researches while RD5 had copies of research proposals approved by the Board of Trustees (BOT). These had been uploaded in the university's website which was being updated.

Every year the HEIs produce their own Annual President's Report. One of the major components of this document is a report on completed research, published research, and funded research. The Annual Reports of the Presidents of the HEIs are distributed to their external stakeholders to showcase the university presidents'

achievements over the course of the year. These HEIs have their respective Research Office and Extension Services Office under their Vice President for Research. The Research Office supervises the research produced by the universities while the Extension Office is in charge of documenting the research outputs, identifying the gaps which can be addressed by the universities, and disseminating research to potential players. The HEIs are required to submit their research outputs to CHED, DBM, Congress, Senate, and DOST, the government agencies tasked to oversee that the HEIs are addressing the mandated areas of their specified knowledge domain (4.3).

#### 4.2.3 Dissemination of Knowledge/Research Results to Internal Stakeholders

In all the schools (100%), the knowledge/research results of the HEIs are disseminated to internal stakeholders composed of undergraduate and graduate students, faculty members, administrative staff, academic council, administrative council, and the Board of Regents/Trustees. The following methods are used for distribution:

##### 4.2.3.1 Printed Form:

- 1) Publication in reputable international refereed journals;
- 2) Publication of a compendium of abstracts of students and faculty researches;
- 3) Distribution of printed copies to other colleges, administrative council, academic council, and specific offices and officials;

##### 4.2.3.2 Formal Reports:

- 1) Submission of reports to the Administrative Council and the Academic Council regarding the status of the different research projects including completed research projects for the year;
- 2) Presentation of the annual research outputs.

##### 4.2.3.3 Digital Format:

- 1) Uploaded on the virtual research portal of the institutions and social media (Facebook page of the institution);
- 2) Creation of a website where all activities related to the research undertakings of the HEIs is uploaded;

3) Dissemination via institutional emailing system to the students, faculty and staff;

4) Circulation of university memoranda to disseminate action researches that is relevant to policy making;

#### 4.2.3.4 Events:

1) Conduct of Annual Presentation of Research Outputs covering the presentation of research and extension outputs, Annual Research Colloquium, Internal Research Congress for undergraduate students, graduate students, and faculty members and Students' Congress where students were invited to present their research outputs;

2) Conduct of Pathways to Journal-Refereed Publications to disseminate research results to all members of the faculty and assist them in developing their own research.

3) Assignment of Faculty Researchers to help faculty members present their own papers and publish their works in international refereed journals or Scopus-refereed journals.

Several interviewees provided examples of how they distributed research results to internal stakeholders: RD5 shared that the university had a research journal and that action research relevant to policy making was disseminated to their internal stakeholders through memos and their offices were provided with copies of a Customer Satisfaction Report. S/he added that his/her office had been planning to hold a Students' Congress where their students would be invited to present their research results. RD2 stated that their internal stakeholders were provided hard copies of their university's research reports.

RD6 explained his/her university had conducted Research Colloquia and a Research Congress for their graduate, undergraduate students, and faculty. They also submitted reports to the Administrative Council and the Academic Council regarding the status of the different research projects as well as finished research projects for each year. Similarly, RD1 stated that his/her university had conducted the Annual Presentation of Research Outputs (APREO) for the presentation of research and extension outputs by faculty researchers of the university from all of their multiple campuses.

RD3 shared that his/her university holds a Colloquium where all researches produced for that year and presented in different international conferences are discussed. Furthermore, they had created Pathways to Refereed Journal Publication, a strategy of its Research Management Office under the OVP, to disseminate all research results to all the members of the faculty with the possibility that they might be able to use it or it might help them develop their own research. The papers of the faculty members that would be submitted under Pathways would be assessed by evaluators; if their papers pass, the office would provide them assistance in improving their papers and getting them published. They would also be given the chance to disseminate their research results in the form of a paper presentation under Resounding. The university had also created Pathways to Citation to assist their faculty members in increasing the citations of their papers. On the other hand, RD4 acknowledged that although his/her office was supposed to manage/ monitor and thus disseminate all research projects of their HEI, there were projects that were not reported to his office; their dissemination was done individually depending on what their unit was capable of, such as sharing their research among themselves, or sharing the link in their Facebook, even sharing the copy openly in their Facebook.

Indeed, as discussed by Krikorian and Kapczynski (2010) in Chapter 2, new knowledge created can grow better when they can easily be accessed in a respectful and harmonious work environment.

“Conversely, RD4 remarked that not all researches can be shared:

There are researches that are still awaiting publication; when they get published, they become confidential due to the funding. Not all have open access to published research. We disseminate those with open access through our Facebook page or through email.”

#### 4.2.4 Dissemination of Knowledge/Research Results to External Stakeholders

There is a diversity of responses regarding dissemination of research results to external stakeholders. For example, RD4 stated that his/her university disseminates their research results to external stakeholders in digital format through the HEI's Research Portal or by email and printed copies through a courier service for concerned government agencies such as the Senate, Congress, Commission of Higher

Education (CHED), or Department of Education (DepEd). Similarly, RD2 stated that his/her university provides hard copies of their research results to their external stakeholders to give them equal importance as their internal stakeholders.

RD6 mentioned that their faculty is encouraged to present their research outputs in different research consortia and research conferences. At the same time, they are given incentive grants for their research presentations and publication.

RD1 and RD6 explained that their HEIs encourage them to publish their research outputs in highly reputable CHED-accredited journals while RD7 stated that their research results are submitted to their library which then share copies of these with other universities and colleges. Their HEI has a Library Exchange Program that includes exchange of journals with other institutions.

RD1 shared that interested industry representatives are usually the ones who approach and partner with their university. They set up meetings with the university to find out which of the research outputs or projects could be of use to them. If they are not interested in any of these projects or researches, they will suggest or introduce topics that interest them and the university evaluates its capability to pursue these topics. Further, RD1 outlined the process flow of projects observed in his/her university starting with a project proposal, followed by conduct of the research, then validation of the results. If the results were satisfactory, then the particular project or research would be turned over to the Extension Department who would bring it to the beneficiary of the project. For example, if the beneficiary of the project was a mushroom farm, then the Extension Department would ensure that a mushroom farm would be the one to use the technology. The beneficiary of the project had to sign a Memorandum of Agreement (MOA) with the university. Among the terms of the agreement was for the beneficiaries to report or give their feedback about the benefits they gained from the technology of the project/research.

RD5 admitted that s/he had no knowledge of dissemination of research results to external stakeholders because s/he had not experienced it yet. However, his/her office was planning to hold a Forum for their external stakeholders.

To sum up, the knowledge/research results of the HEIs are generally disseminated to the external stakeholders who are composed of fellow members of the institutional consortium, community constituents, industries, the Department of Education (DepEd), Commission on Higher Education (CHED), Congress (House Committee on Education), Senate (Committee on Education), Department of Science and Technology (DOST), Local Government Units (LGUs), Barangay, Non-Government Organizations (NGOs), and Private Universities, through the following:

#### 4.2.4.1 Digital Format:

- 1) Posting in institutional social media platforms such as Facebook page;
- 2) Creating an online database where one had only to subscribe to other online databases linked together in order to view it;

#### 4.2.4.2 Printed Form:

- 1) Sharing the results output with other HEIs and research journals of fellow members in the institutional consortium;
- 2) Exchanging research journals with other institutions through the Library Exchange Program;
- 3) Publishing in reputable CHED-accredited and international refereed journals;
- 4) For government agencies, disseminating the printed research outputs through a courier service such as Luzon Brokerage Company (LBC);

#### 4.2.4.3 Events:

- 1) Signing of Memorandum of Understanding that eventually led to the signing of Memorandum of Agreement (MOA) with external stakeholders;
- 2) Holding institutional webinars to the clientele;
- 3) Presenting in research consortia, in local and international research conferences;
- 4) Inviting external stakeholders to a presentation of the university research output and discussing with them appropriate outputs for their use.

RD4 summed up the importance of knowledge dissemination with the statement:

“Research results should be widely disseminated and distributed, especially to the stakeholders who might be able to pick up something from these researches, whether they are research chairs or not.”

The same sentiment was echoed by RD7 when s/he said, “We should measure its impact to the stakeholders, not the number of publications.” See Table 4.2 below for an outline of the methods HEIs used in distributing the research results to their internal and external stakeholders.

**Table 4.2**

*Methods HEIs Used to Distribute their Research Results to Internal and External Stakeholders*

Format	Internal Stakeholders	External Stakeholders
Printed Form	1) Publication in reputable international refereed journals 2) Publication of Compendium of Abstracts of students and faculty researches. 3) Distribution of printed copies to other colleges, administrative council, academic council, and specific offices and officials.	1) Publication in reputable CHED-accredited and international-refereed journals. 2) Circulation of the research outputs with other HEIs and research journals of fellow members in the institution. 3) Information exchange through research journals of other institutions through the Library Exchange Program.

**Table 4.2** (Continued)

*Methods HEIs Used to Distribute their Research Results to Internal and External Stakeholders*

Format	Internal Stakeholders	External Stakeholders
Formal Reports	<p>1) Submission of reports to the Administrative Council and the Academic Council regarding the status of the different research projects including completed research projects for the year.</p> <p>2) Presentation of the annual research outputs.</p>	<p>Dissemination of the printed research outputs to concerned government agencies through a courier service.</p>
Digital format	<p>1) Uploaded on the virtual research portal of the institutions and social media (e.g., Facebook).</p> <p>2) Creation of a website where all activities related to the research undertakings of the SUCs are uploaded.</p> <p>3) Dissemination via institutional emailing system to the students, faculty, and staff.</p> <p>4) Circulation of university memoranda to disseminate action researches relevant to policy making.</p>	<p>1) Engagement in institutional social media platforms (e.g., Facebook).</p> <p>2) Creation of an online database to enable subscribers of other online databases linked together to view it.</p>

**Table 4.2** (Continued)

*Methods HEIs Used to Distribute their Research Results to Internal and External Stakeholders*

Format	Internal Stakeholders	External Stakeholders
Events	1) Conduct of Annual Presentation of Research Outputs (for presentation of research and extension outputs), Annual Research Colloquia, Students' Congress, and Internal Research Congress. 2) Conduct of Pathways to Journal-Refereed Publications 3) Assistance of Faculty Researchers to help faculty members present their own papers and publish their works in international-refereed journals or Scopus-refereed journals.	1) Presentation in research consortia, local and international research conferences. 2) Conduct of institutional webinars to the clientele 3) Invitation to external stakeholders to a presentation of the university research output and discussion with them appropriate outputs for their use. 4) Negotiation of Memorandum of Understanding that eventually leads to the signing of Memorandum of Agreement (MOA) with external stakeholders.

#### 4.2.5 Measuring KMb

Based on the responses of the interviewees from the seven (7) HEIs, there is no unified, standard mechanism in place to measure the mobilization of research results. They use different means such as: (RD7) the provisions of Administrative Order No. 25, which harmonizes national government performance monitoring, information and reporting systems and puts in place a Planning Director to check their targets and outputs and a Quality Assurance (QA) officer to ensure that their deliverables are done satisfactorily; (RD1) feedback from beneficiaries of a project about the benefits gained from the technology of the project/research; (RD6) a report based on the quantity of research outputs utilized by the Department of Education

(DepEd) or by the Division or the frequency of the research outputs and for qualitative results, a report on the impact of the research or project to the community; (RD3) an impact assessment on how the barangay or community benefited from the technology followed by a research leading to commercialization; and (RD2) an evaluation form that keeps track of the progress of the research – if it has been completed, for publication, or for patenting – prepared by the researchers themselves.

On the other hand, RD5 acknowledged s/he was not sure there was such a mechanism in place as his/her university's manual had a policy pertaining only to the dissemination and utilization of patents. However, based on the actual situation, they have yet to realize it because they have not yet reached the position where their patented invention was really used or sought after. Comparably, RD4 stated that the only mechanism they had was the requirement for faculty members with research completed or published to report this to his/her office so they would be awarded points for Performance-Based Bonus (PBB) or Individual Performance Commitment and Review (IPCRF) purposes.

To ensure the efficiency and effectiveness of the knowledge mobilization of the research results generated by the HEIs in the NCR, all seven interviewees (100%) are of the opinion that an institutionalized, unified, and standardized framework for measuring knowledge mobilization will help guide the universities in incorporating a common set of performance scorecards to monitor, evaluate, and report knowledge mobilization systematically, effectively, and accurately. This validates the call of Fetalver (2010) in Chapter 2 for mechanisms to monitor and evaluate research utilization.

In this way, it will be easier to determine the usefulness of the research results generated by the HEIs to their internal and external stakeholders. RD2 underscores the importance and timeliness of this kind of mechanism since what his/her university has “was formulated way back in 2012, so we are now revising it.” Similarly, RD4 shared his/her plans.

“... to reorganize our Research Portal ... to upgrade it in terms of Content so all researches of the university — regardless of kind, campus, or unit — can be easily accessed. It will also show the research completed even if these are just the Abstract, and the link of publications.”

#### 4.2.6 Preservation of Research Results

All seven HEIs (100%) have been actively engaged in several strategies to preserve the knowledge/research results and make them accessible to future internal and external stakeholders. All seven also acknowledged the library as the common repository of the knowledge/research results of the HEIs, the place where all knowledge/research results of the universities can be easily accessed by internal and external stakeholders. RD1 and RD5 stressed that their respective offices had been taking steps to ensure that these researches would not simply remain on the library shelves but be shared with the community. This is important because, in the words of RD4:

“What’s the point of knowledge if you will not share it? Because if you will not share it, it cannot be utilized. So, there is really a need to share, research should not be left in the library or research completed should not end after being submitted. There is a need to present, disseminate, distribute. If it is possible, to place it in a pamphlet, brochure, or magazine.”

The research results are also converted to digital format to produce a database, and filed in the office of the Extension Director (RD7) or uploaded to make them available in the research portal or server of the university (RD1) unless there are connectivity issues which is a problem of one HEI (RD5). Lastly, all completed researches are compiled in their research journals and submitted to the Office of the President to become part of the President’s Annual Report (from 100% of interviewees).

To quote RD4:

“We have a database of research reports because we are required by CHED to submit a report on research completed every year, for the last three years, publications every year, and even publications for the last three years. So those are available on reports submitted to CHED, or reports submitted to the Office of the President, and some of them are uploaded actually in the Research Portal of the university, both the research complete and the research published. So, these are usually in Excel form, with the title, author/researcher, the unit, ... the campus, the kind of research, whether CHED funded, or Private Practice Research Group (PPRG) funded, or compliance, or self-initiated, these are all identified.”

RD4 went on to explain specifically that only technical reports funded by CHED and outside sources were available and submitted to the offices of their university president and vice president. On the other hand, their respective libraries were provided both hard and soft copies of graduate theses and dissertations, which would then be converted to online commons in PDF format so they would become part of the website. Further, RD4 admitted his/her office did not have the means to adequately preserve research reports as the mandate of his/her office was limited only to publication of technical reports funded and not self-initiated. Although digital copies of unpublished research reports were available, they could not be uploaded in the Portal to preserve their security. Only the title, researcher, and Abstract of research completed were available in the Portal to preserve them digitally but they could not be disseminated or uploaded yet if these were still unpublished so they could not be considered as a reference and become part of Turnitin.

RD6 described the process flow followed in his/her university with his/her office getting the full copy of the manuscript to review and evaluate in preparation for internal publication of the research work. The Research Journal of the university, which was already in the finalization stage, would ensure that not only would the university have its copy of the research results but also that these results had been properly evaluated and that stakeholders would have their own copy of the Journal. RD6 added that his/her university had a display area where the prototype samples they had developed were showcased.

RD7 mentioned his/her university's use of developmental research or the use of past research as a basis for continuing research as well as incremental innovation to help eliminate the wastage of resources used in previous researches.

RD2 explained that his/her university could make these research results easily accessible to all of their stakeholders as long as these are covered for public viewing by the Data Privacy Act of 2012 or RA No. 10173. Similarly, RD1 mentioned that his/her university had showcased the technologies they developed but only after requiring the participants (both the internal and external stakeholders) to sign a Non-Disclosure Agreement (NDA) prohibiting them from sharing or copying what the university had developed.

The research directors generally agree that since HEIs have different ways of preserving the knowledge/research results of their universities, it will be helpful if each has a focal point or office where all knowledge/research results generated – whether in printed form or digital format – will be centrally located. Furthermore, policies on the dissemination of this knowledge to internal and external stakeholders should be expressed in specific, clear, well-structured, and easily understood language.

#### 4.2.7 Utilization of Research Outputs

All research directors (100%) expressed primary concern on the utilization of research outputs, both internally and externally. This echoes the findings by Levin (2008a; 2008b), Hénault (1992), and Fetalver (2010) who stated in Chapter 2 that the research outputs of universities should be shared with beneficiaries or potential players to produce something useful, thereby bringing business value from the research.

RD4 pointed out that research projects being done by his/her office, the Research Center for Teacher Quality (RCTQ), has led to what is now the Philippine Professional Standards for Teachers (PPST).

“That is a very critical product of the various research projects my office looked into because it is now a national policy... Their previous projects are about the various needs of teachers and standards ... teacher developmental needs, and those all contributed in providing the necessary empirical data to support the idea that teachers should have standards they should be adhering to as part of their professional development.”

For his part, RD3 mentioned that his/her university has provided technology adoption assistance every year from its College of Engineering to an LGU or barangay like the Barangay Emergency Alert System it has provided to a barangay in Lobo, Batangas to alert its residents if there is a storm surge or an earthquake.

RD1 shared that before they could determine the significance of the project to an industry or community, a Memorandum of Agreement (MOA) between the university and the community/beneficiary would be drawn assuring the implementing HEI of feedback or a report which the HEI could then use as its basis for determining the impact of the project.

RD5 admitted s/he had limited knowledge about mobilization but his/her idea was to provide their community these research results, and that these results would get translated into extension activities to benefit the community. RD6 acknowledged that his/her university had not yet fully explored technology transfer because they were just beginners in the field of research.

RD1 observed that one of the requirements of the Department of Budget and Management (DBM) is for HEIs to submit the number of their utilized projects. However, he/she noticed that the target set by DBM was quite low. “For example, for this year DBM had set the university’s target at only three projects. Although we follow what DBM had set for us, five of our projects had already been utilized by our beneficiaries.”

RD2 admitted that although they had evaluated innovative devices, instruments, and equipment that their students, especially engineering students, had created, they were not aware how they were utilized later on.

#### 4.2.8 Related Issues and Concerns

##### 4.2.8.1 Cultivating Interest in Research and Ensuring Research Productivity

Four of the seven interviewees (57%) made comments related to cultivating interest in research and ensuring research productivity. As explained in Chapter 2, to generate knowledge production and produce quality research outputs, it is critical that researchers are equipped with research skills and competencies. Research capability can be developed and nurtured through seminars, workshops, and conferences. It involves reinforcing the knowledge, skills, and attitudes of, and retraining and retaining a continuous stream of a new generation of researchers (Republic of Philippines Office of the President, 2016; Higher Education Institution, 2017). It also includes providing the faculty with bigger budget, payment of honoraria, and deloading of teaching assignment to encourage them to engage in research (PRL10).

RD7 expressed the hope that faculty members who believed that their sole role was to teach and impart knowledge to their students would change their mindset and contribute to research activities in their university, as the Administration had been fully supportive of the university’s research efforts and government funding

agencies had only been waiting for their submissions. As RD1 stated, “It is very important for them to understand that their research output can be used for their promotion and, at the same time, it will also improve the rank of our college.”

RD3 shared that to increase its publication rate in a year’s time, his/her university assigns faculty researchers and faculty extensionists in every college who do not only have the technical expertise but are also equipped with knowledge production capabilities such as conducting webinars. They are also tasked to disseminate all guidelines of the Office of the Vice President of Research (OVPR) as well as assist faculty members publish their works in international refereed journals or Scopus- indexed journals. This strategy seems to be working well because the university has reached its target of 100 publications this year because of dissemination.

RD2 admitted his/her university had an aging faculty population aside from them not being actively engaged in research; thus, his/her university is striving for research productivity. His/her office had proposed different research programs and strategies to elevate the theory capability, especially of their faculty researchers by providing them the necessary training in research methodologies and approaches, intellectual property rights, and other similar topics. They would also explore other innovations in research efforts by their faculty members, especially those who would like to try to engage in research abroad, those interested in pursuing their work in the laboratories of universities in foreign countries. To quote RD2, “For us to have research outputs, we have to evaluate and mobilize the university’s research results. It’s indeed hard to mobilize if there are no outputs.” Similarly, PRL10 explained that to increase the number of researchers in their HEI, they conduct Research Mentoring where they invite the country’s best researchers to mentor their faculty. The HEI also provides de-loadment of teaching loads of faculty, grants, and incentives to those whose research get published or cited or to those who want their works to be published. The University provides 400\$ for publication.

#### 4.2.8.2 Establishing faster and more efficient means of sharing knowledge among HEIs

Three of the seven interviewees (43%) specifically addressed the possibility of faster and more efficient means of sharing of research results among

HEIs. Specifically, RD4 believed that sharing of resources or knowledge among HEIs, if not all HEIs, could still work so that their database – whether it was only up to the Abstract of Research Completed or Publication, especially theses or faculty researches – could be shared faster between universities, at least among members of a consortium. To achieve this, a portal for the members of the consortium could be created or the portal of the HEIs could show all the links. A minimal fee could be charged, similar to a library fee, to ensure access to the resources. Further, RD4 underscored the importance of accessibility of resources when s/he added, “It has to be more systematic to make sharing faster between consortia.” Similarly, RD3 proposed that the database of HEIs be indexed on Scopus or Web of Science to make them more accessible.

Thinking beyond the university level, RD6 believes it will be more fruitful if there is not only an international mobilization of research results but also a collaboration in research projects among different universities outside the Philippines. This reiterates the findings of the Higher Education in Developing Countries: Task Force on Higher Education and Society (2000) discussed in Chapter 2 which advocates for the promotion of international linkages as they will undoubtedly redound to considerable benefits to the public in the form of more windows of opportunities for expertise and reciprocation as well as access to economic, intellectual, technical, and social possibilities offered by the international community.

#### 4.2.8.3 Recognizing Publication of Research Outputs in Other Journals

Publication helps other researchers to advance their works and builds new knowledge. Thus, RD1 encourages HEIs to be more open and consider other journals, not only those indexed in Scopus or ISI as there are many other trusted indexing agencies that are also of higher quality like E-Compendex.

#### 4.2.8.4 Using Quartile in Granting Incentives of Research Outputs

One interviewee (14%) notes that some HEIs have a big number of submissions of research outputs. Thus, the use of Quartile indexing to measure the quality of outputs or determine successful publication in Quartile 1 and 2 is now being considered. A check with Scopus and Web of Science ISI database reveals that journals are arranged by quartiles (1, 2, 3, and 4), with Quartile 1 having a very high standard; thus, the most difficult for a paper to get published. With this in mind, RD1

admits his/her office has categorically stated as part of its research policy that it will also accept publication in Quartiles 3 or 4 so as not to limit submissions and increase its research outputs. Further, as articulated by RD1, it can be argued that the only bearing Quartile 1 indexing has been on the researcher himself/herself – it shows he/she is really good or competent.

#### 4.2.8.5 Bridging the Gap

RD4 proposes the creation of a magazine-type publication where all research completed that has not been published will be placed, in a language that can easily be understood by non-researchers. This will not be technical in nature, where the statistics and the framework will also be presented, but will include something that will inform the readers about the findings and solutions to research problems. This validates the observation of Fetalver (2010) that there is a need to strengthen the course of action to ensure effective communication of research outputs conducted in higher education institutions in the Philippines.

### 4.3 Project Research Leaders' Interviews

This subsection describes and analyzes the second phase of the interview process of the research. From the knowledge stream from each of the seven HEIs, the researcher selected two projects to be at the end state: one complete and one near completion. The researcher then sent a second letter to each of the presidents of the seven (7) HEIs requesting to interview the university's research leaders who are in charge of these projects. Ten (10) project research leaders from five (5) HEIs participated in the on-line interview. While the project research leaders from two (2) HEIs did not participate during the online interview, they answered the survey questionnaire.

The researcher requested from each participant at least 30 minutes of their time for an online interview, which proved adequate. Table 4 below shows the period of interview for each research project leader of the learning institutions:

**Table 4.3***Summary of Interview Time with Project Research Leaders*

Project Research Leader Institutions		Period of Interview (hh:min:sec)
Marikina Polytechnic College (MPC)	1 Completed Research	00:17:39
	1 Nearly Completed Research	00:26:44
Philippine Normal University (PNU)	1 Completed Research	00:21:36
	1 Nearly Completed Research	00:15:01
Polytechnic University of the Philippines (PUP)	1 Completed Research	00:21:03
	1 Nearly Completed Research	00:36:14
Rizal Technological University of the Philippines (RTU)	1 Completed Research	00:15:47
	1 Nearly Completed Research	00:48:10
Technological University of the Philippines (TUP)	1 Completed Research	00:18:04
	1 Nearly Completed Research	00:18:35

The project research leaders are regular faculty members/research coordinators in the college/ department offices of their respective universities. While these faculty members have regular teaching assignments, their special task to generate research for their institution is an additional credential for their professional growth.

#### 4.3.1 Managing the Research Outputs

HEIs have different ways to manage their research outputs for their community, both external and internal: (PRL3) present researches to conferences or communicate the output for the benefit of its internal and external community; (PRL8) inform the Extension Management Office and the Intellectual Property Management Office (IPMO) of the results of all researches to make sure that they are properly disseminated, that there is technology transfer, and that the IPMO can take charge of the application if a particular research has resulted into a utility model,

industrial design, patent, or trademark while providing researchers financial support and incentives to enable them to present their works in national and international conferences, publish their works, and research results that lead to policy change; (PRL1) provide students better exposure and hands-on application on the use of welding machines for cutting and beveling and help make it possible for other schools to offer quality but affordable technical education especially in the field of welding, mechanical works, and other technological courses; (PRL2) submit research outputs to the university's unit for managing researches so it can review the alignment of the research topics into the university's research agenda and provide the respondents of the study a copy of the results; (PRL4) disseminate, present, and publish their research outputs and maintain communication lines between the researchers and the higher ups for its internal community and maintain constant communication with research partners, collaborators, and other members of the HEI consortium for its external community; (PRL7) upload research outputs in Online Commons (internal community) and technical reports in the HEI's Research Portal (external community), a reiteration of what came out during the interview with RD4.

PRL6 points out the HEI's location is an important factor in creating a convenient and practical ready-to-eat product that they distribute to evacuation centers to nourish and sustain their community during typhoons since their school is in a flood-prone area. PRL5 remarks that despite the low research turn out of the research outputs of his/her HEI, their linkage with their Local Government Units (LGUs) in their multiple campuses (Cavite, Aurora, Visayas) enables them to manage their research outputs for their external community.

PRL10 briefly explains the long process in managing his/her HEI's research outputs for its internal community starting with a Small Group Discussion (SGD) among possible collaborators or adapters who have the skill of technopreneurship, and a Focus Group Discussion (FGD) for proposal making, then presentation in the Research Colloquium, followed by a recommendation by the University Research and Extension Council (UREC), and finally Board approval for its funding. For its external community, the process begins with pairing up or grouping faculty members from different departments who then identify the research thrust of the funding agency and the gaps to be funded by the university. On the other hand, PRL9 cites

their practice of applying the technology they have created inside the campus first before it is introduced later to the community. Table 4.4 below summarizes the HEIs management of the research outputs for their internal and external communities.

**Table 4.4**

*HEIs' Management of the Research Outputs for Internal and External Communities*

Format	Internal Community	External Community
Research Agenda	<p>1) Submit research outputs to EPRDC, the university's unit for managing researches which reviews the alignment of the research topics into the university research agenda.</p> <p>2) Create a Small Group Discussion (SGD) for possible adapters or collaborators, a Focus Group Discussion (FGD) for proposal making, then present in the Research Colloquium, earn a recommendation from the University Research and Extension Council (UREC), and lastly, get Board approval for funding.</p>	<p>1) Identify the research thrust of the funding agency first and the gaps to be funded by the university.</p> <p>2) Ensure that quality research outputs are funded and presented in various national and international conferences.</p> <p>3) Give faculty members or researchers incentives or financial support to enable them to present their works in national and international conferences, publish their works, and come up with research results that lead to policy change.</p>

**Table 4.4** (Continued)*HEIs' Management of the Research Outputs for Internal and External Communities*

Format	Internal Community	External Community
Capability Building	Provide students with better exposure and hands-on application on the use of welding machines for cutting and beveling.	Help make it possible for other technological schools to offer quality but affordable education especially in the field of welding, mechanical works, and other technological courses.
Research Utilization	<ol style="list-style-type: none"> <li>1) Apply the technology inside the campus first.</li> <li>2) Disseminate, present, and publish their research outputs and maintain communication lines between the researchers and the higher ups.</li> </ol>	<ol style="list-style-type: none"> <li>1) Bring research outputs to the community or the LGUs so they can check which can be adopted or applied to their community.</li> <li>2) Distribute to external stakeholders or adopted communities who end up in evacuation centers during typhoons the ready-to-eat food product the HEI had created.</li> <li>3) Introduce the technology later on to their community.</li> <li>4) Present researches to conferences or communicate the output for the benefit of its internal and external community.</li> </ol>

**Table 4.4** (Continued)*HEIs' Management of the Research Outputs for Internal and External Communities*

Format	Internal Community	External Community
Extension Program	Inform other officers in the research sector particularly the Extension Management Office and the Intellectual Property Management Office (IPMO) of the results of various researches to make sure that the results are appropriately disseminated to communities, that there is technology transfer, and that the IPMO can take charge of the application if particular research has resulted into a utility model, industrial design, patent, or trademark.	Maintain constant communication with partners or research collaborators.
Research Output	<ol style="list-style-type: none"> <li>1) Create a convenient product that can help nourish our students in evacuation centers during typhoons.</li> <li>2) Upload research outputs in Online Commons.</li> </ol>	Upload technical reports in the Research Portal, with the permission of the researchers who conducted the study.
Monitoring & Evaluation	Note the low turn-out of research outputs because of few researchers in the community.	Provide respondents of the study a copy of the output.

#### 4.3.2 Meeting the Needs of Stakeholders

Stakeholders, both internal and external, have a crucial role to play in the professional development of the education system. Their engagement causes a positive impact on the system advancement as it can benefit both the university and the community it impacts, brings important issues to light, promote evidence-informed decision making, and encourage HEIs to develop corporate social responsibility.

Thus, HEIs have conducted researches with outputs that they hope are relevant and useful to their respective internal and external stakeholders. PRL2 explains that these outputs are stipulated in the Memorandum of Agreement (MOA) with its partner-institution as well as listed as one of the targets in the University's Office Performance Commitment and Review Form (OPCRF) for internal stakeholders and during the Focus Group Discussion between the HEI and its external stakeholders. PRL3, PRL6, and PRL8 mention the conduct of a needs assessment or needs analysis research and training needs analysis to make sure their research outputs will benefit their stakeholders such as lead to a policy change or necessary modifications in ensuring peace and order during international events, or improve the skills and livelihood and supplement the income of their adopted communities, an information that was shared during an earlier interview with RD3.

Similarly, PRL1 shares that his/her university offers effective instruction and training to students within the budget of their parents while their research outputs enable the students and instructors to have free access to materials and make them aware of the needs of their community or barangay, like providing them farming implements to make their work easier. On the other hand, PRL7 relates that most of their faculty researches aim to address the needs of their students like the specific teaching pedagogies that are very effective to them while for PRL4, a needs assessment tells them how they can serve their students better in terms of instruction and preparation of their theses.

PRL9 mentions the proposal of the Department of Science and Technology (DOST) for the mass production of their HEI's technology to service all the barangays of their local government unit (LGU). PRL7 offers the information that his/her office initiated a call for submission of a project research plan to address the

needs of their internal stakeholders. PRL5 and PRL4 both explain their researchers are free to work on their research projects based on their respective universities' Research Agenda, hold conferences, symposia, Research Colloquia/Fora, and publish a Research Manual, as well as answer calls for submission of research proposals or papers from DOST, CHED, and other institutions while the University's Linkage Office looks for collaborating agencies and schools and establishes industry linkages for their students' On-the-Job Training (OJT).

Other forms of assistance offered by HEIs to their stakeholders include the availability of internally-funded research and commissioned research (PRL7) and institutional funds for UREC-approved projects, deloading of teaching assignment, grants, incentives in the form of 400\$ for publication, and honoraria on top of the regular salary of the faculty (PRL10). By and large, the conduct of these researches and their dissemination and utilization eventually by the community is made possible largely by the efforts of the HEIs. PRL9 expresses his/her appreciation and gratitude for the Administration's support. In the words of PRL9:

“The University provides us funds. Although it is not much, the University has adequate resources because the Administration fully supports our efforts... We are thinking of taking on additional communities. Actually, our target is to service all the barangays in [our city] because everything is provided for.”

#### 4.3.3 Conducting Needs Assessments

To identify/address the potential players in their respective communities, the HEIs use varied needs assessment instruments to identify their potential players.

PRL3 shares his/her university uses a needs assessment questionnaire prepared by the department conducting the research, evaluated and approved by the Extension Management Office to find out “what the barangay residents really need” which echoes what RD3 shared during the interview earlier; PRL4 mentions the conduct of a needs assessment by his/her university's Research and Development Center for their internal stakeholders while a questionnaire prepared/modified by faculty researchers is used for their external stakeholders. Similarly, PRL9 identifies his/her university's use of a needs assessment instrument for Non-Government Organizations (NGOs) and the local government unit (LGU); PRL1 explains a survey questionnaire prepared by the researcher and validated by higher level/senior faculty

including officers in the Research Office helps their researchers identify the potential needs of the community and set the goals as to the possible output they will provide the community to improve their lives based on the issues, opportunities, and problems determined from the survey questionnaire. Similarly, PRL6 mentions conducting a survey to determine which community needs priority assistance in the form of livelihood programs that will help them produce their own products and start small businesses of their own.

PRL8 shares practices such as conducting a table discussion with community leaders, observing and asking the community during the Faculty Extension to validate the feedback from community leaders, and partnering with private enterprises or industries to provide materials for the project. Thus, it becomes a sort of a community, university, and industry partnership in terms of making sure that the results of the needs assessment are addressed appropriately.

Other ways used by HEIs to identify potential players include (PRL5) conducting a research and extension activity called “Intensifying Research and Extension” where participants from various colleges discuss the problems they see in the community; (PRL7) conducting a survey to identify the particular capability strategies needed to capacitate the faculty in achieving a level of research culture; (PRL10) conducting Research Mentoring to increase the number of researchers, and holding Focus Group Discussions (FGD) where faculty from different campuses are grouped together; and (PRL2) having the Community Partnership and Extension Office (CPEO) of the university present the projects to all the partners, who then choose projects based on their needs.

Although the HEIs have different ways to identify the potential players in their respective community, they “try to make sure their research works are beneficial to [their] stakeholders particularly those who are directly involved with the University” (PRL8).

#### 4.3.4 Utilizing Research Outputs

HEIs have taken steps to ensure that their research outputs are opportunities to maximize the assistance they provide to their communities.

PRL5 explains that to establish that their potential players are really interested in utilizing university research outputs; they put up an exhibit where they showcase all their research outputs and invite their stakeholders to identify which ones they can adapt to their needs and provide the necessary funding. This validates the information articulated earlier by RD1 who shared that interested industry representatives were usually the ones who approached and partnered with them on research outputs or projects that could be of use to them.

PRL8 remarks that “we have to make sure that every research output can translate into a program which can be handled by the Extension Management Office of the University towards improvement of its own community.” Likewise, PRL3 states that they expect the community to use and adapt the research outputs of his/her university as a source of their livelihood like “when we impart to them knowledge on curing pork or urban gardening.” PRL1 acknowledges the role played by his/her university’s Extension Office in providing them valuable assistance in applying their research outputs to help their community.

Specifically, PRL4 cites the case of players in their community who had asked for training on mushroom culture and production and plant biotechnology, and after their training they would venture to build their own farm. The university also provides technical advice and consultation to businesses. As a result, (PRL9) stay-at-home parents in their community now grow their own vegetables and even sell their harvests. Indeed, this confirmed what RD2 claimed in an earlier interview that their work on mushroom biotechnology showed the greatest impact.

PRL6 shares that their community who are mostly poor and live in flood-prone area use their ready-to-eat and nutritious instant soup in case of emergencies.

PRL8 states that his/her university’s Extension Management Office has directed their Intellectual Property Management Office (IPMO) to assist researchers if their outputs result into a utility model, industrial design, patent, or trademark or whatever is available that can benefit both the University and the other stakeholders as well. Further, PRL10 discloses that his/her university has created a Center that will

take charge of commercializing their projects. Moreover, PRL2 points out that their partner-institution replicates the best practices from the research output to other communities and other schools in the Division; PRL7 goes on to say that his/her HEI's research enhances Philippine teaching standards and provides technical assistance, inputs to policies, and recommendations to standardize and improve teacher quality.

#### 4.3.5 Measuring the Effectiveness of Research Outputs

The project research leaders interviewed recognize that their HEIs do not have a uniform and standardized measuring instrument yet to measure the effectiveness of their research outputs (PRL9, PRL1- external stakeholders, PRL5, PRL8 – internal stakeholders). PRL10 believes that the measurement should be in terms of the commercial value of the project, like if the community earns profits from it. However, to quote PRL 10: “We don't have this kind of project yet because we are just starting with the commercialization phase. That's our target next time.” Further, PRL8 maintains that the instrument should measure the commercialization of the Utility Models (UMs), Industrial Designs (IDs), and patents developed by the HEI.

Other HEIs have different kinds of measuring instruments: PRL2 uses a measuring instrument approved for use by the Educational Policy Research and Development Center (EPRDC), but as RD4 clarifies, this covers only research completed or published for Performance-Based Bonus (PBB) and Individual Performance Commitment and Review Form (IPCRF) purposes, so the faculty concerned will be given incentive; PRL6 uses survey questions prepared by the proponents themselves and validated by experts, while PRL5 uses evaluation form prepared by the researchers themselves following the guidelines of the Extension activities such as the number of beneficiaries of the activity, the effectiveness of the activity, or the client's satisfaction.

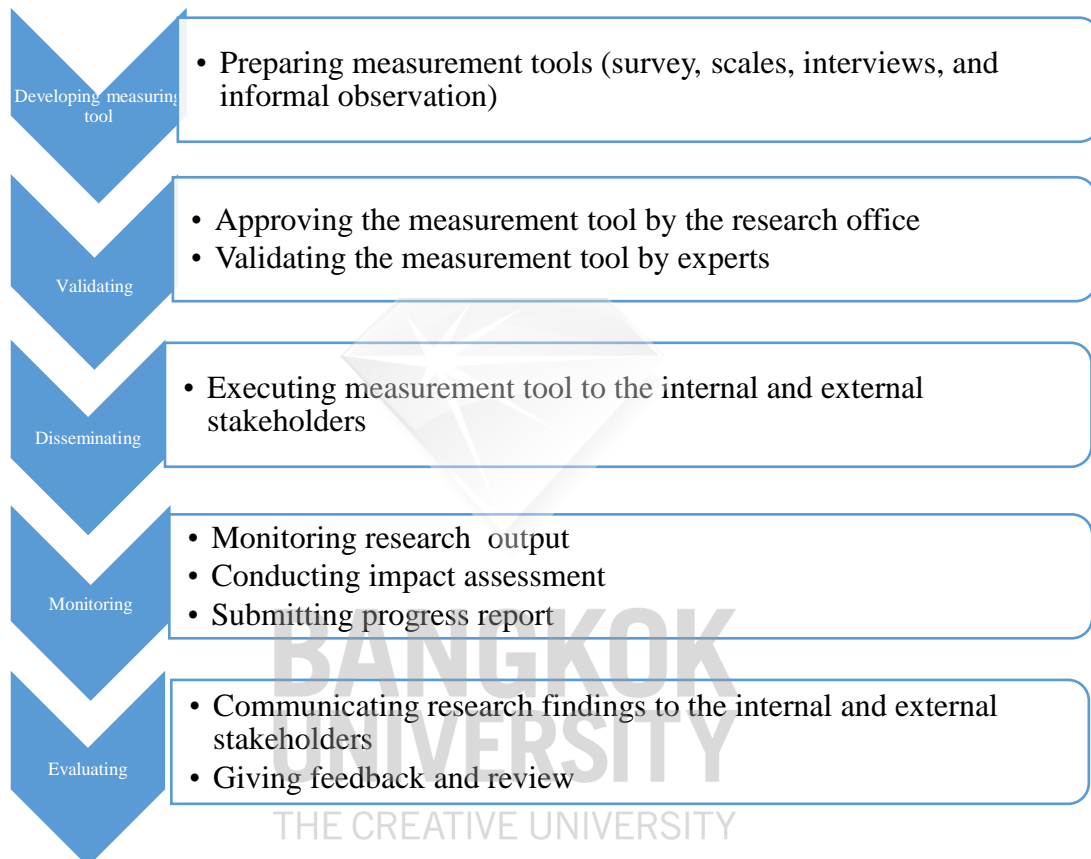
PRL7 uses a Monitoring and Evaluation Form for its internal stakeholders while CHED-funded projects for their external stakeholders require a publication per million grants. “So [if] you have a nine-(9) million grant, you need to have nine (9) publications in all. That's really very difficult.” Also, there is an output-based instrument or 6 Ps (Publication, People Service, Production, Popularization, Partnership, and Policies) that has to be addressed upon completion of the project for

other agencies like the National Research Council of the Philippines (NRCP). Similarly, PRL3 has evaluation forms and survey questionnaires based on the guidelines approved by its Board of Regents (BOR) for its internal stakeholders while researchers return to the community after six months to find out if the community applies what it has been given. PRL1 mentions the use of statistical treatment of data in questionnaires to determine the quality of the cutting, tensioning, the workability, economy, and safety of the machine for its internal stakeholders. PRL8 has an impact assessment conducted by its Extension Management Office right after every program is implemented, a reiteration of what was earlier shared by RD3.

On the other hand, PRL9 shares they submit an Accomplishment Report complete with pictures to the Research Director and University Vice President while PRL4 states their submission includes Monthly Progress Report, Accomplishment Report, Financial Report, and Evaluation in the form of a presentation of the full-blown research. RD4 describes the same process in an earlier interview as just an evaluation form consolidated by the University Research and Extension Council (UREC) to keep track of the progress of a research - if it has been completed, for publication, or for patenting. Clients are also asked to evaluate their products and services, like how prompt and efficient they are in replying to communication and requests using the form from their Research and Development Center. Other projects have their own evaluations which follow the guidelines outlined in their Research and Development Manuals. The same process is followed for the external community. As shown in Figure 4.1 below, measuring the effectiveness of a research output once it gets implemented follows a process.

**Figure 4.1**

*Process followed by HEIs in Measuring the Effective Implementation of Research outputs To Internal and External Stakeholders*



Summing up, developing a measuring tool such as survey questionnaire, informal observations, interviews, etc. is done by the proponents/researchers themselves based on the guidelines set by their respective research offices or funding agencies. The measuring tool developed is then validated by content and language experts before being implemented in the field or community. Monitoring the research project to keep track of the progress of the project is done through reports submissions. Evaluating the research is done by asking for feedback and review of the project, conducting an impact assessment, and making a visual inspection of the community to determine if there is indeed knowledge use or to establish areas that need improvement in the implementation of the project.

#### 4.3.6 Evaluating the Usefulness of the Research Results

On a scale of 1-10, with 10 as the highest and 1 as the lowest rating, one (or 10% of interviewees) Project Research Leader (PRL3) gives a rating of 10 as to the usefulness of their university's research results for both their internal and external stakeholders in terms of these results having benefited teachers and students and having a positive impact on the community.

Two interviewees (20%) give a 9 rating. One interviewee (PRL2) gives a rating of 9 for usefulness of the research results to its internal and external stakeholders because the researches satisfy the requirements for accreditation and the clients are the ones who requested for the training program. Still another interviewee (PRL10) explains his/her 9 rating by saying, "Since we are a technology-based university, all are useful. However, they are not being utilized the project gets disconnected when it is brought to the community for utilization."

There are three (30%) 8 ratings. PRL 9, PRL4, and PRL6's rating is an 8 for both their internal and external community, although PRL9 confides s/he can give a 9 for their external community because now they grow their own vegetables and even sell their harvests.

On the other hand, PRL8 (10%) gives the lowest rating (1) "since very few Utility Models (UMs), Industrial Designs (IDs), and patents are being used and there is zero commercialization (of their research results)." PRL8 admits the futile efforts of his/her HEI trying to market the 86 or close to a hundred of their UMs, IDs, and patents to partners or industries who are more than capable to fund and reproduce these to eventually commercialize or to donate to a particular community and use any of these.

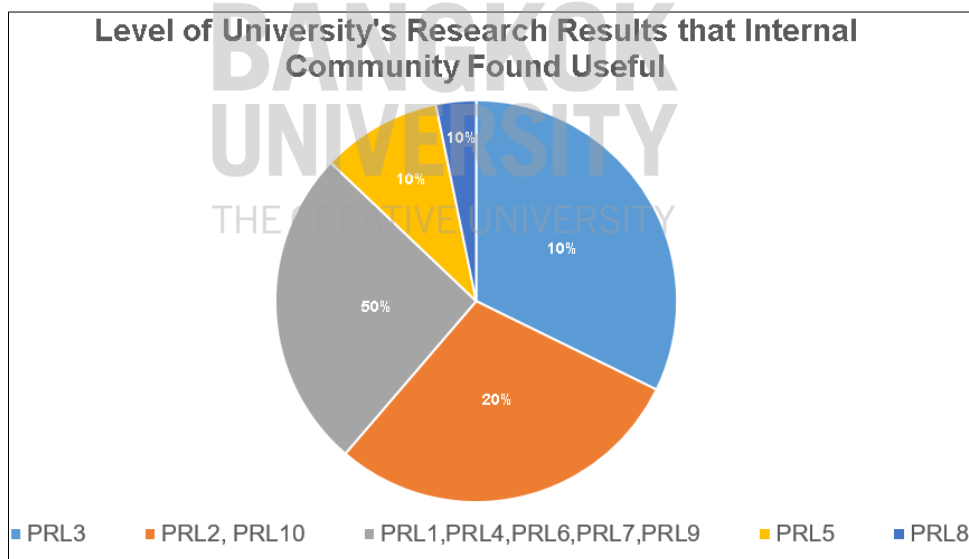
Several project research leaders do not have the same rating as to the usefulness of university research results for their internal and external communities. PRL1 gives an 8 for its internal community and a 9 for its external community; PRL7 gives an 8 for the usefulness of his/her university's research to its internal community since their researches are based on knowledge gaps, research gaps, and the needs of the internal stakeholders but a 10 for its external community because these are commissioned or dedicated researches that have already been approved based on the needs of the partner-agency. PRL5 gives a 2 or 3 for its internal community because

their “teachers prefer a full-time teaching job and very few faculty members are engaged in research” and a 4 for its external community.

To sum up, for internal stakeholders, the majority of the project research leaders have above-average answers ranging from level 5 to level 10. The responses of the researchers show they are satisfied with the usefulness of their research results to the internal community of the university. For external stakeholders, the majority of the researchers also have above-average answers ranging from level 5 to level 10. The responses of researchers show they are also satisfied with the usefulness of the research results to the external community of the university. As noted in Figure 4.2, for all but one responder, these responses also reflect a potential for improvement.

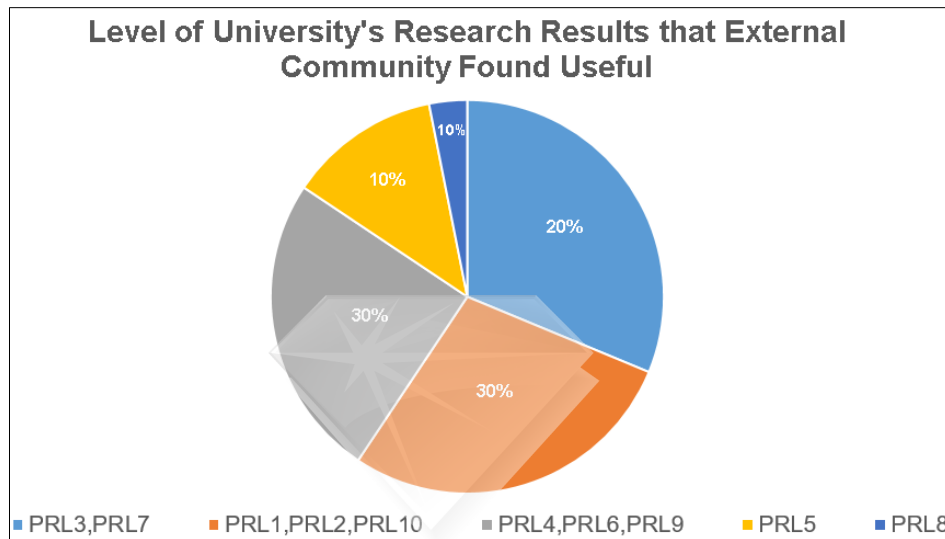
#### Figure 4.2

*Below Summarizes the Usefulness of the University’s Research Results for Its Internal and External Stakeholders*



**Figure 4.3**

*Level of The University's Research Results Found Useful by Internal and External Community*



#### 4.3.7 Making a difference to Stakeholders

The project research leaders have varied ratings as to the difference their researches had made to their stakeholders.

On a scale of 1 – 10, with 10 as the highest and 1 as the lowest rating, two respondents (20%) have a rating of 9 or 10 because of the big impact of their project to parents, students, and teachers (PRL3) and it addresses the research agenda of the agency requiring the research (PRL7). Note that PRL3 also has a rating of 10 in the previous question (4.4.6).

Another two project research leaders (20%) have a rating of 9: (PRL1) since the research outputs are being used mostly by their students and faculty, the community can see for themselves the results of the researches their students have conducted; and (PRL2) one Division Office has found it beneficial to its constituents.

PRL 4 gives a 6 or 7 rating but clarifies that the limitations of the research were discussed with representative sectors during their Stakeholders' Meeting.

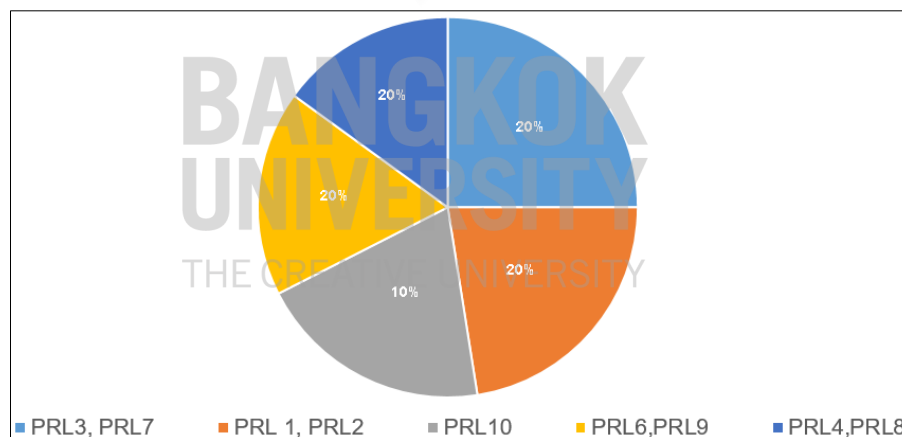
PRL10 gives an 8 without providing an explanation.

Both PRL6 and PRL9 (20%) have a rating of 7 because the research cannot be fully applied yet as the pandemic has delayed the release of the result of the physical-chemical test (PRL6).

PRL8's answer is "somewhere from 1-6 in terms of the impact to the community of the extension programs" while PRL5 has no specific rating because his/her university follows the Global Development Plan as their Research Agenda. See Figure 4.4 below for a summary of the level of difference the research had made to stakeholders within the bounds of its focus.

**Figure 4.4**

*Level of Difference the Research had made to Stakeholders within the Bounds of Its Focus*



#### 4.3.8 Evaluating the effectiveness of the research process

As to the effectiveness of the process in getting the research out to the larger group of stakeholders who can use it, the ratings given by the project research leaders interviewed range from as high as 10 to as low as 3, although the majority (80%) has an above average rating ranging from 6 to 10 as shown in Figure 4.5.

PRL7's rating is either 9 or 10 because it is a new platform created by the university to entice even common people to look at the research in full. Two interviewees (20%) give a rating of 9 because in the words of PRL3 "there was still room for improvement" as s/he expresses the hope that their research outputs will be

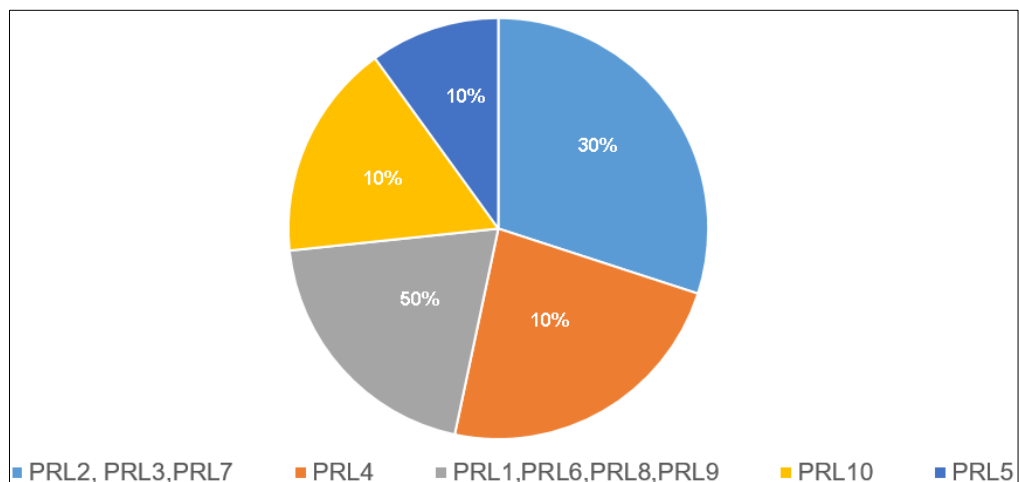
disseminated not only to a particular group but also to those of different professions or fields which is seconded by PRL2 with his/her opinion that the university should extend its focus or reach to other communities or partner-institutions in other regions or provinces, not just in the National Capital Region (NCR).

Three interviewees (30%) give a rating of 6 since (PRL6) the research has not been applied; (PRL9) the Extension Office should take charge of these kinds of transactions “so the needs of the community can be properly addressed and research outputs can be properly disseminated to the larger group of stakeholders” (PRL1), and the university does not have a measuring tool.

On the other hand, PRL4 (10%) gives a rating of 6 -7 because “we are still improving our process of having our prototype equipment patented.” PRL10 gives a 5 because the faculty still needs to realize the importance of research in the community while PRL5 gives a 3 due to the low number of the university’s faculty workforce being actively involved in research as “out of 300 faculty members of the university, there are only 26 researchers who are actively involved in research.” PRL8 does not have a direct answer although s/he admits that “the policies and processes are great.”

**Figure 4.5**

*Level of Effectiveness of Current Processes in Getting Research out to the Larger Group of Stakeholders*



#### 4.3.9 Enriching the Research Process

Due to their exposure to their respective university's researchers and research policies, the project research leaders interviewed offer a wealth of information on how to improve the research process. Their suggestions, when taken together, cover the research process.

Both PRL5 and PRL1 (20%) hold a similar view that there is a need to build a research culture among the faculty. This can be accomplished by conducting a Research Lecture Series to equip the faculty with better research skills and techniques to enable them to conduct their research more efficiently, generate more research outputs, and produce products that fit the needs of the community. PRL10 proposes holding a Mentoring Workshop, providing incentives to the faculty like bigger budget, payment of honoraria, and deloading them of teaching assignment, and reducing red tape to avoid delays in the implementation of the project. Specifically, PRL6 hopes the university administration will provide researchers their own space or building where researches – especially those that deal with food – can be conducted, while PRL9 believes Faculty Researchers should not be tasked to look for potential clients whose needs they can cater. To quote PRL9:

“We should have our own roles to perform. Researchers like us should not concern ourselves with looking outside the University for clients whose needs we can cater. This should be the function of the Extension Services. They should be the ones who should go out and connect with LGUs to determine their needs, not us looking for potential clients. We have the technology so we should not wait for potential clients whose needs we can cater. We should merely submit our research output and an Accomplishment Report to the Extension Services. There should be teamwork among us in fulfilling our roles and discharging our duties.”

On the other hand, PRL4 believes the Intellectual Property Management Office should play a more active role in helping faculty researchers secure the patents and copyright of their prototype machines/researches.

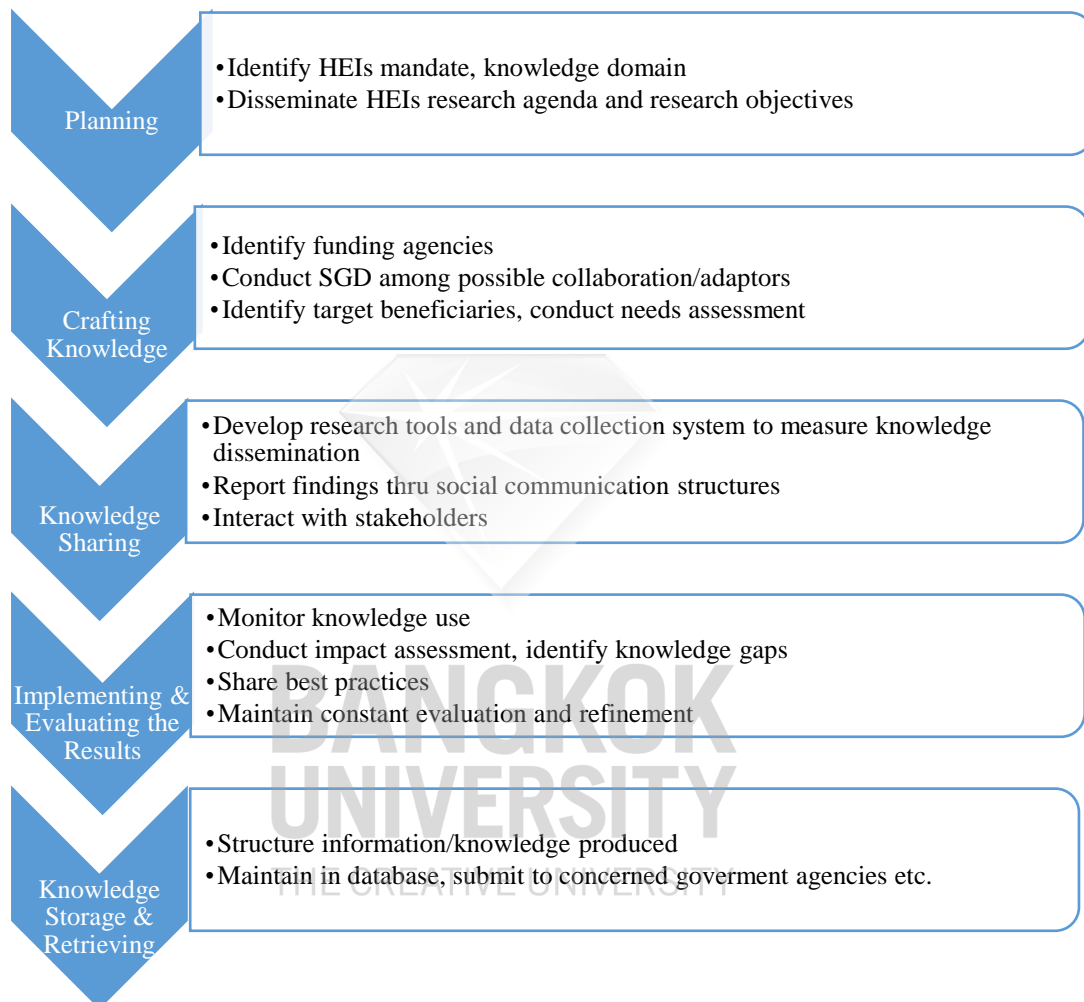
PRL 2 suggests the universities extend their reach to other communities and look for partners in areas outside of the National Capital Region (NCR).

PRL10 voices out the need to reduce bureaucratic red tape especially in the release of research funds to ensure the completion of the research project on time.

PRL3 proposes the dissemination of research outputs to others from different professions or different fields. Similarly, PRL7 suggests that researchers convert their research outputs into a 3-5 video that will entice or motivate not only researchers but also the common people or those who are not research enthusiasts to take a look at these researches in full as a way of reaching out to a larger group of people, while PRL8 recommends that universities ensure the sustainability of the research work after its completion by ensuring the availability of financial assistance. All of these issues touch directly or indirectly on the potential and actual use of – and measurement of – effectiveness of university researches.

#### **4.4 Critical Components of Knowledge Mobilization**

The interviews with the Research Directors (RDs) and Project Research Leaders (PRLs) of the seven (7) selected higher education institutions (HEIs) detailed in 4.2 and 4.3 above brings to light five (5) critical components of the knowledge mobilization process: Planning, Crafting Knowledge, Knowledge Sharing, Implementing and Evaluating the Results, and Knowledge Storage and Retrieving as shown in Figure 4.6 below.

**Figure 4.6***HEIs Critical Elements of Knowledge Mobilization***4.4.1 Planning**

University researchers meet together to plan their research topics and ensure that these are aligned with the specific knowledge domain or mandate of the law that created their HEIs, that their research initiatives are based on the Research Agenda and the research objectives of their HEI as approved by the Administration, and that they can successfully generate and disseminate knowledge or information across the HEI.

For instance, Eulogio “Amang” Rodriguez Institute of Science and Technology (EARIST) is mandated to “establish a trade technical education department, vocational-technical teacher education department, graduate education department, and offer such other opportunities and technician courses essential to meet the needs of Manila and other metropolitan areas.” As such, its knowledge is geared towards science and technology specifically on the national harmonized agenda of DOST, one of which is science and technology.

Marikina Polytechnic College’s (MPC) mandate is “to offer higher professional and technical instructions and training to prospective teachers and instructors in technical education and skills development (TESD) in teacher education institutions (TEIs) in the country with the aim of producing a cadre of professional teachers and instructors qualified to teach in the nationwide network of public and private technical schools and training centers.” The research results of the College are therefore mostly about industrial technology and how to develop different instructional materials for technology majors or technical-vocational (tech-voc) students, with the focus or main agenda of their research on shoes and leather craft.

The Philippine State College of Aeronautics (PHILSCA), being the only aeronautical state institution of higher learning in the country, has a “very distinct congressional mandate to offer aeronautical and other aviation-related courses not only in the technical and baccalaureate levels but also to afford those in the fields of the aeronautical engineering and airlines industries the opportunity to pursue advanced studies.” Thus, its program agenda is focused more on the aviation field and the liberal sciences.

The Philippine Normal University (PNU) is mandated by Republic Act No. 9647 (June 30, 2009)

“to provide technical support to the Department of Education (DepEd) and Commission on Higher Education (CHED) in their programs and projects on teacher training, teacher education, continuing professional education of teachers and academic supervisors, and teacher education curricula; build and develop a database of education policies to serve as a resource to the country's policy makers; conduct researches, case studies and other appropriate methodologies to enhance curriculum and training designs for teacher training, teacher education and continuing

professional education of teachers and academic supervisors; [and] as may be directed by Congress, provide assistance to legislators in the design and analysis of legislative proposals concerning teacher training, teacher education, continuing professional education of teachers and academic supervisors, teacher education curricula, and other issues affecting teacher education.”

In line with this, PNU has produced knowledge that is important and relevant in terms of education in general and teacher education in particular. Basically, this covers (1) the teaching – learning process or how students learn therefore how teachers should teach; (2) educational programs, curriculum design, program, delivery etc.; and (3) pedagogy which is connected to both including instruction and assessment.

Polytechnic University of the Philippines (PUP) is mandated “to primarily provide higher occupational, technical and professional instruction and training in the applied arts and sciences and to promote applied research, advance studies, and progressive leadership in the stated fields; to offer programs in other polytechnic areas in addition to its present offering of ladder-type higher vocational, technical, and professional programs in the areas of business and distributive arts, education and the social sciences related to the fields of commerce and business administration; and to enrich the academic program in other fields of study such as agriculture, arts and trades, and fisheries by integrating such courses as are necessary to produce individuals with highly-technical and managerial skills.” To create knowledge based on this mandate, PUP is focused on the following research agenda: (1) poverty reduction, peace, and security; (2) infrastructure through science and technology; (3) competitive industry and entrepreneurship; (4) social and cultural development; and (5) environmental conservation, protection, and rehabilitation through sustainable development.

Rizal Technological University (RTU) is tasked “to provide highly professional, scientific, technological, and special instructions in the field of engineering and technology, education, sports, business and entrepreneurial technology, and the arts and sciences; promote research, extension and advance studies in its areas of specialization; pursue and endeavor to lead in the development of work-integrated learning through partnership with industry and involvement of

students in civic activities.” However, although RTU is a technological university, most of its faculty members are doing social sciences research. For instance, in 2017, out of all the researches, 10% pursued were in pure science, 5% in engineering, and 85% in the social sciences, with most of the faculty from the College of Engineering engaged in social sciences research. This made RD2 think that maybe the HEI’s researchers are focused on the social sciences on the metacognitive side, which is less creative or less innovative, especially since RTU is a technological university.

Technological University of the Philippines (TUP) shall provide “higher and advanced vocational, technical, industrial, technological, and professional education and training in industries and technology, and in practical arts leading to certificates, diplomas, and degrees; provide progressive leadership in applied research, developmental studies in technical, industrial, and technological fields and production using indigenous materials; effect technology transfer in the countryside; and assist in the development of small-and-medium scale industries in identified growth centers.” True to the name of the university, TUP focuses on creating knowledge that will further develop and advance technologies such as the application of the Internet of Things (IoT) and sustainability of technologies like food technology and business, as well as social areas.

#### 4.4.2 Crafting Knowledge

Higher Education Institutions have highly competent workforce who support the vision and mission of their respective universities, especially in the field of research. PRL10 shares their practice of gathering faculty from their different campuses to form focus groups and craft or generate knowledge based on the needs of their concerned communities or target beneficiaries. PRL3 and PRL10 share that their HEIs have been very supportive to all their researchers by offering them institutional funding, honoraria, grants, deloading of teaching assignments, other incentives in the form of funds for publication, citation, food, transportation, and the like both for individual as well as for group research. However, PRL1 thinks the faculty needs to be equipped with better research skills and collaborative techniques to enable them to conduct their research more efficiently, generate more research outputs, and produce products that fit the needs of the community. Unfortunately, PRL 5 sadly acknowledges the lack of research culture in their HEIs as many are not engaged in

research. This is the same problem pointed out by both RD2 and RD7 in their HEIs because the focus of their faculty is on teaching which makes the situation difficult. Since their HEIs have no research outputs, they have no research results that they can mobilize. Thus, they have proposed different research programs and research strategies to elevate the theory capability especially of their faculty researchers. Fortunately, their faculty has realized that they will not get their promotion if they have no research output.

PRL4 reveals that his/her HEI conducts conferences and symposia to develop the faculty members' enthusiasm and interest in research while follow-up programs are provided to faculty who are experienced in research to enhance and strengthen their skill in conducting researches. Also, their Research and Development Office has developed a Research Manual which serves as a guide to faculty researchers on how to develop good research in their area of specialization.

To capacitate the entire faculty to have or to be able to achieve a level of research culture, PRL7 shares that his/her HEI conducted a survey on the faculty/s research needs so they could identify what particular capability strategies would be applied or implemented.

PRL3 notes that when they conduct a research, they usually think of what their community needs like solving or providing a solution for a particular problem, to help the community at the end of the project. Besides, they conduct a research only within their field of expertise.

Since institutional funding is of smaller value (PRL10), HEIs help their faculty researchers identify funding sources outside of the HEI such as funds from the Commission on Higher Education (CHED). As such, HEIs are able to generate research outputs that have made a big difference in the lives of their respective communities/stakeholders.

Through the years, the Philippine Normal University (PNU) been noted for its numerous researches geared towards improving education in the country, has provided the empirical data that has guided the development of what is now the Philippine Professional Standards for Teachers (PPST), a national policy for all teachers that is very consistent with the mandate of PNU as the National Center for

Teacher Education. This policy has a big impact on Filipino teachers and Filipino students taking up teacher education.

Technological University of the Philippines (TUP) has undertaken a sustainable electrification project that uses hydro, solar, and wind turbine as sources of energy for the whole community in Sitio Singawan, Dingalan, Aurora, an island that did not have electricity. The project started in 2018 after being approved by the town mayor and is still ongoing because it is a big community and the HEI is still building energy sources.

TUP also did the Mesa Project in collaboration with PNU. This project is intended for K-3 students whose work tables in their classroom will automatically become their shield and protect them when an earthquake occurs. Their tables automatically change their shape once they detect movement like an earthquake. The stakeholders or beneficiaries of this project are the kindergarten students of the Institute of Teaching and Learning (ITL) of PNU. TUP and PNU have endorsed this project to DepEd so the department can adapt it.

As another example, a faculty researcher of Polytechnic University of Philippines (PUP), in a joint research program under the Department of Science and Technology (DOST) and the Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (PCAARRD), developed a kit that will be distributed to mango farmers to help in the early detection, management, and prevention of scab disease pathogens and anthracnose, the most destructive disease of Philippine carabao mangoes. Another example of research from the same HEI that has made a big impact is the System Information Management. It benefits the students and their parents because it eliminates the long queues during enrolment period as students do not have to be physically present at the university and payments can be made at any Landbank branch while the faculty does not have to encode the names of students enrolled in their classes.

A student researcher of the Philippine College of Aeronautics (PHILSCA) came up with banto seal, a sealant used in aircrafts derived from a local tree, which won him a prize. Also, a faculty researcher presented a paper about Aviation English in Japan.

Eulogio “Amang” Rodriguez’s (EARIST) extension program for Hiyas ng Maynila Gawad Kalinga (GK) located in Laguna has created a big impact on the community. Although EARIST has undertaken several extension programs, the one involving the use of hybrid energy to power up the pumps of the GK community has the strongest impact because of its benefits to the community; it is what the community needs.

Rizal Technological University (RTU) has been actively engaged in urban agriculture, specifically, mushroom biotechnology, for five years now which has shown the greatest impact to its community. The university grows nine species of mushrooms. It also does gene banking, publication of mushroom cookbooks which show different ways to cook mushrooms, and also urban mushroom production. They have produced mushrooms that they sell to Micro, Small, and Medium Enterprises (MSMEs) or to communities with households or restaurants.

True to its target of helping the footwear industry players of the community, students-researchers of Marikina Polytechnic College (MPC) are able to develop prototypes of different shoes which were showcased in the Shoe Museum during the Anniversary Celebration of Marikina City. In addition, their faculty is able to develop some alternative materials for shoe fabric made out of corn husk. Unfortunately, the materials cannot be fully utilized yet since these are still undergoing patenting. It is their hope that this can be fully used in the future.

#### 4.4.3 Knowledge sharing

HEIs use different ways to share or communicate knowledge created to all stakeholders. Some HEIs share research results produced by providing them hard copies to make them easily accessible to all stakeholders as long as they are covered for public viewing under Republic Act 10173 or the Data Privacy Act of 2012 (RD2), through their website, or different social structures like Facebook, as well as by having a Memorandum of Understanding that eventually leads to the signing of a Memorandum of Agreement with external stakeholders (RD3) or through Research Congress/ Colloquia/ Fora/ Conferences held either on the university, national, or international level (RD1, RD3, RD6). Some outputs are published in the Research Journal (RD1, RD5, RD6), online journal system or OJS (RD3), a Compendium of Abstracts of research submissions of their faculty and students (RD7), or uploaded

and posted in the Research Portal of the HEIs while others are posted in Online Commons or converted into policy briefs and printed copies are sent to specific offices and officials through a courier service such as Luzon Brokerage Corporation or LBC Express (RD4).

On the other hand, action researches that are relevant to policy making are disseminated through Memos and offices are provided copies of the Customer Satisfaction Report (RD5). For PRL4, their practice is to maintain constant communication between the researchers and the higher ups and with partners or research collaborators.

PRL7 explains that aside from conferences and publication, they launched the social media platform called Showcasing Interesting and Notable Academic Genres or simply SINAG where they convert research outputs into 3 -5-minute video to entice or motivate not only researchers but also the common people or those who are not research enthusiasts to take a look at the research in full and to reach out to a larger group of people.

#### 4.4.4 Implementing and Evaluating the Results

HEIs have created offices to assist their researchers apply the knowledge produced to the community (RD1, RD2 - University Research and Extension Council; RD3 - Extension Management Office; RD4 - Educational Policy Research and Development Center; RD5 - Research and Extension; RD6 - Research and Development Office; RD7 - Research Development and Production Services). This office also monitors knowledge use by the community and other stakeholders, conducts impact assessment of the projects completed, identifies the strengths, weaknesses, and knowledge gaps to improve the KMb process and to be able to serve the community better, shares best practices with stakeholders, and maintains regular evaluation and improvement of the project to foster a culture of continuous learning and development.

Specifically, RD3 shares that his/her HEI usually signs a Memorandum of Understanding (MOU) that eventually leads to a Memorandum of Agreement (MOA) with its external stakeholders. Then, aside from monitoring its implementation once a research is adopted by the barangay or community, they also make an impact assessment on how the barangay or community benefited from the technology

adoption. In contrast, RD1 shares that they also enter into a MOA with beneficiaries of a project and includes among the terms of the agreement for the beneficiaries to give their feedback about the benefits they gained from the technology transfer.

PRL6 states that their research is mostly for the use of their stakeholders who are, based on their survey, mostly poor and live in flood-prone areas and end up in evacuation centers during heavy rains where they are provided ready-to-eat Magicks Instant Nutri Soup (Malunggay, Ginger, Chicken, Kangkong, and Sweet Potato). Students and staff as well as residents of three barangays who were given the instant soup gave a Very Satisfactory approval rating when surveyed on the effectiveness of the product.

PRL9 explains that they have an instrument in evaluating the needs of their community when they conduct an assessment before signing a collaboration and Memorandum of Agreement (MOA) with them. S/he shares that their HEI has an existing MOA with Non-Government Organizations (NGOs) and local government unit (LGU) of Mandaluyong City. Once a project is completed, they submit an Accomplishment Report complete with pictures to the Director and the Vice President of the HEI.

Since PNU's researches have implications to policy, RD4 explains that they provide copies of its research results to the Senate Committee on Education, House (Congress) Committee on Education, CHED, and DepEd because "these are the institutions that will use the type of knowledge that we produce primarily because they are the ones who have something to do with education and teacher education."

On the other hand, RD5 acknowledges they are "still working to extend the research results to the community, especially those that are applicable or relevant so we can achieve our agenda to help the community which is one of our objectives."

Since there is no uniform nor standard instrument to measure the effectiveness of knowledge mobilization to their internal and external stakeholders, researchers use other means such as compliance with the national government-mandated instruments regarding researches undertaken and research outputs completed/published like the Individual Performance Commitment and Review (IPCRF) and Performance-Based Bonus (PBB) from RD4, PRL8, and PRL10 and

Administrative Order 25 which harmonizes the national government performance monitoring, information, and reporting systems (for RD7).

RD2 recalls having an evaluation form that keeps track of the progress of a research – if it has been completed, for publication, or for patenting, but since it was formulated way back in 2012, they are now revising it. PRL3 also uses evaluation forms. Aside from this, the researchers return to the community after six (6) months to find out if there is knowledge use. Likewise, PRL5 also uses an evaluation form prepared by the researchers themselves. They also submit the number of beneficiaries of the activity as well as the effectiveness of the activity or Client Satisfaction.

PRL9 shares submitting an Accomplishment Report complete with pictures to the Director and the Vice President since their HEI does not use any metric tool. RD6 describes using quantitative measure (e.g., the number of their research outputs that had been utilized by DepEd or the Division Office or the frequency of use of these research outputs) and qualitative results (e.g., the impact of the research or project to the community).

PRL2 mentions using a research instrument that was approved for use with the research. Likewise, PRL6 uses an instrument prepared by the proponents or researchers themselves and validated by experts.

PRL7 recalls an instrument used for a research for their external community is to have a publication per a million grants. “So let’s say, you have nine (9) million grant, you need to have nine (9) publications in all. That’s really very difficult.”

PRL4 discloses that researchers in their HEI are aware that part of conducting a research is being under evaluation. Thus, they submit a monthly Progress Report that includes all weekly activities and the percentage of accomplishment within the week, the Financial Report, as well as the evaluation in the form of the presentation of the full-blown research and an Accomplishment Report. Their clients are asked to evaluate the HEI’s products and services, like how prompt and efficient the researchers are in replying to their communication and request, to determine the effectiveness of their research outputs.

PRL1 states that for their internal community, their HEI has developed a questionnaire to determine the quality of the cutting, tensioning, the workability, economy, and safety of the machine. They also observe statistical treatment of data.

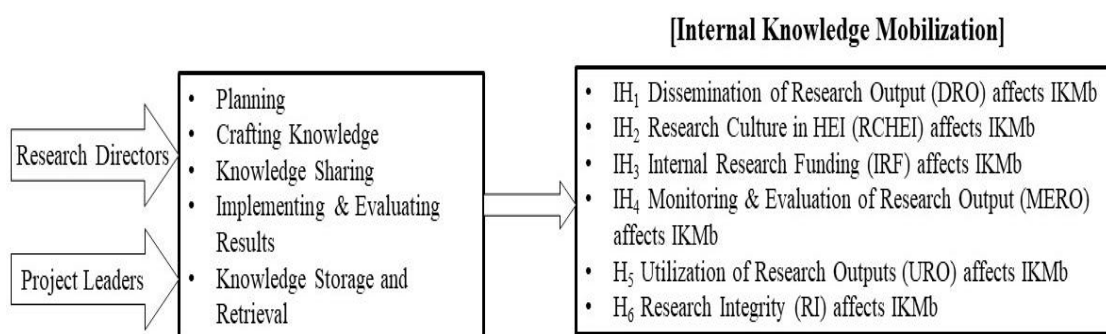
#### 4.4.5 Knowledge Storage and Retrieving

To wrap up, the knowledge produced by the HEIs is stored in hard copies in the offices of their respective university president and vice president and their libraries and research journals as well as digital copies in the website or research portal of the HEIs to ensure the accessibility of research outputs to pertinent stakeholders. Further, updated lists which also include the names of researchers and contact points are submitted to the concerned government agencies such as: (1) Commission on Higher Education (CHED); (2) Department of Education (DepEd); (3) Congress of the Philippines; (4) Philippine Senate; (5) Department of Budget and Management (DBM); (6) Department of Science and Technology (DOST); and (7) National Library of the Philippines. Publication in the Research Journal ensures that the stakeholders are provided their copies of the knowledge produced by the HEIs. Soft copies of the outputs can be accessed in the university's Research Portal and database. Knowledge created by the HEIs should be easily accessed to promote and encourage incremental innovation and a culture of knowledge mobilization within the HEI. Further, allowing past researches to be used as one of the bases for continuing research helps eliminate wastage of resources used in previous researches (RD7).

#### 4.5 Internal Knowledge Mobilization to Hypotheses

**Figure 4.7**

*Internal KMb to Hypotheses*



From interviews with the Research Directors (RDs) and the Project Research Leaders (PRLs), the following factors stand out to have an influence on successful internal knowledge mobilization: Research Culture in HEI (RCHEI), Research integrity (RI), Internal Research Funding (IRF), Dissemination of Research Output (DRO) Utilization of Research Outputs (URO), and Monitoring and Evaluation of Research Outputs (MERO).

#### 4.5.1 Research culture in HEI (RCHEI)

Universities strive to equip their faculty and students with research capability-building skills and techniques to enable them to produce quality research outputs that they can mobilize. RD1 sadly notes that not everyone in their HEI wants to go into research. This is echoed by PRL5 who pointed out that in their HEI “the problem lies in the lack of research culture. Many are not engaged in research. We can get the picture from a measly number of only 26 individuals who are active in research out of the 300 plus (faculty) members.” From RD2 “if there are no research outputs, we have no research results that we can mobilize.” Thus, s/he stresses the need to strive for research productivity of their faculty members, especially because their HEI has an “aging population.” RD7 further notes their faculty has to change their mindset so they would be motivated to go into research. PRL10 shares the Research Mentoring Workshop their HEI conducts where the country’s best researcher’s mentor their faculty has resulted in a noticeable increase in their HEI’s number of researchers. RD3 observes that the assignment of Faculty Researchers and Faculty Extensionists to every college or department in their HEI “has created a big impact in increasing the research productivity of our university.”

#### 4.5.2 Research integrity (RI)

Refers to honesty, transparency, fairness, accuracy, and accountability in conducting the research. It is important in maintaining ethical conduct in the methods used and the research results from this. Among the research integrity practices, RD1 mentioned that they require their stakeholders to sign a Non-Disclosure Agreement (NDA) before inviting them to attend the exhibit showcasing the university research outputs. Then, the HEI processes or files the patents for these technologies. PRL4 affirms the importance of having these prototypes patented first before being presented to stakeholders so they cannot be duplicated or copied. S/he happily

observes that their Intellectual Property Management Office is up to the task of protecting the rights of their faculty researchers and at the same time making the available researches easily accessible to their stakeholders. Another practice to maintain research integrity is to make sure that researchers undertake studies only within their field of expertise as pointed out by PRL3. Further, RD2 states that for transparency purposes, they make their research results accessible to all their stakeholders as long as these are covered for public viewing under the Data Privacy of 2012 or Republic Act No. 10173. Similarly, PRL2 points out that the same training s/he provided to the division office/partner-institution can be easily replicated or achieved in other schools, in other division offices.

#### 4.5.3 Internal research funding (IRF)

Refers to the use of a university's existing financial resources to help in generating research initiatives, gathering preliminary data, or implementing research results. Research funding has been said to play a critical role in ensuring the success of implementing university-based research results. From RD5 "Since our school is specialized, most of the needed instruments are quite expensive; we are still in the process of purchasing the equipment for our physical facilities we cannot procure testing here in our country. Thus, some are still proposals and their outcomes are still uncertain." PRL10 discloses that the institutional fund provided by the university for projects approved by the University Research and Extension Council is of smaller value because infrastructure is not included which makes other researchers opt for external funding.

#### 4.5.4 Internal dissemination of research outputs (DRO)

Involves the effective sharing of knowledge among the members of the university who are all working together under the same strategic plan. The interviews show that HEIs use varied strategies to disseminate effectively their research outputs to their internal stakeholders. PRL4 shares that they make research outputs available internally through the presentation, publication, as well as communication between the researcher/s and the higher ups. Similarly, PRL8 makes sure that their research outputs are properly and appropriately disseminated to their stakeholders while RD5 notes that they provide their offices with Customer Satisfaction Report.

#### 4.5.5 Utilization of research outputs (URO)

Is the process of using research-generated knowledge to address the needs of their target community like the particular teaching pedagogies that are very effective to their students or developing the HEI's Research Portal to address the need for an online system where all their research outputs could be available to their stakeholders as described by PRL7. The utilization of research outputs within a university is essential for evidence-based decision-making, improving practices, promoting innovation, and enriching capacity building. PRL8 shares that the conduct of internal needs analysis research has helped them to “identify the strengths and weaknesses of their faculty workforce and has provided the Dean with direction or focus in terms of career improvement knowledge development, knowledge production, or instruction.” PRL2 expresses satisfaction on how their internal stakeholders have found their researches useful in supporting the teaching-learning and engagement functions and in addressing local and national development needs which has earned their HEI high points and fulfilled an accreditation requirement.

#### 4.5.6 Monitoring and evaluation of research outputs (MERO)

Refers to the processes that allow researchers involved to keep track of the activities of the project and assess the effectiveness and impact of the research over time and at the end of the program. This provides the researchers an opportunity for continuous improvement of the mobilization process as it helps pinpoint stages of the process that need improvement. PRL4 acknowledges that part of their research is being aware that they are under evaluation. Thus, HEIs have developed and validated their own instruments to monitor and evaluate the effectiveness of the activity. Others rely on the national government's guidelines such as the Performance Based Bonus (PBB) and the Individual Performance and Commitment Review Form (IPCRF) as incentive system for those with research completed or published. On the other hand, PRL4 asks their “clients to evaluate our products and services, like how prompt and efficient we are in replying to their communication and requests.”

Table 4.5 below presents the summary of these essential or core phrases mentioned by the Research Directors (RD) of the HEIs interviewed that show the link of these core ideas to the variables of IKMb.

**Table 4.5**

*Summary of Essential or Core Phrases Mentioned by the Research Directors*

Summary of Mentions by RDs in IKMb
<ol style="list-style-type: none"> <li>1) assign Faculty Researchers and Extensionists to every college or department</li> <li>2) change the mindset of faculty</li> <li>3) strive for research productivity</li> <li>4) not everyone wants to go into research</li> <li>5) Non-Disclosure Agreement (NDA)</li> <li>6) HEI processes or files the patents</li> <li>7) research results are accessible to all</li> <li>8) apply Data Privacy Act of 2012 or Republic Act No. 10173</li> <li>9) some proposals have not been approved due to budget constraints</li> <li>10) publish in Research Journal and provide offices with Customer Satisfaction Report</li> <li>11) upload in Research Portal, convert to policy briefs, publish and send thru email or Facebook page</li> <li>12) present annually research and extension outputs</li> <li>13) disseminate and assist faculty in presenting and publishing their works</li> <li>14) publish in Research Journal and Compendium of Abstract and provide copies to other colleges</li> <li>15) provide hard copies</li> <li>16) conduct Research Colloquium, Research Congress</li> <li>17) use of Aviation English by a faculty researcher</li> <li>18) report research completed or published for PBB and IPCR purposes.</li> <li>19) feedback by beneficiaries about the benefits gained from the project</li> <li>20) impact assessment</li> <li>21) comply with AO 25.</li> <li>22) for patents only although patented invention was not really used or sought after</li> </ol>

**Table 4.5** (Continued)

*Summary of Essential or Core Phrases Mentioned by the Research Directors*

Summary of Mentions by RDs in IKMb
23) evaluation form keeps track of the progress of a research – completed, for publication, or for patenting
24) number of research outputs utilized by DepEd or by the division
25) impact of the research to the community

On the other hand, the Project Research Leaders of the HEIs mentioned the following essential or core phrases as outlined in Table 4.6 below that show the link between these core ideas and the variables that significantly affect IKMb.

**Table 4.6**

*Mentions made by the Project Research Leaders (PRLs) Interviewed*

Summary of Mentions by PRLs in IKMb
1) lack of research culture
2) conduct Research Mentoring Workshop
3) prototypes are patented first
4) stakeholders sign NDA
5) training can be replicated in other schools, in other divisions
6) researchers undertake studies within their field of expertise
7) of smaller value thus, other researchers opt for external funding
8) communication between researcher/s and the higher ups
9) researchers present and publish their papers, and cite papers published by faculty members of the HEI
10) upload in the HEI Research Portal; publication, presentation, and social media
11) address the needs of target beneficiaries e.g. for particular teaching pedagogies, easy access to all their research outputs, systematic enrolment system
12) identify the strengths and weaknesses of their faculty

**Table 4.6** (Continued)*Mentions made by the Project Research Leaders (PRLs) Interviewed*

Summary of Mentions by PRLs in IKMb
13) support the teaching-learning and engagement functions and address local and national development needs, an accreditation requirement
14) offer effective instruction and training to students within the budget of their parents
15) utilize the technology inside the campus first
16) create an instant soup for students in evacuation centers during floods
17) monthly progress report and Accomplishment Report; clients evaluation of their products and services
18) instrument prepared by researchers themselves to measure effectiveness of the activity or client satisfaction
19) Performance based incentive system of the government
20) Evaluation forms, survey forms
21) Review process
22) MOA and OPCRf
23) questionnaire to determine the quality of the cutting, tensioning, workability, economy, and safety of the machine; statistical treatment of data
24) survey forms
25) Accomplishment Report with pictures

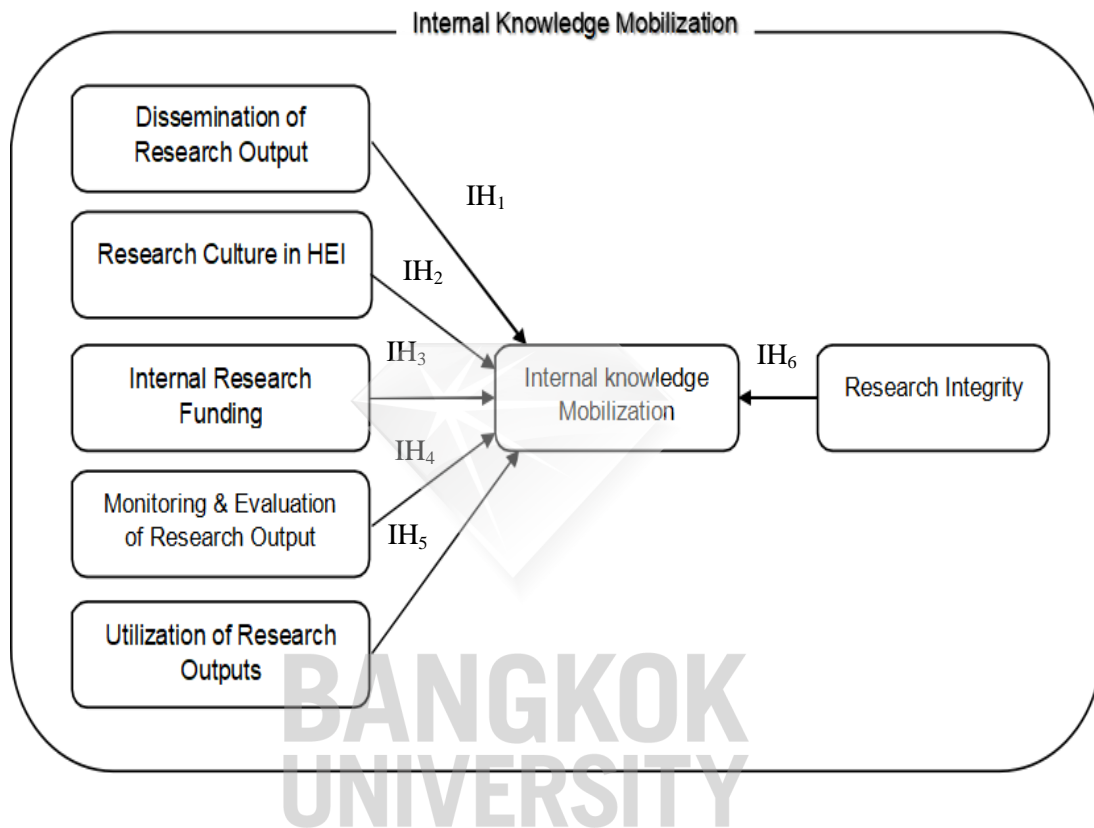
#### **4.6 Internal Stakeholders Pre-KMb Model and Questionnaire Development**

##### **4.6.1 Internal KMb Model**

To sum up, the effectiveness of Internal Knowledge Mobilization (IKMb) is influenced by Dissemination of Research Outputs (DRO), Research Culture in HEI (RCHEI), Internal Research Funding (IRF), Monitoring and Evaluation of Research Outputs (MERO), Utilization of Research Outputs (URO), and Research Integrity (RI) as shown in Figure 4.8 below.

**Figure 4.8**

*Success Factors for Effectiveness of Internal Knowledge Mobilization*



For this reason, the following hypotheses are presented:

IH<sub>1</sub> Dissemination of Research Output (DRO) affects the effectiveness of IKMb.

IH<sub>2</sub> Research Culture in HEI (RCHEI) affects the effectiveness of IKMb.

IH<sub>3</sub> Internal Research Funding (IRF) affects the effectiveness of IKMb.

IH<sub>4</sub> Monitoring & Evaluation of Research Output (MERO) affects the effectiveness of IKMb.

IH<sub>5</sub> Utilization of Research Outputs (URO) affects the effectiveness of IKMb.

IH<sub>6</sub> Research Integrity (RI) affects the effectiveness of IKMb.

Table 4.7 below presents the hypotheses summary for the effectiveness of Internal Knowledge Mobilization that was constructed based on the results of the interviews conducted and the corresponding survey questions that were formulated based on these hypotheses. The survey questionnaire was validated by content and language experts.

**Table 4.7**

*Connection between Hypotheses for Effectiveness of IKMb to Survey Questions*

Hypotheses for IKMb	Qualitative Survey Questions
IH <sub>1</sub> Dissemination of Research Output (DRO) affects the effectiveness of IKMb	<ol style="list-style-type: none"> <li>1) The university's research outputs meet the needs of the stakeholders.</li> <li>2) The research has a positive impact on the lives of the university's stakeholders.</li> <li>3) Research outputs are used to inform and shape university policies, programs, and practices.</li> </ol>
IH <sub>2</sub> Research Culture in HEI (RCHEI) affects the effectiveness of IKMb	<ol style="list-style-type: none"> <li>1) The administration fosters a positive research culture by developing policies and programs that support and sustain the research productivity of researchers at all stages of their careers.</li> <li>2) The university has a straightforward, practical, and realistic research training management plan to enhance the research skills and develop the expertise of its students and academic staff.</li> <li>3) The administration promotes research excellence through a fair financial and non-financial reward, benefit, and incentive system.</li> <li>4) The university offers adequate research services and facilities for the conduct of research.</li> </ol>

**Table 4.7** (Continued)*Connection between Hypotheses for Effectiveness of IKMb to Survey Questions*

Hypotheses for IKMb	Qualitative Survey Questions
IH <sub>3</sub> Internal Research Funding (IRF) affects the effectiveness of IKMb	<p>1) The availability and allocation of institutional funding adequately supports students and academic staff's research training opportunities and experiences.</p> <p>2) The institutional funding for research projects should cover all research expenses, including the dissemination and publication of research outputs.</p> <p>3) Institutional funding of approved research is released on time and not restricted by the government's bureaucratic red tape.</p>
IH <sub>4</sub> Monitoring & Evaluation of Research Output (MERO) affects the effectiveness of IKMb	<p>1) The university uses a needs assessment instrument to fully identify/address objectively the needs of potential players in the community.</p> <p>2) The university uses a metric tool to objectively measure the effectiveness of its research outputs to its internal community.</p> <p>3) The research community of the university is fully informed that assessing research outputs ensures accountability of key stakeholders of the research.</p>
H <sub>5</sub> Utilization of Research Outputs (URO) affects the effectiveness of IKMb	<p>1) We receive and have access to related research outputs from universities across the Philippines.</p> <p>2) The research outputs from my university are shared with other university researchers throughout the country.</p>

**Table 4.7** (Continued)*Connection between Hypotheses for Effectiveness of IKMb to Survey Questions*

Hypotheses for IKMb	Qualitative Survey Questions
H <sub>5</sub> Utilization of Research Outputs (URO) affects the effectiveness of IKMb	<p>3) The university maintains constant interaction and engagement with non-governmental organizations (NGOs), local government units (LGUs), communities, and other organizations and industries to build and sustain a strong, working collaborative partnership with them.</p> <p>4) The university provides means for linkages with other institutions, local or international, to create intellectual synergy.</p>
H <sub>6</sub> Research Integrity (RI) affects the effectiveness of IKMb	<p>1) The university's researchers gain informed consent from research respondents / participants, ensure their anonymity in the communication of research findings, and respect data privacy law.</p> <p>2) The university provides its researchers with adequate guidance in good research practices.</p> <p>3) The university expects the highest ethical standards from its researchers and is committed to upholding the integrity of academic research.</p>

The survey questionnaire distributed to internal stakeholders has three (3) additional questions that respondents were requested to answer. As presented in Table 4.8 below, these additional quantitative survey questions are connected to the hypotheses.

**Table 4.8***Connection between Hypotheses and Quantitative Survey Questions*

Hypotheses for IKMb	Quantitative Survey Questions
IH <sub>1</sub> Dissemination of Research Output (DRO) affects effectiveness of IKMb	How could the university more effectively communicate research findings to the community?
IH <sub>4</sub> Monitoring & Evaluation of Research Output (MERO) affects effectiveness of IKMb	Please provide one example of feedback from the external stakeholder community regarding the effectiveness of research outputs.
H <sub>5</sub> Utilization of Research Outputs (URO) affects effectiveness of IKMb	Please provide one example of by whom and how research outputs were used by external stakeholders.

1) Dissemination of Research Outputs (DRO)

The internal stakeholders enumerated different ways on how their respective university can communicate research findings to the community effectively:

1.1) By conducting events

1.1.1) Holding extension services, maximizing use of community extension projects or outreach activities to specific demographics where the research has direct impact

1.1.2) Holding University forums, preferably held annually, with presenters using layman's terms

1.1.3) Presenting research findings in conferences, symposia, conferences, lectures to other schools

1.1.4) Working directly with the community to apply the results of the research

1.2) Oral form

1.2.1) Holding regular meetings on current researches completed and researches in the process of completion to ensure there is no duplication of study

- 1.2.2) Conducting seminars or webinars
- 1.2.3) Oral presentations, paper presentations
- 1.3) Through printed form
  - 1.3.1) Publication
  - 1.3.2) Publishing peer-reviewed research papers
  - 1.3.3) Policy briefs/discussion papers
  - 1.3.4) Publishing a compendium of research findings and distributing it to LGUs and all extension partners
  - 1.3.5) Publishing of research abstract
  - 1.3.6) Giving access to journal research articles
- 1.4) Through digital means
  - 1.4.1) Establishing a publishing forum to give experience to researchers publishes their own work
  - 1.4.2) Posting updated activities and research undertakings of the university in official websites or social media pages
  - 1.4.3) Sending information through emails to relevant stakeholders and partners
  - 1.4.4) Holding research forums and presentations where educators from across the country and abroad can participate
  - 1.4.5) Holding social media publication to share information regarding research completed
  - 1.4.6) Collaborating with different stakeholders to hold a series of virtual seminars for the community using infographics
  - 1.4.7) Giving the public open access to the researches
- 1.5) Others
  - 1.5.1) Establishing more linkages with LGUs
  - 1.5.2) Developing Research and Data Management in the institution
  - 1.5.3) By promoting and supporting researchers
  - 1.5.4) Doing active research
  - 1.5.5) Guiding novice researchers on how to publish research studies in reputable publications

- 1.5.6) Providing action-oriented research /information dissemination
- 1.5.7) Strengthening external research linkages
- 1.5.8) Assigning a monitoring committee to check if research findings are shared with external stakeholders
- 1.5.9) Involving the public library to enable the community to access research findings
- 1.5.10) Educating the public on the importance of using evidence-based research in making important decisions
- 1.5.11) Documenting impact research and all researches utilized by stakeholders, highlighting their use by stakeholders to increase everyone's awareness and they become potential disseminator of information
- 1.5.12) Using all platforms to give everyone more access
- 1.5.13) Involving key persons who are held in high esteem by the community in the research
- 1.5.14) Working on research problems that cater to the needs of the community
- 1.5.15) Creating a mechanism where researchers have to disseminate their findings to the community first before being awarded their certificate of completion
- 1.5.16) Communicating research findings to those who are responsible for acting on the information disseminated

To sum things up, the respondents may have different ideas on how to disseminate their research outputs but they agree that it is really important to disseminate knowledge produced by the university to the community, even to the public in general.

## 2) Monitoring & Evaluation of Research Output (MERO)

Out of 220 respondents, at least 57 respondents who answered they have no idea on the effectiveness of their HEI's research outputs, either because they are new in the HEI or they simply skipped responding to this item. One respondent categorically stated that there was no assessment made after the completion of the project while still another said results of the evaluation in their HEI are usually held

confidential and are known only to the researcher/s concerned. One respondent noted that decision to adapt a research still lies in the hands of influential officials of the Department of Education (DepEd) who have their own political agenda.

On the whole, however, a majority of the respondents gave positive feedback regarding the effectiveness of their HEIs research outputs, using adjectives such as relevant, engaging, excellent, doable, very useful, and the like because as explained by a respondent, the research outputs were instrumental in conserving and spreading understanding cultural diversity and promoting peace among different ethnic groups so much so that the proponents of the research received an appreciation from the Manobo tribe and the office of the provincial capital of Agusan del Sur. Three (2) respondents gave negative feedback saying the research was not easy to implement, not congruent with societal needs, and tough [referring to the implementation of the Philippine Professional Standards for Teachers (PPST)].

### 3) Utilization of Research Outputs (URO)

Out of 220 internal respondents of the survey questionnaire, a total of 27 respondents said they are not aware or they cannot remember how their HEIs' research outputs were used by their external stakeholders.

The following objectives were identified by the internal respondents on how their HEIs' research outputs were used by their external stakeholders.

3.1) to determine the impact of the HEI's extension programs and develop more appropriate and responsive plans, programs, and sustainable community partnership

3.2) to provide valuable input on the strategies of teaching and development of instructional materials for Kindergarten teachers

3.3) to use as reference in preparing city and barangay ordinances

3.4) to guide the Department of Education in improving its system and method of implementation of its programs

3.5) to craft an extension program based on the needs of an Agta (an indigenous tribe) community

3.6) to standardize assessment of teacher performance

3.7) to improve the livelihood, health, and standard of living conditions of women workers and barangay residents

3.8) to provide further trainings for employees of LGUs, DSWD after conducting Citizens Satisfaction Index System (CSIS) study

3.9) to aid in the revision of the curriculum, legislation, and other government policies

3.10) to equip parents with strategies on how to help their children in their Mathematics lessons and other online classes

3.11) to assess the curriculum of the College of Education based on the performance of newly-hired teachers

3.12) to understand motivation of employees and formulate effective policies and guidelines that will enable them to work effectively and efficiently

3.13) to reduce the reliance on private vehicle use and move toward environmentally sound mobility solutions

3.14) to improve the health and well-being of overweight and obese mothers

#### **4.7 Internal Stakeholders Survey**

The participants for internal stakeholders for the survey questionnaire are based on seniority levels. It is composed of the following levels with their corresponding classifications:

A - Director of Research or Full Professor. The single highest grade/post at which research is normally conducted.

B - Senior Researcher or Principal Investigator or Associate Professor. These researchers are holding positions that are considered more senior than those held by the newly qualified graduates of doctoral programs.

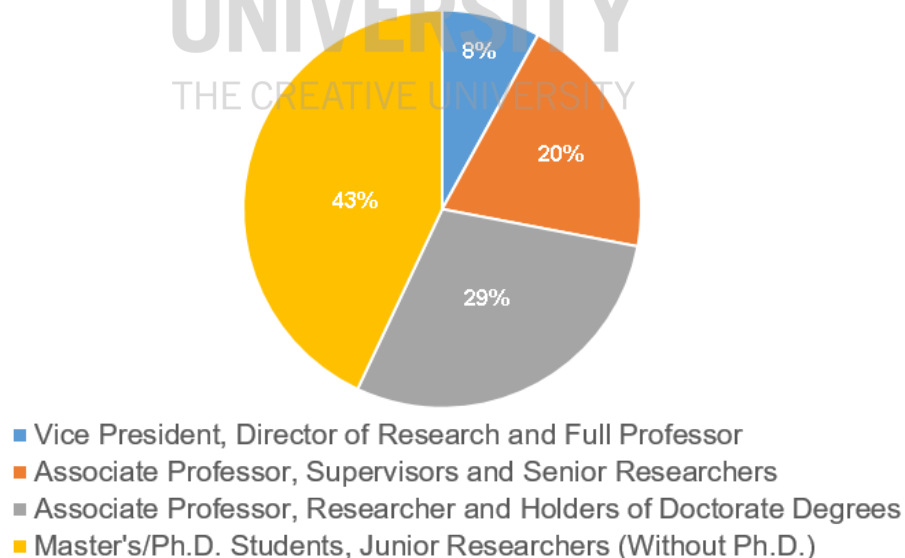
C - Researcher or Investigator or Assistant Professor or Assistant Professor or Post-doctoral fellow. This is the first/post a newly qualified graduate of a doctoral program would normally be recruited.

D - Students pursuing their Master's/Ph.D. programs or Junior Researchers (without a Ph.D.). These are students taking up their Master's/Ph. D. programs who are engaged as researchers or researchers working in posts that do not normally require a doctorate degree (Adapted from Organisation for Economic Co-operation and Development, 2015).

As shown in Figure 4.9, a total of 220 internal stakeholder-participants responded to the survey questionnaire for internal stakeholders. There were 17 participants (8% of total) who were under Category A; 45 participants (20% of total) under Category B; 63 participants (29% of total) under Category C; and lastly, 95 participants (43%) under Category D. With these levels of classifications, the researcher ensured that all the groups in the internal stakeholders sector were well represented, from junior researchers to senior researchers taking into account their educational qualifications and job titles.

**Figure 4.9**

*Research by Seniority Levels (Internal Stakeholders)*



#### 4.7.1 KMb Internal Stakeholders Survey

After exploring the qualitative results and analyzing the data, the researcher constructed a survey questionnaire based on the results of open-ended questions to underpin the observed phenomena. The questionnaire is primarily quantitative in nature, using five Likert scales, and includes three open-ended questions to determine if the internal KMb model is appropriate and effective in assessing KMb effectiveness in HEIs. The survey questionnaire was developed to measure the predictors related to the studies. The variables constructed were based on content analysis of open-ended questions and classified accordingly. Table 4.9 below shows the variables and the corresponding survey questions that have been constructed.

**Table 4.9**

*Variables with Corresponding Survey Questions (Internal Survey Questionnaire)*

Variables	Survey Questions
Dissemination of Research Output (DRO)	1) The university's research outputs meet the needs of the stakeholders. 2) The research has a positive impact on the lives of the university's stakeholders. 3) Research outputs are used to inform and shape university policies, programs, and practices.
Research Culture in HEI (RCHEI)	1) The administration fosters a positive research culture by developing policies and programs that support and sustain the research productivity of researchers at all stages of their careers. 2) The university has a straightforward, practical, and realistic research training management plan to enhance the research skills and develop the expertise of its students and academic staff.

**Table 4.9** (Continued)*Variables with Corresponding Survey Questions (Internal Survey Questionnaire)*

Variables	Survey Questions
Research Culture in HEI (RCHEI)	<p>3) The administration promotes research excellence through a fair financial and non-financial reward, benefit, and incentive system.</p> <p>4) The university offers adequate research services and facilities for the conduct of research.</p>
Internal Research Funding (IRF)	<p>1) The availability and allocation of institutional funding adequately supports students and academic staff's research training opportunities and experiences.</p> <p>2) The institutional funding for research projects should cover all research expenses, including the dissemination and publication of research outputs.</p> <p>3) Institutional funding of approved research is released on time and not restricted by the government's bureaucratic red tape.</p>
Monitoring & Evaluation of Research Output (MERO)	<p>1) The university uses a needs assessment instrument to fully identify/address objectively the needs of potential players in the community.</p> <p>2) The university uses a metric tool to objectively measure the effectiveness of its research outputs to its internal community.</p> <p>3) The research community of the university is fully informed that assessing research outputs ensures accountability of key stakeholders of the research.</p>
Utilization of Research Outputs (URO)	<p>1) We receive and have access to related research outputs from universities across the Philippines.</p> <p>2) The research outputs from my university are shared with other university researchers throughout the country.</p>

**Table 4.9** (Continued)*Variables with Corresponding Survey Questions (Internal Survey Questionnaire)*

Variables	Survey Questions
Utilization of Research Outputs (URO)	<p>3) The university maintains constant interaction and engagement with non-governmental organizations (NGOs), local government units (LGUs), communities, and other organizations and industries to build and sustain a strong, working collaborative partnership with them.</p> <p>4) The university provides means for linkages with other institutions, local or international, to create intellectual synergy.</p>
Research Integrity	<p>1) The university's researchers gain informed consent from research respondents / participants, ensure their anonymity in the communication of research findings, and respect data privacy law.</p> <p>2) The university provides its researchers with adequate guidance in good research practices.</p> <p>3) The university expects the highest ethical standards from its researchers and is committed to upholding the integrity of academic research.</p>
Knowledge Mobilization (KMb)	<p>1) There is widespread dissemination of the research outputs of the university to concerned stakeholders.</p> <p>2) Potential players in the community make use of the university's research outputs to improve the lives of the community.</p> <p>3) The current process is effective in transmitting research output to the larger group of stakeholders who can use it.</p>

The questions, as shown in Table 4.9, were validated by a content expert and a language expert whose competence in the area of knowledge mobilization and languages, respectively, is recognized. Furthermore, after validating the survey

questionnaire, Cronbach's alpha was utilized to test the internal consistency of the validated survey questionnaire. Table 4.10 shows a summary of the reliability of Cronbach's Alpha.

**Table 4.10**

*Summary of Internal KMb Predictors Reliability Statistics*

Predictors	Cronbach's $\alpha$
DRO	0.835
RCHEI	0.861
IRF	0.69
MERO	0.818
URO	0.799
RI	0.852
KMb	0.81

The results of Cronbach's alpha reveal how closely related a set of items is as a group (Institute of Digital Research & Education, n.a). A survey questionnaire was sent to internal stakeholders identified by officials of the seven (7) Higher Education Institutions (HEIs) in the National Capital Region of the Philippines. There were 220 respondents to the survey questionnaire. The survey questionnaire consisted of 23 items with three (3) open-ended questions. The purpose of the internal consistency was to determine the reliability of the survey questionnaire. According to Bujang, Omar, and Baharum (2018), assessing the internal consistency of data tests the reliability of the respondent's feedback on a research instrument (or domain of a questionnaire), instrumentation, or rating evaluated by subjects, which will indicate the stability of the tools. As a result, Cronbach alpha is used to assess the consistency or dependability of multiple items, measurements, or ratings. Furthermore, Cronbach alpha is used to assess the stability of the instrument that measures the research variables.

According to Hair et al (2016), the value of the reliability analysis can be interpreted based on strength using the Rule of Thumb as indicated in Table 4.11

**Table 4.11**

*Strength of Association Determination*

Alpha Coefficient Range	Strength of Association
$< 0.6$	Poor
$0.6 < 0.7$	Moderate
$0.7 < 0.8$	Good
$0.8 < 0.9$	Very Good
$0.9 >$	Excellent

The researcher utilized multiple regression analysis for the quantitative data gathered. Multiple regressions were used to examine the relationship between the dependent variable (IKMb) and the independent variables (DRO, RCHEI, IRF, MERO, URO, and RI). Table 4.12-4.14 shows the summary of the effectiveness of internal knowledge mobilization (IKMb) with sub the following sub-tables: Table 4.12 Regression summary of internal knowledge mobilization, Table 13.2 ANOVA summary of internal knowledge mobilization, and Table 4.13 Regression coefficients of internal knowledge mobilization. Table 4.14 shows an overview of the influences of two or more variables on each other to predict internal knowledge mobilization. Table 4.12-4.14 Summary of the effectiveness of internal knowledge mobilization result

**Table 4.12***Regression Summary of the Effectiveness of Internal Knowledge Mobilization*

Result	R	R <sup>2</sup>	Adjusted R <sup>2</sup>
1	0.652	0.425	0.419
2	0.828	0.686	0.681
3	0.841	0.708	0.702
4	0.847	0.717	0.710
5	0.851	0.725	0.716

**Table 4.13***ANOVA Summary of the Effectiveness of Internal Knowledge Mobilization*

Result		Sum of Squares	df	Mean Square	F	P
1	Regression	25.975	2	12.988	71.091	<.001
	Residual	35.076	192	0.183		
	Total	61.052	194			
2	Regression	41.888	3	13.963	139.164	<.001
	Residual	19.164	191	0.100		
	Total	61.052	194			
3	Regression	43.227	4	10.804	115.197	<.001
	Residual	17.824	190	0.094		
	Total	61.052	194			
4	Regression	43.785	5	8.757	95.851	<.001
	Residual	17.267	189	0.091		
	Total	61.052	194			
5	Regression	44.251	6	7.375	82.526	<.001
	Residual	16.801	188	0.089		
	Total	61.052	194			

**Table 4.14***Regression Coefficients of the Effectiveness of Internal Knowledge Mobilization*

		Collinearity Statistic						
Result		Unstandardized	Standard Error	Standardized	T	p	Tolerance	VIF
1	(Intercept)	0.921	0.282		3.264	0.001		
	RCHEI (IV)	0.485	0.087	0.437	5.590	< .001	0.490	2.042
	IRF (IV)	0.271	0.080	0.264	3.377	< .001	0.490	2.042
2	(Intercept)	0.236	0.216		1.094	0.275		
	RCHEI (IV)	0.091	0.071	0.082	1.275	0.204	0.396	2.525
	IRF (IV)	0.084	0.061	0.082	1.369	0.173	0.461	2.170
	DRO (IV)	0.742	0.059	0.716	12.594	< .001	0.509	1.965
3	(Intercept)	0.256	0.209		1.224	0.223		
	RCHEI (IV)	0.017	0.072	0.016	0.244	0.808	0.367	2.726
	IRF (IV)	0.022	0.062	0.021	0.352	0.725	0.428	2.337
	DRO (IV)	0.624	0.065	0.602	9.594	< .001	0.391	2.559
	MERO (IV)	0.254	0.067	0.260	3.778	< .001	0.325	3.077

**Table 4.14** (Continued)*Regression Coefficients of the Effectiveness of Internal Knowledge Mobilization*

		Collinearity Statistic						
Result		Unstandardized	Standard Error	Standardized	T	p	Tolerance	VIF
4	(Intercept)	0.186	0.208		0.894	0.372		
	RCHEI (IV)	-0.014	0.072	-0.013	-0.196	0.845	0.355	2.815
	IRF (IV)	-0.017	0.063	-0.016	-0.268	0.789	0.401	2.491
	DRO (IV)	0.605	0.065	0.584	9.368	< .001	0.386	2.594
	MERO (IV)	0.204	0.069	0.209	2.953	0.004	0.298	3.357
	URO (IV)	0.157	0.063	0.153	2.470	0.014	0.392	2.550
5	(Intercept)	0.389	0.224		1.735	0.084		
	RCHEI (IV)	0.040	0.075	0.036	0.537	0.592	0.319	3.131
	IRF (IV)	-0.011	0.062	-0.010	-0.170	0.866	0.401	2.496
	DRO (IV)	0.615	0.064	0.593	9.607	< .001	0.384	2.606
	MERO (IV)	0.236	0.070	0.242	3.380	< .001	0.286	3.495
	URO (IV)	0.183	0.064	0.178	2.870	0.005	0.379	2.637
	RI (IV)	-0.167	0.073	-0.140	-2.283	0.024	0.390	2.563

Note. The following covariates were considered but not included: RCHEI(IV), and IRF(IV).

In order to statistically examine the identified predictors of external knowledge mobilization, a forward regression analysis was carried out. Jeffrey's Amazing Statistics Program (JASP) software is an open-source statistical program designed to conduct statistical analysis. Table 4.2 shows that result 1 obtained a value adjusted  $r^2 = 0.419$  or 41.9% variance in predicting internal knowledge mobilization. Result 2 obtained a value adjusted  $r^2 = 0.681$  or 68.1% variance in predicting internal knowledge mobilization. Result 3 obtained value adjusted  $r^2 = 0.702$  or 70.2% variance in predicting internal knowledge mobilization. Result 4 obtained a value adjusted  $r^2 = 0.710$  or 71% variance in predicting internal knowledge mobilization. Lastly, result 5 obtained a value adjusted  $r^2 = 0.716$  or 71.6% variance in predicting internal knowledge mobilization. The results reveal that ideally result 5 has more impact in predicting internal knowledge mobilization compared with the other results. Table 4.13 shows that result 1 to result 5 is significant with a p-value of .001 ( $p < 0.05$ ). Table 4.14 reveals the results of the following results:

Result 1: Internal Knowledge Mobilization (IKMb) =  $\beta_0 + \beta_1 * \text{Research Culture in Higher Education Institution (RCHEI)} + \beta_2 * \text{Internal Research Funding (IRF)}$

RCHEI: The coefficient for RCHEI was found significant with a p-value of .001 ( $p < 0.05$ ), indicating that the RCHEI has significant positive effect on the internal knowledge mobilization. The coefficient estimate 0.437 (SE=0.087, t-value=5.590). This coefficient indicates that RCHEI predicts IKMb.

IRF: The coefficient for IRF was found to be significant with a p-value of .001 ( $p < 0.05$ ), indicating that the IRF has significant positive effect on the internal knowledge mobilization. The coefficient estimate 0.264 (SE=0.080, t-value=3.377). This positive coefficient indicates that IRF predicts IKMb.

Result 2: Internal Knowledge Mobilization (IKMb) =  $\beta_0 + \beta_1 * \text{Research Culture in Higher Education Institution (RCHEI)} + \beta_2 * \text{Internal Research Funding (IRF)} + \beta_3 * \text{Dissemination of Research Output (DRO)}$

RCHEI: The coefficient for RCHEI was found not significant with a p-value of .204 ( $p < 0.05$ ), indicating that the RCHEI has significant negative effect on the internal knowledge mobilization. The coefficient estimate 0.082 (SE=0.071, t-value=1.275). This coefficient indicates that RCHEI does not predict IKMb.

IRF: The coefficient for IRF was found not significant with a p-value of .173 ( $p < 0.05$ ), indicating that the IRF has significant negative effect on the internal knowledge mobilization. The coefficient estimate 0.082 (SE=0.061, t-value=1.369). This coefficient indicates that IRF does not predict IKMb.

DRO: The coefficient for DRO was found to be significant with a p-value of .001 ( $p < 0.05$ ), indicating that the DRO has significant positive effect on the internal knowledge mobilization. The coefficient estimate 0.716 (SE=0.059, t-value=12.594). This coefficient indicates that DRO predicts IKMb.

Result 3: Internal Knowledge Mobilization (IKMb) =  $\beta_0 + \beta_1 * \text{Research Culture in Higher Education Institution (RCHEI)} + \beta_2 * \text{Internal Research Funding (IRF)} + \beta_3 * \text{Dissemination of Research Output (DRO)} + \beta_4 * \text{Monitoring and Evaluation of Research Output (MERO)}$

RCHEI: The coefficient for RCHEI was found not significant with a p-value of .808 ( $p < 0.05$ ), indicating that the RCHEI has significant negative effect on the internal knowledge mobilization. The coefficient estimate 0.016 (SE=0.072, t-value=0.244). This coefficient indicates that RCHEI does not predict IKMb.

IRF: The coefficient for IRF was found not significant with a p-value of .352 ( $p < 0.05$ ), indicating that the IRF has significant negative effect on the internal knowledge mobilization. The coefficient estimate 0.021 (SE=0.062, t-value=0.253). This coefficient indicates that IRF does not predict IKMb.

DRO: The coefficient for DRO was found to be significant with a p-value of .001 ( $p < 0.05$ ), indicating that the DRO has significant positive effect on the internal knowledge mobilization. The coefficient estimate 0.602 (SE=0.065, t-value=9.594). This coefficient indicates that DRO predicts IKMb.

MERO: The coefficient for MERO was found to be significant with a p-value of .001 ( $p < 0.05$ ), indicating that the DRO has significant positive effect on the internal knowledge mobilization. The coefficient estimate 0.602 (SE=0.067, t-value=3.788). This coefficient indicates that MERO predicts IKMb.

Result 4: Internal Knowledge Mobilization (IKMb) =  $\beta_0 + \beta_1 * \text{Research Culture in Higher Education Institution (RCHEI)} + \beta_2 * \text{Internal Research Funding (IRF)} + \beta_3 * \text{Dissemination of Research Output (DRO)} + \beta_4 * \text{Monitoring and Evaluation of Research Output (MERO)} + \beta_5 * \text{Utilization of Research Output (URO)}$

RCHEI: The coefficient for RCHEI was found not significant with a p-value of .845 ( $p < 0.05$ ), indicating that the RCHEI has significant negative effect on the internal knowledge mobilization. The coefficient estimate -0.013 (SE=0.072, t-value=-0.196). This negative coefficient indicates that RCHEI does not predict IKMb.

IRF: The coefficient for IRF was found not significant with a p-value of .789 ( $p < 0.05$ ), indicating that the IRF has significant negative effect on the internal knowledge mobilization. The coefficient estimate -0.016 (SE=0.063, t-value=-0.268). This negative coefficient indicates that IRF does not predict IKMb.

DRO: The coefficient for DRO was found to be significant with a p-value of .001 ( $p < 0.05$ ), indicating that the DRO has significant positive effect on the internal knowledge mobilization. The coefficient estimate 0.584 (SE=0.065, t-value=9.368). This coefficient indicates that DRO predicts IKMb.

MERO: The coefficient for MERO was found to be significant with a p-value of .004 ( $p < 0.05$ ), indicating that the MERO has significant positive effect on the internal knowledge mobilization. The coefficient estimate 0.209 (SE=0.069, t-value=2.953). This coefficient indicates that MERO predicts IKMb.

URO: The coefficient for URO was found to be significant with a p-value of .014 ( $p < 0.05$ ), indicating that the URO has significant positive effect on the internal knowledge mobilization. The coefficient estimate 0.153 (SE=0.063, t-value=2.470). This coefficient indicates that URO predicts IKMb.

Result 5: Internal Knowledge Mobilization (IKMb) =  $\beta_0 + \beta_1 * \text{Research Culture in Higher Education Institution (RCHEI)} + \beta_2 * \text{Internal Research Funding (IRF)} + \beta_3 * \text{Dissemination of Research Output (DRO)} + \beta_4 * \text{Monitoring and Evaluation of Research Output (MERO)} + \beta_5 * \text{Utilization of Research Output (URO)} + \beta_6 * \text{Research Integrity (RI)}$

RCHEI: The coefficient for RCHEI was found not significant with a p-value of .592 ( $p < 0.05$ ), indicating that the RCHEI has significant negative effect on the internal knowledge mobilization. The coefficient estimate 0.036 (SE=0.075, t-value=0.537). This coefficient indicates that RCHEI does not predict IKMb.

IRF: The coefficient for IRF was found not significant with a p-value of .789 ( $p < 0.05$ ), indicating that the IRF has significant negative effect on the internal knowledge mobilization. The coefficient estimate -0.010 (SE=0.062, t-value=-0.170). This negative coefficient indicates that IRF does not predict IKMb.

DRO: The coefficient for DRO was found to be significant with a p-value of .001 ( $p < 0.05$ ), indicating that the DRO has significant positive effect on the internal knowledge mobilization. The coefficient estimate 0.584 (SE=0.064, t-value=9.607). This coefficient indicates that DRO predicts IKMb.

MERO: The coefficient for MERO was found to be significant with a p-value of .001 ( $p < 0.05$ ), indicating that the MERO has significant positive effect on the internal knowledge mobilization. The coefficient estimate 0.242 (SE=0.070, t-value=3.380). This coefficient indicates that MERO predicts IKMb.

URO: The coefficient for URO was found to be significant with a p-value of .005 ( $p < 0.05$ ), indicating that the URO has significant positive effect on the internal knowledge mobilization. The coefficient estimate 0.178 (SE=0.064, t-value=2.870). This coefficient indicates that predicts IKMb.

RI: The coefficient for RI was found to be significant with a p-value of .024 ( $p < 0.05$ ), indicating that the RI has significant positive effect on the internal knowledge mobilization. The coefficient estimate -0.140 (SE=0.073, t-value=-2.283). This coefficient indicates that predicts IKMb.

Overall, result 5 fit of the multiple regression result was statistically significant (F-statistic = 82.526,  $p < 0.001$ ), indicating that the result as a whole is a good fit for the data. The adjusted R-squared value for the result was 0.716 suggesting that 71.6% of the variation in external knowledge mobilization by the included variables. The obtained value of 0.716 or a 71.6% variance in predicting knowledge mobilization supports the following hypotheses:

First hypothesis a p-value of .001 ( $p < 0.05$ ), the IH<sub>1</sub> Dissemination of research output affects the effectiveness of internal knowledge mobilization is accepted. The dissemination of research outputs positively affects internal knowledge mobilization.

Second hypothesis a p-value of .592 ( $p < 0.05$ ), the IH<sub>2</sub> Research culture in higher education institution affects the effectiveness of internal knowledge mobilization is rejected. The research culture in higher education institution negatively affects internal knowledge mobilization.

Third hypothesis a p-value of .866 ( $p < 0.05$ ), the IH<sub>3</sub> Internal research funding affects the effectiveness of internal knowledge mobilization is rejected. The internal research negatively affects internal knowledge mobilization.

Fourth hypothesis a p-value of .001 ( $p < 0.05$ ), the IH<sub>4</sub> Monitoring and evaluation of research outputs affects the effectiveness of internal knowledge mobilization is accepted. The monitoring and evaluation of research outputs positively affect internal knowledge mobilization.

Fifth hypothesis a p-value of .001 ( $p < 0.05$ ), the IH<sub>5</sub> Utilization of research outputs affects the effectiveness of internal knowledge mobilization is accepted. The utilization of research outputs affects internal knowledge mobilization positively.

Sixth hypothesis with a p-value of .024 ( $p < 0.05$ ), the IH<sub>6</sub> research integrity affects the effectiveness of internal knowledge mobilization is accepted. Research integrity positively affects internal knowledge mobilization.

Table 4.15 below shows the summary of hypotheses of internal knowledge mobilization (IKMb).

**Table 4.15**

*Hypotheses Summary of the Effectiveness of Internal Knowledge Mobilization (IKMb)*

Hypotheses Summary of IKMb	Results
IH <sub>1</sub> Dissemination of research output affects the effectiveness of internal knowledge mobilization (DRO)	Accepted
IH <sub>2</sub> Research culture in higher education institution affects the effectiveness of internal knowledge mobilization (RCHEI)	Rejected
IH <sub>3</sub> Internal research funding affects the effectiveness of internal knowledge mobilization (IRF)	Rejected

**Table 4.15** (Continued)*Hypotheses Summary of the Effectiveness of Internal Knowledge Mobilization (IKMb)*

Hypotheses Summary of IKMb	Results
IH <sub>4</sub> Monitoring and evaluation of research outputs affects the effectiveness of internal knowledge mobilization (MERO)	Accepted
IH <sub>5</sub> Utilization of research outputs affects the effectiveness of internal knowledge mobilization (URO)	Accepted
IH <sub>6</sub> Research integrity affects the effectiveness of internal knowledge mobilization (RI)	Accepted

This approach warrants individually examining the contribution of each predictor as they are added in the model. Additionally, multi-collinearity was used to ensure that there was no relationship between the predictors. Multivariable regression analysis was used to reduce the confounding effects on the explanatory variables. The term "multicollinearity" refers to the intercorrelation of variables. Multicollinearity, the methods to identify it, and its impact on the outcomes of multiple regression analysis are all defined. When the variance inflation factor (VIF) is greater than 5 to 10, multicollinearity is prevalent. Multiple regression models that are statistically stable result from excluding multicollinear explanatory variables (Kim, 2019). Table 4.14 shows that in result 1 (RCHEI and IRF) predictors VIF < 5, no multicollinearity is prevalent. For result 2 (RCHEI, IRF, and DRO) predictors VIF < 5, there is no multicollinearity is prevalent. In result 3 (RCHEI, IRF, DRO and MERO) predictors VIF < 5, no multicollinearity is prevalent. In result 4 (RCHEI, IRF, DRO, MERO and URO) predictors VIF < 5, no multicollinearity is prevalent. Lastly, in result 5 (RCHEI, IRF, DRO, MERO, URO and RI) predictors VIF < 5, no multicollinearity is prevalent.

In predicting the effectiveness of internal knowledge mobilization, forward regression analysis was also carried out. This approach warrants individually examining the contribution of each predictor as they are added in the results/models. Results in Table 4.13 indicate the results/models generated are all statistically significant. By comparison, result 5 indicates a better model compared with the other

results/models as indicated in the variance distribution in sum of squares. It is the result that has the highest sum of squares among regression results/models showing to account more variance to the said result as shown in Table 4.13 Result 5 includes DRO, MERO, URO and RI as predicting variables. As seen in Table 4.12, when these variables are combined, they can explain 71.6% ( $r^2 = 0.716$ ) of the changes in the variance of internal knowledge mobilization. This means that when these variables have increased or decreased, the internal knowledge mobilization is expected to change as well.

Specifically, the values in Table 13.3 indicate the contributions of DRO, MERO, URO and RI in predicting the effectiveness of internal knowledge mobilization (IKMb). Although research culture (RCHEI) in HEIs and internal research funding (IRF) were hypothesized to predict IKMb, they were excluded in all models. This means that the variance of these variables is not found to contribute to the variance of the IKMb; hence, it cannot be used as explanatory to predict variables.

The values indicated by DRO, MERO, and URO in predicting the effectiveness of internal knowledge mobilization (IKMb) increase when research integrity (RI) is included in the model. While the model still indicates statistically significant results, there are changes in the extent of the contributions of the earlier variables. Specifically, initially analyzed factors increased slightly (from Model 3 to Model 4) when RI was accounted for, indicating the RI's impact on internal knowledge mobilization. It is noteworthy to mention, however, that the overall contribution of RI to IKMb is inversely proportional. This means that as efforts are made to strengthen research integrity, internal knowledge mobilization becomes limited.

**Table 4.16***Internal Hypotheses, Questions, Results and Validity*

Hypotheses	Group Questions	Results
IH <sub>1</sub> Dissemination of Research Output (DRO) affects the effectiveness of IKMb	<p>1) The university's research outputs meet the needs of the stakeholders.</p> <p>2) The research has a positive impact on the lives of the university's stakeholders.</p> <p>3) Research outputs are used to inform and shape university policies, programs, and practices.</p>	Accepted
IH <sub>2</sub> Research Culture in HEI (RCHEI) affects the effectiveness of IKMb	<p>1) The administration fosters a positive research culture by developing policies and programs that support and sustain the research productivity of researchers at all stages of their careers.</p> <p>2) The university has a straightforward, practical, and realistic research training management plan to enhance the research skills and develop the expertise of its students and academic staff.</p> <p>3) The administration promotes research excellence through a fair financial and non-financial reward, benefit, and incentive system.</p> <p>4) The university offers adequate research services and facilities for the conduct of research.</p>	Rejected

**Table 4.16** (Continued)*Internal Hypotheses, Questions, Results and Validity*

Hypotheses	Group Questions	Results
IH <sub>3</sub> Internal Research Funding (IRF) affects the effectiveness of IKMb	1) The availability and allocation of institutional funding adequately supports students and academic staff's research training opportunities and experiences.	Rejected
	2) The institutional funding for research projects should cover all research expenses, including the dissemination and publication of research outputs. 3) Institutional funding of approved research is released on time and not restricted by the government's bureaucratic red tape.	
IH <sub>4</sub> Monitoring & Evaluation of Research Output (MERO) affects the effectiveness of IKMb	1) The university uses a needs assessment instrument to fully identify/address objectively the needs of potential players in the community. 2) The university uses a metric tool to objectively measure the effectiveness of its research outputs to its internal community. 3) The research community of the university is fully informed that assessing research outputs ensures accountability of key stakeholders of the research.	Accepted

**Table 4.16** (Continued)*Internal Hypotheses, Questions, Results and Validity*

Hypotheses	Group Questions	Results
H <sub>5</sub> Utilization of Research Outputs (URO) affects the effectiveness of IKMb	<p>1) We receive and have access to related research outputs from universities across the Philippines.</p> <p>2) The research outputs from my university are shared with other university researchers throughout the country.</p>	Accepted
	<p>3) The university maintains constant interaction and engagement with non-governmental organizations (NGOs), local government units (LGUs), communities, and other organizations and industries to build and sustain a strong, working collaborative partnership with them.</p> <p>4) The university provides means for linkages with other institutions, local or international, to create intellectual synergy.</p>	
H <sub>6</sub> Research Integrity (RI) affects the effectiveness of IKMb	<p>1) The university's researchers gain informed consent from research respondents / participants, ensure their anonymity in the communication of research findings, and respect data privacy law.</p> <p>2) The university provides its researchers with adequate guidance in good research practices.</p>	Accepted

**Table 4.16** (Continued)*Internal Hypotheses, Questions, Results and Validity*

Hypotheses	Group Questions	Results
H <sub>6</sub> Research Integrity (RI) affects the effectiveness of IKMb	3) The university expects the highest ethical standards from its researchers and is committed to upholding the integrity of academic research.	

To recap, higher education institutions (HEIs) have initiated activities to fulfill their mandate from the Commission on Higher Education (CHED) to produce high quality academic investigations that will promote the generation of learning and national development and the international comparability of Philippine higher education system. An example of this activity to strengthen its internal knowledge mobilization is the implementation of mentoring programs where experts and senior researchers from various fields provide guidance and support and offer professional development opportunities to the faculty to enhance their research skills and productivity and produce research outputs that fit the needs of the community (4.2.8.1, PRL7, PRL10, PRL1, RD2, RD3) whose needs are probed to ensure they are aligned with the objectives of the research and the research agenda of the HEI (4.3.2). Higher education institutions accelerate their research initiatives in order to stimulate knowledge creation and innovative technologies by providing adequate research funds and reducing bureaucratic red tape in the approval and release of research funds (4.3.9). Research results have to be reported promptly to as wide an audience as possible to share the knowledge produced and facilitate further research and innovation using multiple platforms and formats in the language and style that can be easily understood (4.2.8.5). Also, the researchers' interest and passion in undertaking research may be kindled by providing them a supportive and dynamic work environment (4.2.4).

#### **4.8 Effective External Knowledge Mobilization to Hypotheses**

On the other hand, effective external knowledge mobilization is determined by External Research Funding (ERF), Dissemination of Research Output (DRO), Utilization of Research Outputs (URO), and External Services (ES).

##### **4.8.1 External research funding (ERF)**

As shared by PRL10 provides bigger budget and also payment of honoraria to researchers on top of their regular salary so they focus more on external researches (external funding). With external research projects, the researchers identify first the thrust of the funding agency (before they write the proposal). “Unfortunately, sometimes it often takes a year before the request for approval of the funding is announced like in our last project.” However, RD7 points out that the problem is not with the Administration nor with research funding agencies “as they are only waiting for our research submissions.”

##### **4.8.2 Dissemination of research outputs (DRO)**

RD1 discloses that representatives of industries are the ones who set up meetings with their university researchers to find out which of the research outputs or projects could be of use to them. If they are not interested in any of these projects or researches, they will suggest or introduce topics that interest them and the university evaluates its capability to pursue these topics. In contrast, PRL5 says they bring their research outputs to the community or the local government units (LGUs) to see which can be applied or adopted in their community as how their linkages in Cavite, Aurora, and Visayas started. PRL8 maintains that their researchers are able to present their research outputs in various national and international conferences because they are provided adequate funds. They are also provided financial support in the publication of their research work because there are journals that require publication fee. RD4 shares that one of the future plans of his/her office is to create a magazine type publication where all research completed that have not been published will be placed, in the language that can be easily understood even by non-researchers, that will inform the readers about the findings and solutions to research problems. This is due to his/her strong belief in the importance of dissemination of research outputs: “Research results should be widely disseminated and distributed, especially to the stakeholders who might be able to pick up something from these researches, whether

they are research chairs or not.” PRL3 proposes the dissemination of research outputs to others from different professions or different fields. Likewise, PRL7 suggests that researchers convert their research outputs into a 3-5 video that will entice not only researchers but also the common people or those who are not research enthusiasts to take a look at these researches in full as a way of reaching out to a larger group of people.

Summing up, the knowledge/research results of the HEIs are generally disseminated to the external stakeholders who are composed of fellow members of the institutional consortium, community constituents, industries, the Department of Education (DepEd), Commission on Higher Education (CHED), Congress (House Committee on Education), Senate (Committee on Education), Department of Science and Technology (DOST), Local Government Units (LGUs), Barangay, Non-Government Organizations (NGOs), and Private Universities, in digital format, hard copies in printed form, formal reports, or by holding events such as fora, institutional webinars, conferences, and the like.

#### 4.8.3 Utilization of research outputs (URO)

It is a plan of action that involves putting into practice the findings from research and is expected to make a difference once it is mobilized to the target community. PRL3 voices out her belief that they expect the community to use and adopt their research outputs to improve the source of their livelihood which is the same objective of a research described by RD3 and conducted by a faculty member of the HEI as the lead proponent. This study is called Loop-mediated Isothermal Amplification (LAMP) and was undertaken jointly with the Department of Science and Technology (DOST) and the Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (PCAARRD) to develop kits that help the carabao mango growers detect early and thus prevent the growth of dark spots caused by fungi on Philippine carabao mangoes. RD1 talks about an ongoing project of their HEI in one community in Sitio Singawan, Dingalan, Aurora using sustainable electric energy (hydro, solar, and wind turbine as sources of energy) for the whole community.

Research impacts on development and practice, thus, PRL8 makes sure that their HEI's research-based evidence leads to a policy change. Also, the training needs analysis they had conducted has resulted in a number of programs and projects that have improve the skills and change the status of living of their adopted barangay. "We have to make sure that every research output can translate into a program ... towards improvement of (the) community which can be handled by the Extension Management Office and delivered to our adopted barangay." However, although their university researchers have created close to a hundred Utility Models (UMs), Industrial Designs (IDs), and patents, very few are being used or there is zero commercialization. They have been trying to sell these to industry partners who are willing to fund their reproduction and eventual commercialization or donation for use to a particular community but of no avail. RD5 talks about a product innovation called the "Pili seal" created by a student inventor using waste material from *pili* tree to avoid fuel leakages.

PRL7 describes the nationwide research s/he has recently conducted for the Commission on Higher Education (CHED) that proposes the TPACK framework for the Philippine STEAM Education Model for the use of all HEIs that house and manage STEAM educators and STEAM programs in the country. In another development, both RD4 and PRL7 mention the Philippine Professional Standards for Teachers (PPST), the research that has created a big impact to Filipino teachers and even Filipino students taking up teacher education. It was developed to enhance the teaching standards of the Philippines. It is now a national policy that teachers follow in their career pathing, their graduate education and training, even in their work as their Individual Performance and Commitment Review (IPCRF) is connected to PPST. In a similar vein, the success of the mushroom biotechnology project of the HEI as attested by an outpouring of positive feedback and expression of gratitude from its community has prompted the Department of Science and Technology (DOST) to propose the mass production of their technology to all the barangays of their LGU as shared by both PRL9 and RD2 who candidly remarked that their work on mushroom biotechnology has shown the greatest impact. This validates the suggestion of PRL2 to extend the HEI's reach or focus to other communities or other partner-institutions outside the National Capital Region (NCR), even in the provinces.

#### 4.8.4 External services (ES)

Are external activities, projects, or services conducted by the members of the staff and researchers of the HEIs in collaboration with the community, industry, local government units, national government agencies, or non-government organizations as external stakeholders as part of their curricular offering, community-based research, or extension/community service. PRL1 volunteers the information that their HEI has an Extension Office that assists the faculty in applying their research outputs to help the community. In conducting their extension programs, PRL8 forms a sort of a university, community, and industry partnership with private industries being given areas where they can participate such as provide the materials needed in a project, making sure that the results of the needs assessment are addressed appropriately.

Likewise, PRL2 shares their practice where their Community Partnership and Extension Office (CPEO) invites all their partner-institutions and community groups to an annual workshop and presentation of all their HEI's extension programs and projects. The partner-institutions, community groups, and CPEO then discuss the details of the implementation of their selected projects.

PRL4 talks about their many clients who build their own mushroom farm after receiving training on mushroom culture and production. Their Project Staff had also provided interested clients training on tissue culture, plant propagation and the like. S/he shared the story of a client from Hongkong who asked their Project Staff for help to culture a particular species of banana and orchids he brought with him. Their Project Staff also provides technical advice and consultation to business and receives invitation to conduct Extension Training Programs outside the school, sometimes in the provinces, before the pandemic.

RD7 mentions the use of hybrid energy to power up the pumps of their extension program for Gawad Kalinga, a non-profit, non-income, and non-governmental organization in Laguna, that has made the strongest impact among their extension programs because of its benefit to the GK community while RD1 talks about an ongoing project of their HEI in one community in Sitio Singawan, Dingalan, Aurora using sustainable electric energy (hydro, solar, and wind turbine as sources of energy) for the whole community. On the other hand, RD3 shares about the Barangay

Emergency Alert System their HEI installed in Lobo, Batangas that transmits signals to a barangay to alert its residents if there is a storm surge or an earthquake.

To put in a nutshell, HEIs perform various external services, among them: provide training, technical advice, consultation to business, practical and light farming implements, and technology transfer as part of their academic curriculum, and undertake collaborative projects that create impact on the lives of their target community, industry partners, local government units (LGUs), other government agencies such as DepEd, CHED, Senate, and Congress, and non-government organizations (NGOs).

Table 4.17 below presents the summary of these essential or core phrases mentioned by the Research Directors (RD) of the HEIs interviewed that show the link of these core ideas to the variables of EKMB.

**Table 4.17**

*Summary of Essential or Core Phrases Mentioned by the Research Directors*

Summary of Mentions by RDs for EKMB
<ol style="list-style-type: none"> <li>1) Industries meet with the HEI</li> <li>2) publish research in magazine type using simple language</li> <li>3) research funding agencies are only waiting for submissions</li> <li>4) use of Pili sealant in aircrafts</li> <li>5) implementation of PPST to improve teaching standards</li> <li>6) mushroom biotechnology greatest impact</li> <li>7) carabao mango growers are given kits to detect and prevent the growth of dark spots in green mangoes</li> <li>8) hybrid energy in GK community</li> <li>9) sustainable electric energy</li> <li>10) emergency alert system to residents of a barangay in Lobo, Batangas in cases of earthquake or storm surge</li> </ol>

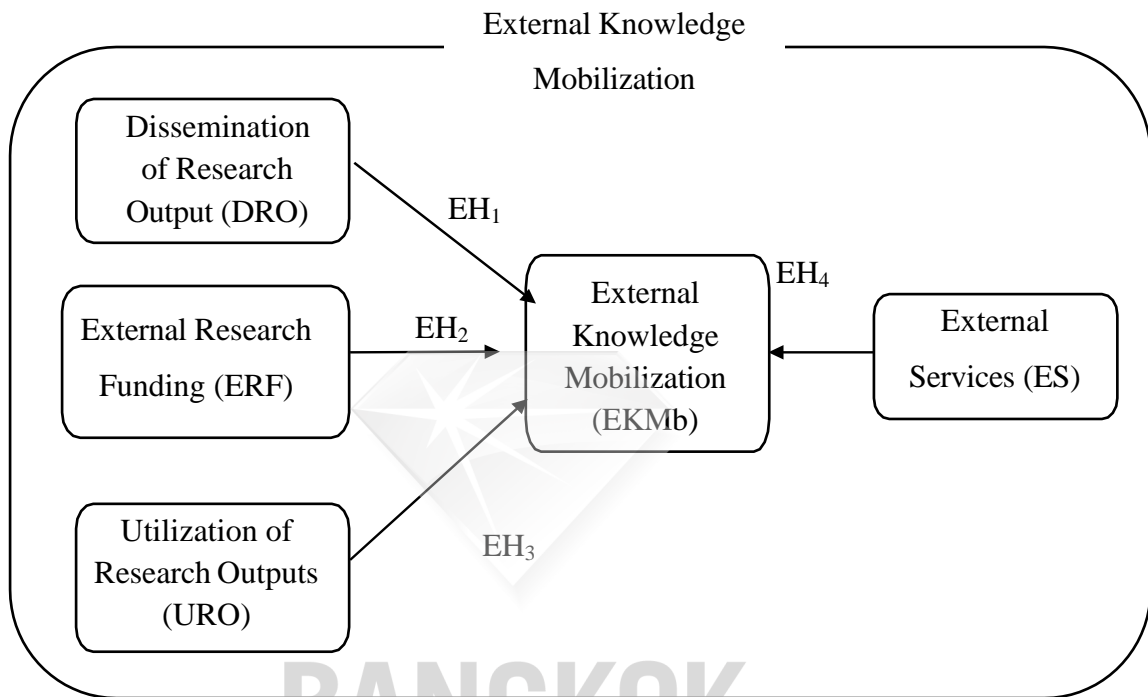
On the other hand, the Project Research Leaders of the HEIs mentioned the following essential or core phrases as outlined in Table 4.18 below that show the link between these core ideas and the variables that significantly affect EKMb.

**Table 4.18**

*Mentions made by the Project Research Leaders (PRLs) Interviewed*

Summary of Mentions by PRLs for EKMb
1) research outputs brought to the community or the local government units (LGUs)
2) present research in conferences and publish them in journals
3) disseminate research outputs to others from different professions or different fields
4) convert research into a 3-5 video to reach larger group of people
5) provide bigger budget and honoraria aside from regular salary
6) expect community to adopt research outputs to improve source of their livelihood
7) research leads to policy change; change the status of living of adopted community
8) TPACK framework for the STEAM Education Model of all HEIs under CHED
9) mushroom biotechnology
10) extend HEI's focus to other communities outside NCR
11) its Extension Office assists in implementing research
12) form university-community-industry partnership
13) partner-institutions are invited to a presentation of their extension projects
14) assists clients build own mushroom farm

As presented in Figure 4.9 below, External Knowledge Mobilization makes knowledge produced by universities useful and impactful to the community through the dissemination of research outputs (DRO), availability of external research funding (ERF), and the stakeholders' utilization of these research outputs (URO) for better external services (ES) to meet the needs of the target beneficiaries.

**Figure 4.9***Success Factors for External Knowledge Mobilization*

For this reason, the following hypotheses are presented:

EH<sub>1</sub> Dissemination of Research Output (DRO) affects the effectiveness of EKMb.

EH<sub>2</sub> External Research Funding (ERF) affects the effectiveness of EKMb.

EH<sub>3</sub> Utilization of Research Outputs (URO) affects the effectiveness of EKMb.

EH<sub>4</sub> External Services (ES) affects the effectiveness of EKMb.

Table 4.19 below presents the hypotheses summary for the effectiveness of External Knowledge Mobilization that was constructed based on the results of the interviews conducted and the corresponding survey questions that were formulated based on these hypotheses. The survey questionnaire was validated by content and language experts.

**Table 4.19**

*Connection between Hypotheses for External Knowledge Mobilization to Survey Questions*

Hypotheses for EKMb	Survey Questions
EH <sub>1</sub> Dissemination of Research Output (DRO) affects the effectiveness of EKMb	<p>1) The university's research outputs meet the needs of the stakeholders.</p> <p>2) The research has a positive impact on the lives of the university's stakeholders.</p>
EH <sub>2</sub> External Research Funding (ERF) affects the effectiveness of EKMb	<p>1) The approval by external funding agencies (like LGUs, DepEd, CHED, DOST, private corporations and foundations, and other local and international government and non-government bodies) of research projects depends on priority research areas and disciplines set by the external funding agencies themselves.</p> <p>2) External funders of research projects have a simplified procedure for releasing of funds and financial reporting requirements.</p> <p>External funding agencies have a significant influence on the conduct of the research through the requirements and conditions they impose</p>
EH <sub>3</sub> Utilization of Research Outputs (URO) affects the effectiveness of EKMb	<p>1) The university provides means for linkages with other institutions, local or international, to create intellectual synergy.</p> <p>2) We share university research outputs with other members of the community who can benefit from them. The university seeks feedback from external stakeholders on the effectiveness of its research outputs.</p> <p>3) We provide feedback to the university on the effectiveness and usefulness of research outputs.</p>

**Table 4.19** (Continued)

*Connection between Hypotheses for External Knowledge Mobilization to Survey Questions*

Hypotheses for EKMb	Survey Questions
	<p>4) We participate in and support the development of university research.</p> <p>5) When I have a question related to research findings, the university is available to assist.</p>
EH <sub>4</sub> External Services (ES) affects the effectiveness of EKMb	<p>1) The community consistently works with students and faculty through projects that are part of an academic course, community-based research, extension/community service, or other activities.</p> <p>2) The university takes the initiative to communicate with the stakeholders and the community to enhance their uptake and use of research findings.</p> <p>3) There is an institutional mechanism where opportunities for regular discussions allow the community to express their concerns.</p>

The survey questionnaire distributed to external stakeholders has three (3) additional questions that respondents were requested to answer. As presented in Table 4.20 below, these additional quantitative survey questions are connected to the hypotheses.

**Table 4.20**

*Connection between Hypotheses of External Knowledge Mobilization (EKMb) and Quantitative Survey Questions*

Hypotheses of EKMb	Quantitative Survey Questions
EH <sub>4</sub> External Services (ES) affects the effectiveness of EKMb.	Please provide one example of the successful use of university research outputs and its impact on the community? (ES)
EH <sub>1</sub> Dissemination of Research Outputs (DRO) affects the effectiveness of EKMb	How could the university more effectively communicate research findings to the community? (DRO)
EH <sub>3</sub> Utilization of Research Outputs (URO) affects the effectiveness of IKMb	How could the university make research findings more useful to you? (URO)

1) External services (ES)

There were 126 external stakeholders who participated in the study. Nine (9) respondents could not provide any example of the successful use of university research outputs and its impact on the community while five (5) skipped answering this question.

Among the successful external activities, projects, or services conducted by members of the HEIs in collaboration with their external stakeholders include innovations in food technology to sustain them in times of calamities and create livelihood opportunities and income-generating projects (e.g. MAGICKS Powdered Soup, young female chicken as a main ingredient for halang-halang, Bigani Sardines in Oil, ethyl alcohol from virgin coconut virgin oil), Covid-19 research initiatives not only in health care but also in education (e.g. mental health status of the general population, healthcare professionals, and university students during coronavirus disease outbreak, dissemination of information and health essentials to vulnerable communities, intervention measures/ tutorials to help students, parents, and teachers cope with online education), production of instructional materials to bring awareness on the various cultures in the province as a result of cultural mapping, a

city-wide policy and program for the welfare of the elderly community of Cebu City and for the urban biodiversity landscape project as a result of researches on gerontology and urban biodiversity, preservation of the heritage of an indigenous tribe to reclaim their history and assert their right to their memory, monitoring and evaluation of teachers' performance [Results-Based Performance Management System (RPMS) based on the Philippine Professional Standards for Teachers (PPST)], the development of Amphibious Vehicle for Disaster Response, and the research of the University of the Philippines on the use of 20 peso coin instead of 20 peso banknote.

### 2) Dissemination of research outputs (DRO)

There were 119 external stakeholders who participated in the survey questionnaire. Three (3) respondents could not give any answer. The variety of responses given by the majority of respondents on how the university can effectively communicate research findings to the community are as follows: (a) by digital means using social media, videos, posters, infographics (b) through events e.g. conferences, forums, public presentation of the findings, consultation with stakeholders, etc. (c) by publication online or print (d) through the conduct of extension activities of the university (e) by opening access to online library (e) through a Memorandum of Agreement/ Understanding with stakeholders (f) by providing funds for this purpose.

### 3) Utilization of research outputs (URO)

Out of 119 external stakeholders who participated in the survey questionnaire, three (3) respondents did not answer how their university could make research findings more useful to them. The rest of the participants gave varied answers. Among them are the following:

The external researchers admitted that they had become well-informed about community issues and would thus, be able to conduct researches related to local problems in society. Researches would be useful if these would be translated into workable policies, proposed program/action plan, or localized instructional materials, if they are sustainable, relevant and needs-based, and improve the quality of life of the community, if adequate funds are provided, if they are accessible to other researchers reporting their findings and presenting their recommendations in research forums, symposiums, or conventions or uploading them in a database available to all,

or if stakeholders are provided abstracts of researches. A couple of respondents suggested having a program where researches are shared to the community and people are encouraged to pursue research and to identify ways on how to use research findings as baseline information in conducting extension services in their community. Higher education institutions may also provide opportunities for the faculty to make a follow-through of their studies and publish their researches or pursue more scholarly works. By and large, universities have the power to make research outputs useful through their own efforts in collaboration with their stakeholders.

#### **4.9 External Stakeholders Survey**

The external stakeholders who participated for the survey questionnaire are selected based on their seniority levels. These levels with the corresponding classifications are:

A - Director of Research or Full Professor. This is the single highest grade/post at which research is normally conducted.

B - Senior Researcher or Principal Investigator or Associate Professor. These researchers are working in positions that are not considered as senior or top position (A) but they are still more senior in rank and status than the newly qualified graduates of doctoral programs.

C - Researcher or Investigator or Assistant Professor or Assistant Professor or Post-doctoral fellow. This is the first/post into which a newly qualified doctoral graduate would normally be recruited.

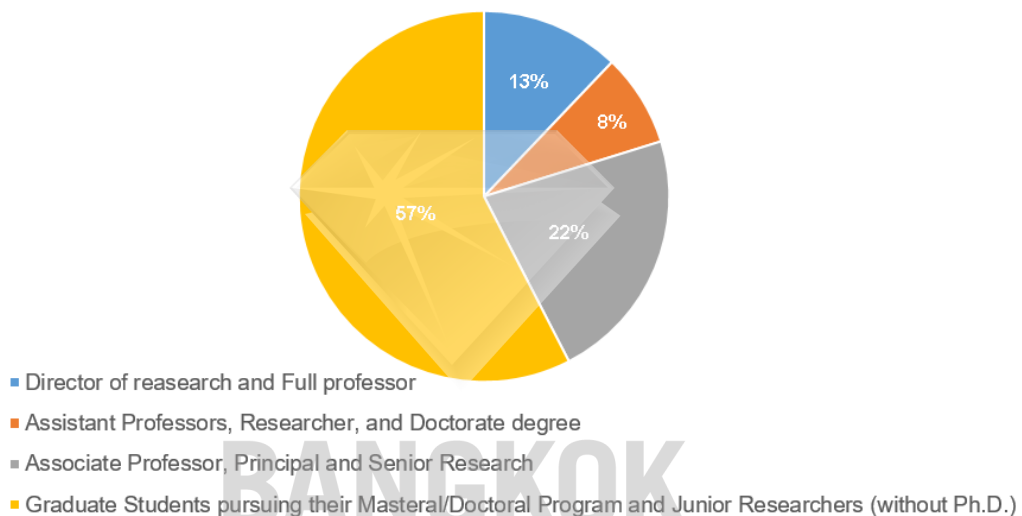
D - M.A./Ph.D. Students or Junior Researchers (without a Ph.D.) These are either students who are pursuing their master's or doctorate degree or those engaged as researchers or researchers working in posts that do not normally require a doctorate degree (Adapted from Organisation for Economic Co-operation and Development, 2015).

As shown in Figure 4.10, a total of 126 external stakeholders participated in answering the survey questionnaire. Category A has 16 participants (13% of total) who are Directors of Research and Full Professors. For Category B, the 10 participants (8% of total) are associate professors, principals, and senior researchers while Category C has a total of 28 participants (22% of total) composed of Assistant

Professors, Researchers, or those with Doctoral Degrees. Lastly, there are a total of 72 participants (57% of total) under Category D. These include students taking up their M.A./Ph.D. and Junior researchers without Ph.D.

**Figure 4.10**

*Researcher by Seniority Levels (External Stakeholder)*



#### 4.9.1 External Stakeholders Survey

To further explain the qualitative results, the researcher constructed a survey questionnaire to underpin the observed phenomena. The questionnaire is primarily quantitative, using five Likert scales, and includes three open-ended questions to determine if the external knowledge mobilization (EKMb) model is appropriate and effective in assessing knowledge mobilization effectiveness in Higher Educational Institutions (HEIs). The survey questionnaire was used to measure the variables related to the studies which were constructed based on content analysis of the open-ended questions and were classified accordingly. Table 4.21 shows the variables and the corresponding survey questions.

**Table 4.21***Predictors with Corresponding Survey Questions (External Survey Questionnaire)*

Variables	Survey Questions
Dissemination of Research Output (DRO)	1) The university's research outputs meet the needs of the stakeholders. 2) The research has a positive impact on the lives of the university's stakeholders.
External Research Funding (ERF)	1) The approval by external funding agencies (like LGUs, DepEd, CHED, DOST, private corporations and foundations, and other local and international government and non-government bodies) of research projects depends on priority research areas and disciplines set by the external funding agencies themselves. 2) External funders of research projects have a simplified procedure for releasing of funds and financial reporting requirements. 3) External funding agencies have a significant influence on the conduct of the research through the requirements and conditions they impose
Utilization of Research Outputs (URO)	1) The university provides means for linkages with other institutions, local or international, to create intellectual synergy. 2) We share university research outputs with other members of the community who can benefit from them. 3) The university seeks feedback from external stakeholders on the effectiveness of its research outputs. 4) We provide feedback to the university on the effectiveness and usefulness of research outputs. 5) We participate in and support the development of university research.

**Table 4.21** (Continued)*Predictors with Corresponding Survey Questions (External Survey Questionnaire)*

Variables	Survey Questions
	6) When I have a question related to research findings, the university is available to assist.
External Services (ES)	1) The community consistently works with students and faculty through projects that are part of an academic course, community-based research, extension/community service, or other activities. 2) The university takes the initiative to communicate with the stakeholders and the community to enhance their uptake and use of research findings. 3) There is an institutional mechanism where opportunities for regular discussions allow the community to express their concerns.
Knowledge Mobilization (KMb)	1) The university's research outputs meet the needs of the stakeholders. 2) Potential players in the community make use of the university's research outputs to improve the lives of the community. 3) The current process is effective in transmitting research outputs to the larger group of stakeholders who can use it.

As shown in Table 4.21, the questions were validated by one content expert and one language expert whose competence in knowledge mobilization and languages, respectively, is recognized. Furthermore, after validating the survey questionnaire, Cronbach's alpha was utilized to test the internal consistency of the validated survey questionnaire. Table 4.22 shows a summary of the external predictors' reliability results.

**Table 4.22**

*Summary of the Effectiveness of External KMb Predictors Reliability Statistics*

Predictors	Cronbach's $\alpha$
DRO	0.706
ERF	0.821
URO	0.91
ES	0.818
KMb	0.818

The results of Cronbach's alpha reveal how closely related a set of items is as a group (Institute of Digital Research & Education, n.a). A survey questionnaire was sent to the external stakeholders identified by the same seven (7) Higher Education Institutions (HEIs). Upon retrieval, 126 responded to the survey questionnaire. The survey questionnaire consisted of 17 items with three (3) open-ended questions. The purpose of internal consistency is to determine the reliability of the survey questionnaire. According to Bujang, Omar, and Baharum (2018), assessing the internal consistency of the data is done to test the reliability of the respondent's feedback on a research instrument (or domain of a questionnaire), an instrumentation or rating evaluated by subjects which will indicate the stability of the tools. As a result, the Cronbach alpha is used to assess the consistency or dependability of multiple items, measurements, or ratings. Furthermore, the Cronbach alpha is used to assess the stability of the instrument that measures the research variables.

According to Hair et al. (2016), the value of reliability analysis can be interpreted based on the strength using the Rule of Thumb as indicated in Table 4.23 below.

**Table 4.23***Strength of Association Determination*

Alpha Coefficient Range	Strength of Association
< 0.6	Poor
0.6 < 0.7	Moderate
0.7 < 0.8	Good
0.8 < 0.9	Very Good
0.9 >	Excellent

The researcher utilized multiple regression analysis for the quantitative data gathered to examine the relationship between the dependent variable (EKMb) and the independent variables (DRO, ER, URO and ES). Table 4.24-4.26 shows the summary of the effectiveness of external knowledge mobilization (EKMb) with sub the following sub-tables: Table 4.24 - Regression summary of external knowledge mobilization, Table 4.25 - ANOVA summary of external knowledge mobilization and Table 4.26 - Regression coefficients of external knowledge mobilization. Table 23 shows an overview of the influences of two or more variables on each other to predict the effectiveness of external knowledge mobilization.

Table 4.24-4.26 Summary of the Effectiveness of External Knowledge Mobilization result

**Table 4.24***Regression Summary of the Effectiveness of External Knowledge Mobilization*

Result	R	R <sup>2</sup>	Adjusted R <sup>2</sup>
1	0.802	0.643	0.636
2	0.854	0.729	0.721
3	0.868	0.754	0.744

Note: Null model includes ERF (IV), DRO (IV)

**Table 4.25***ANOVA Summary of External Knowledge Mobilization*

Result		Sum of Squares	df	Mean Square	F	P
1	Regression	20.540	2	10.270	90.211	<.001
	Residual	11.384	100	0.114		
	Total	31.924	102			
2	Regression	23.283	3	7.761	88.923	<.001
	Residual	8.641	99	0.087		
	Total	31.924	102			
3	Regression	24.078	4	6.019	75.185	<.001
	Residual	7.846	98	0.080		
	Total	31.924	102			

Note: Null Model Includes ERF (IV), URO (IV)

**Table 4.26***Regression Coefficients of External Knowledge Mobilization*

		Collinearity Statistic						
Result		Unstandardized	Standard Error	Standardized	t	p	Tolerance	VIF
1	(Intercept)	0.547	0.283		1.936	0.056		
	ERF (IV)	0.047	0.081	0.049	0.582	0.562	0.510	1.962
	URO (IV)	0.807	0.088	0.767	9.173	<.001	0.510	1.962
2	(Intercept)	0.163	0.257		0.634	0.527		
	ERF (IV)	-0.007	0.072	-0.008	-0.102	0.919	0.500	1.999
	URO (IV)	0.409	0.105	0.389	3.907	<.001	0.276	3.627
	DRO (IV)	0.543	0.097	0.512	5.607	<.001	0.328	3.048
3	(Intercept)	0.112	0.247		0.453	0.651		
	ERF (IV)	-0.025	0.069	-0.026	-0.368	0.714	0.497	2.013
	URO (IV)	0.209	0.119	0.198	1.755	0.082	0.196	5.090
	DRO (IV)	0.472	0.096	0.444	4.938	<.001	0.310	3.230
	ES (IV)	0.305	0.097	0.306	3.150	0.002	0.266	3.765

In order to statistically examine the identified predictors of the effectiveness of external knowledge mobilization, a forward regression analysis was carried out. Jeffrey's Amazing Statistics Program (JASP) software is an open-source statistical program designed to conduct statistical analysis. Table 4.24 shows that result 1 obtained value adjusted  $r^2 = 0.636$  or 63.6% variance in predicting external knowledge mobilization while result 2 obtained an adjusted  $r^2 = 0.721$  or 72.1% variance in predicting external knowledge mobilization. Lastly result 3 obtained adjusted  $r^2 = 0.744$  or 74.4% variance in predicting external knowledge mobilization. The results reveal ideally that result 3 has a large impact on external knowledge mobilization.

Table 4.25 shows that result 1 is significant with a p-value of .001 ( $p < 0.05$ ), model 2 is significant with a p-value of .001 ( $p < 0.05$ ), and model 3 is significant with a p-value of .001 ( $p < 0.05$ ).

Table 4.26 reveals the results of the following models:

Result 1: External Knowledge Mobilization (EKMb) =  $\beta_0 + \beta_1 * \text{External Research Funding (ERF)} + \beta_2 * \text{Utilization of Research Output (URO)}$

ERF: The coefficient for ERF was found not significant with a p-value of .562 ( $p < 0.05$ ), indicating that the ERF has a significant negative effect on the EKMb. The coefficient estimates 0.049 (SE=0.081, t-value=0.582). This coefficient indicates that ERF does not predict EKMb.

URO: The coefficient for URO was found to be significant with a p-value of .001 ( $p < 0.05$ ), indicating that the URO has significant positive effect on the external knowledge mobilization. The coefficient estimate 0.767 (SE=0.088, t-value=9.173). This positive coefficient indicates that URO predicts EKMb.

Result 2: External Knowledge Mobilization (EKMb) =  $\beta_0 + \beta_1 * \text{External Research Funding (ERF)} + \beta_2 * \text{Utilization of Research Output (URO)} + \beta_3 * \text{Dissemination Research Output (DRO)}$

ERF: The coefficient for the ERF was found not significant with a p-value of .919 ( $p < 0.05$ ), indicating that the ERF has significant negative effect on the EKMb. The coefficient estimate -0.008 (SE=0.072, t-value=-0.102). This negative coefficient estimate indicates that ERF does not predict EKMb.

URO: The coefficient for the URO was found to be significant with a p-value of .001 ( $p < 0.05$ ), indicating that the URO has significant positive effect on the external knowledge mobilization. The coefficient estimate 0.389 (SE=0.105, t-value=3.907). This coefficient indicates that URO predicts EKMb.

DRO: The coefficient for the DRO was found to be significant with a p-value of .001 ( $p < 0.05$ ), indicating that the DRO has significant positive effect on external knowledge mobilization. The coefficient estimate 0.512 (SE=0.512, t-value=5.607). This coefficient indicates that DRO predicts EKMb.

Result 3: External Knowledge Mobilization (EKMb) =  $\beta_0 + \beta_1 * \text{External Research Funding (ERF)} + \beta_2 * \text{Utilization of Research Output (URO)} + \beta_3 * \text{Dissemination Research Output (DRO)} + \beta_4 * \text{External Services (ES)}$

ERF: The coefficient for the ERF was found not significant with a p-value of .714 ( $p < 0.05$ ), indicating that the ERF has significant negative effect on the EKMb. The coefficient estimate -0.026 (SE=0.069, t-value=-0.368). This negative coefficient estimate indicates that ERF does not predict EKMb.

URO: The coefficient for the URO was found to be not significant with a p-value of .082 ( $p < 0.05$ ), indicating that the URO has significant negative effect on the external knowledge mobilization. The coefficient estimate 0.198 (SE=0.119, t-value=1.755). This coefficient indicates that URO predicts EKMb.

DRO: The coefficient for the DRO was found to be significant with a p-value of .001 ( $p < 0.05$ ), indicating that the DRO has significant positive effect on the external knowledge mobilization. The coefficient estimate 0.444 (SE=0.096, t-value=4.938). This coefficient indicates that DRO predicts EKMb.

ES: The coefficient for the ES was found to be significant with a p-value of .002 ( $p < 0.05$ ), indicating that the ES has significant positive effect on the external knowledge mobilization. The coefficient estimate 0.306 (SE=0.097, t-value=3.150). This coefficient indicates that ES predicts EKMb.

Overall, result 3 fit of the multiple regression model was statistically significant (F-statistic = 75.185,  $p < 0.001$ ), indicating that the model as a whole is a good fit for the data. The adjusted R-squared value for the model was 0.744, suggesting that 74.4% of the variation in external knowledge mobilization by the

included variables. The obtained value of 0.744 or a 74.4% variance in predicting knowledge mobilization supports the following hypotheses:

First hypothesis a p-value of .001 ( $p < 0.05$ ), the EH<sub>1</sub> Dissemination of research output affects the effectiveness of external knowledge mobilization is accepted. The dissemination of research outputs positively affects internal knowledge mobilization.

Second hypothesis a p-value of .714 ( $p < 0.05$ ), the EH<sub>2</sub> External research funding affects the effectiveness of external knowledge mobilization is rejected. The external research funding negatively affects external knowledge mobilization.

Third hypothesis a p-value of .082 ( $p < 0.05$ ), the H<sub>3</sub> Utilization of research outputs affects the effectiveness of external knowledge mobilization is rejected. The utilization of research outputs negatively affects external knowledge mobilization.

Fourth hypothesis with a p-value of .002 ( $p < 0.05$ ), the H<sub>4</sub> External services affects the effectiveness of external knowledge mobilization is accepted. External services positively affects external knowledge mobilization. Table 24 below shows the summary of hypotheses of external knowledge mobilization.

**Table 4.27**

*Hypotheses Summary of External Knowledge Mobilization (EKMb)*

Hypotheses of EKMb	Results
EH <sub>1</sub> Dissemination of Research Output (DRO) affects the effectiveness of EKMb	Accepted
EH <sub>2</sub> External Research Funding (ERF) affects the effectiveness of EKMb	Rejected
EH <sub>3</sub> Utilization of Research Output (URO) affects the effectiveness of EKMb	Rejected
EH <sub>4</sub> External Services (ES) affects the effectiveness of EKMb	Accepted

This approach warrants individually examining the contribution of each predictor as they are being added in the model. Additionally, a multicollinearity ensures that there is no relationship between the predictors. Multivariable regression analysis was used to reduce the confounding effects on the exploratory variables. The term "multicollinearity" refers to the intercorrelation of variables. Multicollinearity, the methods to identify it, and its impacts on the outcomes of multiple regression analysis are all defined. When the variance inflation factor (VIF) is greater than 5 to 10, multicollinearity is prevalent. Multiple regression models that are statistically stable result from excluding multicollinear exploratory variables (Kim, 2019). Table 4.26 shows result 1 predictors  $VIF < 5$ , that no multicollinearity is prevalent. For result 2 predictors  $VIF < 5$ , no multicollinearity is prevalent. In result 3 predictors ERF, DRO, and ES is  $< 5$ , while the  $VIF > 5$  for the ERF predictor with variance of .09, multicollinearity is prevalent.

**Table 4.28**

*External Hypotheses, Questions, Results and Validity*

Hypotheses	Questions	Results
EH <sub>1</sub> Dissemination of Research Output (DRO) affects the effectiveness of EKMb	1) The university's research outputs meet the needs of the stakeholders. 2) The research has a positive impact on the lives of the university's stakeholders.	Accepted
EH <sub>2</sub> External Research Funding (ERF) affects the effectiveness of EKMb	1) The approval by external funding agencies (like LGUs, DepEd, CHED, DOST, private corporations and foundations, and other local and international government and non-government bodies) of research projects depends on priority research areas and disciplines set by the external funding agencies themselves.	Rejected

**Table 4.28** (Continued)*External Hypotheses, Questions, Results and Validity*

Hypotheses	Questions	Results
EH <sub>2</sub> External Research Funding (ERF) affects the effectiveness of EKMb	<p>2) External funders of research projects have a simplified procedure for releasing of funds and financial reporting requirements.</p> <p>3) External funding agencies have a significant influence on the conduct of the research through the requirements and conditions they impose</p>	
EH <sub>3</sub> Utilization of Research Outputs (URO) affects the effectiveness of EKMb	<p>1) The university provides means for linkages with other institutions, local or international, to create intellectual synergy.</p> <p>2) We share university research outputs with other members of the community who can benefit from them.</p> <p>3) The university seeks feedback from external stakeholders on the effectiveness of its research outputs.</p> <p>4) We provide feedback to the university on the effectiveness and usefulness of research outputs.</p> <p>5) We participate in and support the development of university research.</p> <p>6) When I have a question related to research findings, the university is available to assist.</p>	Rejected

**Table 4.28** (Continued)*External Hypotheses, Questions, Results and Validity*

Hypotheses	Questions	Results
EH <sub>4</sub> External Services (URO) affects the effectiveness of EKMB	<p>1) The community consistently works with students and faculty through projects that are part of an academic course, community-based research, extension/community service, or other activities.</p> <p>2) The university takes the initiative to communicate with the stakeholders and the community to enhance their uptake and use of research findings.</p> <p>3) There is an institutional mechanism where opportunities for regular discussions allow the community to express their concerns.</p>	Accepted

To wrap up, for effective External Knowledge Mobilization, HEIs need to establish academic links to leverage transfer of technology and innovations created through their networks of knowledge sharing and knit research insights with communities, industries, university consortia, local government units (LGUs), government agencies such as the Commission on Higher Education (CHED), Department of Education (DepEd), Department of Science and Technology (DOST), and non-government organizations (NGOs) to ensure synergy in the implementation of the projects.

#### 4.10 Knowledge Mobilization through the Lens of RD4

S/he plans to upgrade the Research Portal of the HEI in terms of content so that all researches of the HEI regardless of kind, campus, or unit can be easily accessed. The Research Portal will also show all researches completed even if these are just the Abstract and the link of publications which is important because if it is open access, it can be downloaded.

This is important because in the words of a scholar, “What’s the point of knowledge if you will not share it? Because if you will not share it, it cannot be utilized.” So there is really a need to share, research should not be left in the library or research completed should not end after being submitted. There is a need to present, disseminate, distribute.

If it is possible, these research results should be published in a pamphlet, brochure, or magazine, similar to what is being done in their HEI’s publication with Project “Showcasing Interesting and Notable Academic Genres” or simply called *Sinag*. Research results should be widely disseminated and distributed especially to the stakeholders who might be able to pick up something from these research, whether they are research chairs or not.

Another plan is to create a magazine-type publication where all research completed that have not been published will be placed, in the language that can easily be understood even by non-researchers. This will not be technical in nature where the statistics and the framework will be presented but something that will inform the readers about the findings and solutions to research problems.

RD4 is optimistic that the sharing of resources or knowledge created among HEIs such as their database of researches especially thesis or faculty researches even it is only up to the Abstract of research completed or publication can be made faster, more efficient, and systematic at least among all members of the consortium, if not all HEIs.

This can be done by creating a Portal for the consortium (e.g., the South Manila Educational Consortium [SMEC] with 12 higher educational institutions as members) or RD4’s HEI’s Portal can show all the links. The Portals of other HEIs can also be made more accessible to RD4’s HEI’s Portal. Other HEIs may not allow others easy access because even those working on their thesis/dissertation need to

secure first a library-to-library permit before they can conduct their research. So, the access does not have to be free. A minimal fee may be charged by HEIs because anyway there is also a library fee. But access to resources is very important.



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## **CHAPTER 5**

### **FINDINGS AND DISCUSSION**

This chapter contains the discussion and summary of the findings based on the presentation and analysis of data in Chapter 4, the results drawn from these findings, and the practical implications of the research to develop policy recommendations.

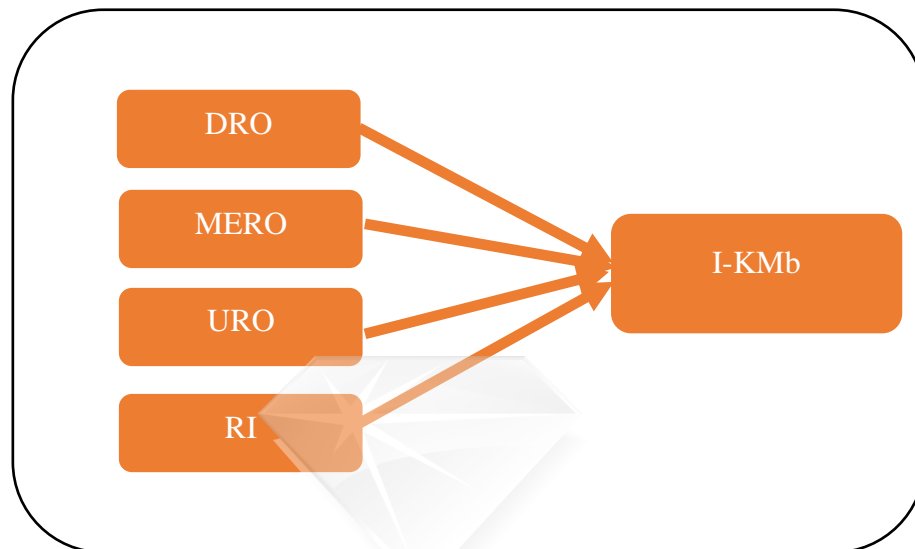
#### **5.1 Effective Internal Knowledge Mobilization (IKMb)**

For effective internal knowledge mobilization, result 1 can be attributed to research culture in higher education institutions and internal research funding (13.3) while result 2 can be explained by dissemination of research outputs (13.3). On the other hand, result 3 can be explained by dissemination of research outputs and monitoring and evaluation of research outputs (13.3). Result 4, can be explained by the dissemination of research outputs, monitoring and evaluation of research outputs, and utilization of research outputs (13.3). Finally, result 5 can be explained by dissemination of research outputs, monitoring and evaluation of research outputs, utilization of research outputs, and research integrity (13.3). Due to the rising trend in R-squared values, the capacity of the results to describe the effectiveness of internal knowledge mobilization is enhanced with each additional predictor (13.1).

Furthermore, due to the highest value of r-squared and significant coefficient as shown in 13.1, the researcher selects result 5 to explain the large variation of the effectiveness of internal knowledge mobilization as shown in the Figure 5.1, the initial model designed by the researcher to measure the effectiveness of the university's internal mobilization outputs based on what emerged from the research and the results of the interviews conducted.

**Figure 5.1**

*Conceptual Model of the Effectiveness of Internal Knowledge Mobilization*



After conducting the research, the perceptions and ideas of internal stakeholders on the dissemination of research outputs, research culture in HEIs, the availability of internal research funding, monitoring and evaluation of research outputs, utilization of research outputs, and research integrity are detailed below.

#### 5.1.1 Dissemination of Research Outputs

The dissemination of research outputs is an integral part of the research process. Internal dissemination of research outputs involves the effective sharing and utilization of knowledge among the members of the university who are all working together under the same strategic plan.

The results of the survey conducted validate the experiences shared by the participants during the on-line interview of the seven respondents from the HEIs. They state that to increase knowledge mobilization to the internal stakeholders, dissemination of research outputs should be harmonized with the university research agenda. Table 4.16 or Table 4.5 shows the summary of the responses made by the interviewees on dissemination of research outputs including journal publication, conference presentations, online dissemination, policy briefs, and sending Memos and hard copies to internal stakeholders. RD5 adds that they provide their offices with

Customer Satisfaction Report. The different ways in which knowledge mobilization is disseminated to internal stakeholders (4.2.3) are briefly explicated below.

#### Journal publication

Researchers can have their works published in academic journals, which are widely read by other researchers, academics, and professionals in their field. This can be accomplished by submitting articles to peer-reviewed journals, which are reviewed by experts in the field before they are accepted for publication.

#### Oral presentations

Researchers can share their findings with other researchers and receive feedback on their works by presenting them during colloquia, fora, research congress, conferences, seminars, meetings with colleagues, small group discussion, and focus group discussion.

#### Online dissemination

Researchers can disseminate their work online by using social media platforms, research gateways, email, online commons, academic blogs, and websites. This can help to increase the visibility of their works and provide colleagues access to the results of their research.

#### Policy briefs

Researchers can create policy briefs that summarize their research findings and are intended for policymakers and decision makers in the university/government. These policies and guidelines provide sustainability, priorities, and direction in disseminating research outputs to the potential players and fortify the implementation of research outputs to ensure that the knowledge generated will be implemented and made meaningful to the beneficiaries (Republic of Philippines Office of the President Commission on Higher Educational (2005); Republic of Philippines Office of the President, 2009).

By fostering collaboration, enabling evidence-based decision-making, promoting professional development, and optimizing resources, internal KMb can contribute to the overall success of the university's research efforts. Implementing strategies such as establishing a centralized platform, providing clear guidelines, encouraging regular communication, customizing dissemination methods,

implementing incentives, and monitoring and evaluating the process can enhance the effectiveness of internal KMb dissemination efforts.

Dissemination of research outputs in internal KMb is important because it promotes collaboration and synergy, aids in policy making and decision making, advances professional development, and fosters resource optimization (5.1.1.1 through 5.1.1.4).

5.1.1.1 Collaboration and synergy. Internal KMb encourages researchers and staff members to work collaboratively, share ideas, and build upon each other's work. This practice nurtures the culture of team spirit and embraces harmony and unity within the organization or university (4.2.6; 4.4.2).

5.1.1.2 Policy making and decision-making. Internal KMb influences decision makers in the university to formulate and implement changes in policies based on research that had been conducted rigorously; thus, the information generated by research may be considered as input by decision and policy makers (4.2.3).

5.1.1.3 Professional development. Since Internal KMb promotes knowledge-sharing, it nurtures the culture of knowledge creation within the university that encourages innovation and the exchange of vital information among the researchers and staff members, enabling them to become stronger as professionals (4.2.6: 4.3.2).

5.1.1.4 Resource optimization. Internal KMb helps ensure the optimum utilization of the resources of the university to enhance the productivity and efficiency of its workforce (researchers and staff members) by making sure they can easily access its research results (4.2.8.2).

The strategies that can facilitate dissemination of research outputs in internal KMb include setting up a unified forum, establishing clear guidelines, promoting regular communication, adjusting method of dissemination, implementing incentives, and keeping track of and conducting regular assessment (5.1.1.5 through 5.1.1.10)

5.1.1.5 Set up a unified forum. Organize a unified channel such as a private network or a shared drive where researchers can easily search, send, store, or gain access to research results (4.2.6; 4.4.5).

5.1.1.6 Establish easy to understand guidelines. Ensure that researchers are provided clear instructions on how to disseminate their research results internally. This may include preparing research summaries, reports, presentations, or infographics in easy-to-understand language (4.2.3).

5.1.1.7 Promote regular communication. Motivate researchers and staff members to develop the culture of knowledge sharing and exchange of critical information by holding conferences, seminars, workshops, and regular meetings. These forums enable researchers to present their research and give others the opportunity to ask questions and give feedback (4.2.3; 4.3.1; 4.5.4).

5.1.1.8 Adjust method of dissemination. Adapt the method of disseminating research results to the interests, needs, and preferences of the target users. Use varied formats such as podcasts, videos, or interactive websites to give them a more dynamic and engaging experience (4.2.3).

5.1.1.9 Implement incentives. Provide academic research incentives to researchers who actively participate in the mobilization of internal knowledge to potential players to acknowledge their hard work and inspire them to continue. These may come in the form of granting them additional benefits like honoraria or deloading of teaching assignment, rewards, awards, or more funding sources (4.2.8.1; 4.3.1).

5.1.1.10 Keep track of and assess regularly. Continuously monitor and evaluate the effectiveness of internal KMb dissemination strategies. Collect feedback from researchers and staff members to identify areas for improvement and make the necessary adjustments (4.3.5; 4.5.6).

## 5.1.2 Research culture in HEIs.

Based on Table 4.14, the data gathered from the respondents show that research culture in HEIs is not a predictor of internal knowledge mobilization. Among the initially identified predictors, research culture in HEIs (RCHEI) is found not to contribute significantly to internal knowledge mobilization. However, scholars and universities should strive to acquire research capability-building efforts to produce quality research outputs. It is essential that researchers and universities are equipped with the necessary competencies to conduct research and create new knowledge. RD2 put it succinctly when s/he said that if they have no research outputs, they have no research results that they can mobilize. HEIs can strengthen, retrain, or

retain a continuous stream of a new generation of researchers by initiating research-capability building activities such as seminars, workshops, trainings, and conferences to produce, create, and generate quality knowledge resources (Republic of Philippines Office of the President, 2016; Higher Education Institution, 2017).

#### 5.1.3 Internal research funding.

As shown in Table 4.14, the results of the questionnaire survey do not validate internal research funding as a predictor. It is found not to contribute significantly to internal knowledge mobilization. However, based on interview responses, funding is essential in implementing university-based research results. Financial sustainability has been found to play a critical role in the conduct and dissemination of research results. Internal research funding comes from the percentage allocated by the HEI to research from its annual budget provided by the national government. Since this is limited, there are other means available to get internal research financing, such as grants, pilot studies, research stipends, travel awards, and conference assistance. These resources can help in the creation of fresh research initiatives, gathering of preliminary data, or distribution of study results. For researchers to create and improve their research initiatives, internal research funding might offer those helpful tools and assistance. Additionally, it can aid in the development of multidisciplinary partnerships and the facilitation of the conversion of research results into useful applications that benefit society.

#### 5.1.4 Monitoring and Evaluation of Research Outputs

To determine if the monitoring and evaluation of research outputs can be predicted, a multiple regression analysis was made using participants from HEIs in the National Capital Region. It was found that monitoring and evaluation of research outputs positively affect internal knowledge mobilization.

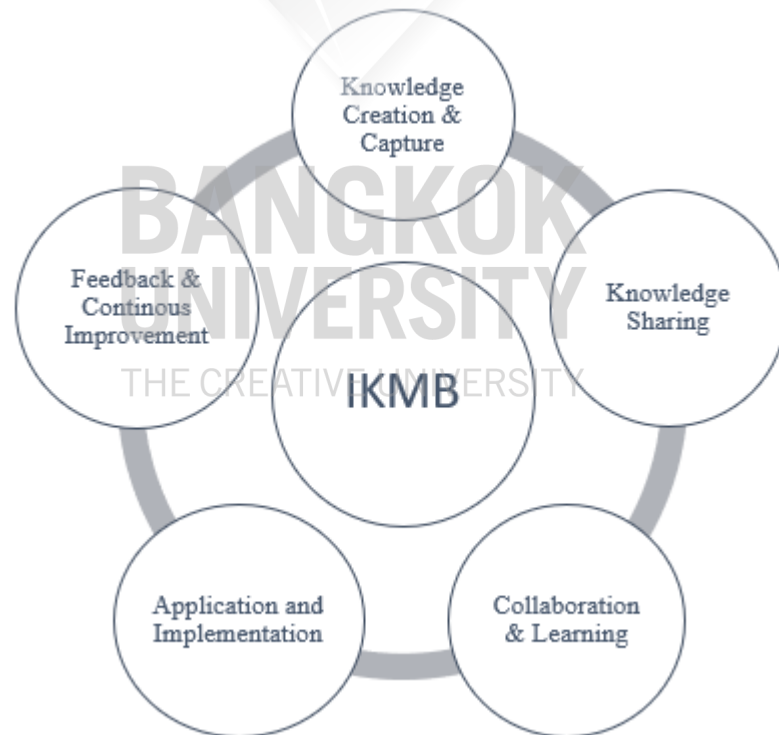
The results reveal that researchers from the seven Higher Education Institutions (HEIs) monitor and evaluate their university's research outputs through the use of various tools such as evaluation forms, survey questionnaires, self-made evaluation instruments, impact assessment, and 6Ps (Publication, People service, Production, Popularization, Partnership, and Policies). The tools are distributed to internal stakeholders of the university to measure the effectiveness of the university research outputs. In this light, the need to have a standard and unified metric tool in

measuring the effectiveness of the university's research outputs emerges from interviews with Research Directors (RD) and Project Research Leader (PRL) (4.2.1 through 4.2.8; 4.3.1 through 4.3.9).

From the interviews, the design of the preliminary tool to measure the effectiveness of internal knowledge mobilization of HEIs emerges as shown in Figure 5.2 below. This includes knowledge creation and capture, knowledge sharing, collaboration and learning, application and implementation, and feedback and continuous improvement (4.4.1- 4.4.5).

**Figure 5.2**

*Measuring Tool for Effective Internal Knowledge Mobilization in HEIs*



1) Knowledge Creation and Capture

New knowledge can be generated by motivating the faculty and students to conduct research, experimentation, or problem-solving activities. Knowledge created can be captured and documented by putting in place mechanisms such as knowledge management systems or regular team meetings (4.4.1; 4.4.2).

## 2) Knowledge Sharing

Sharing of knowledge within the HEI can be facilitated through various channels, such as internal newsletters, intranet platforms, regular team meetings or focus group discussions. Stakeholders can be encouraged to share their expertise and experiences with their colleagues (4.4.3).

## 3) Collaboration and Learning

Promote a culture of collaboration and learning within the HEI by providing opportunities for stakeholders to engage in cross-functional projects, communities of practice, or training programs. Encourage stakeholders to learn from each other and leverage their collective knowledge (4.4.3).

## 4) Application and Implementation

Support stakeholders in applying the shared knowledge to their work. This may be done by helping them access the appropriate resources, materials, and training that will enable them to use and adapt the shared knowledge seamlessly into their own organization (4.4.4).

## 5) Feedback and Continuous Improvement

Set up an effective mechanism that encourages stakeholders to give their feedback on the use and implementation of research results. Conduct an impact assessment on knowledge mobilization effectiveness to identify areas for continued development and enhance future knowledge mobilization efforts of universities (4.4.4; 4.5.6).

To make sure that research projects of universities achieve their objective of advancing knowledge which contributes to the economic development of the stakeholders/community and society, it is essential to keep track and assess research outputs. A standardized monitoring and evaluation instrument may be used to measure the relevance, quality, and efficiency of research outputs. Also, feedback from the community/stakeholders will help researchers in the successful implementation of the research results (4.2.5).

The dissemination of research outputs may be measured and assessed through qualitative metrics, qualitative methods, indicators of knowledge transfer and uptake, or continuous evaluation (5.1.4.1 through 5.1.4.4)

#### 5.1.4.1 Quantitative Metrics (4.2.3; 4.4.4)

##### 1) Publication and citation counts

Putting a figure on the number of publications and research works that cited the research outputs can be an indicator of the extent and impact of the research in the academe.

##### 2) Download and usage statistics

Using download counters can keep track of the number of times research outputs were downloaded or utilized by other researchers and other stakeholders.

##### 3) Collaboration metrics

Quantifying the number of partnerships established from knowledge sharing with research partners can suggest the value of promoting knowledge exchange and collaborative work.

#### 5.1.4.2 Qualitative methods (4.2.3; 4.2.8.1; 4.3.2)

##### 1) Interviews and surveys

Using interviews and surveys with stakeholders can generate reliable qualitative feedback that can provide insights on the value and impact of the research result.

##### 2) Case studies

Conducting comprehensive case studies may be done to investigate the way the research outputs was implemented and their impact on specific projects or programs. They are valuable sources of insights into the realistic results of the research.

##### 3) Professional opinions and peer review

Getting professional opinions and going through a peer review process can help uphold integrity of the research. Also, it confers scholarly legitimacy and external recognition on the research, its researcher/s, and the universities that produced it since the reviewers who are considered experts in their field have no affiliation with the researchers.

#### 5.1.4.3 Indicators of Knowledge Transfer and Uptake (4.2.4; 4.3.1; 4.5.5)

##### 1) Making changes in policy and practice.

Any changes in the policy or practice of the HEI can point to the impact of the research. Keeping track of these changes can be done by monitoring closely policy documents, guidelines, or reports circulated by the HEI.

##### 2) Training and capacity building activities

A change that has resulted in setting up a training or capacity building project to enhance the program, policies, and practices of the HEI may be attributed to the impact or influence of research outputs.

##### 3) Feedback and testimonials

An evidence of the effectiveness of a research in addressing the stakeholders' needs and concerns is the positive assessment of their experience in the conduct of the research.

#### 5.1.4.4 Continuous Evaluation (4.2.7; 4.3.5; 4.4.4)

##### 1) Initiating the establishment of an evaluation framework

Put in place evaluation frameworks or indicators that take into account the HEI's goals and objectives. This will ensure the objectivity of the evaluation process and facilitate the formulation of the right metrics.

##### 2) Conducting regular monitoring and reporting

Employ a system that will regularly monitor and report the status of research results and their implementation. This will aid in checking their development, determining areas that need improvement, and ensuring decisions made are based on the information collected.

##### 3) Setting up a feedback mechanism

Initiate a feedback system which will enable stakeholders to evaluate the effectiveness and efficiency of the research output and makes sure it is aligned with their needs and expectations. Conducting surveys or customer satisfaction reports can help gather information to determine the value and impact of the research output identify areas that need improvements or uncover unmet needs, ensure the research process remains efficient and effective, and can lead to greater innovative research ideas.

Monitoring and assessing the knowledge mobilization of research results is critical in determining its effectiveness. A combination of approaches may be used such as quantitative metrics, qualitative methods, knowledge transfer, and continuous evaluation to have a more thorough understanding and appreciation of the processes involved in the dissemination and implementation of research results. Regular monitoring, reporting, and feedback mechanisms are crucial for ensuring ongoing improvement and maximizing the impact of research outputs.

5.1.5 Utilization of research outputs. The utilization of research outputs positively affects internal knowledge mobilization. The interviews reveal that utilization of research outputs can be used to create new products and technologies that enhance people's lives. PRL1 provides better exposure to their students for the hands-on application on the use of welding machines s/he has developed. These machines are lighter because they are manually operated and do not use electricity. Similarly, PRL6 shares that since his/her school is in a flood-prone area, their researchers have created ready-to-eat Magicks Instant Nutri Soup to help provide sustenance to their students who end up in evacuation centers during typhoons.

Additionally, research can be employed to shape policy-making by offering evidence-based recommendations to decision-makers. For example, PRL3 recalls that one of the best researches his/her university has done is the System Information Management because it enables their students to enroll right away wherever they are. It also benefits the faculty because they do not have to encode the names of the students enrolled in their classes. PRL8 mentions the needs analysis research his/her HEI conducts on faculty members to identify their strong and weak points to enable the College or the Administration to have a direction to look into or the areas that they can focus on in terms of career improvement, knowledge development, and knowledge production of faculty members, in terms of publication, teaching, instruction, or extension.

Moreover, research can be applied to enhance the education system, providing insights into efficient teaching techniques and approaches. For instance, PRL7 explains that most of their faculty researches aim to address the needs of their internal stakeholders like the particular teaching pedagogies that are very effective to their students. Likewise, RD4 explains that the researches his/her HEI conducts are

geared towards the creation of knowledge in education in general and teacher education in particular such as for teachers and learners to improve the teaching-learning process.

The utilization of research outputs can be applied in many ways to benefit the university and its internal stakeholders, from developing new products and technologies to informing policy-making and advancing scientific knowledge.

The utilization of research outputs within a university is a key aspect of internal knowledge mobilization (KMb). It is integral for evidence-based decision-making, improving practices, fostering innovation, and enhancing capacity building. By implementing strategies such as dissemination and accessibility, communication and engagement, integration into decision-making processes, collaboration and interdisciplinary approaches, training and support, and monitoring and evaluation, organizations can effectively utilize research outputs to drive positive change and achieve their goals. The internal utilization of knowledge mobilization efforts makes sure that research results produced by the higher education institution (HEI) serve to benefit its stakeholders as well. The significant functions of internal utilization of KMb include promoting evidence-informed decisions, improved processes and practices, innovation and problem solving, and capacity building (5.1.5.1 through 5.1.5.4)

#### 5.1.5.1 Evidence-informed decisions.

Integrating research-supported facts and relevant evidence over guess work, instinct, or personal bias in making decisions can improve performance and increase efficiency, transparency, and accountability. By utilizing research findings effectively, universities can optimize their operations and achieve better outcomes (4.3.2).

#### 5.1.5.2 Improved processes and practices.

Implementing research results can result in improved processes, policies, programs, and services being offered by the higher education institutions (4.3.5; 4.5.5).

#### 5.1.5.3 Innovation and problem-solving.

Research output often contains innovative ideas and solutions to complex problems. By utilizing these outputs, universities encourage their own researchers and staff to develop a culture of innovation and creativity leading to improved problem-solving capabilities (4.8.3).

#### 5.1.5.4 Capacity building.

Utilizing research outputs internally can contribute to the professional development and capacity building of staff members. It helps them stay updated with the latest knowledge and practices in their field, enhancing their skills and expertise (4.4.2; 4.5.5).

Strategies that may be employed to facilitate the application of internal KMs are dissemination and accessibility, communication and engagement, integration into decision-making process, engagement with multi-disciplinary partners, training and support mechanism, and the conduct of regular monitoring and evaluation (5.1.5.5 through 5.1.5.10)

#### 5.1.5.5 Dissemination and accessibility.

Ensure the accessibility of research outputs to relevant stakeholders within the university through centralized platforms, such as intranets or shared drives, where research outputs are stored and organized for easy retrieval (4.4.5).

#### 5.1.5.6 Communication and engagement.

Foster a culture of communication and engagement within the university to encourage the utilization of research outputs. Promote professional development and continuing education by presenting and discussing research findings during regular meetings, conferences, seminars, or workshops (4.2.3; 4.4.3).

#### 5.1.5.7 Integration into decision-making processes.

Embed research output into decision-making processes by actively involving researchers or subject matter experts in relevant discussions and decision-making forums. This ensures that research findings are considered and inform the decision-making process (4.4.4).

#### 5.1.5.8 Engagement with multidisciplinary partners.

Bring together professionals and researchers with different expertise. This will enable the researchers to look into the implementation process of the research project with fresh perspective (4.4.2).

#### 5.1.5.9 Training and support mechanism.

Implement a workshop and training program to equip staff members with the necessary knowledge and skills for the effective utilization of research results such as analytical assessment, evidence synthesis, or research translation (4.2.8.1; 4.8.4).

#### 5.1.5.10 Administer regular monitoring and evaluation.

Establish a standard monitoring and assessment system to evaluate consistently effectiveness of the HEI's use of its research results. This may include conducting surveys or interviews or collecting customer feedback forms (4.6.1; 4.8.3).

#### 5.1.6 Research integrity

Upholding research integrity positively affects internal knowledge mobilization. It is noteworthy, however, that the overall contribution of research integrity to IKMb is inversely proportional. This means that as efforts are made to strengthen research integrity, internal knowledge mobility becomes limited.

When researchers prioritize maintaining high standards of integrity, it helps to ensure that research is conducted ethically and that the findings are accurate, valid, reliable, and credible enough to inform public policy and other important decisions.

For example, Table 4.20 that presents a summary of the responses given by interviewees on research integrity shows that university research prototype undergoes patent procedure before it is presented to the stakeholders to avoid duplication and protect the rights of its creator. Another example cited by RD1 is asking the stakeholders to sign a Non-Disclosure Agreement (NDA) before inviting them to attend the exhibit showcasing the university research outputs.

Research carried out with integrity also provides opportunities for knowledge advancements as a result of free and open inquiries conducted by HEIs such as making sure that researchers undertake studies only within their field of expertise. For instance, PRL3 admits that since "I am a mycologist; the researches

I conduct are limited only to fungi.” The interviews establish several key principles to promote research integrity and the different strategies that may be followed to uphold them.

Universities can promote research integrity by upholding the principles of ethical conduct, transparency and openness, quality assurance, intellectual property, and providing training and education (5.1.6.1 through 5.6.5).

#### 5.1.6.1 Ethical conduct (4.5.2)

##### 1) Informed consent.

Researchers should obtain the consent of the participants involved in the research activities, ensuring they understand the purpose, risks, and benefits of their participation.

##### 2) Confidentiality and privacy

The confidentiality and privacy of research participants are ensured and that their personal information is handled securely and not disclosed without their written consent.

##### 3) Conflict of interest

Researchers should disclose any potential conflicts of interest that may compromise the integrity, dissemination, collaboration, and objectivity of the research. Policies and procedures that will manage and mitigate conflicts of interest should be established.

##### 4) Research ethics review

A research ethics review process is set up to ensure that research activities meet ethical standards and relevant regulations and guidelines are complied with.

#### 5.1.6.2 Transparency and Openness (4.4.5)

##### 1) Data management.

Good data management practices including data documentation, storage, and sharing are adopted to ensure the transparency and replicability of the research.

## 2) Methodological transparency

Research methods, including data collection, analysis, and interpretation are properly documented to enable others to understand and assess the validity and reliability of the research results.

## 3) Open access

Open access to research outputs such as publications, reports, and datasets is promoted to facilitate knowledge sharing and collaboration both internally and externally. PRL7 shares their practice in uploading monographs or technical reports in their university's Research Portal, with the permission of the researchers. The university's Research Center for Teacher Quality (RCTQ) is also open to researchers who want to take a look at their data, of course with permission, and so from there, they can benchmark on the processes and the data and do data mining for their own researches.

### 5.1.6.3 Quality assurance (4.5.2)

#### 1) Rigorous research design

A well-planned research design will ensure that the study is valid, reliable, and produces meaningful results.

#### 2) Peer review.

A peer review process evaluates the quality, accuracy, and consistency of research outputs before dissemination. This can involve internal or external experts who provide feedback and recommendations for improvement.

#### 3) Replication and verification

Replication and verification of research findings ensure their validity and generalizability. This can involve internal replication studies or collaboration with external researchers.

### 5.1.6.4 Intellectual property (4.3.9; 4.5.2)

#### 1) Intellectual property rights

Intellectual property rights arising from research activities can be ensured by putting in place relevant policies and procedures. This includes securing patents for inventions or innovations, copyright protection, and licensing agreements.

## 2) Attribution and recognition

Appropriate citation of works used in one's own research and proper acknowledgement of the contributions of other researchers are ways of giving credit where credit is due. Universities should establish mechanisms to recognize and reward researchers for their contributions to knowledge mobilization.

### 5.1.6.5 Training and education (4.2.8.1)

#### 1) Research ethics training

Training and education on research ethics and integrity to researchers and staff members involved in research activities helps to ensure a shared understanding of ethical conduct and compliance with relevant policies and guidelines.

#### 2) Responsible conduct of research

Universities conducting research promote the practice of responsible scientific inquiry by conducting education and training programs, workshops, conferences, and seminars as well as through informal conversations during mentoring and focus group discussions. This includes topics such as research ethics, data management, responsible authorship and publication, proper use of citations, and conflicts of interest in research.

To sum up, the predictors dissemination of research outputs (DRO), monitoring and evaluation of research output (MERO), utilization of research output (URO) and research integrity (RI) play a vital role in strengthening the impact of internal knowledge mobilization as shown in the conceptual model design in Figure 5.1.

## 5.2 Effective External Knowledge Mobilization (EKMb)

For effective external knowledge mobilization, result 1 can be attributed to external research funding and utilization of research output (23.3) while result 2 can be explained by utilization of research outputs and dissemination of research outputs (23.3). Finally, result 3 can be explained by dissemination of research outputs and external services (23.3). Based on the rising trend in R-squared values, the capacity of the result to explain the effectiveness of external knowledge mobilization is enhanced by each additional predictor (23.1).

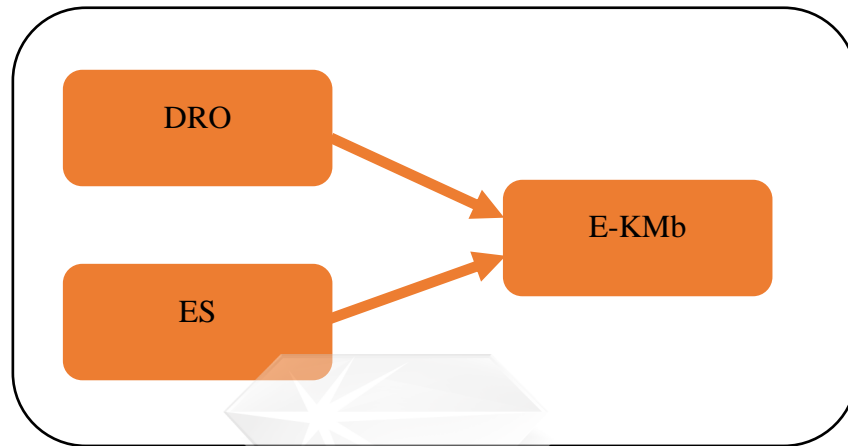
Table 4.24-4.26 above shows the summary of the effectiveness of external knowledge mobilization where results of both 2 and 3 are found to be statistically significant. In result 2, DRO and URO are the predictors while result 3 includes ES. It is noteworthy to mention that ERF and URO are eliminated in the generated results as they do not contribute in predicting external knowledge mobilization. In Table 4.26, when holding DRO, ERF, and URO constant, DRO is found to statistically predict the effectiveness of external knowledge mobilization, which is evident in result 2 of the analysis. When External Services (ES) is accounted for as indicated in result 3, the contribution of DRO to the variance of EKMB has decreased (from .543 to .472). The same result shows that ES appear to significantly contribute in predicting the effectiveness of external knowledge mobilization.

From Table 4.24 above, result 3 appears to explain-better the effectiveness of external knowledge mobilization. Aside from the statistical significance of the contribution of both predictors, its  $r^2$  and adjusted  $r^2$  values are better than those found in result 2. When combined, DRO and ES can explain 74.4% of the variance of external knowledge mobilization. This indicates that when resources are directed to increase DRO and ES, positive changes in effective external knowledge mobilization can be observed.

Furthermore, due to the highest value of r-squared and significant coefficient as shown in 4.26, result 3 is selected to best explain the large variation of effective external knowledge mobilization as shown in the Figure 5.3, the initial model designed by the researcher to measure the effectiveness of the university's external mobilization outputs based on what emerged from the research and the results of the interviews conducted.

**Figure 5.3**

*Conceptual Model of the Effectiveness of External Knowledge Mobilization*



After conducting the research, the perceptions and ideas of external stakeholders on dissemination of research output (DRO), external research funding (ERF), utilization of research outputs (URO), and external services (ES) are detailed below.

#### 5.2.1 Dissemination of research outputs (DRO)

The dissemination of research outputs positively affects the effectiveness of external knowledge mobilization. The survey results reveal that this significantly predicts effective external knowledge mobilization with a p-value .001 ( $p < .05$ ). Based on the interviews, the efforts of Higher Education Institutions (HEIs) to disseminate research results to their external stakeholders include publishing journal articles, holding local and international conferences, holding events such as paper conference presentations, participating in relevant performances and exhibitions, submitting reports in printed form or digital format, and granting media interviews through the social media to a broad range of audiences composed of peer researchers, professional practitioners, and policy makers, as well as signing a Memorandum of Agreement with concerned communities and agencies. Dissemination of research results is crucial for advancing knowledge and guiding decision making. Furthermore, since research findings are germane to their particular areas of interest or have practical significance to the needs of the community, they are considered

relevant for dissemination. Further, stakeholders may value the timeliness of research output dissemination, as they may need to access the latest research findings to inform their community.

The perceptions of external stakeholders on the dissemination of research outputs can be influenced by their own requirements, needs, interests, and priorities, as well as the quality and relevance of the research itself.

Thus, the dissemination of research outputs is an essential part of the research process. It involves sharing the data gathered, the findings of the research, and insights gained with the broader academic community, policymakers, industry partners, and the general public, enabling the research to reach its intended beneficiaries who can maximize the usefulness of the research. Thus, RD4 is hoping “for faster, more efficient, and more systematic sharing of resources or knowledge created among HEIs, if not all HEIs, at least among members of the consortium.”

To ensure the successful dissemination of research outputs, the strategies that may be helpful to consider are identifying target audience, considering dissemination channels, using open access, engaging with stakeholders, communicating effectively, and measuring impact (5.2.1.1 through 5.2.1.6) (4.2.4).

#### 5.2.1.1 Identify Target Audience

Determining the target audience of the research output is crucial for successful dissemination. Researchers need to consider who can benefit from the research, such as fellow researchers and scholars in related fields, policymakers, organizations working in related areas, or the general public since different strategies may be required to reach each audience effectively, recognizing that different audiences have different needs, interests, and expectations.

#### 5.2.1.2 Consider Dissemination Channels

Research outputs can be disseminated through traditional academic channels such as using peer-review for both conference presentations and journal publications and holding seminars. However, researchers should also consider using alternative means such as open-access publications, online platforms, social media, and public lectures to reach a wider audience and enable a focus on the importance of their works.

### 5.2.1.3 Open Access

Open access allows easier accessibility of research outputs to anyone who is interested, making knowledge acquisition easier to obtain. Open access journals, repositories, and preprint servers have become popular in recent years, enabling researchers to disseminate their work more widely and expeditiously. Open access also fosters collaborative work and the free exchange of ideas. RD 4 proposed for SMEC to create its Portal or for his/her university's Portal to show all the links. Likewise, the Portals of other universities can also be made more accessible. Note that emerging Artificial Intelligence agents around the world have access to open access journals.

### 5.2.1.4 Engage with Stakeholders

Effective dissemination leads to improved and active engagement with stakeholders such as industry partners, policymakers, and community organizations who can adopt the findings of the research into practical applications impacting on policies and addressing community issues and concerns.

### 5.2.1.5 Communicate Effectively

Successful dissemination requires effective communication of research findings in a way that is easily understandable to the target audience, using plain language summaries, visual aids, and infographics to make the work more engaging and accessible. Clear and concise language should be used to convey the findings and practical implications of the research.

### 5.2.1.6 Measure Impact

Assessing the impact of research dissemination is important to determine its effectiveness. Indicators such as citations, media coverage, social media engagement, and policy changes may serve as guides to measure the impact of the work. Reactions, critiques, and evaluation can help researchers improve their dissemination strategies and thus help the research output gain leverage.

## 5.2.2 External Research Funding (ERF)

The gathered data from the participants of the interviews shows that the survey questionnaire results do not validate the external research funding variable (ERF with a p-value of .714 ( $p < .05$ ) in HEIs. External research funding in higher education institutions does not affect effective external knowledge mobilization.

However, based on the interviews with project research leaders from the HEIs, external funding in research is essential to underpin and serve potential players' requirements. This will ensure that knowledge resources will not be wasted but will create new value for stakeholders. In addition, external funding strengthens a researcher's research capacity and make certain that the research produced will be implemented in the community. An example of this is the loop-mediated isothermal amplification (LAMP) kits developed to diagnose the anthracnose of Philippine carabao mangoes. Developing the kits requires funding to make them available to the clients to protect their crops from the disease. Mango is one of the essential fruits cultivated in the Philippines. The Philippine mango fruit has a good reputation internationally due to its sweetness and exotic taste. "The LAMP kit is envisioned to benefit mango growers, researchers, quarantine personnel, and policymakers as the kit is intended to be used for phytosanitary measures" (Luci-Atienza, 2022). The project which costs millions of pesos was funded by the Department of Science and Technology (DOST) and Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) in collaboration with Mie University, Japan under the DOST – JSPS Joint Research Program (Philippine Council for Agriculture, n.d.). As PRL10 mentioned, the institution-allocated budget to conduct research is smaller, so researchers depend on external funding. Based on the literature, to meet and serve the requirements of the external stakeholders, allocation must be sufficient to ensure that knowledge resources will not be wasted but create value for the potential players (Gatsby, 2016; Bennet & Bennet, 2007).

### 5.2.3 Utilization of Research Outputs (URO)

The gathered data from the participants of the interviews also reveals that the survey results do not validate the utilization of research outputs in HEIs variable. The utilization of research outputs (URO with a p-value of .082 ( $p < .05$ )) in HEIs does not contribute significantly to predict effective external knowledge mobilization. Thus, the utilization of research outputs in higher education institutions does not affect the effectiveness of external knowledge mobilization. Based on Table 4.7 showing the summary of utilization of research outputs, when university conducts research on the effectiveness of a new teaching method, the general public may want to know how it can be applied in other educational settings. The university maintains

constant communication with its partners such as the Department of Science and Technology (DOST), local government units (LGUs), other Higher Education Institutions (HEIs), other members of the university consortium, and industry partners of the university for benchmarking and for possible signing of a Memorandum of Agreement. RD4 cited an example of a research of an HEI that has been utilized on a national level is the research for teachers' developmental needs that has led to what is now the Philippine Professional Standards for Teachers (PPST). It has now become a national policy and guide that teachers follow in their career pathing as even their Individual Performance Commitment and Review (IPCR) is connected to PPST. Teacher education is affected because even undergraduate programs or even graduate programs on teacher education somehow needs to consider the standards of the PPST. It has a big impact now to Filipino teachers and even Filipino students taking up teacher education.

#### 5.2.4 External services (ES)

From survey result, external services efforts of HEIs positively affect the effectiveness of external knowledge mobilization as the services can significantly predict effective external knowledge mobilization with a p-value .002 ( $p < .05$ ). Based on the interviews, HEIs conduct research and extension projects based on the needs and problems of their respective communities. Among these are providing training, technical advice, consultation to business, practical and light farming implements, and technology transfer as part of their academic course. Furthermore, HEIs undertake collaborative projects that create an impact on the lives of their industry partners, local government units, non-government organizations, foreign university partners, alumni and other government agencies such as Department of Education, Commission on Higher Education, the Senate, and Congress.

An example of an extension program that has created a strong impact to the community is the one undertaken by RD7 and his/her colleagues in collaboration with Gawad Kalinga, a non-profit, non-governmental organization. This is the use of hybrid energy to power up the pumps of the GK community in Laguna. Such extension activity has benefited the community tremendously because it is what the community needs (4.4.2; 4.8.4).

The factors that may be considered to increase the impact of knowledge mobilization on external services include recognizing the importance of external services, identifying relevant external services, working together, maximizing the use of existing platforms, customizing research topics for external resources or services, keeping track and evaluating, and building relationships (5.2.4.1 through 5.2.4.7).

#### 5.2.4.1 Recognize the Importance of External Services

External services provide valuable platforms for disseminating research outputs to a wider audience. These services may include industry-specific platforms, professional networks, online communities, knowledge-sharing platforms, and consulting services that can help researchers meet stakeholders and industry professionals who may be potential users of the research findings.

#### 5.2.4.2 Identify Relevant External Services

Researchers should identify relevant and credible external services to determine which of them are accessible and aligned with the university's research area and target audience. Among these are communities engaged in the same industry, social network services or platforms involved in related fields such as industry associations or clubs, and online groups where stakeholders and possible end-users of the research output are actively involved. PRL2 mentioned his/her work with their partner-institution requiring the creation of an innovative training design in the use of instructional materials and pedagogy. S/he voiced out his/her expectations that the partner-institution replicates to other schools in their Division the best practices gained from their research results.

#### 5.2.4.3 Partner and Work Together

Getting together to work closely with external services who share your goals can strengthen efforts to disseminate research results. For instance, working together with external services opens more opportunities that will enable you to benefit from their existing professional competence, resources, platforms, or networks. This may include efforts or services carried out jointly with external services partners or fellow creators of knowledge.

#### 5.2.4.4 Maximize the Use of Existing Platforms

Researchers can utilize to their advantage existing platforms that are popular for sharing and disseminating knowledge and information. They may submit

write-ups, blogs, or research summaries written in clear and easy to understand language, participate in vlogs, webinars or podcasts, or contribute to online chat forums and discussions.

#### 5.2.4.5 Customize Research Topic for External Resources or Services

Researchers have to adjust their content to make it relevant to the needs, interests, and requirements of their external resource or service provider. This means presenting their research results in a language that can be easily understood, using the format and style consistent with the guidelines prescribed by the said external service.

#### 5.2.4.6 Keep track of and Evaluate

Researchers conduct regular monitoring and evaluating of the significance of their research outputs to establish their effectiveness on external services. Among the strategies they perform to accomplish this are checking out the number of views and downloads as well as picking up comments or engaging with followers on the platform. Also, researchers ask for feedback from end-users or stakeholders regarding the usefulness and relevance of the research from the point of view or experience of the external services. The feedback can help researchers refine their dissemination strategies and improve the effectiveness of their engagement with external services.

#### 5.2.4.7 Build relationships

For long-term engagement and work collaboration, HEIs and their researchers (extension services staff) should establish themselves as reliable and knowledgeable contributors of knowledge dissemination and collaboration. This will establish a strong relationship built around trust and credibility with external service providers. This can be done by actively engaging with the service providers, participating in discussions, and responding positively and promptly to comments or inquiries.

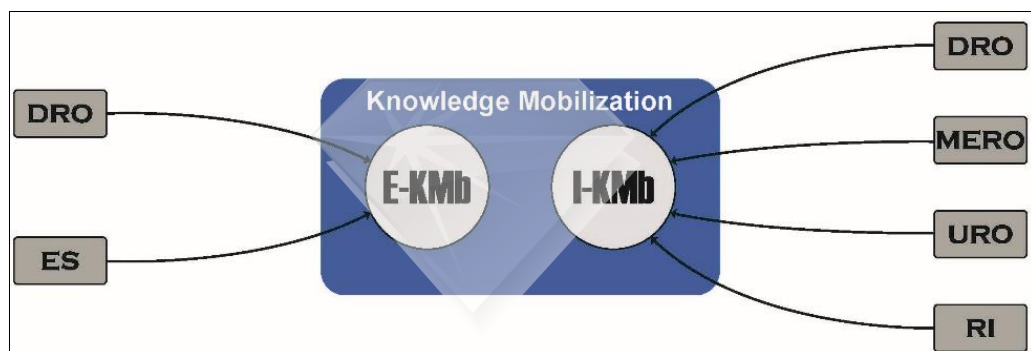
To reiterate, the predictors of dissemination of research outputs (DRO) and external services (ES) have significant roles in intensifying the impact of external knowledge mobilization as shown in the conceptual model design in Figure 5.4 and thus in predicting the increase of external knowledge mobilization in higher education institutions.

### 5.3 Significant Elements Impacting Knowledge Mobilization

To bring all of these elements together, based on the foregoing discussion, the effective application of knowledge mobilization, both internal and external, is significantly influenced by several factors as shown in Figure 5.4.

**Figure 5.4**

*Significant Elements Impacting Effective Knowledge Mobilization*



Dissemination of research outputs (DRO), utilization of research outputs (URO), Monitoring and Evaluation of Research Outputs (MERO), and Research integrity (RI) have a strong impact in the effective application of knowledge mobilization to internal stakeholders. Research Integrity (RI) establishes the trustworthiness of the knowledge created and disseminated (DRO) by HEIs through different means to stakeholders who can make use of them or can apply them (URO). Regular monitoring and evaluation of the implementation of the research project (MERO) is done to ensure the activity's effectiveness, the client's satisfaction, and improve the usefulness and implementation process of the project.

On the other hand, external knowledge mobilization is impacted significantly by Dissemination of Research Outputs (DRO) and External Services (ES).

Dissemination of research outputs (DRO) is sharing of knowledge produced by HEIs from the researchers, in plain and clear language that can be easily understood to the community, as well as to policymakers, even to non-academic audiences or non-researchers, who might be able to pick up something from these researches, as a way of reaching out to a larger group of people for better external services (ES) and to

ensure the knowledge generated by HEIs goes back to improve the welfare of the community.

This study was undertaken to address several secondary questions (SQs) to support the discovery of the solution set for the primary question. Findings for the secondary questions are discussed from 5.4 through 5.6 (SQ1 – SQ3) leading to the discussion of the primary question (PQ) in 5.7.

#### **5.4 (SQ1) What is the current state of knowledge mobilization of research results in Philippine Higher Education Institutions (HEIs)?**

As introduced in Chapter 2, universities or higher education institutions comprise the biggest sole creator of academic investigation. As such, HEIs are mandated by the Commission on Higher Education (CHED) to mobilize projects that assure the knowledge it created goes back to society, and they do not become “ivory towers”. Therefore, HEIs have undertaken projects and activities that fall under the specific knowledge domain mandated by the law that created them. Most of these domains are under science and technology, specifically on the national harmonized agenda of the Department of Science and Technology (DOST), industrial technology, the sustainability of technologies such as food technology but also includes education in general, teacher education and teacher technical education and skills development (TESD) in particular; and professional, business and entrepreneurial technology.

For instance, the Philippine Normal University (PNU) – whose knowledge domain is education in general and teacher education knowledge in particular – has created research outputs and training programs to enhance teaching standards in the Philippines.

A research that has created a big impact to the community is that undertaken by Technological University of the Philippines (TUP) whose specific knowledge domain is technology transfer. The project uses hydro, solar, and wind turbine as sources of sustainable electric energy for the whole community of Sitio Singawan, Dingalan, Aurora. The project started in 2018 and it is still ongoing, with the team from the HEI still building the energy sources because the island is big and did not have electricity.

A research project of Eulogio “Amang” Rodriguez Institute of Science and Technology (EARIST) – whose focus is on science and technology specifically on the national harmonized agenda of the Department of Science and Technology (DOST) – is on the use of hybrid energy to power up the pumps for Hiyas ng Maynila Gawad Kalinga community located in Laguna.

Another continuing project of Marikina Polytechnic College is the creation, production, and distribution of ready-to-eat Magicks Instant Nutri Soup (made of Malunggay, Ginger, Chicken, Kangkong, and Sweet Potato) for their community when they end up in evacuation centers during calamities such as typhoons. One of the knowledge domains of this HEI is food and service management.

Polytechnic University of the Philippines (PUP) – whose mandate includes providing technology adoption to a local government unit (LGU) or barangay – has provided Barangay Emergency Alert system to a barangay in Lobo, Batangas. This is a system that transmits signals to alert its residents if there is a storm surge or an earthquake.

Located in the suburbs but still a bustling city, Rizal Technological University (RTU) – tasked to provide highly professional and entrepreneurial technology among other things – has urban agriculture as its specific knowledge domain which is divided into plant biotechnology and mushroom biotechnology. The projects are ongoing as the application of technology is continuous. For plant biotechnology, the HEI provides training on tissue culture, plant propagation, etc. and has been receiving positive feedback on its Facebook page, especially from the community who has found the technology introduced to them very useful. They have expressed gratitude in their testimonies because they are now growing their own vegetables, with some even selling their harvest which brings about a change in their economic status and improvement in their family income. However, RTU considers its work on mushroom biotechnology as having shown the greatest impact. The HEI grows different species of mushrooms, nine (9) species to date, does gene banking, publishes mushroom cookbooks which show different ways on how to cook mushrooms, and also urban mushroom production. They have produced mushrooms that they sell to small and medium micro enterprises (SMME) or to communities like households or restaurants. They provide technical advice, consultation to business,

and training on mushroom culture and production and later on, the trainees venture to build their own mushroom farm. RTU also conducts Extension Training Programs outside the school and, before the pandemic; they were able to reach out even to far flung areas. At present, the Department of Science and Technology (DOST) have proposed that the HEI mass produce their technology for the benefit of the community. Thus, the HEI is thinking of taking on additional communities until they reach their target to service all the barangays in Mandaluyong City since the DOST is providing adequate resources and logistics to ensure the successful widespread implementation of the project.

Clearly, these HEIs are able to mobilize and implement their research outputs to their respective communities despite the heavy workload of their faculty researchers. This has resulted in the economic growth of the community, a fact for which the beneficiaries of the projects are grateful.

Unfortunately, not all HEIs have managed to mobilize their research results. One HEI whose specific knowledge domain is under the aviation field acknowledges that they are still working to extend their research results to the community such “that these results get translated into extension activities to benefit the community especially those that are applicable or relevant so we can achieve our agenda to help the community which is one of our objectives” (4.4.4). This particular HEI is now in the process of reviewing their research outputs to determine how they can be enhanced “to share the results with the community so they can be utilized” (4.2.7).

### **5.5 (SQ2) How can the Effectiveness of Mobilization of Research Results in Higher Education Institutions (HEIs) be Measured?**

As discussed in the Conceptual Framework, research results of HEIs are a product of knowledge generated by HEIs that should be converted into something useful and mobilized to the beneficiaries (2.10). From the information revealed by the interviews, the following strategies are used by HEIs to measure the mobilization of their research results:

### 5.5.1 Commercialization of the Value of Technology Transfer or Knowledge Transfer

Technology or knowledge transfer is a collaborative process between the creators of knowledge or technology such as the HEIs to flow or be disseminated to external stakeholders such as the community, industry partners, local government units (LGUs) and non-governmental organizations (NGOs). PRL10 asserted that “the measurement should be in terms of the commercial value of the project; for example, if the community earned profits from it” (4.3.5), or (PRL8) if there is commercialization of the Utility Models (UM), Industrial Designs (IDs), and patents developed (4.3.5). However, Guillermo M. Luz, Co-Chair of the National Competitive Council (NCC) observes that there is a noticeable low partnership between the universities and industries as the research results of universities are not readily accessible to the private sector while funding of academic research by industries is not adequate enough. For instance, PRL8 cites his/her own HEI has several Utility Models (UMs), Industrial Designs (IDs), and patents that they are trying to sell to partners or “look for an industry partner that is more than capable to fund us, to reproduce these eventually, to commercialize all of these things, or to donate (them) to a particular community, and use them.” Nonetheless, out of close to a hundred UMs, very, very few are being used, or there is zero commercialization of these UMs (4.3.6). This validates the suggestion proposed in Chapter 2 by Guillermo M. Luz that research outputs should be given to the industries so they can be converted into something useful. The private sector will then give royalties to the school “to create business value for the research” (Leon, 2011 as cited in Lacanilao, 2024). PRL8 voices out his/her idea of measurement as “how many of these research outputs have resulted into technology transfer” or how technology is applied in extension activities to improve businesses' products, services, and operations or create new products and technologies that enhance people's lives, provide livelihood programs that enable the community to produce their product and start small businesses (4.3.2; 4.8.3). PRL10 shares that “our project is to actually create a Center that will commercialize our projects” (4.3.5). Tracking the revenues earned by the community or industry from successful technology or knowledge transfer, or the

number of patents, utility models (UMs), or industrial designs (IDs) developed can be done to help measure the effective mobilization of research results in HEIs.

#### 5.5.2 Collaborative Research

This is research undertaken involving coordination between the researchers, industry, private organizations, local government units, and/or communities.

Collaboration between HEIs and their external collaborators can be measured with the HEI by formulating and monitoring regularly key indicators that it has contextualized based on the goals or objectives it aims to achieve with the implementation of the project and the unique challenges or experiences as well as the opportunities available to the HEI like sources of funding. Some of these indicators that can be measured using quantitative and qualitative data from interview, metrics or reports are the quality and relevance of the research being mobilized, the efficiency by which the project is being implemented, the capability of both the external collaborator and HEI to implement it, the innovations or new technologies being shared, and the satisfaction of the clients with the project. An example of collaboration with industry cited by RD1 (4.8.2; 4.2.4) is the partnership between interested representatives from the industry who are usually the ones who approach and partner with his/her HEI. They set up meetings with researchers of the HEI to find out which of their outputs or projects can be of use to them. If they are not interested in any of these projects, they suggest or introduce topics that interest them and the HEI evaluates their capability to pursue these topics. Funding for the project is expected to be provided by the industry or organization that has chosen to adopt the HEI's research. Thus, HEIs benefit from research collaboration through funding and additional resources while industry gains opportunities to work with skilled workers who have professional training and specialized expertise. Another example is the community, university, and industry partnership formed to make sure the needs of the community are addressed appropriately (PRL8, 4.8.4). Similarly, the training program PRL2 designed is in response to the needs of his/her HEI's partner-institution as stipulated in their Memorandum of Agreement (4.3.2).

#### 5.5.3 Impact on Policy and Decision Making

Research guides policy and decision makers by providing them with reliable and relevant knowledge as well as concrete evidence for more effective policies and

decisions. RD5 reports that they disseminate Action Researches that are relevant to policy making through Memos and they provide offices with copies of Customer Satisfaction Report (4.2.3). These research results became the basis in crafting some of the important policies of the university. Further, (RD4) the HEI converts some research results to policy briefs and then these are sent to the Philippine Senate and Congress, Commission on Higher Education (CHED), and the Department of Education (DepEd) (4.2.2). The HEI makes sure the research result leads to a policy change in the government agency's manner of implementing safety protocols (4.3.2). The impact of the HEI's research results on policy and decision making can be measured by monitoring the policy briefs produced by the HEI or the influence of the HEI's research results on legislations passed in the Senate or Congress.

#### 5.5.4 Public Engagement and Extension Services

Researchers present their research results and engage with their fellow researchers and stakeholders through various platforms such as Research Congress, Conferences, Colloquia, fora, workshops, or lecture series, and even through social media like Facebook (4.2.4). They also disseminate their research results to the community in the HEIs' outreach and extension activities (4.8.4 2). Public engagement and extension services can be measured by monitoring the number of and effectiveness of lectures, workshops, etc. presented in connection with the mobilization of the research result as well as the level of the community's awareness of the research. Effectiveness is determined by tracking the research results that have been converted into policy briefs (4.2.2; 4.4.3) by developing research and data management, by creating a Monitoring Committee or Task Force that will check research outputs shared with the external community (4.4.4), by checking up on the research findings that were actually used or applied in the community (4.3.5; 4.4.4), by letting the beneficiaries use the research results and then gathering feedback from them (4.4.4), and by monitoring the research-based extension projects (4.4.4).

#### 5.5.5 Social and Economic Impact

HEIs and, in many cases, the industry or private organizations team up to translate the HEI's research results into extension activities to bring about a positive impact on the community; for example, using the HEI's technology to improve businesses' products, services, and operations or create new products and technologies

that improve people's lives (4.4.2), to provide livelihood programs that enable the community to produce their product, start small businesses (4.3.3), and commercialize research outputs to avoid wastage. Measuring the economic and societal impact of mobilization of research results can involve indicators such as job creation and economic benefits from the research outputs. For instance, many families in a community outside of Manila have experienced a change in their economic status as a result of technology and knowledge transfer in the extension activities conducted by the HEI. Due to the impact on the community of the HEI's implementation of its research results, the Department of Science and Technology (DOST) has proposed that the HEI mass produce its technology to benefit other communities as well (4.3.2). Similarly, the innovative sustainable invention by a student of the Philippine State College of Aeronautics of an aviation sealant from the waste of pili tree resin, commonly known as "spent resin" or "de-oiled resin", does not only prevent fuel leakages better than any commercial sealant as proven by 20 different standardized tests. It has also been proven safe and non-toxic to the user's health unlike the commercially available sealant which releases unpleasant and toxic odors and could adversely affect the health of aircraft mechanics and technicians because of their direct contact with the product (4.4.2; 4.8.3).

### **5.6 (SQ3) What Analytical Framework can be Designed to assess the Effectiveness of KMb Research Results in HEIs?**

Interviews with Research Directors (RDs) and Project Research Leaders (PRLs) of HEIs presented a more concrete picture of the kind of framework they expect if an objective evaluation or assessment of the HEIs' research outputs are to be made. To make a recap of their answers: RD7 believes "we should measure its impact to the stakeholders, not the number of publications" (4.2.4) while RD3 opines making an impact assessment on how the barangay or community benefited from the technology followed by research leading to commercialization (4.2.5). RD2 underscores the importance of timeliness of this kind of mechanism so they are now revising theirs since what their university has was formulated way back in 2012 (4.2.5). PRL10 believes that the measurement should be in terms of the commercial value of the project, like if the community earns profits from it. Conversely, PRL8

maintains that the instrument should measure the commercialization of the Utility Models (UMs), Industrial Designs (IDs), and patents developed by the HEI (4.3.5).

On the other hand, a senior official of an HEI was also interviewed for this study to get his/her insights on knowledge mobilization and the analytical framework that can be designed to assess the research results of HEIs. Despite the short notice and heavy schedule, s/he was generous in sharing his/her time and perspective on the topic. S/he reiterated that faculty members of HEIs are expected not only to teach their assigned courses but also to produce and disseminate research. The faculty may find the second role challenging as only a small percentage of them are involved in creating knowledge in many higher education institutions (5.2.1). Thus, it is essential for faculty researchers to have a dedicated interest and enthusiasm in conducting research. The Administration of HEIs plays an important role in motivating their faculty to be actively involved in the exciting field of research. Among the different ways in which HEIs can help improve their research productivity is by allocating adequate funding for research as the budget assigned to research sends a strong message to the faculty about the importance the Administration places on research and the institution is making research an essential part of the organizational culture. Besides, funds are necessary to update the research competencies of the faculty and provide them incentives in the form of reduction of their teaching load without diminution of their salary (4.3.2). Since institutional research funding is usually not much, the Administration can also assist in looking for external funding sources whose criteria and funding focus align with the researcher's and HEI's project (4.4.2). Further, putting in place a more enhanced capability building program can drive and lead faculty members "to produce high-quality research" to enable them to become not only passive consumers of information but also active contributors to the generation of new knowledge in their discipline and its practical utilization (4.4.2). Further, HEIs can help provide opportunities for faculty engagement on research-related activities such as, organizing research fora, participating in national meetings of professional research organizations, and serving as research lecturers, research instructors, research coordinators, research assistants, and/or members of thesis proposal defenses, and the like. The academic community also needs to be proactive in building stronger relationships or network with stakeholders, industry partners, and

community to accelerate the production and effective utilization of research results. In order to do this, they have to be sensitive and perceptive to the interests, needs, and expectations of their stakeholders and community. HEIs can continue to inspire and motivate researchers by promoting continuing capabilities-building research programs (e.g., current research methodologies, research grant writing, writing research for publication, statistics or data treatments, etc.) (4.2.8.1). Also, HEIs can connect their internal knowledge mobilization activities with their external mobilization efforts by leveraging their research results as a means to produce innovations that will establish mutually beneficial partnerships with their network of partners (4.4.4). Despite diversity among the members of the academe, industry, and community due to their differences in education level, interests, socioeconomic status, needs, etc., when all of them work collaboratively in synergy for the benefit of their community, research results may be mobilized effectively and successfully (4.8.4).

### **5.7 Primary Research Question how can the Effectiveness of Knowledge Mobilization (KMb) of Research Results in Higher Education Institutions (HEIs) be Assessed?**

Assessing the effectiveness of Knowledge Mobilization of research results in higher education institutions (HEIs) means measuring the effectiveness of the research in terms of its dissemination, adoption, and effective application by stakeholders. Among the instruments and strategies that HEIs use to assess this effectiveness are:

#### **5.7.1 Surveys and Interviews**

Research evaluators can gain valuable insight into the impact of the mobilization and utilization of the research results on the community by conducting surveys or interviews. These instruments can assess the suitability, usefulness, and impact of the research in confronting real-world issues and concerns. Interviews with research experts of the HEIs reveal that Marikina Polytechnic College (MPC) has been using survey questions prepared by the proponents/researchers themselves and validated by experts to measure the effectiveness of their research outputs and to determine the quality of the cutting, tensioning, workability, economy, and safety of the machine for its internal stakeholders (4.4.4). Similarly, Polytechnic University of

the Philippines (PUP) uses survey forms following guidelines approved by the HEI's Board of Regents (4.4.4). Likewise, Rizal Technological University (RTU) uses a Customer Satisfaction Survey questionnaire where clients were asked to evaluate the HEI's products and services, like their promptness and efficiency in responding to communication and requests (4.4.4).

#### 5.7.2 Impact Assessments

Knowledge mobilization can be effectively assessed by conducting impact assessments on the societal, economic, or environmental impacts of the research. This can include assessing modifications in policy, improvements in practice, or contributions to social and economic development. Interviews with the Research Director and the Project Research Leaders show that Polytechnic University of the Philippines (PUP) always conducts impact assessment once a research is adopted by a community (4.4.4). Aside from monitoring, PUP also makes an assessment of how the barangay or community benefited from the technology. Similarly, the Research Director of Marikina Polytechnic College (MPC) acknowledges that what they have been doing was more on qualitative results like evaluating the impact of the research or project on the community (4.2.5).

#### 5.7.3 Feedback and Evaluation from Clients

Gathering feedback from clients and stakeholders can assess the suitability, usefulness, and impact of the mobilization of research results. This can be done through feedback surveys, focus group discussions (FGD), or dialogue with the clients. Technological University of the Philippines (TUP) enters into a Memorandum of Agreement with the beneficiaries of its research (4.2.4; 4.2.7). Among the terms of this agreement is for the beneficiaries to report or give their feedback about the benefits they gained from the technology of the project/research. Aside from this, TUP has an evaluation form prepared by the researchers themselves following the guidelines of the Extension activities that require submission of relevant information such as the number of beneficiaries of the activity, the effectiveness of the activity, or client satisfaction (4.4.4). Researchers of Polytechnic University of the Philippines return to the community after six (6) months to find out for themselves if there is knowledge use or technology transfer (4.4.4). Philippine Normal University (PNU)

uses a Monitoring and Evaluation Form to assess the effectiveness of its knowledge mobilization to its internal stakeholders (4.4.4).

Aside from these, there are other strategies that higher education institutions (HEIs) use to assess the mobilization of their research results. Among these are:

- 1) Compliance with the order from the Department of Budget and Management (DBM) to meet the target set of the number of researches utilized (4.2.7).

- 2) Compliance with the government's Administrative Order No. 25 which harmonizes the national government performance monitoring, information, and reporting systems and provides that the Planning Director check their targets and outputs and the Quality Assurance Officer ensures that their deliverables are done satisfactorily (4.2.5).

- 3) Quantitative report about the number of researches utilized by the Department of Education (DepEd) or by the Schools Division Offices or the frequency of the utilization of research outputs (4.2.5).

- 4) Compliance with the target set in the Performance-Based incentive system imposed by the national government (4.4.4).

- 5) An output-based instrument or 6 Ps (Publication, People Service, Production, Popularization, Partnership, and Policies) for assessing knowledge mobilization of projects funded by other agencies like the National Research Council of the Philippines (NRCP) (4.3.5).

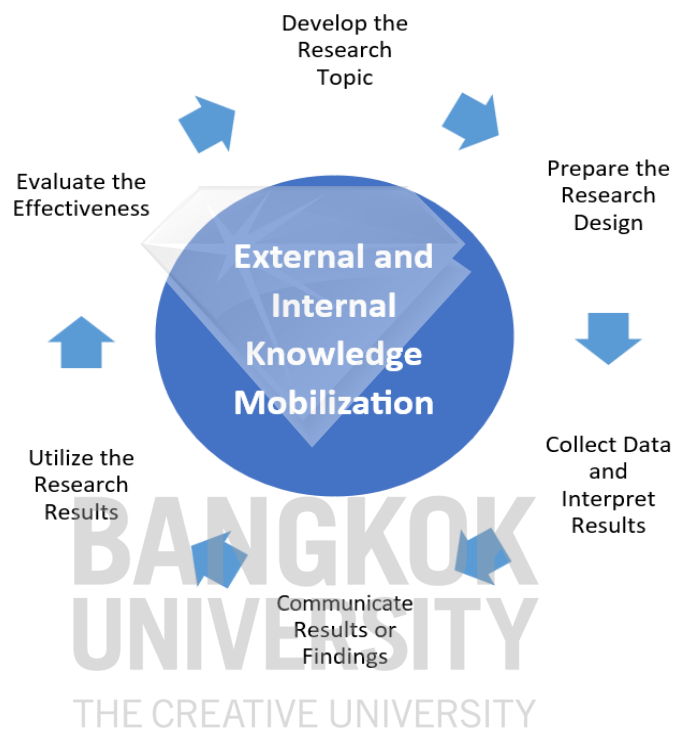
PRL8 underscores the importance of mobilizing the research results of HEIs and the need to ensure their effectiveness: “We have to make sure that every research output can translate into a program in the University towards improvement of its own community; to make sure also that the Intellectual Property Management Office (IPMO) should apply whether the research outputs can result into a patent, a utility model, an industrial design, a trademark, or whatever is available that can benefit both the University and the other stakeholders as well” (4.3.4).

Effective internal and external knowledge mobilization can be summarized using the framework of the Knowledge Mobilization (KMb) process as presented in Figure 5.5 below. This figure was adapted from Figure 2.5.3 Knowledge Mobilization

Strategy (Networks of Centres of Excellence of Canada, 2015) as mentioned in Chapter 2 under Review of Related Literature.

**Figure 5.5**

*Internal and External Knowledge Mobilization Process*



As shown in the figure above, the knowledge mobilization process starts with the researchers/collaborators meeting in small groups (SGD) and a focus group (FGD) for proposal making to develop a research topic by selecting a topic that is aligned with the specific knowledge domain or mandate of the law that created their HEI and with research initiatives based on the research agenda and research objectives of their HEI as well as on the identified needs of their target beneficiaries (4.4.1). Preparing the research design is essential to the success of the research process in as much as it provides a detailed framework of the structure of the study such as the research questions, variables, data collection, and statistical analysis methods (4.4.2). Collecting data is gathering information relevant to the research topic using the methods outlined in the research design and then interpreting the results. Data gathering is an important part of a research work because it provides researchers the

necessary information about the research topic to be able to draw conclusions and make recommendations after an analysis and interpretation of the data collected. Communicating research results or findings promptly to stakeholders and wider audiences is the next step in the knowledge mobilization process. Disseminating the research result to internal and external stakeholders through available platforms and formats leads to building trust and confidence in each other's professional work as they learn from each other, strengthens each other's professional development, and encourages the active involvement and cooperation of community partners in adopting the research project (4.2.8.2; 4.4.3). Next is utilizing the research results into practical application. One of the important goals of HEIs in conducting research is to ensure that research generated findings are applied in practical use to make an impact on people's lives from developing new products, services, or technologies to informing policy or decision making (4.3.4; 4.4.4). Evaluating the effectiveness of knowledge dissemination is essential because it raises awareness on the issues and concerns surrounding the research and encourages collaboration. Also, a system of feedback mechanism to measure the benefits gained by the community that utilized the research project as well as an evaluation on the effectiveness of the knowledge mobilization efforts of the HEIs has to be in place for the continuous improvement and success of the knowledge mobilization efforts of the HEIs (4.4.4).

To wrap up, the knowledge mobilization process means establishing the connection between academic research produced by universities or higher education institutions and the active engagement of the network of community, industry, or non-governmental organization for whom the research will make a difference. It fosters a culture of collaboration and team work among the university researchers or academe, community, local government officials, industry partners, and non-governmental organizations. Thus, the effectiveness of knowledge mobilization – whether it is for internal or external mobilization – depends on meeting the needs of the target beneficiaries and supporting the university researchers in addressing those needs.

## **CHAPTER 6**

### **FINDINGS AND RECOMMENDATIONS**

This chapter provides the summary of the findings of the study guided by the research questions that the study sought to answer. It includes discussions on the use of the SPARK model as the analytical framework for assessing the effectiveness of internal knowledge mobilization, the LINKS model as the analytical framework for assessing the effectiveness of external knowledge mobilization, and SPARK-LINKS model for assessing the effectiveness of knowledge mobilization. This is followed by discussions on key insights formulated based on the data collected, the practical implications of knowledge mobilization and its limitations, recommendations for its effective mobilization, and ethical considerations observed in the conduct of this study.

#### **6.1 Internal SPARK Knowledge Mobilization Model**

In line with the Commission on Higher Education (CHED) mandate “for a stronger research orientation,” HEIs have initiated research-related activities and trainings as a means to strengthen their research program to be at the forefront of “technology-directed and innovative/creative research that is locally responsive and globally competitive.” For effective internal knowledge mobilization, the SPARK model as shown in Figure 6.1 may be used.

**Figure 6.1**

*SPARK Model for Effective Internal Knowledge Mobilization*



For effective internal knowledge mobilization, HEIs have put in place measures that aim to ignite the SPARK within their researchers' hearts and minds to inspire them to create knowledge, innovate, and add value to an existing idea with enthusiasm and passion. The Administration plays a crucial role in initiating / encouraging research-related activities and training programs as a means to strengthen their research programs to maintain their competitive edge. For example, implementing mentoring programs where experts and senior researchers from various fields provide guidance and support and offer professional development opportunities to the faculty to enhance their research skills and productivity, producing research outputs that fit the needs of the community to support their research agenda and maintain a competitive edge (4.2.8.1). Other strategies emerging from this research that can be implemented to strengthen the research program of HEIs and support the researchers are as follows:

1) Provide trainings and workshops to capacitate the faculty in improving their research methodology, data analysis skills, research writing, research grants writing, and writing for publications (4.2.8.1).

2) Institutionalize a merit and reward system for research achievements and provide financial remuneration and funding opportunities to motivate researchers (4.2.8.1). Being informed during the interviews that a large number of faculty refuse to engage in research (RD7) is not really surprising as full-time teaching is already a consuming job demanding much of a teacher's time, effort, and energy. Their heavy workload does not leave them enough time to do other meaningful tasks, much less an exacting task such as conducting research. The Administration can work with the Commission on Audit (COA), Department of Budget and Management (DBM), and Civil Service Commission (CSC) to set clear guidelines for determining double compensation and measuring research productivity, and providing incentives such as reduction of teaching assignments without salary diminution, honoraria, sabbaticals, and the like (4.3.2).

3) Promote the integration of research into the curriculum by promoting research and teaching in their respective HEIs. The Administrators can advance the research culture by encouraging faculty to adapt research findings and experiences such as teaching pedagogies that have been found to be effective into their teaching strategies to bring new ideas into the classroom, enrich the teaching-learning experience, and establish a research-informed teaching environment (4.3.2).

4) Provide access to international-refereed and CHED-accredited journals and databases and build research infrastructure such as libraries, laboratories, and spaces exclusively for conducting research to ensure hygiene and sanitation can be observed when conducting laboratory tests (4.2.8.2; 4.3.9).

5) Establish consortia with other universities similar to the South Manila Educational Consortium (SMEC) and the Philippine Higher Education Research Consortium (PHERC), and develop partnerships with government agencies such as Department of Science and Technology (DOST), Department of Education (DepEd), Commission on Higher Education (CHED), local government units (LGUs), non-government organizations (NGOs) such as Gawad Kalinga, industries, and international bodies such as the partnership between Marikina Polytechnic College and Singapore Polytechnic (4.2.8.2)

6) Strengthen the Intellectual Property Management Office (IPMO) so it can play a more active role in helping faculty researchers to secure patents to their

industrial designs (IDs), utility models (UMs), trademarks and copyright (PRL4) and create a Center that will take charge of Technology Transfer (PRL8) and commercialization of their projects (4.3.9; 4.3.4).

Internal stakeholders include the Administrators and staff, faculty, students and their parents who have their own goals and objectives, have an interest in the research project, and have an effect or are affected by its results. Thus, university researchers probe the needs of potential stakeholders to ensure their needs are aligned with the objectives of the research and the research agenda of the HEI. The interviews showed that the following strategies have been instrumental in identifying and addressing the needs and concerns of potential stakeholders:

1) Identify the roles, interests, needs, influence, and expectations of potential stakeholders who will be involved and impacted by the research, which leads to better collaboration and outcomes (4.3.3).

2) Use different methods to assess the needs of potential stakeholders. Some of these methods as reflected in the interviews include needs analysis, surveys, and focus group discussions (FGD). These methods, which may be employed singly or in combination, provide researchers an awareness of the needs and expectations of potential stakeholders. For instance, through surveys and interviews most faculty researches of an HEI aim to address the needs of their students, like what specific teaching pedagogies are very effective to them or how they can serve their students better in terms of instruction and preparation of their theses (4.3.2).

3) Seek the opinion of stakeholders in decision making to show that their insights and experiences are valued and their interests are respected. This increases the chances of smoother implementation and adoption of research projects (4.3.3).

4) Conduct capacity building training to equip researchers with the necessary skills to effectively identify stakeholders' needs (4.2.8.1).

5) Adapt communication strategies to different audiences to ensure the usefulness and accessibility of the research (4.2.8.5; 4.3).

6) Conduct a regular monitoring and evaluation system to determine the degree of the impact of the research on stakeholders and whether the research meets their needs (4.3.5).

7) Uphold ethical standards in all interactions with stakeholders. This includes obtaining informed consent, Non-Disclosure Agreement (NDA), and voluntary participation, ensuring confidentiality and anonymity of participants, and safeguarding data privacy (4.2.6).

HEIs can accelerate research initiatives to stimulate research and innovative technologies. The interviews revealed that the following strategies can be adopted to enhance the HEIs' research initiatives:

1) Make research part of the organizational culture by providing an institutional merit system of faculty engagement in research-related activities such as organizing research fora and paper conferences; serving as research lecturers, research teachers, research assistant, or research coordinators; supervising undergraduate research students as advisers (4.3.2); conducting field works or community immersions; performing research-based community extension services, etc. (4.4.1; 4.4.2); and providing advanced research facilities and opportunities to pursue professional development (4.2.8.1).

2) Reduce bureaucratic red tape by simplifying the administrative process, particularly the process of releasing funds to the researchers so they do not have to observe a tight timeline with regards to the release of their research funds and thus delay the completion of the research project (PRL10). It is ironic to note that although the Board of Regents, the highest governing body of the HEI, has already approved a research project; researchers have to secure their approval for every activity, which usually takes a month (4.3.9).

3) Develop linkages with government agencies and private industries to promote technology transfer and sustainable development, gain access to valuable resources otherwise not readily available in HEIs, and ensure their curriculum offerings and research projects are relevant and current (4.3.2).

4) Foster academic collaboration with other higher education institutions under the principle of reciprocity in the form of academic exchange programs of students and faculty, joint conferences, lectures and discussions, and exchange of academic publications and materials such as laboratories, tools, and equipment (4.2.4; 4.2.8.2).

5) Broaden sources of research funding by working not only with budget from the national government but also looking for research grants from government agencies and private industry partners, philanthropic foundations, alumni groups, and international grants as sources of additional funding (4.3.2).

6) Establish international collaboration to gain access to additional and specific expertise and specialized equipment, tap into new sources of funding, gain new perspectives on research, build relationships with others in the field, and promote wider dissemination of research results (4.2.8.2).

Research results have to be reported promptly to as wide an audience as possible to share the knowledge produced, receive feedback, contribute to the existing body of knowledge, and facilitate further research and innovation. A study is not considered completed if its results have not been shared and disseminated. The following strategies can be employed to enhance the communication and dissemination of research results.

1) Understand your audience to adapt the language and presentation style to the needs, expectations, and interests of the target audience. Take a leaf from Lee Iacocca who once famously quipped, “You can have brilliant ideas but if you can’t get them across, your ideas won’t get you anywhere.” Avoid jargons for non-specialist and non-technical audiences. Use clear, concise, and plain language to make research reports more accessible (4.2.8.5).

2) Use multiple formats and platforms to reach a wider audience. Transmitting research findings beyond conventional academic communities is now an important feature to research dissemination. Thus, maximizing the use of digital platforms to promote and increase the accessibility and visibility of research results has become a necessity today (4.2.4). With the extreme popularity being enjoyed by Artificial Intelligence (AI), adding the use of open-source documents in disseminating research results serves the research community and the public because of its potentially widest-reaching impact.

3) Set up events such as conferences, forums, and workshops where researchers can communicate their findings directly to stakeholders to facilitate a clearer and more insightful understanding and discussion of research results (4.4.3).

4) Invite feedback and collaboration to help measure and improve research impact and effectiveness of dissemination efforts and identify new areas to expand the research and innovate (4.4.4).

The researcher's passion in knowledge mobilization may be kindled to promote a dynamic research culture that encourages technological innovation, enhances the quality of education, drives economic development and contributes effectively to progress in the community and society. The strategies emerging from this research that can be used to encourage researchers to engage actively in research dissemination and mobilization are as follow:

1) Provide a supportive work environment by (1) making sure researchers have access to necessary resources such as equipment, facilities, and support staff, (2) implementing a system to recognize and reward research achievements in the form of granting financial benefits, promotion, and sabbatical leaves, and (3) supporting their participation in international and national conferences to present their works.

2) Conduct training workshops, conferences, and symposia to kindle faculty members' enthusiasm and interests and update their research knowledge and skills by offering them faculty development opportunities such as the latest research methodologies, knowledge mobilization strategies, research grant writing, and effective communication approaches involving varied types of audiences, Data Privacy Act of 2012 etc. (4.2.8.1).

3) Initiate the establishment of Knowledge Mobilization Platforms like the Center for Technological Innovation, Technotransfer Offices, or Technology Adoption Offices to help researchers convert their research results into practical application as well as commercialize their outputs (4.2.5; 4.3.4; 4.3.5).

4) Keep lines of communication between researchers and Administration open to promote academic discussion including feedback on the research and sustaining support to the project (4.3.1).

5) Promote a collaborative environment within the HEI among researchers from different fields of specialization and campuses. Interacting in focus groups with members from diverse background can lead to new ideas and innovative projects (4.3.1).

In this context, there are five “sparks” that represent essential features of the model in support of internal knowledge mobilization. These are inception, illumination, collaboration, metamorphosis, and continuity. Each of these sparks is briefly addressed below.

1) Inception - This refers to the point at which faculty researchers develop the spark of an idea that starts the knowledge mobilization process. It includes the HEIs’ programs that enable faculty researchers to pursue initiatives related to the knowledge mobilization process such as holding Focus Group Discussions (FGDs) to ascertain that the identified problems or knowledge gaps are within the ambit of the research framework of their HEIs (4.3.1; 4.4.1; 4.5.2).

2) Illumination – This is the spark that inspires researchers to create new knowledge, generate an innovative idea, or develop creative solutions to problems by shining the light on past experiences, exploring different options, and adopting a different perspective of looking at things (4.4.2).

3) Collaboration – This is the spark that ignites the passion of all stakeholders involved in the research mobilization process (academia, industry, community, government, and non-profits) to establish meaningful partnerships, create synergies and form networks, create a community of practice, and promote the transfer of knowledge and innovation smoothly and effectively for their mutual benefit through engagement and networking, social media, educational events, co-creation, and the like (4.2.8.2; 4.8.4; 4.4.4).

4) Metamorphosis – This spark fuels action and social changes in practices and policies, creating impact not only on academic advances across and within disciplines but also on society and the economy, thus leading to improved quality of life. This involves transforming knowledge created into practical knowledge, converting research outcomes into real-world solutions (4.3.4).

5) Continuity – This is the spark that drives the constant involvement and interest of key players in the research project to ensure its continuous mobilization. It involves drawing up long term goals or a sustainability plan that includes building strategic partnerships and collaboration and designing a plan of action to respond to changes which enable the program, activities, and partnership to continue (4.3.9).

Further expanding the metaphor, there are “sparks” emerging in the context of the framework of effective Knowledge Mobilization. These include:

- 1) Research findings – These have to be reported to Innovative or unconventional insights from research outcomes can serve as a spark that can lead to their integration into practice or use and adoption.
- 2) Technological Advancements – Recent breakthrough in technology can spark changes in knowledge use and knowledge sharing as it has shown unprecedented access to a wealth of knowledge and has made it easier than ever to connect with others all over the world, in real time.
- 3) Change in policy direction – New policies introduced can act as a spark by stimulating policy debate based on research evidence which may lead to confirmation and implementation or withdrawal of the policy.
- 4) Social Needs - Current changes in society, some of which include industrialization, modernization, urbanization, Artificial Intelligence (AI) etc., can serve as a spark that generates evidence-based knowledge creation, dissemination, and mobilization.

To sum up, “spark” in effective internal knowledge mobilization—both in its representation of research findings and as a metaphor—focuses on the essential strategies that fuel the forward drive of the knowledge mobilization process, ensuring that knowledge is generated, effectively disseminated, and mobilized to bring about a significant impact in society.

## **6.2 External LINKS Knowledge Mobilization Model**

For external knowledge mobilization, the LINK model may be used to represent the framework that can be designed for effective external knowledge mobilization efforts.

**Figure 6.2**

*LINKS Model for Effective External Knowledge Mobilization*



The L-I-N-K-S model as presented in Figure 6.2 above showing the interlocking connection in a chain link represents the strong connection that ties up all the significant players to ensure the effectiveness of external knowledge mobilization. HEIs need to establish academic LINKS to leverage transfer of technology and innovations to establish mutually beneficial partnerships with a network of stakeholders. To “knit” seamlessly these research findings to form a strong link needs synergy that promotes a smooth transfer of knowledge, expertise, and technology from one institution or organization to another to ensure effective external knowledge dissemination.

When HEIs leverage their research results, this can impact on their stakeholders, whether they are in the academe, community, industry, or policymaking, through collaboration and partnerships with industry, government agencies, local government units (LGUs), and non-profits. To leverage their research results, HEIs can use different knowledge dissemination strategies to prioritize and support the effective dissemination and mobilization of knowledge within and beyond the academic community such as scholarly publications like journal articles and conference proceedings (4.2.4) traditional platforms like conferences, symposiums, or

workshops, and digital platforms (4.2.3; 4.2.4). HEIs can also consider using non-conventional medium to reach a wider audience like non-specialists or non-research enthusiasts by developing a magazine type publication (4.2.8.5) or creating infographics, or converting the research output into a short video using plain or non-technical language that common people can understand (4.3.9). Still another way for HEIs to leverage their research results for competitive advantage is by integrating knowledge mobilization activities into their internal policies and practices by ensuring that the objectives of these activities are aligned with the HEIs' vision, mission, research agenda, and mandate (4.3.1; 4.4.1; 4.3.7), providing institutional funding support for knowledge mobilization activities (4.2.8.1; 4.4.2), and developing an instrument to monitor and assess the effectiveness and impact of their knowledge mobilization initiatives (4.2.5; 4.3.5).

Researchers conduct research to generate new knowledge by investigating problems from different points of view to create new ideas, products, or solutions that have a significant impact on society. They use knowledge to innovate and create new solutions to meet the needs of their external stakeholders, a challenging task because these stakeholders have their unique needs, expectations, and preferences. A lesson gleaned from interviews with respondents is to be open to the points of view of others as well as to changing trends in the industry, and adjust strategies in disseminating knowledge mobilization to target communities and stakeholders, based on their feedback and insights (4.2.3). Another lesson is to increase funding opportunities and research resources to be able to provide a program of rewards and recognition for faculty members to go into research work and research writing especially for innovation projects (4.3.9). Bill Gates, the Microsoft founder, expressed his belief in the importance of funding in driving innovations when he said, "that the way you get innovation is you fund research." Still another important lesson is to establish linkages and collaboration with industry and foreign universities (4.2.8.2). Also, HEIs should actively help facilitate the licensing such as patent and copyright of intellectual properties like utility models and industrial designs, etc. created by their researchers, including royalty sharing scheme or selling, if necessary, with the industry (4.3.4). To sum up, to innovate an existing knowledge and come up with original ideas that will

benefit the institution, community, and society requires openness, flexibility, collaboration, and continuous learning to achieve success in knowledge mobilization.

HEIs network with a diverse range of stakeholders to build and maintain strong, meaningful, and mutually beneficial partnerships. Working collaboratively with others opens the possibility of working with others who have different perspectives and experiences; thus, making it possible to have the opportunity to learn from each other critical information otherwise not revealed through printed documentation or tacit knowledge. Networking also fosters a knowledge sharing culture which is essential in knowledge mobilization as knowledge should be shared with stakeholders who might be able to pick something from these researches and have the ability to do something better with it (4.2.6). There are several insights that can be gained from interviews with respondents on how to establish networks with stakeholders. Among them is developing significant relationships with stakeholders that can support and sustain the knowledge mobilization initiatives of the HEIs and thus enhance the impact of their knowledge mobilization efforts (4.8.4). Also, HEIs need to be proactive and have the initiative to bring their research outputs to government agencies, community, LGUs, or industries. In this connection, the HEIs can organize an exhibit to showcase their research outputs and invite potential partners to identify which of these research outputs can be adapted to their needs (4.3.4). Also, the HEIs can set up meetings with stakeholders to find out which of the research outputs can be of use to them (stakeholders) or to request them to suggest or introduce topics that interest them to enable the faculty researchers of HEIs to evaluate their capability to pursue these topics (4.2.4). Altogether, networking with stakeholders for effective external knowledge mobilization refers to a collaborative and supportive working environment where the culture of knowledge sharing and continuous learning thrives, and where researchers with a proactive mindset build and maintain strong relationships with stakeholders.

To knit research insights in the context of effective external knowledge mobilization is to disseminate and implement research results meaningfully to target end-users to benefit the institution, the community, and society. Community involvement and engagement can help make the research relevant and sustainable, make the research process better planned, applied, and utilized, facilitate community

understanding of research objectives, and reduce misunderstanding about the research, thereby increasing the likelihood that the research project will be widely accepted. Listening to the voice of the members of the community who come from diverse background and have different interests and outlook in life improves communication and understanding, builds mutual trust and relationships, gives the community the opportunity to address its own needs, and can lead to better outcomes. It also taps into the grassroots level as a good source of network partner or collaborator. To fully utilize the potential of community involvement, all available platforms such as digital and traditional media can be used. Online communities and online forums can foster community engagement and offer accurate information. Research results may also be published in magazine type format using plain language, interesting and appealing visuals, infographics, or may be converted to video form to encourage a wider audience reach (4.2.8.5; 4.3.9). Aside from community, HEIs can “knit” with experts from different fields (4.3.9). Such close collaboration facilitates the exchange of ideas that can lead to creative solutions and innovative applications. The Administration can promote collaboration as one of the HEI’s core values by offering a system of rewards and incentives not only for individual accomplishments but also for team achievements (4.2.8.1). Researchers can also encourage feedback and establish a system to regularly monitor and measure the effectiveness of mobilization of research results to ensure the continuous improvement and relevance of its implementation (4.4.4). Generally, to knit the research insights is a metaphor for all the actors of knowledge mobilization– the academe, industry, community, non-profits – weaving and incorporating research insights seamlessly using all available platforms to engage a wider audience. Just like when different colored and textured wools and yarns are knitted together literally do not mix to create a new color but rather they enhance the intensity of each other’s color; thus, knitting research insights metaphorically is ensuring that the academe community, industry, and government agencies are linked closely together in a strong and mutually beneficial collaborative work to share experiences, expertise, and resources for effective external knowledge mobilization to serve the community and improve society.

Synergy refers to the interaction or cooperation among different groups working together to produce something more valuable. Thus, to synergize strategies of knowledge dissemination and mobilization means that all the actors – academic researchers, community, industry, government agencies, and policy and decision makers - need to create and follow a cohesive plan that will enable them to make use of their combined expertise, efforts, resources, and networks to maximize the impact and ensure the success of their knowledge mobilization initiatives (4.3.3). Generally, this can be made possible by making sure the potential stakeholders, community, and HEI are working towards a shared vision, goal, and objective. However, the reality that these valued stakeholders are a diverse group with their own unique perspectives, experiences, and ideas have to be acknowledged. To synergize their knowledge mobilization efforts from this diversity, HEIs (the Administration specifically) should welcome these differences as opportunities for driving innovation, engagement, problem solving and decision-making skills, enhancing adaptability, and encouraging personal growth. They can initiate policies that promote a safe environment where open dialogue is encouraged such as the practice of gathering faculty from their different campuses to form focus groups and generate knowledge based on the needs of their concerned communities or target beneficiaries (4.4.2). More importantly, they should support and inspire empowered communication, ensure the transparency of information sharing, establish clear communication channels, and promote trust and collaboration between and among all the actors involved in the knowledge mobilization process so they can accomplish their shared goal and purpose together successfully. Further, HEIs must have a system that will continuously monitor and evaluate their knowledge mobilization process to gather information regarding challenges and feedback including stakeholders' participation and involvement in the project, realization of planned outcomes (if any), levels of satisfaction of beneficiaries, etc., to identify areas of improvement and enable them to adjust their strategies and boost their impact (4.3.5). In a nutshell, to synergize effective external knowledge mobilization entails aligning the goals and objectives of all the actors involved, promoting collaboration and partnerships, embracing diverse perspectives, improving communication, and continuously assessing and improving efforts.

Thus, using the “L-I-N-K-S” model for effective external knowledge mobilization involves the use of varied approaches, tools, and strategies to disseminate and implement connections and move the research results to action:

1) Digital Platforms – Online data base, online internet portal, and professional or academic social media (e.g. blogs, wikis, video, or photo sharing sites) and social network (e.g. Facebook, LinkedIn, MySpace, etc.) enables exchange of information and communication and sharing of data, enhance awareness, provides unrivaled access to the research results, and helps researchers influence a wider audience. Also, virtual events such as webinars, webcasts, and online forums offers tools to connect and reach out to the targeted audience and potential stakeholders with a limited budget and resources (4.2.4).

2) Face-to-Face or In-Person Presentations – Traditional on-site events such as conferences, symposia, and workshops provide opportunities for sharing the latest industry trends and innovations and promote stronger networking and collaboration connections between researchers and target users that can lead to meaningful partnerships (4.2.4).

3) Community consultation engagements – These are activities that include establishing dialogue, collaboration, and connection with the target community and addressing their needs, interests, and goals seriously that allows support for the project, builds trust, and nurtures long-term relationships that benefit both sides (4.3.3).

4) Skills Training Program Initiatives – The technical advice, consultation to business, and extension training programs provided by HEIs in connection with their mandate are designed to reinforce the skills and competence of target beneficiaries to change their economic status and/or start their own business (4.3.4).

5) Policy brief (Print)- As the term suggests, this tool is produced to connect with decision makers or policy makers and thus, present a short and clear summary of a research to give a background of the problem, policy recommendations or policy options, and key findings or course of action (4.4.3).

6) Publication (Print) – Journals and newsletters enable dissemination of knowledge created to those who need to know the latest technology and innovation as well as the latest research results (4.2.4).

7) Infographics and visual media – This strategy of knowledge dissemination presents information or data using visual images with minimal text making it engaging, appealing, and easier to understand. It helps to simplify complex concepts, making it easier for non-specialists to connect to its text-heavy content (4.4.3).

8) Collaborative Partnerships – Academic institutions have formed partnership with industries, other educational institutions (university consortia), government agencies, local government units, and non-profit organizations because it has been found to promote exposure to varied points of view and ideas and improve the relevance and usefulness of the research. Also, the involvement of the community in the research process ensures that any innovation or knowledge that may be generated is meaningful and will significantly increase the potential for the research to be adopted and actually used to bring about change (4.3.4).

9) Measuring tools – Regular monitoring and getting feedback loops from knowledge users and target beneficiaries help identify specific gaps and needs which are opportunities for growth and improvement as they enable researchers to continuously process and use that information to take the necessary action, do things better, improve knowledge dissemination and thus ensure the effective mobilization of research outputs (4.3.5; 4.3.6).

10) Policy Integration – It means tapping the expertise of specialists and senior researchers who can provide mentoring and advisory roles to the program and ensure that evidence-based research informs policy and practice. It also includes providing the HEIs' research outputs that have implications to policy directly to the proper policy makers and institutions that will find this new type of knowledge useful and will facilitate the application of this knowledge in crafting legislation (4.2.8.1).

11) Technology and Knowledge Transfer Offices – HEIs have their respective Intellectual Property Management Office (IPMO) that is tasked with helping their faculty researchers secure patents, license, or copyright to their works first before presenting them to external stakeholders. This is intended to protect the

intellectual rights of faculty researchers on their works while ensuring access to research outputs. One HEI has even actually started creating a Center that will commercialize their projects (4.3.4).

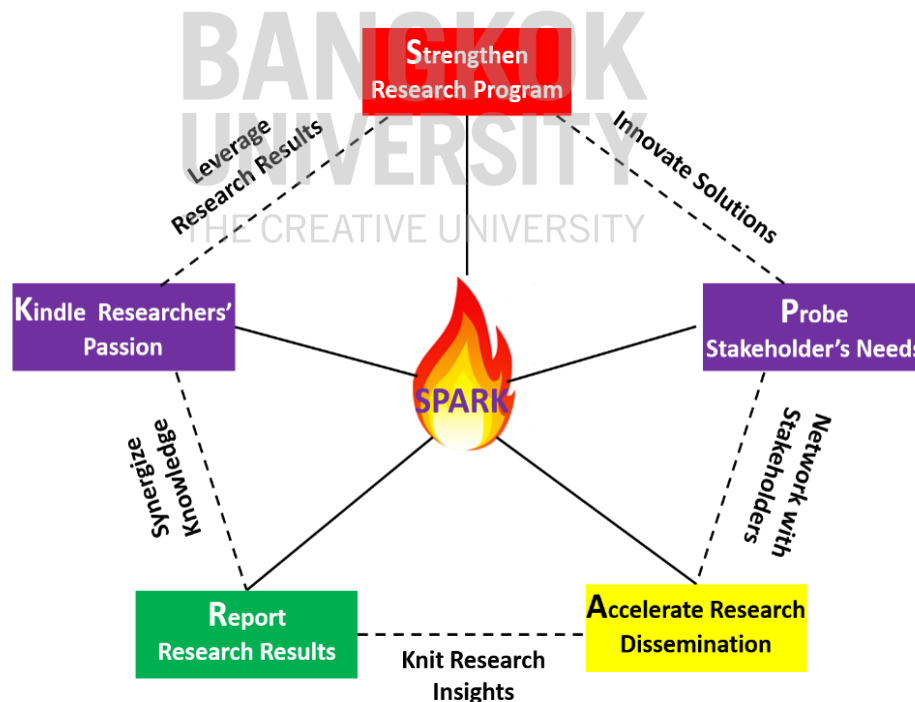
Just like an image or text that represents a hyperlink on paper, when you “click” (go to) any of the “links” discussed above, you will be “redirected” to each of the tools or strategies of knowledge disseminations and mobilization.

### 6.3 Internal and External Sparks-Links Model

The Spark-Links Model presented below in Figure 6.3 may be used as the analytical framework design for assessing the effectiveness of internal and external knowledge mobilization.

**Figure 6.3**

*Spark-Links Model for Effective Internal and External Knowledge Mobilization*



The Spark-Links Model as presented above showing brightly colored rectangles interfaced with a chain link is the design for the analytical framework for effective knowledge mobilization. The rectangles are lit brightly to symbolize the

need for HEIs to maintain that spark that fuels the awareness and attention of their faculty on research as part of the culture of the organization, and thus, they have to generate and use new knowledge and motivate them to (1) adopt another way of looking at things to benefit society, (2) drive them to use all available platforms and networks to accelerate knowledge sharing and application effectively, (3) activate research assessment tools to identify areas of improvement, and (4) keep the embers glowing by sustaining knowledge and technology use and adaptation.

The interlocking connection in the chain link interfacing the brightly colored rectangles represent the tight and strong connection among academia, community, government agencies, private industries, and non-governmental organizations who are engaged in a mutually beneficial partnership throughout the knowledge mobilization process. Such collaboration promotes the smooth transfer of knowledge, expertise, innovation, and technology from one institution or organization to another, thereby ensuring the effective dissemination and utilization of knowledge and producing meaningful benefits to target beneficiaries.

The whole framework, altogether, is designed to amplify the research results of HEIs and effectively convey them to both of their internal and external stakeholders. This ensures that knowledge is mobilized and put into practical action, ultimately benefitting the target stakeholders.

#### **6.4 Key Insights**

Effective knowledge mobilization promotes and strengthens social progress, innovation, and productivity. This includes developing a collaborative community with the dynamic participation of the stakeholders who can efficiently synthesize the different sources of knowledge made available and accessible to them. For knowledge mobilization to be effective there is a need for a positive institutional culture that supports cooperation, openness, and learning. Institutions have to put in place a mechanism that will integrate across their operations and strategies a system of recognizing and acquiring external knowledge. This can be done by collaborating with other academic institutions and professional organizations and forming consortia or partnership with industries and other universities. The use of modern technology such as digital platforms, online communities, and social media make it easier for

individuals and institutions to connect, share, and access knowledge and innovations created thus, accelerating knowledge mobilization.

Adding Artificial Intelligence (AI) capability to such a system, no doubt, will significantly enhance the HEIs research capabilities as AI holds immense possibilities in revolutionizing various industries and sectors, including education. However, for AI to have a significant impact on knowledge mobilization efforts, the knowledge generated through AI research needs to be consistently and effectively mobilized and applied in practical settings.

One aspect of knowledge mobilization in AI is the conversion of complex AI algorithms and models into user-friendly applications. This means making AI technologies accessible to non-experts and ensuring that they can be easily integrated into existing systems. For example, AI-powered chatbots can assist customer service representatives in their roles of providing personalized and efficient support to customers. In the field of knowledge mobilization, the use of AI's advanced technologies includes generating new ideas and exploring solutions and opportunities from existing knowledge and promoting collaborative work and knowledge-sharing among researchers, industry professionals, policymakers, and other stakeholders. This, which can be achieved by conducting conferences, workshops, and collaborative researcher projects, brings us back to the importance of the human in knowledge mobilization. However, by encouraging the exchange of ideas and expertise through AI, HEIs can help accelerate external and internal knowledge mobilization (Crompton & Burke, 2023). Governments can create research-based policies, focus on complex societal issues, and promote economic development by mobilizing external knowledge. Clearly, today's knowledge-based economy relies essentially on external knowledge mobilization as an important factor of innovation, productivity, and progress.

Similarly, the critical role of internal knowledge mobilization cannot be downplayed in driving innovation within institutions and organizations. It enables institutions and organizations to look into new options, create new solutions, and stay in the lead of the competition by locating, identifying, and communicating relevant knowledge. Further, consolidating varied knowledge sources and viewpoints can lead to the creation of innovative ideas and out-of-the-box approaches to problem-solving.

Likewise, internal knowledge mobilization equips policy makers and decision-makers with up-to-date and pertinent information. Organizations can make conscious decisions, reduce the likelihood of problems, maximize potential developments, and strengthen the efficiency and competence of the HEI by taking advantage of internal knowledge. For internal knowledge mobilization to be truly successful, there is a need to have a fully supportive institutional environment, an efficient system of handling information and resources, and strong stewardship. Institutions and organizations must promote a culture that holds in high regard information sharing, team work, and continuous improvement. They also need to inculcate a strong sense of information management systems that facilitate identifying, securing, storing, retrieving, and disseminating knowledge.

In short, internal knowledge mobilization enables institutions and organizations to unleash the full potential of their accumulated intellectual resources. Institutions and organizations are able to direct innovation, strengthen decision-making, and enhance overall effectiveness by utilizing and taking advantage of their internal knowledge.

## **6.5 Practical Implications**

External and internal knowledge mobilization affect the performance and competitive advantage of an institution, eventually translating research efforts into impacts on society. The practical impacts or implications are:

### **6.5.1 Improves Research Collaboration**

External knowledge mobilization involves forming partnerships and collaborations with external stakeholders such as industry, government agencies, and community or non-governmental organizations that will enable higher education institutions to gain opportunities in the form of expertise and funding. This can lead to increased productivity and efficiency, and enhance the quality of their research and impact on society.

### **6.5.2 Accelerates Innovation and Technology Transfer**

External knowledge mobilization can simplify and actively speed up the transfer of knowledge, technologies, and innovations from higher education institutions to their external partners. This can lead to the creation of new products,

services, or processes; promote entrepreneurship; and encourage the establishment of new business ventures, thereby contributing to the economic development of the community.

#### 6.5.3 Enhances Curriculum Development

Since external knowledge mobilization involves active collaboration and engagement with external stakeholders, higher education institutions have the opportunity to gain a better understanding of growing trends, demands, and challenges found in the industry and society. Such knowledge is helpful and relevant in updating and revising existing curricula, introducing new programs, and ensuring that graduates have the knowledge and skills required for industry employment and social interaction.

#### 6.5.4 Promotes Stronger ties with Communities

Effective external and internal knowledge mobilization enable higher education institutions to forge a strong working alliance with local community groups, local government agencies, industry partners, and non-profit organizations. This strong connection allows higher education institutions to be in a position to help improve various aspects of local communities such as address challenges encountered by the community and help groups of people within the community achieve their full potential. Among the engagement activities they can work together are collaborative research projects, community-level based education plans, and information sharing initiatives that benefit both the institution and the community.

#### 6.5.5 Boosts the Influence and Honor of the Institution

Effective external and internal knowledge mobilization provide high value to the name of the institution. Thus, by actively collaborating with stakeholders and partners, institutions show the significance, impact, and contribution of their work to the community in particular and society in general. This can easily attract hardworking and brilliant faculty and students, open doors for funding opportunities, and improve the institution's national and international rankings.

## 6.6 Limitations of KMb

While internal and external knowledge mobilization can bring about varied benefits, higher education institutions should be aware of several constraints. Some of these include:

### 6.6.1 Internal Knowledge Mobilization

#### 6.6.1.1 Limited scope.

Internal knowledge mobilization primarily focuses on sharing knowledge within the university. This may hinder the communication of research findings and new practices to a wider audience, potentially being unable to take advantage of possible opportunities for external collaboration.

#### 6.6.1.2 Archived knowledge.

In universities with multiple departments, there is a risk of knowledge being kept, with limited collaboration between different departments which can hinder the university's ability to maximize diverse points of view and skills.

#### 6.6.1.3 Unwillingness to change

There may be faculty or departments that may resist change or be reluctant to share their knowledge and practices. Thus, it can be challenging to overcome this resistance and promote a culture of knowledge sharing and collaboration.

#### 6.6.1.4 Inadequate resources

Universities may face constraints in terms of time, funding, or personnel to effectively carry out plans and programs in mobilizing internal knowledge. This can affect significantly the ability to generate and maintain knowledge sharing platforms, conduct events, or offer training and support.

### 6.6.2 External Knowledge Mobilization

#### 6.6.2.1 Inadequate management over knowledge use.

Once knowledge is disseminated externally, universities lose control over how it is utilized or understood by external stakeholders. Misconception or distortion of research findings can occur, very likely impinging on the university's status or the validity of knowledge utilization. Thus, it is critical to ensure the context of research findings and provide a contact person for clarification and questions.

#### 6.6.2.2 Intellectual property issues and concerns

Sharing research outputs externally may bring out issues and concerns about protecting intellectual property rights involving utility models, industrial designs, copyright, etc. Thus, universities need to carefully handle and safeguard intellectual property concerns while accommodating the need for knowledge mobilization.

#### 6.6.2.3 Limited participation and implementation.

Despite efforts to involve external stakeholders, there is no assurance of their active participation to adopt the shared knowledge. External stakeholders may have other concerns that take precedence, or they may have limited experience, skills, or competence to use the knowledge effectively.

#### 6.6.2.4 Time and resource limitations

Creating and maintaining collaborative works, disseminating research results, and engaging with external stakeholders, which are all essential components of external knowledge mobilization, need major investments of time and resources. Thus, universities may face challenges in allotting adequate resources to successfully organize external knowledge mobilization activities. That being said, it is important to recognize the necessary trade-off between short-term issues and long-term gains.

#### 6.6.2.5 Communication and language constraints

Working closely together with external stakeholders who are from diverse sectors, disciplines, or geographical regions may result in communication and language barriers which can significantly affect effective knowledge mobilization.

By understanding and addressing these challenges, higher education institutions can design and implement a program or plan of action to enhance the effectiveness of both internal and external knowledge mobilization efforts.

## 6.7 Recommendations

To effectively mobilize knowledge both internally and externally, universities can consider the following recommendations:

### 6.7.1 Internal Knowledge Mobilization

6.7.1.1 Set up a centralized system where information or knowledge within the university can be easily shared.

This can be done by initiating the development of a private network or intranet that will connect all the computers and researchers within the university. This will ensure the researchers of fast and secured connections and accessibility with knowledge generated within the university, as well as enhances interaction, cooperation, collaboration, and knowledge sharing among them. Making AI as an integral part of the network can also be taken into account (4.5.5; 5.1.1.5).

#### 6.7.1.2 Support interdisciplinary cooperation.

Hold regular meetings, workshops, focus group discussions, or cross-functional project teams to encourage collaboration and communication between departments and disciplines within the university, allowing for the sharing of varied points of view and skills (4.4.2; 5.1.5.8).

#### 6.7.1.3 Encourage and enable knowledge sharing strategies.

Encourage the exchange of ideas and experiences by promoting active engagement and discussion among researchers and staff members. Conduct seminars, workshops, or brown bag sessions where researchers and staff members can report about their work and share their knowledge (4.2.3; 4.4.3; 5.1.1.7).

#### 6.7.1.4 Nurture a culture of learning

Foster continuous learning and professional development within the university. Strengthen the knowledge and skills of researchers and staff members by giving them opportunities to attend conferences, workshops, or training programs (4.2.8.1; 4.8.4; 5.1.1.7).

### 6.7.2 External Knowledge Mobilization

6.7.2.1 Collaborate with external stakeholders. Actively engage with external stakeholders such as industry partners, policymakers, community organizations, and other research institutions by working with them on research projects; participating in conferences, webinars, and events; and creating networks for

information and skills sharing (4.2.4; 5.2.1.4).

#### 6.7.2.2 Publish and communicate research results

Publish research findings in peer-reviewed journals and relevant publications to reach a wider audience. Make research outputs available through open-access platforms or by sharing abstracts, reports, or infographics on the university's website or learning portal (4.2.4; 5.2.1.3).

#### 6.7.2.3 Organize knowledge exchange presentations. Hold conferences, symposiums, or workshops where researchers can participate and present their work to a broader audience to facilitate knowledge transfer, networking, and collaboration with external stakeholders (4.2.4)

#### 6.7.2.4 Collaborate on research projects. Pursue the range of possibilities and options with external partners on research projects collaboration. This can involve shared funding applications and resources as well as expertise, leading to strategic partnerships and increased knowledge mobilization (4.8.4).

#### 6.7.2.5 Use social media and online platforms. Maximize the use of social media platforms, blogs, and other online channels to share research findings using plain language; engage with the public; and encourage discussions around the university's research areas. This can help reach a wider audience and promote knowledge mobilization outside the limits of conventional approaches (4.2.4; 5.2.1.2; 5.2.1.5).

Effective knowledge mobilization needs the use of a combination of internal and external plans of action. By establishing internal knowledge sharing platforms, fostering collaboration, promoting a culture of learning, and actively engaging with external stakeholders, higher education institutions can maximize the impact of their research results and contribute to positive change both within and outside the organization.

## 6.8 Future Studies

The HEIs used as subjects of this study are all located in the National Capital Region, the most urbanized region in the country where research outputs are expected to be mobilized for the improvement of the quality of life of the community and growth of the economy. Consequently, despite the common function and goals of

HEIs in the Philippines to conduct research for the creation and preservation of knowledge, instruction, and training, for the dissemination of knowledge to the community, and for application of knowledge to serve the community, the results of this study and the application of the framework generated could not be generalized due to the limited number of HEIs that were tapped to participate in the study. Thus, for future researches conducted in various regions in the country (the Philippines), frameworks specifically designed within the context of the HEIs' unique conditions, needs, challenges, and opportunities available to them may be used as baseline data to measure the implementation of their external and internal knowledge mobilization practices effectively. Another suggestion for future studies is to conduct research to determine the specific criteria for each of the critical elements of knowledge mobilization to gauge the effectiveness of the HEI's efforts in mobilizing its research results.

#### **6.9 Ethical Considerations**

The respondents of this study had been assured of anonymity in accordance with the Data Privacy Act 2012 of the Philippines. They were informed they were free to disregard the data collection activities if they did not conform to the interview process.

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**APPENDICES**

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## **Appendix A**

### **PNU Research Agenda**

“The updating of the PNU-URA mainly comprised the crafting of the new research agenda framework. To make the university's research function more relevant, the alignment of the University research agenda with the mandate of PNU as National Center for Teacher Education (NCTE) was the prime consideration. Thus, the revision of the research agenda framework ensured the responsiveness of the research efforts in harmonization with the University's instruction and extension functions for the fulfillment of its mandate as NCTE. The updated research agenda provides a clearer direction; that is, the goals and objectives are well defined and relevant.”

“The updating of the research topics called for inputs informed by the changes and developments in a local and global community which necessitate a teacher education institution (TEI) such as the PNU to redefine its role and assert its relevance. Thus, considering their social awareness and expertise in their respective disciplines, the University tapped some selected administrative staff and faculty to compose the participants of a focus group discussion (FGD) to identify new research topics as inputs to the updating of the research agenda.”

“In the first quarter of 2016, the focus discussion (RTD) was held in the University. The RTD was aimed at eliciting from the participant's relevant research topics for inclusion in the new research agenda. To elicit the desired ideas, the participants were provided with four guide questions to anchor their responses. These guide questions were aligned with the goals and objectives of the Philippine Development Plan (PDP), Millennium Development Goals (MDGs), Higher Education Research Agenda 2, National Higher Education Research Agenda (NHERA) 2, and the PNU's Strategic Development Plan (2012-2022). In particular, these goals and objectives pertained to the finding of workable solutions to local and national problems, the introduction of pioneering efforts and initiatives, and generation of products with commercial value.”

“The first guide question focused on the identification of the compelling problems or issues that the participants observed in the basic and higher education and on ways by which PNU as NCTE could help solve the problems or clarify the issues.”

“The second question guided the participants to identify what technology/products the University could produce out of its research for utilization of the community, aid in instruction, and commercialization.”

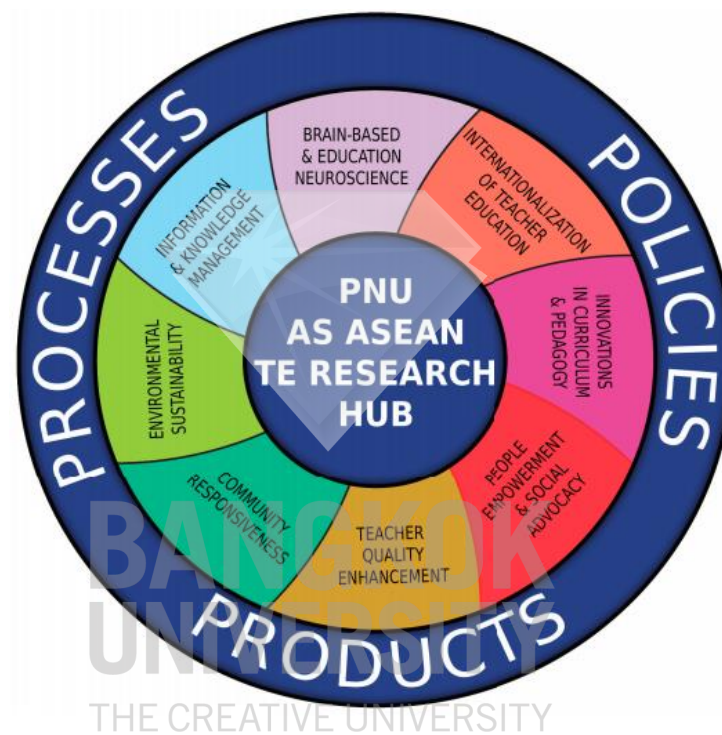
“Identification of transformational research or research that could bring about fundamental change or reform to the community and to the nation, in general, was the target of the third question. These reforms may be in forms of poverty alleviation, gender equality in education, environmental sustainability, and a strong and extensive global partnership for development.”

The final and concluding question led the participants to identify research for which PNU as NCTE should be distinguished or known nationally and globally. Overall, the guide questions engaged the participants in a dynamic discussion, which resulted in the generation of extensive and relevant information needed for the URA revision (Philippine Normal University, 2015, pp 5-6).”

“The PNU Research Agenda Framework the Research Agenda Framework of the University is represented by a moving wheel with PNU as the National Center for Teacher Education (NCTE) and as ASEAN Teacher Education Research Hub serving as its core. Its expanded mandate as NCTE and its current niche as chair of the Association of Southeast Asian Teacher Education (AsTEN) are the PNU drivers for action. Inspired by its vision to be a nationally responsive and an internationally recognized Teacher Education University, PNU ensures that its directions are aligned with the national programs and policies for building national competitiveness and supporting the goals of the ASEAN Socio-Cultural Community and policy declarations of the United Nations. The PNU-Research Agenda reflects the University’s unwavering commitment to service and excellence with research as one of its delivery platforms. The eight spokes in action represent the major research themes from which research endeavors may be drawn. Each of the identified themes offers a wealth of opportunities for knowledge creation and for broadening the current knowledge base in the field to shape up and direct basic and higher education policies and practices. The moving spokes suggest that collaboration is at the heart of any research endeavor at the University. Cross-disciplinary collaborations among the PNU faculty are encouraged as well as with other teacher education institutions (TEIs) or higher education institutions (HEIs) within the country, its ASEAN neighbors, or with

other strategic partner institutions. Forging links and networks with other agencies and organizations for research purposes is also a vital strategy in undertaking high-impact research that will require huge appropriation and highly specialized skills.

PNU – Research Agenda 2016-2018



Equally important is the rim that holds all the spokes together and keeps them in a coordinated fashion. Research undertakings in all areas are expected to provide beneficial applications to society. From this perspective, research-based policies, processes, and products are anticipated to move onto accelerating growth trajectories by complementing and enriching the current knowledge base and opening up new and interesting avenues for research pursuits. The PNU Research Agenda framework represents the dynamism of the 21st century and the readiness of the University to transform itself into a strong research-based teacher education university that will not only set new benchmarks for research in education but will also propel HEIs to move beyond their current instructional space and utilize research for knowledge discovery and accelerating innovations (PNU-RA, 2017, pp. 7-9).”

Based on the PNU Research University Agenda the following research thrust of the various sectors such Philippine Development Plan (PDP), Millennium Development Goal (MDG), Higher Education Research Agenda 2, National Higher Education (NHERA) 2, and PNU's Strategic Development Plan 2012-2022 have been drawn the following components based on CHED National Higher Education Research Agenda (National Higher Education Research Agenda, NHERA | Planipolis, n.d.) namely:

- 1) Knowledge produced and utilized
- 2) Inputs to instruction
- 3) Policy impact
- 4) Research publication
- 5) Consumer use

The “UNESCO World Declaration on Higher Education for the Twenty-first Century acknowledges that knowledge creation, transmission and application are the lifeblood of the knowledge-based economy and higher education institutions are among the primary entities tasked to generate, transmit, disseminate and apply knowledge” (NEHRA 2, 2009, p. 1). They are thus a major component of the nation's research and innovation system. Moreover, from the perspective of education, vigorous and high-quality research underpins and nourishes degree-level learning environments, especially for graduate and post-graduate programs; it provides the inquisitive, critical and independent regimen that develops intellectual capability and advances the boundaries of knowledge and understanding. The Commission on Higher Education is mandated to promote, direct and support higher education institutions in performing their research and instruction functions. With the objective of enabling our colleges and universities to produce high quality research that will advance learning and national development, as well as international comparability of the Philippine higher education system, the National Higher Education Research Agenda was developed by CHED and partner institutions/agencies. The NHERA provides the policies, directions, priorities and thrusts of Philippine higher education research in the medium to long term. Essentially, it encourages networking among HEIs, with each network focusing on themes wherein the members are or can be good at. It promotes partnerships/collaboration of HEIs with other research institutions,

local and foreign, as well as with industry and private laboratories, for the conduct of research, and application of research outputs. NHERA also includes a system of incentives and rewards for outstanding performance in terms of: 1) Producing and creating leading edge knowledge; 2) Applying that knowledge; and 3) disseminating that knowledge to students and the wider community. The first NHERA covered the period 1998-2008 including extension, this second NHERA or NHERA-2 will be for the period 2009-2018. The initiatives under NHERA-1 to improve research capability and productivity among HEIs will be sustained and new challenges will be addressed under NHERA-2 so that higher education research could create appreciable impacts not only across all disciplines of higher education but also in the more real-world socio-economic and cultural milieu (National Higher Education Research Agenda, NHERA | Planipolis, n.d.). These components are necessary for research results of the Higher Education Institutions and are mobilized to the stakeholders. Thus, research results will create value for the beneficiaries once knowledge has been implemented. Even though the efforts of the Philippine Normal University develop Research Agenda to intensify the university research capabilities to achieves its mandates, there is no precise mechanism, formulation of policy, and assessment tool on how knowledge be mobilized or research results to the stakeholders. Hence, the assessment tool is needed to measure to improve the research results of the Higher Education Institution through the lens of knowledge mobilization.

## **Appendix B**

### **List of Interviewees – Research Directors and Project Leaders**

RD 1 – Research Director

RD 2 – Research Director

RD 3 – Research Director

RD 4 – Research Director

RD 5 – Research Director

RD 6 – Research Director

RD 7 – Research Director

PRL1 – Project Research Leader (Completed Research)

PRL2 – Project Research Leader (Nearly Completed Research)

PRL3 – Project Research Leader (Completed Research)

PRL4 – Project Research Leader (Nearly Completed Research)

PRL5 – Project Research Leader (Completed Research)

PRL6 – Project Research Leader (Nearly Completed Research)

PRL7 – Project Research Leader (Completed Research)

PRL8 – Project Research Leader (Nearly Completed Research)

PRL9 – Project Research Leader (Completed Research)

PRL10 – Project Research Leader (Nearly Completed Research)

PRL11 – Project Research Leader (Completed Research)

PRL12 – Project Research Leader (Nearly Completed Research)

PRL13 – Project Research Leader (Completed Research)

PRL14 – Project Research Leader (Nearly Completed Research)

## Appendix C

### Letter to Presidents of Higher Education Institutions (HEIs)

Date: \_\_\_\_\_

Dear Pres. \_\_\_\_\_:

Greetings of peace and love!

I am communicating with you through email with respect and honor in the midst of the pandemic. I hope you do not mind my way of approaching you.

I am a faculty member of Philippine Normal University, Manila, and presently working on my dissertation entitled "Designing a Framework for Measuring Knowledge Mobilization Effectiveness in Higher Education Institutions (HEIs) in the Philippines." This research study is being conducted as part of my requirement for the Doctor of Philosophy in Knowledge and Innovation Management Program requirement at Bangkok University, Bangkok, Thailand.

Part of my research approach is to interview with the seven (7) State Universities and Colleges located in the National Capital Region (NCR) to identify the knowledge produced by the institution through research, who originates it (contact points), how and to whom it is distributed and shared, and who makes use of it in the academic, private and public sectors. As you can see, it is necessary to understand the domains of knowledge being focused upon, and the knowledge flows when research is completed, in order to support development of a framework for measuring knowledge mobilization effectiveness.

With this humble request, the researcher plans to do an online interview with the director/head of your institution's research office due to the pandemic at his/her most convenient time. The expertise of the director/head of your institution will provide valuable input to this research's success, helping insure that the knowledge produced by the university will be useful and used for the utmost benefits of the community.

Any information that is shared will be used for this research study only and treated with high confidentiality following the Philippines' Data Privacy Act 2012.

Thank you so much in advance and I am looking forward to your preferential action to my request. Should there be any questions, please feel free to reach me through my official email (natividad.jp@pnu.edu.ph) or my mobile phone (09175402440).

Very truly yours,

John P. Natividad

Ph.D. Candidate

Bangkok University

Bangkok, Thailand



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## Appendix D

### Qualitative External Questions for Research Directors and Project Leaders

#### Research Directors'

Name: \_\_\_\_\_

Position: \_\_\_\_\_

Email Add.: \_\_\_\_\_

Contact No.: \_\_\_\_\_

#### Questions:

1. How do you describe the knowledge/research results produced by the university? Are there specific knowledge domains in which university research is focused?

2. Can you provide one example of research within the past five years that is making a large difference in the Philippines? Who are the stakeholders who are using that research?

3. Is there a research report that can provide the titles of research and contact points for research produced by the university over the past five years?

4. How does the university manage the dissemination of knowledge/research results to internal stakeholders? Who are the internal stakeholders?

5. How does the university manage the dissemination of knowledge/research results to external stakeholders? Who are the external stakeholders?

6. To your knowledge, are there any current mechanisms in place to measure the mobilization of university research results?

7. What strategies does the university engage to preserve the knowledge/research results and make them accessible to future internal and external stakeholders?

8. Is there anything you would like to add connected to the mobilization of university research results?

Disclosure: Any information that is shared will be used for this research study only and treated with high confidentiality following the Philippines' Data Privacy Act 2012.

**Project Research Leaders'**

Greetings of peace and love!

I am communicating with you through email with respect and honor in the midst of the pandemic because you have been referring by \_\_\_\_\_, director/head of your institution's research office. I hope you do not mind my way of approaching you.

I am a faculty member of Philippine Normal University, Manila, and presently working on my dissertation entitled "Designing a Framework for Measuring Knowledge Mobilization Effectiveness in Higher Education Institutions (HEIs) in the Philippines." This research study is being conducted as part of my requirement for the Doctor of Philosophy in Knowledge and Innovation Management Program requirement at Bangkok University, Bangkok, Thailand.

Part of my research approach is to interview with the fourteen (14) Research leaders who have completed an ongoing research project in State Universities and Colleges located in the National Capital Region (NCR) to identify the knowledge produced by the institution through research, who originates it (contact points), how and to whom it is distributed and shared, and who makes use of it in the academic, private, and public sectors. As you can see, it is necessary to understand the domains of knowledge being focused upon and the knowledge flows when research is completed in order to support the development of a framework for measuring knowledge mobilization effectiveness.

With this humble request, the researcher plans to do an online interview due to the pandemic at his/her most convenient time. The knowledge that you will provide will give valuable input to this research's success, helping ensure that the university's knowledge will be helpful to and used for the utmost benefits of the community. Any shared information will be used for this research study and treated with high confidentiality following the Philippines' Data Privacy Act 2012. Thank you so much in advance and I am looking forward to your preferential action to my request. Should there be any questions, please feel free to reach me through my official email (natividad.jp@pnu.edu.ph) or my mobile phone (09175402440).

Name: \_\_\_\_\_

Position: \_\_\_\_\_

Email Add.: \_\_\_\_\_

Contact No.: \_\_\_\_\_

**Questions:**

1. How do you manage the research output for the community (internal and external)?

2. How do the university's research outputs meet the needs of your internal and external stakeholders?

3. How does the university conduct need assessment to identify/address its potential players in the community?

4. How do potential players in your community utilize the research outputs of the university?

5. Do you have a metric tool that measures the university's research outputs' effectiveness to its internal and external community?

6. From 1-10, what level of the university's research results have the internal and external community found useful?

7. From 1-10, how much of a difference to stakeholders can this research make within the bounds of its focus?

8. From 1-10, how effective do you think the current processes are in getting your research out to that larger group of stakeholders who can use it? How can we do this better?

Disclosure: Any information that is shared will be used for this research study only and treated with high confidentiality following the Philippines' Data Privacy Act 2012.

**Appendix E**  
**Quantitative Internal and External Survey Questionnaires**

Bangkok University  
 Rama 4 Rd., Klong-Toey, Bangkok 10110  
 Bangkok, Thailand

This is to request your time to accomplish the Internal Stakeholders Survey Questionnaire. Responses from this form will only be used for the Designing a Framework for Measuring Knowledge Mobilization Effectiveness in Higher Education Institutions (HEIs) In the Philippines.

By filling out this form, you have read and understood the provided information and agree to participate in collecting data for the said research. Moreover, you are free to withdraw from participating in this study at any time and are free to refuse to answer particular questions. While the information gained in this study will be published, you will not be identified, and the information I provided will remain confidential.

Should you have any questions, you may email Mr. John P. Natividad (natividad.jp@pnu.edu.ph), a Philippine Normal University-Manila Campus faculty and a doctorate student of Bangkok University, Thailand. I hope to receive your responses until October 7, 2021.

Thank you!

Name (Optional): \_\_\_\_\_

Age (Optional): \_\_\_\_\_

Gender (Optional): \_\_\_\_\_

Present Position: \_\_\_\_\_

Institution/Organization: \_\_\_\_\_

Years in that Organization: \_\_\_\_\_

Education Attainment: \_\_\_\_\_

Instruction for Internal Respondents:

This instrument is composed of twenty-three (23) items and three (3) questions for the research entitled *Designing a Framework for Measuring Knowledge Mobilization Effectiveness in Higher Education Institutions (HEIs) in the Philippines*. Kindly rate the following items using the rating scale below by placing a check (✓) in the space. At the same time, answers to the questions can be written in the blank space below. Your answer will be kept in strict confidentiality and for research purposes only.

- 5 – Strongly Agree  
 4 – Agree  
 3 – Neutral  
 2 – Disagree  
 1 – Strongly Disagree

Items	5	4	3	2	1
1. There is widespread dissemination of the research outputs of the university to concerned stakeholders.					
2. The university's research outputs meet the needs of the stakeholders.					
3. Potential players in the community make use of the university's research outputs to improve the lives of the community.					
4. The research has a positive impact on the lives of the university's stakeholders.					
5. The current process is effective in transmitting research output to the larger group of stakeholders who can use it.					
6. Research outputs are used to inform and shape university policies, programs, and practices.					

Items	5	4	3	2	1
7. The administration fosters a positive research culture by developing policies and programs that support and sustain the research productivity of researchers at all stages of their careers.					
8. The university has a straightforward, practical, and realistic research training management plan to enhance the research skills and develop the expertise of its students and academic staff.					
9. The administration promotes research excellence through a fair financial and non-financial reward, benefit, and incentive system.					
10. The university offers adequate research services and facilities for the conduct of research.					
11. The availability and allocation of institutional funding adequately support students and academic staff's research training opportunities and experiences.					
12. The institutional funding for research projects should cover all research expenses, including the dissemination and publication of research outputs.					
13. Institutional funding of approved research is released on time and not restricted by the government's bureaucratic red tape.					
14. The university uses a needs assessment instrument to fully identify/address objectively the needs of potential players in the community.					
15. The university uses a metric tool to objectively measure the effectiveness of its research outputs to its internal community.					

Items	5	4	3	2	1
16. The research community of the university is fully informed that assessing research outputs ensures accountability to key stakeholders of the research.					
17. We receive and have access to related research outputs from universities across the Philippines.					
18. The research outputs from my university are shared with other university researchers throughout the country.					
19. The university maintains constant interaction and engagement with nongovernmental organizations (NGOs), local government units (LGUs), communities, and other organizations and industries to build and sustain a strong, working collaborative partnership with them.					
20. The university provides means for linkages with other institutions, local or international, to create intellectual synergy.					
21. The university's researchers gain informed consent from research respondents/participants, ensure their anonymity in the communication of research findings, and respect data privacy law.					
22. The university provides its researchers with adequate guidance in good research practices.					
23. The university expects the highest ethical standards from its researchers and is committed to upholding the integrity of academic research.					

1. How could the university more effectively communicate research findings to the community?

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2. Please provide one example of by whom and how research outputs were used by external stakeholders.

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3. Please provide one example of feedback from the external stakeholder community regarding the effectiveness of research outputs.

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### **Data Privacy Agreement / Consent**

The researcher, **Mr. John P. Natividad**, recognizes its responsibility under the Republic Act No. 10173, also known as the Data Privacy Act of 2012. The personal data and information obtained from this **Internal Stakeholder Survey Questionnaire** are stored in a confidential file accessible only to authorized persons.

The data collected shall be used for this research study only and treated with high confidentiality. The researcher shall not disclose personal information without his/her consent.

**Consent:**

I have read the Data Privacy Statement and express my consent to Mr. John P. Natividad to collect, record, organize, update, use for research purposes with protection for my identity, contact me, and destroy/delete the file after the research has completed.

I also certify that the information contained here is accurate to the best of my ability.

\_\_\_\_\_

Signature over the printed name of respondent

Date

Thank you very much for participating in answering the survey questionnaire. As part of a token of appreciation, you will receive a Php150.00. To obtain the token, please provide GCASH Account / PAY MAYA Account / BANK Account Number. \_\_\_\_\_

**Bangkok University**

Rama 4 Rd., Klong-Toey, Bangkok 10110

Bangkok, Thailand

This is to request your time to accomplish the External Stakeholders Survey Questionnaire. Responses from this form will only be used for the Designing a Framework for Measuring Knowledge Mobilization Effectiveness in Higher Education Institutions (HEIs) In the Philippines.

By filling out this form, you have read and understood the provided information and agree to participate in collecting data for the said research. Moreover, you are free to withdraw from participating in this study at any time and are free to refuse to answer particular questions. While the information gained in this study will be published, you will not be identified, and the information I provided will remain confidential.

Should you have any questions, you may email Mr. John P. Natividad (natividad.jp@pnu.edu.ph), a Philippine Normal University-Manila Campus faculty and a doctorate student of Bangkok University, Thailand. I hope to receive your responses until October 7, 2021.

Thank you!

Name (Optional): \_\_\_\_\_

Age (Optional): \_\_\_\_\_

Gender (Optional): \_\_\_\_\_

Present Position: \_\_\_\_\_

Institution/Organization: \_\_\_\_\_

Years in that Organization: \_\_\_\_\_

Education Attainment: \_\_\_\_\_

**Instruction for External Respondents:**

You have been recommended to participate in this study by the university because of your past association with research findings. This instrument is composed of seventeen (17) items and three (3) open-ended questions for the research entitled *Designing a Framework for Measuring Knowledge Mobilization (KMb) Effectiveness in Higher Education Institutions (HEIs) in the Philippines*. Kindly rate the following items using the rating scale below by placing a check (✓) in the space. At the same time, answers to the questions can be written in the blank space below. Your answer will be kept in strict confidentiality and for research purposes only.

5 – Strongly Agree

4 – Agree

3 – Neutral

2 – Disagree

1 – Strongly Disagree

Items	5	4	3	2	1
1. There is widespread dissemination of the research outputs of the university to concerned stakeholders.					
2. The university's research outputs meet the needs of the stakeholders.					
3. Potential players in the community make use of the university's research outputs to improve the lives of the community.					
4. The research has a positive impact on the lives of the university's stakeholders.					
5. The current process is effective in transmitting research outputs to the larger group of stakeholders who can use it.					

Items	5	4	3	2	1
6. The approval by external funding agencies (like LGUs, DepEd, CHED, DOST, private corporations and foundations and other local and international government and non-government bodies) of research projects depends on priority research areas and disciplines set by the external funding agencies themselves.					
7. External funders of research projects have a simplified procedure for releasing of funds and financial reporting requirements.					
8. External funding agencies have a significant influence on the conduct of the research through the requirements and conditions they impose.					
9. The university provides means for linkages with other institutions, local or international, to create intellectual synergy.					
10. We share university research outputs with other members of the community who can benefit from them.					
11. The university seeks feedback from external stakeholders on the effectiveness of its research outputs.					
12. We provide feedback to the university on the effectiveness and usefulness of research outputs.					
13. We participate in and support the development of university research.					
14. When I have a question related to research findings, the university is available to assist.					

Items	5	4	3	2	1
15. The community consistently works with students and faculty through projects that are part of an academic course, community-based research, extension/community service, or other activities.					
16. The university takes the initiative to communicate with the stakeholders and the community to enhance their uptake and use of research findings.					
17. There is an institutional mechanism where opportunities for regular discussions allow the community to express their concerns.					

**Questions:**

1. Please provide one example of the successful use of university research outputs and its impact on the community?

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2. How could the university more effectively communicate research findings to the community?

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3. How could the university make research findings more useful to you?

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## DATA PRIVACY AGREEMENT / CONSENT

The researcher, Mr. John P. Natividad, recognizes its responsibility under the Republic Act No. 10173, also known as the Data Privacy Act of 2012. The personal data and information obtained from this external stakeholder survey questionnaire are stored in a confidential file accessible only to authorized persons.

The data collected shall be used for this research study only and treated with high confidentiality. The researcher shall not disclose personal information without his/her consent.

**Consent:**

I have read the Data Privacy Statement and express my consent to Mr. John P. Natividad to collect, record, organize, update, use for research purposes with protection for my identity, contact me, and destroy/delete the file after the research has completed.

I also certify that the information contained here is accurate to the best of my ability.

\_\_\_\_\_  
 \_\_\_\_\_  
 Signature over the printed name of respondent

\_\_\_\_\_  
 \_\_\_\_\_  
 Date

Thank you very much for participating in answering the survey questionnaire. As part of a token of appreciation, you will receive a Php150.00. To obtain the token, please provide GCASH Account / PAY MAYA Account / BANK Account Number. \_\_\_\_\_

## Appendix F

### Answers to the Three Questions in the Quantitative Questionnaire

1. How could the university more effectively communicate research findings to the community?

- Through extension services and publication 6pS
- By means of promoting and supporting researchers
- Peer-review
- Regular meeting on current researches done and are in the process of finishing so that there will be no duplication of study.
- through policy briefs / discussion papers / technical papers
- Through university forums
- Conduct regular conferences
- More linkages to LGUs
- The university can more effectively communicate research findings to the community through conducting seminars or webinars and also by developing Research and Data Management in the institution.
- Guide novice researchers on how to publish research studies in reputable journals.
- Establish a publishing platform which is I think a good way for researchers to get experience publishing their own work and reaching a larger public/community. We should also think about the end user, because once you know your audience, you can start to think of ways to communicate with them.
- by doing active research
- Thru Publication of the research conducted and presenting research findings thru conferences
- by providing an action-oriented research/ information dissemination
- Proper dissemination of activities through the official website or social media pages. Emails to relevant stakeholders and partners on research outputs would also be most welcome.
- Through forum and publication in a layman's term

- through research forum
- By conducting an annual research forum
- strengthen the external research linkages
- Perhaps an establishment of a social media publication dept that will inform the public about the accomplished researches of the university.
- Held research conferences and update university website with section intended to showcase research undertakings of faculty members and related units/agencies
- If there is a monitoring committee to check if there are research findings that are shared to external stakeholders. Follow-up is highly recommended.
- 1. Research can reach the community if it is shared in a government entity that is reachable by common people like for example the national library. 2. Online dissemination of information thru websites and other fora; 3. Publication of compendium of research findings and distribute it to LGU with education sectors and all extension partners 4. Impact research and research used by external stakeholders should be documented, highlighted and promoted so that everyone in the university are aware of it, so that everyone in the community will become potential disseminator of information
- By maximizing the community extension project of the university and applying research to it.
- By conducting research forums and open access of researches to the public.
- By using social media as means to disseminate research findings since in the Philippines, 73 million Filipinos are active social media users.
- Through outreach activities to specific demographics where the research has direct impact.
- Research findings can be published to a larger community for information dissemination.
- Provide seminars that would inform the community about the research findings.
- By making it accessible in any platforms
- The practice is sufficient so far.

- Proper dissemination of research findings
- By publishing them
- Thru webinars and conferences and workshops
- There is an effective communication at present.
- Through online presentation and publication of research abstracts.
- By sharing the results and finding with the community.
- Through the use of the online platforms
- Done when EPRDC disseminate research results within and beyond PNU.
- By having symposia on the latest knowledge created that really benefits the community.

- By helping the researchers publish their works. And by educating the community about how important it is to refer to researches in making important decisions.

- conduct of research
- By sharing these for free
- The university can communicate research findings by showcasing free webinars and sharing information through social media platforms.

- Involve the key persons or respected people that have influence in the community in the research study

- Through research fora, open access to journal research articles
- Find a research problem that will cater the needs of the community.
- Commonly, traditional methods of communicating research include oral presentations, poster presentations, publishing abstracts and peer-reviewed research papers.

- The Technological University of the Philippines communicate effectively their research outputs with the community by conducting seminar-workshops or trainings thru extension activities. Through collaboration with different stakeholders like barangay, private organizations, or companies, the university seeks to contribute to the development of the community. With strong partnerships with different stakeholders, the research findings are communicated effectively and transformed into tangible results which are deemed essential in the community.

- Don't rely on internet publications but rather give directly the result to concern community. Work with them based from the result.
- They can communicate by radio or using Facebook.
- This is achieved by publishing research outputs and by conducting conferences where educators from across the country and abroad can participate.
- Create mechanism for research output dissemination to the community which should form part of the steps before the awarding certificate of research completion.
- Let them access the research itself. Mostly to read one, payment is required. Results of research should be accessible to all.
- Electronic dissemination of research publications where done several times a month. Postings were even created for a widespread of information. Hence researches were acknowledged by enough students and other interested people.
- By conducting a series of virtual seminars that must be attended by the members of the community, by collaborating with different stakeholders, through infographics
- Communicate the research findings to those who are responsible for actions or dissemination of information
- Forums
- Conduct conferences, seminars, webinars, and lectures to other school (big or small school)
- Online depository/library; better use of research posters through groups and classrooms
- Conduct webinars for the readers to fully explain the findings
- Conduct conferences and Research Dissemination Online Conferences
- PNU can effectively communicate research findings to the community through its community extension programs
- By utilizing the web as a platform
- Use popular media
- through various extension activities

- Provide listings of journals where Faculty members can publish.

Communicate frequently in email

- conduct of research conference, publication in journals
- Coordinate and collaborate with the Local government unit, Non govt.

organizations. invite them in the university or visit them in the community and educate them how to utilized research output.

- Try to conduct researches related to community settings.
- through for a
- Through Research Forum.knowledge sharing
- Conduct of periodic forums, to be institutionalized by reflecting these in the

calendar of events

- through publication
- No more, po.
- Through research forum where stakeholders ate invited like the ones from

an adopted barangay or school.

- Initiate Research-based Outreach/Extension Programs
- give appropriate feedback of the research finding so they can have idea.
- Integrate research sharing in regular meetings.
- Provide mechanisms in which research outputs get published or used in the

community.

- there must be a widespread sharing of the research findings to the

community

- The conduct of research colloquium is necessary.
- Utilize the research findings in actual unit programs
- Hold regular research forum attended by the stakeholders.
- more research symposia/ provide opportunities for more practical use of the

community

- the research finding must be applied directly by the respondents in the

community

- Strengthen the guidelines/policies in the dissemination of research findings
- The university has to allocate funds for that purpose

- By holding Stakeholders research Forum
- Through invitation of participants in an international level.
- bring the result to the community not just in forms
- quarterly university wide research presentation
- Conduct forums
- more opportunity to share to stakeholders
- Utilize accessible platforms
- no more to add Its all adequate for all the researchers
- Optimizing Social media campaign
- system-wide research for a Research forums
- Publish more policy reports and white papers, and make this available through various media
  - More research fora and local publications
  - by holding research forum/fora and establishing MOAs on Research collaboration
- Strengthen support to research presentations both locally and internationally
  - The University can also utilize social media to communicate research findings aside from initiating conferences and research publications/journals.
  - Maximize the use of social media to share findings.
  - Organize research fora with the intended stakeholders as audience; provide a copy of the research to the community
    - The university should activate their offices concerned or communicating research findings is within their functions.
  - Sharing the results to the Community
  - Research- Extension collaboration
  - By sharing research outcome in public or presentation online as a trend in this time of Pandemic.

- Creation of a research consortium across institutions (e.g., 3NS), with a website where institutions and members can collaborate, post, etc. on most recent researches on teacher education at the regional level, nationwide (Philippines), ASEAN, Asia and the Pacific.
  - By providing open access to the general public, and utilizing official social media accounts to communicate research findings
    - by disseminating the results for the community's perusal via infographics
    - Through flyers, through seminar-webinar, pamphlet, By providing a copy of the manuscript of my dance researches the PROVINCIAL MUSEUM & LIBRARY of Isabela and the NCIP also
      - By conducting annual research forum and support publications.
      - conduct research dissemination to marginalized community
      - more research fora; dissemination of research abstracts through emails, message boards and other online platforms
      - Thru Social Media.
      - through publications in the normal lights, professional sharing
      - wide dissemination, increase number of research that caters the need of the stakeholders
        - Through info drive and research forum in the community
        - develop infographics; develop policy briefs; organize conferences
        - through research presentation forum
        - by informing them in a gathering
        - in innovative ways such as social media platforms such emails, Facebook and others
  - Conduct regular research fora among stakeholders to disseminate research results.
    - Aside from the existing platforms, the university may use other social media, forum, publications to effectively widen the dissemination of all the research findings of the faculty and university.
    - Conduct regular research colloquium.

- Have a site where finished and ongoing researches can be accessed, researches can be classified by area for stakeholders to readily access them
- I am not sure. Probably laymanizing research communication. For instance, translating findings into posters, or presenting these in concerned Barangay Assemblies, or use of social media to reach target audience.
- Research findings can be communicated in the community through local radios and TV stations. As much as possible, when communicating findings, use the language that is understood by everyone, not English.
- Probably design a platform for sharing the results not just thru publication since chances are, not everyone would be able to access the results from there.
- Maximize social media platforms and international for a
- Through the conduct of regular research forums as a venue of disseminating research findings to the various external stakeholders of the university
- First thing should be is to ensure that any research endeavor have a specific purpose/usability for a specific community so that the research may not remain hidden/useless on a paper only. Since the research result is useful to that community, presentation of findings is easier by topping the key persons in that community for mobilization purposes either to gather the stakeholders for a general assembly or to form a group to make a proposal to implement the recommendations by the researchers based on their findings.
- through publication webinars/seminars
- I believe the university is doing the most effective way to communicate to us about research findings.
- All was mentioned
- Launch partnership and sustain
- Think more alternative plans.
- Facebook Live
- Public research fora, allow open access / have research executive summary made available

- Through knowledge translation and making the findings more understandable and accessible to different audiences in order to increase the impact of research. You have to present a very good package of your work in different ways so that you reach the people you want to reach. And the community could make use the findings and apply it in their day to day activities

- invite stakeholders and involve the community in research undertakings, partner with LGUs and NGOs

- Thru Gmail

- Collaboration between people with diverse skill sets can result to specific solutions.

- Through knowledge sharing via virtual conferences in local, national, and international level.

- presentation of outputs in webinar/workshops

- Strengthen linkages

- Through organizing National/International Conferences

- Through public dissemination.

- To conduct conferences highlighting research findings across the PNU

System.

- Open more community linkages

- Conduct a small group meeting, symposium, seminars.

- fund the dissemination of research

- The University should provide avenues for research findings sharing to the community by involving them whenever there are research presentation activities or they may involve DepEd teachers as audience in both student and faculty sharing.

- Through Linkages

- Use of publication materials

- At present, the University has 3 research journals with two issues per year, all are available online. Moreover, there are two research fora in a year. To be more effective, there must be a more effective communication plan to inform the targeted audience of these available resources.

- kung ito ay gagamitin

- magbukas ng maraming avenue para sa pagpapahayag o paglimbag (publish)

- Collaborate with the concerned individual
- Through colloquia and publication
- through open forum
- hold public consultation and dissemination
- Thru Faculty Researchers
- The university may contextualize their researches on the needs of the

community.

- Create a task force dedicated for the dissemination of the output
- Conducting extensive local research for a
- thru dissemination avenues like conferences
- By sharing the outputs thru webinar format
- Through pooling science communication experts
- By encouraging more faculties to produce, present and publish their

research studies. One is through implementing different training-workshops like the recently held Pathways to Refereed Journal Publications. Another way is to inform them about the incentives and merit promotion to be obtained by producing research.

- No comment
- By organizing colloquia and paper presentations
- They should have a stakeholder meeting
- Feedbacks on the final results of the study
- perhaps via book of abstracts that may be purchased or given to the

members of the community.

- By implementation of research-based extension projects
- Regular meeting with the stakeholders
- To have more concrete plans by implementing the research finding to the

community.

- By having different strategies about Research Findings
- The information should be clear to be able for the university to urge the

community.

- Through presentations and oral discussions
- The university can effectively communicate research findings to the community by knowing and understanding the audience and the purpose of dissemination of the findings.
  - In order for the university to communicate the research findings more effectively, the need for focal persons and linkages as well as publication materials needs to be established to directly discuss the findings to the targeted audiences; thereby ensures effective communication and formulation of optimal solution based on the findings.
    - Actually, there are lots of conventional approach to communicate research findings. With spreading and application of these findings that has relevance today or in the future can help our community.
      - Improve life and assessment of needs
      - Decentralization of research funds to further enhance researchers in the branches and campuses thus can easily communicate the findings to its stakeholders.
        - Information dissemination among its stakeholders
        - THRU GOOGLE FORMS
        - Stronger linkages
        - Proper and effective dissemination of research related updates
        - through stronger dissemination
        - By conducting information to the community. Like seminar etc
        - By having partnership with the stakeholders who would utilize the research findings.
          - Gawin etong bahagi ng extension activity at laging isaalang alang na anghannaliksik ay dpat ang mmmyan ang maging end user
            - Link to community
- The traditional methods of communicating research findings include oral presentations, posters, abstracts and peer-reviewed papers. The key to effectively disseminating your research findings is to understand your audience and the purpose of your dissemination.
  - recognize those people who presented their outputs

- Through automated means
- Research Center of the University always conduct seminars, trainings and colloquium

**2. Please provide one example of by whom and how research outputs were used by external stakeholders.**

- No research was approved and used in the community
- For the IGP of school
- Oral presentations
- outputs of RCTQ are utilized by Dep Ed
- Research outputs were used as:
  - 1) tools in DepEd (Bautista et al)
  - 2) to inform policies for PPST and other standards in DepED (RCTQ studies)
  - 3) research literature (various publications)
  - 4) extension activities (various research products)
- Published articles in the Normal Lights be guide for the students and practitioners
- Research shared in DEPED
- One of the research outputs is teaching strategies used to enhance the teaching and learning process.
  - Impact studies of extension programs were used to develop more appropriate and responsive programs and sustainable community partnership.
  - Because of the paper presentation internationally and locally, the researchers can share their knowledge and experiences with the general audience. Through collaboration with the external stakeholders, they can used the outputs by applying it with their respective institution if applicable
  - The PPST being used by DepEd to measure the developmental and professional growth of DepEd teachers.
  - RCTQ research about NCBTS teachers' policy for promotions.
  - I could not remember.

- results of study/ information dissemination
- PNU researchers are well cited in studies conducted in the field.
- for references of external stakeholders
- My group's research on "Impact Study of Project Kindergarten Teachers Empowerment and Sustainability (Project KiTES) provides valuable input on the strategies of teaching and instructional materials development for Kindergarten teachers.
  - an input to policy development of other institutions
  - The research output we developed in crafting the green teacher education curriculum of PNUV. It was used to develop the different certificate and diploma programs. Also, at the ITL our curriculum employed the research outputs of our faculty members.
    - The TPACK-STEAM research project as funded by CHED. Results were shared to the different SUCs and LUCs.
    - One example is if published research is cited in some other researches published online.
    - The research work of the late Dr. Ochave is one of the most sought-after researches being used; his framework on his study is famous among teachers doing research.
    - In making ordinances, there are some barangays who are using the university's researches as a basis.
    - Department of Education uses and considers the researches of PNU to improve their system and implementation.
    - Most of the researches are published in different printed and digital journals which can be used by external holders used a reference in policy making, educational processes improvement or further research.
    - Research by once center was adapted nationally to standardize assessment of teacher performance.
    - I am honestly not so familiar with this.
    - Results of a study about reading skills of the learners. It can be used by stake

- Holders who are engaged in Brigada Pagbasa., which in return can be used to address reading needs and difficulties of learners
  - To be used as their related lite or reference for action research
  - To be used as their related lite or reference for action research
  - SOS pamphlets
  - Research outputs are offered and communicated to agencies who need it and are used in legislating policies like the Special Education Act
    - Results of PPST is utilized by DEPED
    - The research from the university as well as programs/projects developed during extension programs are shared to external stakeholders.
    - Financial literacy program that is cascaded in the community by the researchers.
    - For example, in teaching. What are the necessary actions during this blended learning.
      - TPACK framework adapted by CHED.
      - the tools developed by researchers in the university are helpful to other researchers and professionals. Teachers in elementary and high school are more likely to benefit from these because there are a lot of researches about education and teachers are more likely to read these.
      - i have no idea
      - I can't remember one
      - In our institution, students' research was all focused in improving a certain barangay or locality. Thus, all of the products and outputs aim to improve the livelihood or living conditions of those in the barangay.
        - DepEd newly hired teachers performance output used to assess curriculum of college of education
        - National high impact research projects conducted by the RTCQ that informed practices and policy making of the Department of Education (DepEd)
        - Using the researchers the external stakeholder may use the study as their guide in doing research also it will provide the answer to the existing problem that a research had.

- In presenting the best practices of PNU SL to other University containing the programs offered to all adopted community.
- Last quarter of the year, a group of researchers from the College of Science, TUP Manila extended their study on making abplastic-free shampoo with conditioner bar with different communities. First part of the extension project was presentation of research studies that deal with the disadvantages of using plastic in the environment. Then, second part dealt with the training on making a plastic-free shampoo with conditioner bar. This project does not only have impact in the environment but also to the lives of the people as this can be a prospective business.
- Currently we conducted needs analysis on a certain agta community.
- They use it to improve their health like research on overweight and obese mother they can have Zumba and exercise to function effectively.
- I'm sorry, I know none.
- Citizen Satisfaction Index System (CSIS) wherein PNU is commissioned by the DILG to gather data on the satisfaction of the citizens on services offered by a particular LGU. After the data were analyzed and interpreted, PNU is tasked to report the findings of the study to LGU under study. This reporting task is part of the agreement between the institution and the DILG.
- Researches resulted to poor achievement of the students can be a basis for creating strategies wherein external stakeholders are involved.
- The Department of education is in great communication and participation with the school. This is particularly true to some ordinances provided by the department, especially in basic education and secondary level. Rpsm materials being one
  - The findings of our group's Research/survey about Filipino's Hope during Pandemic and I used it as basis on one of the topics in My Values Education Class.
  - In teaching
  - Take into account things like website downloads, media attention, social media 'likes' and shares, and requests for the report.
  - DepEd's use of PPST & PPSSH was a product of PNU's Quality Assurance research team
  - Personally, I adapt the teaching techniques which are proven effective.

- Usually for product development and agricultural reforms
- Through the research congress and other related activities held by the university
- PPST was adopted by the government
- SDO Marikina, inputs for their GAD Code Development
- RCTQ and DepEd
- RCTQ – PPST
- Example, research findings that can enhance students learning habit at home: don't just publish it, some parents in majority do not read research publications or don't have time to read, communicate the findings to the parents in the community who has problem with their children's school academic performance.
  - Education policies
  - DepED, CHED and Congress's utilization of PNU research outputs
  - Research of a colleague utilized by the Provincial Tourism (dance steps)
  - Data from RCTQ and EPRDC by DepEd
  - The validated digital stories are used by teachers in the Department of Education
  - DSWD, DepEd
  - Acton researches results were used by the teachers in the field if teaching.
  - PNU NL Extension Programs based on data about need assessment (literacy, livelihood)
    - have no idea yet
    - Research outputs were considered as basis for providing trainings for LGU or DSWD.
      - I was able to share the reflective practice framework with DepEd. I also use the framework in the modules I created in teaching Advanced Research but this is only on my initiative.
        - basis for the implementation of project
        - The research output conducted recently (RCTQ Team) as input to policy making in the department of education and even to the commission on higher education.
          - The developed PPST was research done by RCTQ and was utilized by the Department of Education

- Digitized eco-literature as output of the research of Dr. Bermiso was used in the Extension Service whose targets are teachers in high school teaching literatures. The e-book version was also provided to the Indigenous School which they can use especially in teaching about culture.

- basis for other researches
- research output was utilized in their workplace.
- The research done by the CEGTE Office was used as a springboard for the creation of the Community-based ESD Program
  - during extension activity
  - N/A
  - Educators - Education Program Development
  - Intervention programs
  - Laboratory school programs e.g. (MISOSA project (80"s/ multigrade 90's
  - policy makers
  - Integrated in community extension programs
  - through researches and innovations
  - publications produced in normal lights and other publications of pnu
  - DepEd stakeholders made use of PPST researches by RCTQ
  - Deped policies
  - The PPST was adopted by DepEd and CHED.
  - Researches on policy inputs
  - Research Outputs on Greening the OBTEC were used to develop the EGTE Curriculum, hence the City Government of Cadiz gave funding for scholarship on Diploma in Teaching EGTE or Diploma in EGTE.

- Modules as products of research are used by DepEd teachers.
- I learned that PPST is an output of RCTQ.
- Basis for policy and community development.
- can't think of any yet
- Developmental researches conducted by the university faculty members wherein instructional materials like lesson exemplars were produced and can be of future use to other educators

- Research for our project KiTEs was used as inputs to improve the teaching of beced teachers in Marikina
  - N/A
  - used by teachers, students & other researchers to enhance their life/ learnings through the shared data.
  - Phil National RCTQ, a PNU-based research center, has conducted/accomplished research projects that informed national policy and practice (e.g., PPST is adopted into a national policy by the Department of Education, and which served as basis for assessing public school teachers/leaders' performance).
    - PNU researches are used by DepEd for policy making
    - by conducting dance workshop of my dance research titled "Baile De bakal dance of echague" to the teachers of echague, Isabela with of course a coordination from the Cultural officer of the place and the LGU and DepEd like in my case after that they included it in their town fiesta celebration of the dance as their Street Dance every Mengal Festival of Echague. I documented the dance in 1994 all of a sudden in year 2016 they got my documented research and included as regular part of the Mengal festival until now. They also used Baile de bakal as contest piece for the whole depEd Echague during the same activity.
      - By strong linkages with external stakeholders like DepEd who partnered with PNU and RCTQ who worked on PPST and RPMS
        - rattan study was used for advertisement
        - RCTQ research
        - Thru a forum.
        - such as evaluation tool, literacy program or intervention program being tried out externally
          - Do not have enough knowledge if there is one
          - Have not heard about it.

- The TPACK in Philippine STEAN Education - part of this research is the development of Lesson Exemplars for STEAM teachers. These were used by the teachers as part of the training (component of research) and the experiences of the teachers were presented during the national forum (component of the research project)

- program intervention or enhancement
- using them as guide
- our self-initiated research regarding online training program or on tap the readiness of PNU Athletes to the new mode of training.

- Please refer to EPRDC for these data.
- policy making (PPST, etc); curricular reform and review, references for different education researches

- N/A
- Modules developed by graduate students are now used in DepED.
- I think this question is leading and is assuming that research outputs were already used by external stakeholders.

- I can't state an example. That's why my answer in one of the items related to this is neutral.

- I could not remember unfortunately. In our unit, this is something that I think is a weakness since in one accreditation scene, we were not able to provide a research which has been utilized for stakeholders.

- In aid of legislation and other government policies
- In the planning/preparation of the in-service trainings/seminars for Araling Panlipunan teachers in the DepEd Division of Cadiz City to develop and strengthen their PCK skills.

- The Needs Analysis made by the Extension Team of PNU North Luzon became the basis for a Literacy Program Implementation for the Agta Community in San Pablo Isabela

- policy making
- I am not so certain about this.
- Extension

- School utilization of evaluation instrument devised by a researcher
- NA
- They made it as basis in their planning.
- community extension
- BARMM profile research findings is presented to key stakeholders and utilized by the educ units in that area to improve pre-service learning opportunities.
  - The effectiveness of digital storytelling now is used in the teaching and learning process because it has proven very effective.
    - Creation of city rules and regulations regarding vandalism of public and private properties
      - Extension activity with research driven
      - Engagement is necessary for maintaining stakeholders involved. This means establishing long-term partnerships that are both helpful and productive.
        - Like DepEd teachers implementing training activities after it was found out that Grade 4 teachers were also not ready in transitioning students from K-3 under the MTB-MLE program.
          - PPST
          - Through online publication or stakeholders' fora.
          - Researches conducted by Dr. Marie Paz.
          - Research conducted by former Professor Loque on indigenous dances in Agusan del Sur where the Agusanons enjoy performing in schools and special occasions.
            - Conduct an outreach and extension program to the community
              - sexual harassment cases/ domestic violence researches can be used as data to strengthened policies of a certain institutions
                - In our campus, the extension office usually conducts needs analysis and based on the result of the needs assessment, programs are conducted such as the mother's literacy program.
                  - Based from our extension research activities, our stakeholders are helped enabling them to create some ways and means to augment their income especially the Women's Association in one of the Barangays near our school

- The Philippine Professional Standards for Teachers, a research output of the RCTQ is now being used by the Department of Education in establishing career plans/path for its teachers. This document that discusses what teachers should know, be able to do and value to achieve competence, improved student learning outcomes, and eventually quality education is being embraced by all basic education teachers in the public school system.

- gamitin sa komunidad
- mga manggagawang kababaihan sa mga factory, (health education on breast cancer)
  - These served as their basis for improvement or enhancement programs
  - No concrete knowledge of this
  - Not very much aware of a specific evidence
  - Thru Faculty Researchers
  - Livelihood project and capacity building
  - Sta Mesa Barangays
  - thru commercialization and utilization of outputs
  - The different learning strategies during pandemic that was published by the respondent was shared to the parents' beneficiaries of one extension program in our branch
  - Our research was used in the conceptualization of a computer literacy training design for barangay employees
    - Through technology transfer
    - No example
    - Systems design by computer science faculty are implemented in partner LGUs
    - None
    - The branch external research is presently conducting, no output yet
    - curriculum revisions, administrative policy-making
    - through research capability trainings for DEPED Teachers
    - thru Extension and publication
    - Honestly, I have no idea., since I was not able to do a research for the university., hopefully soon

- Honestly, I have no idea., since I was not able to do a research for the university., hopefully soon

- Human Resource Management System
- Research is a salient part of the growth of every university. It is not just internal stakeholders who can benefit from it but also external stakeholders which they are part of the society. After all, we are living in one world. Research makes it possible for us to unite.

- None
- External stakeholders like Government agencies used the research outputs. Researchers find problems in terms of salaries and other issues in their office and conduct a research to know why employees act in this way or that way. The head must know what are the needs of their employees to motivate them do their job effectively and efficiently.

- N/A
- In line with my specialization, when it comes to business research, customers or even business owners are example of external stakeholders. For customers to choose wisely products and service as well as for the company to come up with realistic and innovative business' strategies.

- Annette Boaz, Stephen Hanney, How to Engage Stakeholders in research: design principles to support improvement

- Give a face-to-face presentation of the findings
- None so far, I have a research output that can be utilized by the local government unit but due to my situation being a designee I don't have much time to focus on its utilization also I am just looking into timing because of political situation in my locality I need local legislators to back up/pursue the utilization of my research output and I am hoping this year it would be utilized.

- Applied and benefits stakeholder
- To reduce the reliance on private vehicle, use and move toward environmentally sound mobility solutions.

- Alumni
- N/A

- N/A
- The Capstone Project researches conducted by students are adapted by the stakeholders.
  - Halimbawa ay ang resulta ng pananaliksik sa mathematics. Parental involvement in teaching mathematics. Bilang bahagi ng dissemination, eto ay naging bhagi ng isang extension activity at naturuan ang mga mgulang ng tamang approaches sa pagtuturo ng matematika sa mga bata.
    - PPST of RCTQ
    - n/a
    - online tutorial this pandemic
    - New methods were applied during the following school sem
    - The stakeholders used the proposed project/research in their respective dept/ organization
      - have a direct client to cater their research.
      - Research of Prof. Redentor Janaban, A Multi-Function Mixer, used by a food processing entrepreneur in Cuenca, Batangas
        - Research output of Engineering Students that was used by a community in Dingalan, Aurora.
        - There are several research projects that were presented in the Local Government Unit such as Barangays, Municipalities. The University and the LGUs will come up with an agreement if the LGUs are interested with the research projects to them. Memorandum of Agreement (MOA)/ Memorandum of Understanding will be forged by both the University and beneficiaries/recipient, in agreement with the terms and conditions stated therein.
          - by practicing it in the community and monitoring of outputs
          - Shampoo bar with Conditioner training
          - Professionals in the Medical Field - Novel inventions and techniques in medical instrumentation
            - Utilization in the industry

3. Please provide one example of feedback from the external stakeholder community regarding the effectiveness of research outputs.

- If the output was released in the market
- Oral presentations
- N/A
- The PPST of RCTQ is based on research (or an example of a research output) and has been validated or pilot tested before its actual implementation. Another example would be the external stakeholders' consultation held by EPRDC to validate or polish the draft of the PNU research agenda framework. The comments of the external stakeholders were integrated to the draft of the PNU research agenda framework to improve or enrich it.

- Commendation from DepEd
- They were able to do and publish another action research articles after our first article were published in the Normal Lights

- During extension services
- Improve the teaching and learning process.
- On my limited experience, have not heard one yet.
- I am not sure with this; I think the feedback from the external stakeholder community is confidential only the researcher or the organizers can view the feedback tool.

- DepEd and some government agencies provided feedback on the implementation of the PPST

- Teachers are now getting their promotions using NCBTS
- I could not remember
- useful research findings /raised awareness
- This feedback may be gleaned from the publications citing PNU researchers
- The research is engaging and doable
- it's very helpful
- “Five, excellent. Doon po sa research na iyon involved talaga kami na kinder teacher at nagagamit po talaga namin.”
- some research outputs are not congruent with the societal needs

- I think the LGU of the PNUV locale used the program for the contextualized teacher enhancement programs of their city.
- One of the research articles of the TPACK-STEAM research project was commended by another researcher, via email to the editorial board where the said article was published. Likewise, most of the published research articles of the said project are now being cited by local and foreign researchers in the field of STEAM Education.
- In our Extension partner EDSES, they are very thankful to our shared CBAR results in Co-curricular Activities, on how we deal with the challenges met, in our different co-curricular activities in PNU-ITL even there is a pandemic.
  - The Research of Dr Ochave was mentioned by researcher.
  - The good feedback from one parent about the effectiveness of a research.
  - None that I remember.
  - N/A
  - Reactions from the teacher assessment standards utilized nationwide were collected which contained both positive and negative comments.
    - N/A
    - By applying the suggestions from the research in their community
    - not sure about this one
    - Relevant
    - There is one research done by reading experts in the university that is used by LCC to improve literacy education in the country
      - Results of deped teachers training with ppst
      - During extension programs, external stakeholder community expresses their gratitude for the insights and inspiration drawn from the sharing of research/study.
      - None.
      - By application of the research is one of the best feedbacks.
      - This research helps us to address the gaps.
      - -
      - N/A

- I have not heard of any feedback from the community about the effectiveness of the research outputs
  - I have no idea
  - I have no background about this.
  - During the research symposium where the outputs/results were showcased, community members were invited and they were eager to express how grateful they are for our institution and how the findings/products have helped their community.
    - Deped adheres to research study research yet decision is still in the hands of those in higher rank in the govt and decision to adapt is still influence by their own political agenda
      - Stakeholders from the University of the Philippines commended the research projects of PNU on language.
      - A research output is effective if the researcher can apply the solution to the existing research problem. The solution came from the research itself. For example, in identifying the conceptual fluency and procedural understanding of a grade 7 learners listened to a teacher made music (just its audio) instead of teaching the learner how to solve fractions in a traditional way. We discovered that learner have prior knowledge about solving fractions and some of them learned more if there is a teacher and student interaction. In here we can justify that learner learned more in conventional way of teaching.
        - They learned a lot from the researches and presentations by applying the concept to their daily living.
        - I do not have the copy of the clientele satisfaction forms but as far as I know, the external community stakeholder sees the research outputs as very effective, relevant, and timely.
          - Nakakatulong sa buhay nila
          - They are happy and wanted to do the activity again.
          - -

- The LGU under study of the CSIS uses the findings of the study to improve their services such one finding wherein there is low level of satisfaction on the educational initiatives and support of their local government on education. As a result, the said LGU passed the ordinance of creating the municipality scholarship programs wherein funds clearly emphasized and benefited hundreds of students in the municipality. Part of the capital outlay was also allotted for the construction of school buildings. The said LGU through STF allocates fund to proposed programs and projects of the different schools in the municipality.

- The outputs of such research became the basis of their extension projects.
- Strong feedback from the stakeholders were observed and great increase in globalized competencies of the students also observed.
- -
- It gives them awareness and sense of responsibility.
- Good
- Scientific and historical research articles contribute to the globe of knowledge in addition to ensuring a thorough understanding of a subject.
- I do not have personal knowledge of this one.
- I get comments from my students that they enjoy and understand the lesson after the implementation
- It is used for product development
- N/A
- Many students both from undergraduate and graduate studies aspires to be a PNUan because of its efficient quality and focus on research
- big help
- Lisqup
- they were very happy, because they can now initiate the development of their own GAD Code
- I don't know one
- see community extension technical report
- I don't have idea.

- adopting to the recommendation of the research output in relation to organizations OPCR.
- PNU research outputs were used to inform policy. This is a strong feedback of high quality research
  - Utilized already (dance steps) Naliyagan Festival
  - NONE THAT I KNOW.
  - The digital stories are very timely in the new normal.
  - The research output is very useful and doable.
  - They used the knowledge they learned for daily use in the field.
  - It responds to the community needs.
  - have no idea yet
  - Sample of feedback is "The survey helps identify concerns, issues or needs of clientele."
  - Students who used my modules found them very helpful in guiding them to do their research activities independently.
    - it was shown in the local TV
    - It provides a clear understanding of the phenomenon.
    - None that I could think of
    - The research output will help conserve and spread understanding of their culture which is need to attain peace among ethnic groups.
      - N/A
      - The research output was very much useful on their work.
      - The result guided the external stakeholders to sustain the conservation effort and continued upskilling their capability in sharing their experiences in mangrove conservation.
        - that research is useful most likely to the marginalized.
        - N/A
        - Very useful to the education curriculum program development.
        - Tough.PPST
        - PPST

- Timely and relevant to the teachers' needs
- they have adopted and improve their policies
- Positive verbal acknowledgement
- for further researches
- NA
- PPST was adopted by DepEd
- Citation from various stakeholders
- Adoption and institutionalization of research findings is the best form of positive feedback.

- references to those outputs
- I am relatively new in the university. I have no idea about this yet.
- None
- The dance will not die a natural death already because all the Yogads of Echague learned the steps most especially it is now part of the event during fiestas. According to the Yogads the dance is not only confined to the Barangays of Malitao ang Damming but now performed by everybody in the Municipality of Echague, Isabela The Yogad Country as they call it.

- The adoption of the research output on DepEd teachers is a proof of the research effectiveness.

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- very nice
- DepEd and NEAP recognizing research inputs of PNU-RCTQ and other researchers in the university

- Served as justification.
- by utilizing the research output
- no assessment done
- Have not heard about it
- through attendance and participation to conferences; or when the research output is cited

- Research outputs are very significant

- not easy to implement
- it is safer to train at home and we are still monitored by our parents.
- Please refer to EPRDC for these data.
- the PPST is used by the DepEd
- N/A
- None that I know of.
- I could not remember as I really have no part generally in researching.

Mentoring is not a thing in the unit.

- Additional funding for education related projects in the university
  - Very significant and timely findings which was used in the planning/preparation of the in-service trainings/seminars for the AP teachers in the whole DepEd Division of Cadiz City.
- the given example above is a project that just started so the effectiveness has not been measured yet
- addressing the needs for improvement
  - No experience yet.
  - Stakeholders improved their skills and knowledge
  - Effective
  - NA
  - More engagement from their participants
  - Evaluation
  - Feedback on which skill can be integrated better in the subjects and which would require more trainings for teachers to be able to integrate it in their subjects as in the case of the Transversal Skills research
  - Because of the current situation Digital storytelling now is being used by most of the teachers.
  - Chief of police urges city administrators to adapt proposed rules and policies regarding juvenile actions
  - Open forum
  - When research output feedback meets or exceeds the expectations of the stakeholder community, it is considered a success.

- Helpful in providing information database in the implementation of the MTB-MLE
- No idea
- Undergraduate students are given opportunities to join Research outputs of fellow students, masteral/doctoral students, and faculty members. Thus, they can give feedback and share their take away.
  - not so sure
  - An appreciation coming from the Manobo tribe leaders and office of province of Agusan del Sur.
    - Not so far experienced on my part. However, those who experienced it received positive feedbacks
      - their situations had been recognized and thus hoping for a better life
      - As an offshoot of a research, PNU NL has Mother's Literacy Program and stakeholders are thankful since it has helped them in working with their children especially nowadays where parents assist their children in their modules.
        - They expressed their joys and gratitude because based from our research and assistance they have now their means of livelihood and made their lives busy for this income generating endeavors of women.
        - The PPST document mentioned in #2 above is now the basis of Teachers' Individual Performance Commitment Review Form indicators. This is a clear manifestation that the country's Department of Education found the RCTQ research output, PPST in this case, as useful and meaningful in their context.
          - nagagamit nila ang mga modelo sa pagsasagawa ng kagamitang panturo at pagtataya ng kurikulum
          - statistics or census ng nagkaroon ng positibong pakinabang matapos gamitin ang programang producto ng research
          - They are grateful and hoping that the output brings their organization a possible change
          - No concrete knowledge of this
          - it has great effect with the situation we are facing to.
          - Not very much aware of specific evidence

- Excellent
- Provide necessary training.
- Useful
- when the research product (food) became an instrument of livelihood generation in the community
  - There are several researchers asking for the copy of the various instrument utilized for a replication
    - Being able to learn effectively during the extension program
    - Through appreciation letters and/or impact assessment
    - No information
    - No information
    - Highly beneficial Highly beneficial
    - None
    - Branch external research is ongoing.
    - n/a
    - It has helped them produce, present, and publish their research outputs as well as implement them in their own schools/classrooms.
      - N/A
      - I have no experience yet, since this is not the forte of my work.
      - The system is very accessible and reliable
      - Research outputs are the product of every successful ideas. In addition to that, more research like this should be taken in consideration for the benefit of not just an individual but many.
        - None
        - They had a chance to know other issues that they didn't notice. Once they prove that the research output is effective, and then the university will gain trust and may become partnership of those external stakeholders.
        - N/A

- Interconnected with my answer in question number 2. One example of feedback from external stakeholders' business owners can generate better income. Additionally, business enthusiast can adopt these references from researches for them to start effectively in their endeavors.

- Willingness to help
- During the research process when they try the system, they find it useful.
- None
- Very timely.
- Relevant
- N/A
- N/A
- The capstone project researcher provided them easier transaction.
- Nkatulong s aknila para mas maturuan pa nila ng maayos ang knilang anak.nangangahulugan na epektibo ang knilang pnnaliksik at nagamit nila eto sa kanilang extension activity.

- DepEd on the PPST Results
- N/A
- good decision making
- With comments and suggestions
- Completely collaboration with the researchers/ university
- Relevant and timely
- Enlarging the capacity of the Multi-function Mixer.
- The stakeholders from dingalan were satisfied with the performance of the technology that was provided to them
  - "up to now, the prototype (Camote Crops Tiller) is utilized by our farmers and we hope that you can come with another research projects that will help our farmers. The prototype was a big help for us."
- Through ordinances in the brgy, or community then presented it to the local government unit for policy making. Example ordinances related to solid waste management,

- Good evaluation in the training output
- N/A
- When the community can put up a startup company



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