



## Research Article

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Received: 24 February 2022 / Accepted: 6 April 2022 / Published: 5 May 2022

# Driving Change: Guidelines for Developing Graduate Programs to Meet High International Standards

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DOI: <https://doi.org/10.36941/jesr-2022-0070>

## Abstract

*This study has contributed to the changes in Chulalongkorn University's graduate program management policy. It investigated the external and internal educational environments of Chulalongkorn University. The findings were used to help Chulalongkorn University's Graduate School in formulating policies and guidelines to develop graduate programs that meet high international standards and balance revenue and student publications. Information was obtained from the official websites of the world's 15 leading universities, and 8 graduates or current students were interviewed. Chulalongkorn University's external educational environment was related to the following aspects: (1) program structures, (2) graduation requirements, and (3) program strategies. The internal factors hindering the development of Chulalongkorn University's graduate programs were as follows: (1) seniority system and faculty possessing long-held stature, (2) relatively limited collaboration with other agencies, (3) failure of the content and nature of master's programs to address business and industry requirements, and (4) emphasis on the scale of a project but failure to focus on the critical thinking process. Four recommendations for the executive board of the Graduate School were suggested.*

**Keywords:** *guidelines for developing graduate programs, program development, comparative study, Thailand, higher education, external and internal educational environment*

## 1. Introduction

Universities make relatively low modifications to graduate programs, and thus, they fail to meet labor market requirements (Pucciarelli & Kaplan, 2016). Therefore, graduating students' competence may not match the demands of the labor market. Furthermore, the number of students enrolled in graduate studies continues to decline. Universities must adapt to the current situation of the labor market to survive. Developing policies and strategic approaches are crucial for driving change (Gibbs

& Murphy, 2009). Hence, Chulalongkorn University aspires to preserve its status as Thailand's top university and improve its international rankings while attempting to increase income to secure its survival. According to the National Qualifications framework for Higher Education in Thailand (Thailand NQF; Graduate Program Criteria, 2015), to dictate the structure and credits required for all postgraduate programs, three types of master's degrees are available: A1, A2, and B. All master's programs must have at least 36 credits in total. A1-type master's degree is a research-only program, and students must complete at least 36 thesis credits without any requirement of attending taught courses. A2-type master's degree is a combination of taught courses and a thesis; thus, students must complete at least 12 coursework and 12 thesis credits, with at least 36 credits in total. A1- and A2-type master's programs require students to publish at least one paper or proceedings in a national or international scholarly journal approved by the Thai Higher Education Commission. B-type master's program requires a total of at least 36 credits, taught courses, and independent study combined. At least three but no more than six credits should be earned by independent study, with the remaining credits acquired from taught courses. However, for B-type master's programs, Thailand NQF (Graduate Program Criteria, 2015) states that an independent study has to be accessible to the public. Therefore, Thailand NQF (Graduate Program Criteria, 2015) permits Chulalongkorn University to offer B-type master's programs. Such programs will enroll more students, thereby attracting more revenue to the university. However, the academic board of Chulalongkorn University is reluctant to endorse such an idea. The primary concern is that offering B-type master's programs will reduce the quality and quantity of publications, particularly in the sciences—such as chemistry, biology, and physics—and health science as students are not required to publish their findings. Therefore, the present study was commissioned by Chulalongkorn University's Graduate School to understand the type of graduate programs offered by the world's leading universities and how Chulalongkorn University can balance revenue and increase the number of student publications.

## 2. Literature Review

The first step in improving a higher education institution's graduate programs to meet the high international standard is studying the internal and external educational environments of the institution (Khan & Law, 2015). The internal environment comprises the culture, operations, people, strategies, and structures of the institution (Khan & Law, 2015). The external environment comprises the education sector and general educational environment (Khan & Law, 2015). This study employed a benchmarking method, a process assisting in the search for the best practices and improved performance. To evaluate the external environment (Tee, 2016), this study applied bureaucratic benchmarking that utilizes only text-based information to provide reference points for comparison (Jackson, 2001).

This study investigated 15 of the world's leading 60 universities ranked by the QS World University Rankings (Years 2021 and 2022) (QS Topuniversities, 2021) and Times Higher Education (THE) World University Rankings (Years 2021 and 2022) (THE World University Rankings, 2021). The QS World University Rankings applies six metrics (Staff Writer, 2021), namely, academic reputation (40%), employer reputation (10%), faculty/student ratio (20%), citation per faculty member (20%), international faculty ratio (5%), and international student ratio (5%) to evaluate and rank 1,000 universities worldwide. THE World University Rankings considers five aspects (Elsevier, 2021), namely, teaching (the learning environment) (30%), research (volume, income, and reputation) (30%), citations (research influence) (30%), international outlook (staff, students, and research) (7.5%), and industry income (knowledge transfer) (2.5%), as indicators to rank more than 1,500 institutions worldwide. Publications and citations data used by both ranking systems are from the Elsevier's Scopus database.

Governments, employers, and the economy expect universities to inculcate the right set of skills in students to meet labor market requirements and manage complex problems related to modern tasks (Millar, 2016). One of the most difficult skills to develop is critical thinking, which can address

these demands. Graduate programs, particularly doctoral programs, by its very nature can promote the development of critical thinking. There are six core critical skills, namely, interpretation, analysis, inference, evaluation, explanation, and self-regulation (Facione, 1998, as cited in Smith, 2015), which are similar to skills acquired in the research process (Smith, 2015). Smith (2015), who has mentored more than 50 students as a dissertation supervisor, suggested some powerful techniques for developing doctoral students' critical thinking abilities, such as reflection, action research, and action learning. The author concluded that critical thinking is an integral component of earning a doctorate degree and that supervisors are crucial in developing critical thinking in doctoral students (Smith, 2015). However, the Thai seniority system is based on various factors, namely, superior age, position ranking, experience, nobility, educational level, knowledge/ability, economic status, patronage, power, and years of organizational service (Wiriyaipinit, 2016). The seniority system in organizations in Thailand was found to be superiority, passive employee, and demotivation oriented. Consequently, any meaningful adjustments in an organization are difficult with such a system (Wiriyaipinit, 2016).

Scholars feel that interdisciplinary subjects and curricula can help find a solution to complicated problems. Jacob (1989, as cited in Jaimie & Karr-Kidwell, 2000) defined an interdisciplinary curriculum as a holistic approach that links the disciplines by emphasizing relationships and connections. Interdisciplinarity can be considered as a tool for equipping students with knowledge and methods from various disciplines. A study on the adoption of interdisciplinary research skills suggested that these abilities can better equip students who may become future managers with in-depth information to assist them in handling organizational challenges in a globalized business environment (Chitakunye & Takhar-Lail, 2015). Therefore, an interdisciplinary curriculum prepares graduates for the real world of business and life (Millar, 2016).

Collaboration is an activity wherein two or more groups or individuals combine their resources to work collaboratively to achieve common educational objectives (Hohmann, 1985, as cited in Hyams, 2000). Collaboration in a university setting, in general, can support the identification of better approaches of conducting operations, empowering efficient staff, promoting the university's image, and achieving its long-term goals (Hyams, 2000). University-industry collaborations can take different forms, such as joint research, contract research, and consulting (Abbasnejad et al., 2011). The agreement between partners to collaborate might take the form of financial support or access to resources or data for a research project (Perkmann et al., 2013). Both universities and businesses benefit from such a partnership. For a university, a relationship with the industry can generate revenue (Cunningham & Link, 2015) and help in the acquisition of new ideas (Perkmann et al., 2013). On the business side, a university partner can provide new ideas, resolve problems (Perkmann et al., 2013), and act as a source of innovation and economic development (Abbasnejad et al., 2011). This type of collaboration drives economic growth and development of a country (Cunningham & Link, 2015).

### **3. Methodology**

This study primarily studies Chulalongkorn University's external educational environment to examine its internal educational environments.

The research methodology comprised two types of data collection: documents and interviews (Creswell, 2009). First, to analyze the external educational environment, researchers gathered information regarding the structure of graduate programs from official websites of the 15 selected world-leading universities; these are available as public documents. Second, 8 participants (alumni or current students) were interviewed and questioned regarding their experiences abroad at those 15 universities. The interview questions were based on information obtained from websites for which the researchers required more detail and explanation, such as in terms of publication and interdisciplinary and collaboration matters. Furthermore, to analyze the internal educational environment, researchers sought the opinion of participants affiliated to the Chulalongkorn University in a certain manner concerning internal factors hindering the development of

Chulalongkorn University's graduate programs.

### 3.1 *Selected Sites and Participants*

The Graduate School Executive Committee established the following criteria to select the websites. The researchers investigated the master's and doctoral programs of 15 universities among the top 60 in both the QS World University Rankings (Years 2021 and 2022) and THE World University Rankings (Years 2021 and 2022). The selected 15 universities included 5 located in North America, 5 in Europe, 4 in Asia, and 1 in Oceania. The details of the master's and doctoral programs of these universities are available in English on their official websites. In total, 56 universities were commonly present in the list of the top 60 universities. Based on the aforementioned criteria, the present study examined information from the following universities' websites: Massachusetts Institute of Technology (MIT) (the United States [U.S.]) (n.d.), Harvard University (the U.S.) (2020), the University of Pennsylvania (UPenn) (the U.S.) (n.d.), University of Toronto (Canada) (n.d.), and the University of British Columbia (Canada) (n.d.) in North America; the University of Oxford (the United Kingdom [U.K.]) (2021), University College London (UCL) (the U.K.) (2021), Imperial College London (the U.K.) (n.d.), the University of Edinburgh (the U.K.) (n.d.), and ETH Zurich (Switzerland) (n.d.) in Europe; National University of Singapore (n.d.), the University of Hong Kong (HKU) (n.d.) (Hong Kong, China), the Chinese University of Hong Kong (CUHK) (Hong Kong, China) (2021), and Tsinghua University (China) (n.d.) in Asia; and the University of Sydney (Australia) (n.d.) in Oceania.

For the purpose of recruiting participants for the interviews, researchers set three criteria: participants who were (1) the alumni or current students at one of the 15 selected universities, (2) expected to graduate with a master's or doctoral degree within 5 years, and (3) affiliated with Chulalongkorn University in some manner, such as being an alumnus or a lecturer. Eight participants with ties to eight different universities agreed to participate: Participant 1 was an alumnus of UCL, Participant 2 was a current student at Tsinghua University, Participant 3 was an alumnus of HKU, Participant 4 was an alumnus of the UPenn, Participant 5 was an alumnus of MIT, Participant 6 was an alumnus of Harvard University, Participant 7 was an alumnus of the University of Oxford, and Participant 8 was an alumnus of the CUHK. Participants 1 and 2 were the alumni of Chulalongkorn University, whereas Participants 3, 4, 5, 6, 7, and 8 were lecturers.

### 3.2 *Human Subject Protection*

To protect the participants' rights, researchers obtained ethical approval from the Chulalongkorn University Ethics Committee before conducting the study and adhered to the ethical principles. The participants who met the aforementioned criteria were identified. The researchers telephoned potential participants to explain the study objectives and asked if they were willing to be interviewed via Zoom, a video-teleconferencing software. The researchers then requested the participants to sign consent forms, made an appointment with each participant, and asked their permission to record interview conversations. The interviews were conducted only via audio. Neither the researcher nor the participants used the Zoom video function during the interviews.

### 3.3 *Data Collection*

The researchers created a table listing the predetermined codes with the corresponding data from each program (Creswell, 2009) to collect data from university websites. The record table comprised the name of the program, study period, program structure (coursework only and coursework and thesis), coursework (content course only, research methodology course only, content and research methodology course, and no coursework), credits required for graduation, required published research papers for graduation, and admission requirements. After filling in the data obtained from the websites, researchers added another column to the table termed "Remarks" to include any

interesting information that did not fit other predetermined codes.

The researchers employed three procedures, namely, triangulation, peer debriefing, and a group of external auditors (Creswell, 2009) to confirm the findings. Moreover, for data triangulation, researchers utilized multiple sources of data by employing two types of data collection procedures: documents and interviews (Merriam, 1998). The Graduate School Executive Committee acted as peer debriefers who reviewed and asked questions regarding the study and provided researchers with an opportunity to improve the research process (Creswell, 2009). Additionally, the Chulalongkorn University Academic Advisory Board acted as an external auditor (Creswell, 2009). The advisory board provided an assessment of the project submitted by the researchers (Creswell, 2009).

### 3.4 Data Analysis

The data collection stage involved an analysis of the data obtained from 15 leading universities' official websites. The researchers entered the data from each program into the prepared tables. The interviews with eight alumni or current students of selected universities were transcribed into Word documents by the researchers. The researchers examined and decoded the data to make general sense of the information (Creswell, 2009). Predetermined and emerging codes were grouped to form categories; major categories were compared and then compiled. Finally, themes were generated.

For the semistructured interview with Chulalongkorn University alumni and lecturers, researchers transcribed the interview conversation from the audio files into Word documents. In the next step, researchers read through the texts multiple times to obtain an understanding of the information and took notes. Later, codes were developed to match the text and similar coded data were classified into categories. The researchers compared and connected all categories in multiple ways and then progressed toward a thematic analysis (Saldana, 2016).

## 4. Results and Discussion

The first part of this section presents findings related to the examination of Chulalongkorn University's external educational environment, while the second part details Chulalongkorn University's internal educational environment.

### *Objective 1: External Educational Environment*

The results derived from analyzing Chulalongkorn University's external educational environment were related to the following aspects: (1) program structures, (2) graduation requirements, (3) program strategies.

#### *1. Program Structures*

We classified program structures of the 15 leading universities into 2 categories: (1.1) the structure of the master's programs and (1.2) the structure of the doctoral programs.

##### *Structure of the Master's Program*

Researchers classified the master's programs into two primary categories: (1.1.1) master's programs aimed at professional development or taught master's programs and (1.1.2) master's programs that are a prerequisite for doctoral programs or postgraduate research programs.

##### *Master's Degrees Aimed at Professional Development or Taught Master's Programs*

Researchers categorized the features of master's programs aimed at professional development or taught master's programs into four types: (1) master's degree with courses in the major field only, (2) master's degree with courses in the major field in combination with an internship, (3) master's degree with courses in the major field in combination with a research project, and (4) master's degree with courses in the major field, including one on research methodology and a requirement of a research project. Types (3) and (4) are similar to the B-type master's program in Thailand NQF (Graduate Program Criteria, 2015).

##### *Master's Degrees as a Prerequisite for Doctoral Programs or Graduate Research Programs*

Researchers categorized the features of master's programs that are a prerequisite for doctoral

degrees into three primary types: (1) thesis/dissertation only, (2) master's degree with coursework in the major field and the requirement of a thesis/dissertation, and (3) master's degree with coursework in the major field, research methodology courses, an internship, a research project, and a thesis/dissertation. The first type (thesis/dissertation only) is similar to the A1 type in Thailand NQF (Graduate Program Criteria, 2015).

#### *Structure of the Doctoral Program*

Doctoral programs can be classified into three types: (1) thesis only; (2) academic discipline, the subject of research methodology, and thesis; and (3) the subject of research methodology and thesis. Types 1 and 3 are similar to A1-type programs in Thailand NQF (Graduate Program Criteria, 2015). Type 2 is similar to the A2-type program in Thailand NQF (Graduate Program Criteria, 2015).

#### *2. Graduation Requirements*

The examination of the official websites of the 15 leading universities revealed that at the master's level, the study duration ranged from nine months to three years. Therefore, the average duration of study for a master's degree is 1.5–2 years. Most universities do not require publications to graduate, except for UPenn (n.d.) in the fields of medicine and science, and Tsinghua University (n.d.), which specifies publication as a graduation requirement.

Participant 7 stated, "At Oxford University, the master's thesis is limited to 8,000 words, which is very short." Participant 7 added, "There is no requirement to be published for graduation." Participant 1, a UCL alumnus, explained, "A word limit in thesis writing allows students to estimate the size of the work."

The duration of doctoral programs ranged from 3 to 8 years; therefore, the average duration was 4–5 years. Most universities required publications for students to graduate, except for the universities in the U.K., Singapore, and Hong Kong. It was determined from the interviews that, although universities in the U.K. and Hong Kong do not require students to publish research papers, the demand for publication may come in other formats; for instance, it may be required to support the qualifying examination, may be an agreement between students and their supervisors, or may be a requirement of a scholarship.

Six participants acknowledged that the development of critical thinking was a priority to pursue Ph.D. at their universities, which is consistent with Smith's (2015) finding that critical thinking is an integral component of earning a doctorate degree. Participant 3 asserted, "What I get from doing research on my Ph.D. is to practice critical thinking such as information filtering skills and logic."

#### *3. Program Strategies*

Data from the official websites of the 15 leading universities suggest that almost all universities design their master's and doctoral programs to be interdisciplinary, thus encouraging collaboration with various organizations. Data from ETH Zurich's official website (2021) indicate that the university designed the graduate program to be interdisciplinary and in collaboration with the private sector. Interdisciplinary collaborative work promotes holistic thinking. Imperial College London (2021) expects graduates to be able to demonstrate a deep conceptual understanding of the field and work across disciplines. The HKU (n.d.) recognizes the importance of interdisciplinarity and aims to invest in interdisciplinary programs in course development where interdisciplinary and multidisciplinary activities can occur. Furthermore, the university expects graduate students to demonstrate the ability to link ideas between disciplines and industry. A key strategy employed by the CUHK (2021) is to promote the crossing of knowledge boundaries (interdisciplinarity).

The interview data from current students and alumni further support that most master's and doctoral programs concentrate on interdisciplinarity and collaboration. Participant 5, from MIT, stated, "I studied biochemistry, which was interdisciplinary between biology and chemistry." Participant 7 stated, "The most interesting part of the program I am studying at the University of Oxford is that I can combine the knowledge of many disciplines to answer the biology questions I am interested in." Participant 3, from HKU, said, "My research team integrates computer science and technology to help solve architecture problems. Moreover, my university collaborates with Tsinghua University, UCL, and other universities around the world." Participant 5 stated, "MIT has a



connection with Harvard University and other famous hospitals. When there is a connection like this; students can also participate in research with these agencies and can request personnel in such departments to become supervisors." Participant 1 stated, "At the time I did my Ph.D. at UCL, my supervisor had connections with various outside organizations."

In conclusion, the 4 considerable issues that Chulalongkorn University learned from the official websites of 15 world's leading universities and interviews with 8 participants are as follows. First, most leading universities offer taught master's degree programs for people in the business and industry sectors who wish to improve and gain current knowledge. Second, as the master's program is a 2-year course, students have limited time to conduct research; hence, most universities do not require publications to graduate. Third, doctoral studies at world's leading universities focus on enhancing students' critical thinking skills. Ultimately, collaboration between agencies both inside and outside the university and interdisciplinarity are current trends that almost all leading universities want to promote.

#### *Objective 2: Internal Factors*

The second objective is to seek the participants' opinion regarding internal factors hindering the development of Chulalongkorn University's master's and doctoral programs. The findings were classified into four themes: (1) seniority system and faculty possessing long-held stature, (2) relatively limited collaboration with other agencies, (3) failure of the content and nature of the master's programs to meet the needs of the business and industry, and (4) emphasis on the scale of a project but failure to pay attention to the critical thinking process.

##### *1. Seniority System and Faculty Possessing Long-Held Stature*

Some Chulalongkorn University lecturers and alumni mentioned problems related to the seniority system among lecturers, which confirmed Wiriyapinit's (2016) findings that a seniority system in an organization can have a negative impact. Moreover, a seniority system can make any type of change difficult.

Participant 1 commented, "I heard from my supervisor that change in the structure of the curriculum and course content was controlled by the senior professors, who may not keep up with the industry, so the course was not developed." Participant 4 stated, "Professors who graduated a long time ago are reluctant to step out of their comfort zone and hesitate to try something new because they do not want to take a risk."

Participant 1 further commented that the faculty showed a lack of enthusiasm for developing programs that meet the requirements of the workforce. Participant 1 stated, "Our lecturers or the faculty are proud that we are the number one university in the country. Therefore, we can recruit high-quality students. We are still living with their [faculty members'] long-held stature. This type of perception does not encourage people to develop an excellent program that meets the needs of industry."

##### *2. Relatively Limited Collaboration With Other Agencies*

An analysis of the information from the official websites of the 15 selected leading universities revealed that almost all universities promote graduate-level interdisciplinary programs and research. They believe that interdisciplinary research can address complicated problems of the current world (Jacob, 1989, as cited in Jaimie & Karr-Kidwell, 2000). Collaboration between organizations inside and outside universities is required to establish multidisciplinary programs. However, Chulalongkorn University's graduate-level interdisciplinary programs and research and collaboration between agencies both inside and outside the university remain limited. According to the interviews, factors hindering interdisciplinarity and collaboration are characteristic of Thai professors' perception of their status and complicated systems.

Participant 5 commented on the characteristics of Thai professors: "Thai university professors have some egotism and independence. They thought that the fields and departments they were affiliated with were their zones. They did not want anyone to come in and they would not cross the zone."

Participant 5 also noted the complicated system of appointing thesis supervisors from other

departments: "There is a complex system and time spent on appointing supervisors from different faculties or departments." The appointing matter must be submitted to the course committee for consideration, which was approximately two months. After passing, the application must be submitted to the Graduate School for approval, which takes two to three months.

Participant 8 mentioned the complex process of approving a thesis proposal, which inhibits interdisciplinary research: "The system of approving a thesis makes it impossible to do interdisciplinary research. First, the thesis proposal is approved by a group of senior professors in the division to make sure that the topic and content of the thesis are in the specific field. Next, there is a meeting in which representatives of each department ensure that the content of the thesis does not overlap with their field of responsibility. If this committee does not approve the proposal, the students have to amend the proposal until the board is satisfied. If there is still a system like this, interdisciplinary research will not occur."

### 3. *Failure of the Content and Nature of the Master's Programs to Meet the Business and Industry Needs*

Almost all world's leading universities collaborate with industry, implying that universities strive to deliver courses that fit the demands of the labor market. However, some participants, such as Participants 6 and 1, commented that the content of master's courses at Chulalongkorn University does not address the industry needs.

Participant 6 stated, "I remarked to some professors that the content of master's courses at Chulalongkorn University was not updated and did not meet the industry's requirements. In addition, it is extremely difficult to appoint persons from the business or industry sectors as external examiners because Chulalongkorn University requires external examiners to have a certain number of publications in academic journals. Normally, business leaders or experts in the field who are not in academic circles do not qualify in this aspect. To appoint persons from the business or industry sectors, the department needs to send an appointment request to the faculty, then to the Graduate School and the university council for approval. It is lengthy, and many times the university council rejects appointing these people. How can we promote a degree if we cannot even invite business leaders, who have firsthand experience in what they are doing, as external examiners? We live in a bubble of academia."

Furthermore, master's-level research courses at Chulalongkorn University do not meet the demands of professionals who seek to improve their knowledge beyond the boundaries of an undergraduate degree. Participant 3 stated, "A lot of my friends who work in industry are looking for master's courses that help increase and expand their knowledge. They do not want to do research. However, there is no such course at Chulalongkorn University. So, they decided to study at other universities."

### 4. *Emphasis on the Scale of a Project But Failure to Pay Attention to the Critical Thinking Process*

Many participants confirmed that fostering critical thinking skills is quintessential for graduate studies (Smith, 2005). Some participants complained that a few master's and doctoral degree supervisors at Chulalongkorn University are more concerned with project scale than with improving students' critical thinking.

Participant 7 stated, "Some supervisors prefer students performing big projects but are not interested in enriching critical thinking abilities that arise from conducting research."

## 5. **Recommendations for Chulalongkorn University's Graduate School Executive Board**

Based on the results from analyzing Chulalongkorn University's external and internal educational environment, four recommendations for the executive board of the Graduate School are suggested. The executive board should consider (1) promoting a clear policy that encourages collaboration between agencies both inside and outside the university, (2) empowering new-generation lecturers,



(3) encouraging thesis and dissertation supervisors to focus on enhancing students' critical thinking skills, and (4) developing taught courses at the master's level as an alternative for those who want to increase their knowledge.

1. *Promote a Clear Policy That Encourages Collaboration Between Academic and Business Agencies Both Inside and Outside the University*

From the aforementioned findings, interdisciplinarity is a global trend that almost all leading universities want to promote. Collaboration between agencies both inside and outside the university is the starting point for interdisciplinary programs and research. This type of research leads to solutions to complicated problems in the industry, business, and the society (Chitakunye & Takhar-Lail, 2015). Furthermore, it can result in quality research papers published in high-ranking international academic journals that meet the standards of renowned world universities. Such types of papers could boost Chulalongkorn University's standings in international rankings. Therefore, the executive board of the Graduate School should invest in interdisciplinary programs in course development. The course content should meet the requirements of the labor market. A policy for promoting interdisciplinary programs and research should be communicated to the faculties and departments responsible for graduate programs. The executive board of the Graduate School should eliminate barriers to interdisciplinary emergence by changing the approval system for thesis proposals and increasing the decision-making power regarding the thesis proposal in favor of students' supervisors. Graduate school administrators should shorten the process and time period for appointing joint supervisors from different faculties or departments.

Collaboration between universities and the industry can help the country's economy grow and thrive (Cunningham & Link, 2015), and both the entities benefit from this collaboration. However, collaboration between Chulalongkorn University and industries remains relatively limited. Therefore, the university must formulate policies to expand its cooperation with the industry. Such collaborations happen at organizational and individual levels. At the individual level, this would be an excellent place to start. The university council should set clear criteria for individuals from the business or industry sectors who can be appointed as external examiners. In this manner, supervisors can determine whom they can invite as external examiners.

2. *Empower New-Generation Lecturers*

Chulalongkorn University employs a large number of new-generation lecturers who have graduated from the world's top institutions in the U.S., Europe, and Asia. They are smart and enthusiastic and have a broad perspective and updated awareness of the industrial world's demands. Chulalongkorn University should not allow the university's seniority structure to make them complacent and demotivated (Wiriapinit, 2016). Rather, the university should leverage individuals' capacity. The university should empower new-generation lecturers to play a crucial role in curriculum development. Based on their knowledge and experience gained abroad at the world's leading universities, it is believed that they can develop curricula that meet the business and industry requirements. Moreover, through their professional relationships, they can ask their former supervisors and other lecturers from these universities for their opinion on Chulalongkorn University curricula.

3. *Encourage Thesis and Dissertation Supervisors to Focus on Developing Students' Critical Thinking Skills*

Many participants who studied at the 15 leading universities stated that their doctoral studies focused on enhancing students' critical thinking skills. However, some participants expressed the opinion that certain thesis supervisors at Chulalongkorn University only concentrate on the scale of projects instead of improving students' critical thinking abilities. A doctoral degree is the highest level of academic qualification; therefore, its primary focus should be the enhancement of students' critical thinking abilities (Smith, 2015). Doctoral degree supervisors play a crucial role in developing students' research thinking process, which in turn leads to the development of critical thinking (Smith, 2015). Therefore, thesis supervisors should be equipped with concepts and techniques for developing students' critical thinking. The Graduate School should formulate a policy that

emphasizes enhancing students' critical abilities. It should bring in specialists in critical thinking development for Ph.D. students to educate and instruct Chulalongkorn University's thesis supervisors, as well as offer them specialized methodologies (Smith, 2015).

#### 4. *Develop Taught Courses at the Master's Level as an Alternative For Those Who Want to Increase Their Knowledge*

Similar to all the leading universities, Chulalongkorn University should offer taught master's degree programs. Personnel in the business and industry sectors who wish to improve and gain current knowledge might benefit from such programs. As the master's program is a 2-year course, students have limited time to conduct research.

Therefore, outstanding data are not acquired from performing a research project under such time constraints. A master's program should not have a mandatory publication criterion for graduation as most papers cannot be published in international journals. Therefore, they do not meet the ranking criteria of both the QS World University Rankings and World University Rankings. Such programs can help the university expand its target groups to include individuals who desire to enhance their knowledge but are uninterested in conducting research. The benefit of this type of program is that the university can increase the number of people enrolled in graduate studies and gain more revenue.

## 6. Conclusion

This external educational environment study used text-based information from 15 of the world's leading universities' official websites and interviewed 8 alumni or current students from these universities, which helped researchers in articulating optimal recommendations. Internal deterring factors that should be addressed were captured via semistructured interviews with Chulalongkorn University alumni or lecturers. The findings obtained from evaluating the external and internal educational environments can assist the Chulalongkorn University Graduate School in formulating policies that dictate how to deliver high-quality postgraduate programs that respond to the university's strategy and labor market requirements.

## 7. Acknowledgments

The authors acknowledge the support of grants from Chulalongkorn University's Graduate School. We would like to express our appreciation to the Graduate School Executive Committee, the Chulalongkorn University Academic Advisory Board, Professor Dr. Parichat Satapitanon, Associate Professor Dr. Thumnoon Nhujak, and Assistant Professor Dr. Yotsawee Saifah for their valuable opinion that provided us an opportunity to improve the research process. We would like to thank all participants who participated in the study.

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