

Implementing Conditions of Hybrid Teaching and Learning Environment in Cambodian Higher Education before and during COVID-19

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Abstract

Cambodian Higher Education (HE) has relied on conventional teaching and learning approach; however, this was disrupted by the closure of Higher Education Institutions (HEI) in 2020 due to the COVID-19 pandemic and the move to online learning. This has resulted in significant changes to HE in Cambodia. Therefore, this article aims to explore the implementation conditions of a Hybrid Teaching and Learning Environment (HTLE) in Cambodian Higher Education and analyze the changes related to the situation created by the COVID-19 crisis.

The reader is first introduced to an understanding of higher education in Cambodia today. This justifies the problem of the research. The theoretical framework defines HTLE and proposes a model for the systemic analysis of the implementation of innovations in HE. Then, the research questions and objectives are detailed as well as the method.

There were 20 Cambodian lecturers from 6 higher education institutions participating in this research using online semi-structured interviews from June to September 2020. To identify the HTLE learning design, it adopted the questionnaire from the European research project HY-SUP. A categorical analysis was applied to teachers' discourses.

Results discussed in the light of the systemic model indicated that the main implementation conditions were related to lecturers' characteristics, such as technological knowledge, engagement, openness to innovation, and self-confidence in HTLE. However, they received less support or no support from their institutions. The COVID-19 crisis appears to be an event that favors the deployment of HTLE for them.

Keywords

Hybrid Teaching and Learning environment, Blended Teaching and Learning, Distance Education, Online learning, innovation, COVID-19

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1 Overview of Cambodian Higher Education Institutions

Higher education institutions known in Cambodia were established in the 1940s and were considered the glory years of education in the 1960s (Mak, 2015). However, the civil war during the 1970s widely dismantled educational infrastructure, including systems, facilities, and human resources across the country (Ayres, 2000). Ayres (2000), in his book *Anatomy of a Crisis: Education, Development, and the State in Cambodia 1953–1998*, describes how “75 percent of teachers, 96 percent of higher education students, and 67 percent of primary and secondary school-age pupils were murdered by the Khmer Rouge” (p. 126). Schools and universities were used as prisons and brutal torture sites instead of educating people. The war was to last from 1975 to 1979.

In 1979, at the end of the civil war, the rehabilitation of higher education started. However, the chronic shortfalls of technicians and leaders in economics, politics, and culture proved a considerable concern for the new regime. Noticeably, at this time, education was also used to promote socialism. The Central Committee of KPRP (Khmer People’s Revolutionary Party) argued that “the main objective of higher education and technical education is to provide good political training and good technical training. Good political training should be concerned with serving and protecting the nation leading to the socialist way and following the objectives of socialism” (Ayres, 2000, p. 139). This ethos is in contrast to the present day, where the Cambodia Qualifications Framework, the current learning outcomes of higher education in Cambodia, stated the purpose of education is to provide knowledge; cognitive skills; interpersonal skills and responsibility; ICT (Information Communication Technology) and numerical skills (MoEYS, 2012).

Higher education in Cambodia refers to formal education and training activities in post-secondary schooling lasting for around 3–6 years, full-time or part-time in public or private Higher Education Institutions (HEIs), resulting in a degree or qualification. There are three types of higher education in Cambodia: institutes, universities, and academies (You, 2012). Notably, the distinction between universities and institutes is that an institute primarily offers training in a particular field but does not provide a wide range of research or training in multidisciplinary subjects. Universities usually specialize in professional fields such as engineering, medicine, agriculture, education, etc. However, the university is the most popular and preferable for Cambodian perception due to career prospects. Royal academies were supposed to play a crucial role as a think tank; however, the lack of human resources to engage in research means these have not achieved their potential.

One of the issues for HE is that the primary source of funding for both private and public HEIs is students’ tuition fees. This problem creates unpleasant implications and consequences for accessing quality and core services of public HEIs, higher education improvement, and society as a whole. McNamara and Ahrens (2013), therefore, argue that Cam-

bodian higher education has been viewed as a private good (knowledge for individual gain) rather than the public good (knowledge for society). They state:

HE is understood as a private good (the student gets the degree, gets a better job, and higher wages) and is regarded as decreasing government support for the individuals who attend universities. Suppose HE is understood more as a public good (e. g., benefits to society of higher educated citizens, attracting more overseas investment because of worker quality). In that case, the government must support quality tertiary education to the highest level. (McNamara & Ahrens, 2013, p. 3).

According to the Ministry of Education, Youth and Sport (MoEYS, 2019), *Education Strategic Plan 2019–2023*, HEIs increased from 110 in 2014 to 125 (48 publics; 77 privates) in 2018. There were 1,947 lecturers with bachelor's degrees (15.5% of all lecturers), 8,751 with master's degrees (69.8 %), and 1,090 with PhDs (8.7%) in 2018. Sadly, student enrolments decreased by 15%, from 249,092 to 211,484. The decrease in student enrolment is probably related to a sudden reform of the Grade 12 national examination in 2014 to strengthen the quality of education. This reform caused passing students to dramatically decline from approximately 80% (2012–2013) to 26% in the August 2014 national exam result. With this low passing rate, the MoEYS allowed those who failed the first national exam a second chance to retake the exam in October of the same year. The passing rate reached 44 % in 2014 (Maeda, 2021). However, the number of passing the Grade 12 national exam has increased over the years. In an optimistic view, the quality of education has been improving through this reform to get qualified students to enter higher education.

The former public Cambodian higher education had been converted into an uncommon model, which was 80% privately funded, mostly from students' tuition fees, a contradiction to a typical developing country private funding level of 20% only. An estimation of public expenditure on higher education was around 0.09% of GDP by 2008, while private expenditure was responsible for 0.49%. Both expenditure rates reached 0.58%, still under the world average of 1% (McNamara & Ahrens, 2013). According to World Bank (2012), Cambodia is the lowest rate of public higher education expenditure with 0.05% of GDP in the East Asia region. The next lowest is Laos, with 0.21% of GDP expended on higher education, which equals four times the Cambodian government's investment in higher education.

According to the MoEYS report, Cambodian HEIs are challenging to enhance the quality of higher education to improve teaching and learning, and research to produce qualified graduates who meet market and social demand for international standards (MoEYS, 2014, 2019). Additionally, an analysis of the current situation in higher education (MoEYS, 2014) divulges an alarming career mismatch between education and employment. For instance, Cambodian university students' popular areas of study are social sciences and business-related fields. In contrast, a small percentage of students study science, engineering, and agriculture, which are considered vital skills to promote Cambodia's econo-

my. Like other countries, Cambodia also pays close attention to higher education quality improvement in teaching and learning to build teacher capacity through the “Higher Education Quality and Capacity Improvement Project” funded by the World Bank (2018). MoEYS (2019), *Education Strategic Plan 2019–2023*, promotes digital education. It further stated, “MoEYS will integrate ICT as a teaching, learning, and knowledge sharing tool across the education sector to equip students with ICT knowledge and skills to transition to the 21st-century world of work” (MoEYS, 2019, p. 60). In this sense, Hybrid Teaching and Learning Environment (HTLE) is a part of the solution because it involves the use of a techno-pedagogical environment consisting of complex mediatization, mediation, and pedagogical innovation.

Most Cambodian higher education institutions do not provide online learning or have a learning management system (LMS). Additionally, they do not have an email account for lecturers to use. Generally, lecturers use their private email, Facebook group, and Telegram group to contact their students. Some lecturers use Facebook group chat and Telegram to send students documents, discussions, and information. Other lecturers also use Google Classroom to share lessons and other learning resources with their students. However, they started experiencing online, and distance teaching during the COVID-19 pandemic exploded in early 2020. This move was a blessing in disguise to allow lecturers to exercise hybrid teaching and learning environment in their courses.

2 Background of Hybrid Teaching and Learning Environment

Modern Higher Education Institutions (HEIs) apply various teaching and learning models to inspire a learning environment to achieve a better course outcome. Many courses have introduced learning environments using ICT, such as e-learning, open distance learning, web-based learning, blended learning, or hybrid learning. These new supporting, teaching and learning environments allow learners to learn anywhere, anytime with a computer and e-learning application (Eliveria et al., 2019).

Harding et al. (2005) defined hybrid teaching and learning environment (HTLE) as an online learning complement to conventional teaching and learning method (face-to-face instructional method). A hybrid learning environment provides learning interactions and experiences from different places at once. It can be an asynchronous group discussion, where one learner sits at home and another participates in the discussion from a cafe. At the same time, the teacher joins in from a classroom at the campus (Nørgård, 2021). On the contrary, Charlier et al. (2006) argued that HTLE represents specific types of learning design. The choice of the label ‘hybrid’ instead of ‘blended’ refers to the creation of a new entity whose significant characteristics are the presence-distance articulation and the integration of technologies to support the teaching-learning process environments (Charlier & Lambert, 2019, p. 2). Thus, Charlier et al. (2006) introduced this definition

“A hybrid teaching and learning environment is characterized by the presence in a learning environment of innovative dimensions linked to distance learning activities. Hybrid teaching and learning environment (HTLE) is based on complex forms of mediatization and mediation because it involves the use of a techno-pedagogical environment” (p. 481). The term ‘mediatization’ concerns the process of designing, producing, and implementing media communication devices. The other term, mediation, refers to transforming human behavior and knowledge through interactions with objects (symbolic or concrete). Charlier et al. (2006) distinguished four types of mediation: semio-cognitive, pragmatic, relational, and reflexive. This definition of HTLE, theoretically grounded, gave the initial framework to identify the typology of hybrid learning courses designed empirically by the HY-SUP research.

The hybrid teaching and learning environments have been studied under the HY-SUP research project to describe hybrid teaching environments, understand their effects on students’ learning and teacher engagement, and get a better understanding of the technological learning environment. According to a mixed-methods study (174 questionnaires and 77 interviews with professors in higher education), through a factorial analysis, 14 factors were identified, comprising in-site active participation; active distance participation; learning support tools; management, communication and interaction tools; multimedia resources; multimedia works; synchronous collaboration tools; comment and annotate online documents; reflexive and interpersonal goals; methodological support; metacognitive support; support by students; freedom of choice, teaching and learning methods; and the use of external resources and actors. Then, a cluster analysis enabled the classification of six types of learning design of HTLE. These types are described below using metaphors (Charlier & Lambert, 2019; Deschryver & Charlier, 2012; Lebrun et al., 2014). As seen below, each type of hybrid teaching and learning environment requires different levels of support and techno-pedagogy (the art of incorporating technology in designing teaching and learning experiences to enrich the learning outcome). Therefore, understanding each type of HTLE will allow us to describe the current teaching and learning environment.

- Type 1 (the Scene): This metaphor presents a space where the teacher plays a central role and textual resources play a predominant role. Teachers favor classroom teaching but provide educational resources for students to download.

- Type 2 (the Screen): This metaphor represents a space of reinstitution of the information, and the student is only a spectator. It introduces technologies and media. Teachers mainly use the teaching and learning environment to make textual and multimedia learning resources for their students.

- Type 3 (the Rural Gite/Cottage Country): This metaphor denotes a traditional place that welcomes guests from various backgrounds to visit and stay, while connotation refers to a combination of tradition and openness content of teaching-learning resources and stakeholders outside the academic world. It emphasizes the organization and

management of the course. Teachers use most of the potential of technological tools to manage their teaching and interaction with students. Therefore, it results in the frequent use of tools to integrate into teaching resources.

- Type 4 (the Crew): This metaphor represents a group of people pursuing a common goal, such as arriving at the port safely or winning the race. To achieve this goal, the Crew must work together, help each other, and communicate effectively within the group. Similarly, teachers pay special attention to students' progress by offering interpersonal and reflexive tools to support learning, communication, and collaboration.

- Type 5 (the Metro): The Metro metaphor is where guidance is essential and freedom is possible. In this sense, teachers focus on supporting and guiding students, being open to external resources and actors, and leaving some freedom to select methods and learning pathways. To sum up, the learning focuses on openness, freedom of choice, and guidance.

- Type 6 (the Ecosystem): This metaphor represents a place of exchange of living matter to ensure balance and development of life. Teachers make use of all dimensions identified to characterize hybrid teaching and learning, such as students' active participation (in-class and remotely), frequent and diversified use of technological tools, availability and production of multimedia documents, peer interaction, and openness of the system to external resources and actors, etc. This type 6 is the one that makes the most use of the techno-pedagogical potential offered by hybrid dimensions.

A second objective of the HY-SUP research was to associate these types of HTLE learning designs with their perceived effects on student learning and teacher engagement. The first three teaching-centered types were perceived by both teachers and students as less supportive of learning. The same was true for student engagement. In our research, this typology will characterize the learning environments proposed by Cambodian lecturers, possibly differentiate their implementation conditions according to the types considered and represent the extent to which lecturers modified the design of their environments during the COVID crisis.

3 Objectives of Research

Higher Education Institutions (HEIs) keep developing and updating their quality of teaching and learning. In this sense, technology often plays a fundamental role in HEIs transformation, and educational shifts benefit from a supportive environment. Therefore, this study examines the present conditions of a hybrid teaching and learning environment (HTLE) in Cambodian higher education. In the absence of studies on HTLE in Cambodian higher education, this study contributes new knowledge to *provide solutions to implementing hybrid teaching and learning environment* in Cambodian Higher Education Institutions.

The key objectives of this research study are to scrutinize and interpret the present conditions of HTLE in Cambodian higher education. Due to the COVID-19 pandemic in early 2020, this research study was expanded to explore HTLE before COVID-19 and during the COVID-19 crisis. Three research objectives have been framed to achieve the aim, such as identifying, exploring, and understanding HTLE in Cambodian higher education. The key objectives are broken down into the following:

- To identify lecturers who have introduced a hybrid teaching and learning environment and describe this environment.
- To explore the conditions that faculty members encounter when implementing a hybrid teaching and learning environment.
- To understand how lecturers implement hybrid teaching and learning environment.

4 Research Question

The main research questions and sub-questions are framed to achieve the objectives.

In which conditions are the Cambodian Higher Education lecturers implementing hybrid teaching and learning environment?

- A. Are these conditions different according to the type of environment developed according to lecturers?
- B. Could we observe changes in the type of environment related to the new situation created by the COVID 19 crisis? How can we understand these changes?
- C. How was this innovation process supported, according to them?

5 The Initial Model of Implementing Hybrid Teaching and Learning Environment

This research study employs and integrates (Depover & Strebelle, 1997; Strebelle et al., 2003) with Ely (1999) model into a new systemic model of the university innovation process to understand implementing conditions of innovation (see Figure 1). The model starts with “*Reasons to innovate*”. It is placed and identified before the “INTRANTS” because it associates with discontent current status quo, such as inefficient, ineffective, or uncompetitive. In contrast, the “INTRANTS” is considered the input of resources from different stakeholders to make innovation possible. After defining particular reasons to innovate, the process moves to “INTRANTS, PROCESS, and EXTRANTS”. These terms were similar to Input evaluation, Process evaluation, and Product evaluation, which Stufflebeam (2003) coined in the CIPP model (Context evaluation, Input evaluation, Process evaluation, and Product evaluation) for evaluation.

5.1 The “INTRANTS”

According to Depover and Strebelle (1997) and Strebelle et al. (2003), the “INTRANTS” can be considered at the Micro, Meso, and Macro levels of the system. They are concerned about available resources to start innovation. The characteristics of “INTRANTS” are explained in the following:

- (1) *Micro-system level (teacher and students)*: At this level, there are certain variables to look at, such as the level of mastery of IT tools and innovative methodological practices by teachers, and their receptivity to innovation (openness to innovation), plus the entry of students’ profile about their level and experiences in the use of ICT. When learners’ current knowledge and experience are far behind in applying technology in the classroom, we (implementor, teacher, head of the department, IT team) need to provide short training to learners to support their difficulties. In this micro-system, implementors must also consider teachers’ current knowledge and skills to master innovation practices (Depover & Strebelle, 1997). If the level of innovation is too far beyond lecturers’ and learners’ capacity, the innovation will be less successful in implementation. Ely (1999) added that we need to think about the availability of time for teachers to learn and implement innovation. The value given by the lecturers toward incentives and rewards (letter of appreciation, increase-teaching rate) also plays a vital role in catalyzing innovation because innovation might break teachers’ comfort zone for a while.
- (2) *Meso-system level (school/institution)*: This level concerns the school profile or facilities such as computer equipment, the openness of innovation, and school climate. Rectors and managers need to prepare and manage a sufficient budget for the physical environment related to implementation. These include internet and WiFi, official email

for lecturers and students, a learning management system to engage students, and the level of freedom for lecturers to exercise innovation.

- (3) *Macro-system level (system/society/nation/state)*: At this level, it concerns the state's role to do innovation. This Macro-system might play less involvement in the innovation input if the state offers full authority and decision to the university to innovate itself but still supports the university in case needed. On the contrary, universities might not have enough power to innovate in the centralized education system, especially in developing countries. They need to go through internal to external discussions such as the university itself, the department of higher education, and the ministry of education, youth and sport (MoEYS).

For us, the focal point 'commitment' of micro-system, meso-system, and macro-system play a central role in making real innovation successful and long-lasting because it needs to be congruent. For example, the school manager or program manager may be committed to introducing innovative teaching and learning to the teaching staff. However, the teaching staff could have less commitment and motivation to adopt new innovative teaching methods due to their own reasons. As a result, the innovation could not happen or happens only for a short time. Vice versa, if the teaching staff have a strong commitment to innovate their teaching, but the school manager has less commitment to support, this also leads to unsuccessful implementation.

5.2 The "SUPPORT"

The change "Processes" of innovation consists of three phases: adoption, implementation, and routinization. The main objectives of supporting these phases are maintaining commitment, solving problems on time, providing feedback on an activity, and planning a budget. All phases need active support or facilitation from the meso-system and macro-system in the process of innovation.

Meso-system support: university rectors, program managers, and heads of departments play significant roles in providing funding, supporting, and monitoring the process until the end. The support and monitoring can be done through fortnight meetings or monthly discussions. This approach could be related to the "Process Evaluation" in the CIPP model for evaluation by Stufflebeam (2014) to monitor, document, and give constructive feedback to strengthen program implementation. The university can provide teachers' training, professional development, and technical services. These activities serve as a vehicle to support the innovation processes, such as developing e-resources to support teaching and learning contents, developing teacher guides to using tools, and organizing training to use tools for lecturers and students. Additionally, incentives or rewards (appreciation letters, increased teaching rate) should be considered to motivate and encourage lecturers to implement innovation.

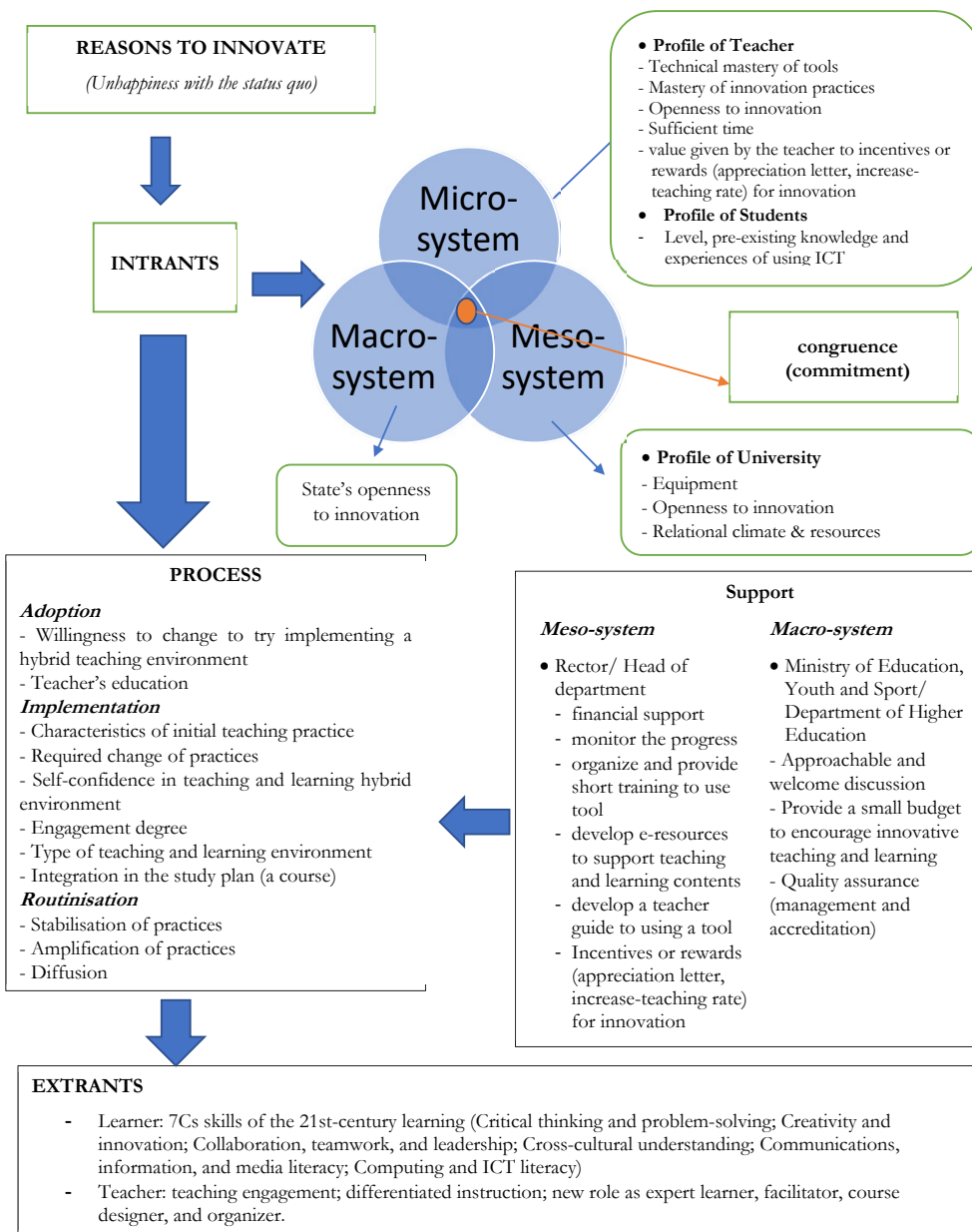


Figure 1: A systemic model of the university innovation process

Macro-system support: Ministry of Education, Youth and Sport (MoEYS) and the Department of Higher Education (DHE) need to be approachable, transparent, accountable, and welcome discussion when the university needs support. Furthermore, the ministry should provide inspection and technical help to ensure the quality of innovation, including management and accreditation to HEIs. Moreover, MoEYS can create a small budget package to provide funding to universities where innovation is implemented to promote higher education quality, accessibility, and engageability.

5.3 The “PROCESS”

As stated above about the focal point of the three systems, the commitment of the stakeholders’ involvement to support the process of innovation is crucial to making innovation happen. This commitment can be seen through direct or indirect action such as implementing, monitoring, and evaluating by providing an ongoing check on a plan’s implementation and processes, such as the *adoption phase*, *implementation phase*, and *routinization phase*.

The *adoption phase* is determined by teachers’ willingness to change and implement HTLE either internal or under an external pressure of the meso-system, demanded by the students, the university management, or the inspectors. It is essential to identify the source of change either from the teacher’s initiation or from outside imposed because the decision to change has distinct psychological consequences on the teacher’s implementation. Another variable that closely influences the adoption phase’s decision is the “teacher’s education” because it mainly relies on teachers’ mastery and confidence in using new tools in innovative practices.

The *implementation phase* is the first experience of intention to put ideas or reform into actual practice. This phase is generally modified from the original ideas at the level of educational practices and in the context (environment) where the practices are set up. The first variable of this implementation phase is *characteristic of initial teaching practice*. This includes openness and freedom (students feel free to ask a question without being judged as stupid), knowledge of innovation, responsiveness, and approachability that teacher offers to students. The second variable is the *change in teachers’ practices*, including support and teaching methods when shifting from face-to-face classrooms to hybrid courses. Students might need more support, guidance, responsiveness, and approachability during innovative implementation. The third variable is the teacher’s *self-confidence in teaching and learning hybrid environments*. In this sense, teachers need to be knowledgeable about innovation. The fourth variable is the *teachers’ engagement degree* which associates with approachability inside and outside schools in academic study. The following variable is the *teaching and learning environment* that the teacher is implementing. The higher level of hybrid type (type 1–6), the more complex support and methods are used. The last variable

is *the integration of practice into a course*. This variable requires flexibility and adjustability based on student knowledge, skills, and study background.

The term routinization would rather be used instead of institutionalization because institutionalization is a more direct remark as an official acknowledgment (Strebelle et al., 2003). There are three main elements in routinization such as stabilization of practices (innovation can be implemented in the long term at the level of the educational practices), amplification of practices (the new practices are regularly employed and integrated into the daily basis of school activities without external help from research or pedagogical team), and diffusion (differential access to information).

5.4 *The “EXTRANTS”*

The Extrants refer to various types of results and can be generally seen as the degree of improvement in macro-system, meso-system, and micro-system. For example, a micro-level improves students' new knowledge, skills, and attitudes; improves satisfaction from lecturers and school staff; or improves the school's problem-solving capacity as a whole. Because the outputs of the HTLE are more focused on the effect of micro-level such as learners and lecturers, we do not explain meso-level and macro-level in this context. For learners, the innovation may help them improve their 21st-century learning skills, such as Critical thinking and problem-solving; Creativity and innovation; Collaboration, teamwork, and leadership; Cross-cultural understanding; Communications, information, and media literacy; Computing and ICT literacy; and Career and learning self-reliance. These skills were called “7Cs 21st-century learning skills” (Trilling & Fadel, 2009). The second part of our research focuses on analyzing these effects; however, we do not present the result of HTLE on students' 21st learning skills in this article due to time constraints on data analysis and interpretation. For lecturers, the innovation could improve teaching engagement, differentiate instruction, and develop a new role as expert learners, facilitators, course designers, and organizers, leading to the satisfaction of students' needs.

6 Research Method

This research study used a semi-structured interview. It contained essential sections, such as lecturer information, course information (before and during COVID-19), and the effects of implementing a hybrid teaching and learning environment (HTLE). The lecturer information section gave information about the lecturer's experiences, teaching practices, and knowledge and skills of using ICT. The course information section provided information about the nature of the course learning and instruction before COVID-19 and during COVID-19 by translating the questionnaire from the HY-SUP research project to identify the types of the learning environment. The last section of this semi-structured interview gave insight into the conditions, challenges, supports, and effects of implement-

ing HTLE. The interview took us from 40 minutes to 1h:20 minutes depending on the speed of individual participants, preparedness by completing some questions in advance, stable internet connection, and personal disturbed by the participant's family. We also expanded this research study on HTLE during COVID-19 due to the COVID-19 pandemic outbreak in early 2020, even though it was not originally planned.

There are some reasons which influence us to use such a particular method. First, we decided to use a semi-structured interview based on the nature of our research questions. Second, this interview approach allowed us to get detailed information from faculty members about Cambodian higher education's hybrid teaching and learning environment, especially before COVID-19 and during COVID-19. The qualitative methodology allows participants to talk about their feelings, ideas, and experiences. The researcher (Mack et al., 2005) can understand how people interpret the world with this approach. Anderson and Arsenaault (2005) also underlined the usefulness of using interviews for data collection; for example, participants are more easily engaged than just asked to fill out a questionnaire. The interviewer can clarify questions and probe the answers.

We invited lecturers implementing hybrid teaching from four universities and two institutes in Phnom Penh, Cambodia. We did pilot testing with 3 participants by online interview call to ensure validity and reliability. The pilot testing allowed us to make an amendment and unclear information on time before doing an actual interview. Twenty lecturers participated in a real interview using a snowball sample. According to Mack et al. (2005) in the book "Qualitative Research Methods: A Data Collector's Field Guide," a snowball sample is also known as a chain referral sample. In this method, the potential participants will be introduced by the previously contacted participants through their social networks. Among the 20 participants, there were 16 male lecturers and 4 female lecturers. They taught different subject areas, such as Research Methodology, Survey Research, Introduction to Linguistics, Comparative Public Policy, Critical Thinking, Professional Writing, Quantitative Research, Contemporary Politics Thoughts, English for Writing Skill, Leadership Skills, Teaching English as Foreign Language, Introduction to theory of public policy, Media and politics, Academic writing, Business negotiation, People skills, Ethic, Biochemistry, English terminology, Academic skill development, Core English, Introduction to political science, Digital literacy, and Academic English.

We decided to do online semi-structured interviews instead of face-to-face interviews in the classroom because of the pandemic COVID-19 during data collection. First, there was no flight operation from Switzerland to Cambodia in June 2020, and people practiced social distance. Second, people were unwilling to accept face-to-face interviews even though the number of infected with COVID-19 was not high compared to the region and globally. Third, all education systems in Cambodia have been physically closed and moved to online or distance learning instead of virtual classroom learning since May 2020. Last

but not least, it was convenient with snowball sampling, fast approach, and timely manner with fewer administration tasks.

Data collection was conducted online with 4 universities and 2 institutes in Phnom Penh, Cambodia, for 3 months, from *June to September 2020*. There were two main reasons to collect data during this period. First, most lecturers are less busy with lecturing because they are lecturing at more than one university and moonlighting. Moonlighting refers to working an extra job to earn extra money outside official working hours. Second, it might be surprising to hear that some students are studying at two universities simultaneously in Cambodia, so this period is a vacation for them to do less homework. However, something turned out to be surprised and unpredictable when COVID-19 had been shaking the world since early 2020. All education systems have been delayed and moved to online or distance learning in Cambodia. However, we were able to complete data collection. There were two simple procedures to get participants involved in this research study. First, we used our network in the university, such as the dean, head of the department, and lecturer himself. We were preparing informed consent for the rector and lecturer; however, due to COVID-19, the university required lecturers to offer online and distance teaching using various tools and platforms. Therefore, we decided to send a request to deans and lecturers directly. Through personal networks in those universities and institutes, we received names of recommended lecturers from the head of department and snowball sampling. After we negotiated with lecturers and agreed to participate in the research, we sent semi-structured interviews through Facebook, Telegram, or email based on their preferences. Before starting the interview, we requested to record their voice for transcribed data.

We also informed them about anonymity and confidentiality to keep their identity anonymously by using a letter to represent their university. During the interview, some accidental problems caused disturbance to the interview process. First, the time zone of Switzerland and Cambodia are six hours apart. For example, if we arranged to interview at 10 AM in Phnom Penh, using Cambodia time, it was at 4 AM in Switzerland. Second, the internet caused trouble with our interview process on some days, which led to cancellations and changed dates. Third, interviewees sometimes texted to change the date to another day due to personal reasons, such as childcare or family health problems. Finally, some interviews took longer than expected and had to be paused since the interviewee's device had to be used by another family member, for example, to take an online examination. We transcribed each audio record into words, merged small themes, and coded. For example, we used (*Ua.L1*) to present *university A* lecturer 1, and (*Ua.L2*) presents *university A* lecturer 2. We also used (*Ia.L*) to represent *Institute A* and *L* for the lecturer.

7 Analysis

This research study is exploratory research. It was analyzed through a self-positioning tool (Deschryver & Charlier, 2012) to classify the type of hybrid teaching and learning environment. The Self-positioning tool, which consists of 14 items, allows us to identify the type of hybrid learning environment, such as “the Scene, the Screen, the Rural Gite, the Crew, the Metro, and the Ecosystem”. This research also employed MAXQDA 2020 qualitative software to analyze lecturers’ views and experiences on conditions, challenges, and support for implementing HTLE.

8 Result

Type of hybrid teaching and learning environment before COVID-19: By analyzing the type of learning environment through a questionnaire on the self-positioning tool HY-SUP, the results indicated that 50% of the course was type 5 (the Metro) and 50% type 6 (the Ecosystem) before COVID-19 based on lecturers’ descriptions. Before COVID-19, lecturers responded highly to in-site active participation, management, communication and interaction tools, use of external resources, freedom of choice, teaching and learning methods, etc. Based on the interview with lecturers, the use of management, communication and interaction tools are to engage students’ learning outside the university, send homework and assignment, notify a special event or learning opportunity, and share documents with students. They usually use Facebook groups, Telegram groups, and sometimes Google classroom to reach their students rather than email accounts. One of the lecturers provided the reasons that he integrates online and offline activities in the following:

I think integrating “online and offline activities” is essential for students because it can help prepare them to (1) work in an international environment, (2) make ease the study because we can engage students, and students can reach us easily when they have questions, (3) improve their self-study if they know and use it in the right way (Uc.L1).

Type of hybrid teaching and learning environment during COVID-19: With 19 courses offered during COVID-19, the result proved that 18 courses (95%) were type 6 (the Ecosystem) among 19 lecturers’ responses based on self-positioning tool analysis. We noticed that the courses in type 5 before COVID-19 evolved towards type 6 during COVID-19. During COVID-19, 19 lecturers gave a high rate to 14 descriptive factors of HTLE on *In-site active participation (synchronous); Distance active participation (asynchronous); Communication and collaboration synchronous tools; Management and interaction tools; Use of multimedia resources and works; Providing metacognitive and students’ support; Offer freedom of choice, teaching and learning methods; and Use of external resources and actors.* One of the lecturers, UC.L20, stated, “I use online applications such as Google classroom,

Skype call, and Telegram to communicate with students during COVID-19. However, before COVID-19, I used Telegram to communicate and engage students, but not Skype”.

8.1 Conditions of Implementing Cambodian Hybrid Teaching and Learning Environment (HTLE)

In this section, we will describe in which conditions Cambodian higher education lecturers implemented HTLE. This description is based on the theoretical model, “a systemic model of the university innovation process”.

8.1.1 Lecturers’ Motivation to Integrate Online, Offline Activities

According to Depover and Strebelle (1997) and Ely (1999), a systemic model of the university innovation process (Figure. 1), innovation begins with the reason to innovate. Based on the finding, there are two main reasons (intrinsic and extrinsic motivation) to implement HTLE. Regarding intrinsic motivation, some elements push lecturers to implement HTLE. These elements include engaging students’ learning inside and outside the classroom, offering external learning resources, preparing students for the workplace, introducing a new way of teaching and learning, developing digital skills, saving time and material, improving self-study, and helping slow learners and absent student to catch up the lesson.

First, the most crucial point that lecturers implement HTLE in their courses is **to engage their students’ learning** both inside and outside the classroom. This consists of sharing documents, discussion, accessing students’ work, and other activities. When students get absent, they can get learning material, information about the class, and lessons online. Students can also reach their lecturers easily when they have questions. One of the lecturers mentioned that “I can send more learning resources to students than just using the textbook” (Ia.L3). Another lecturer stated that “students can learn faster than before when using technology, for example, getting course content faster, more engagement outside the classroom, which improves rapport between teacher and students, and improves the quality of teaching than before” (Ub.L8).

Second, the reason that lecturers implement HTLE is **to offer external learning resources** to their students. Five lecturers mentioned that online activities help students expand their learning experience outside the classroom; lecturers can upload video records for absent students to watch; it also makes it easy to share documents and journals to coordinate students’ learning. One of them expressed that “I integrate online, offline activities because I think students can submit, do, access learning material every time and everywhere they want with an internet connection” (Ub.L13).

Third, lecturers integrate technology into their courses **to prepare students for** the workplace. They elaborated that technology plays a vital role in daily human life, research, and

the international work environment. One of the lecturers underlined, “I want students to learn and experience online, offline activities to prepare themselves to study abroad and workplace” (Ub.L18).

Fourth, lecturers implement HTLE to introduce a **new way of teaching and learning and develop digital skills**. They want to innovate the way they work and communicate with students more conveniently and easier than before, and students have the flexibility to learn. One of the lecturers expressed his opinion in the following:

What motivates me to integrate online and offline activities into my course is that I think Cambodian students' knowledge of online learning is not widely known. Compared to other developed countries, they existed long ago and now use it better. Looking at our curriculum, we have not been accustomed to existing technology yet. I want young teachers and students **to get used to technology** by using online teaching activities to gain new experiences, enrich knowledge, get fast information, and do an internet searches. So, I encourage other people **to use technology to facilitate teaching and learning**. (Uc.L14)

Last but not least, other lecturers implement HTLE **to save time and material, improve self-study, and help the slow learner and absent students catch up with the lesson**. One of the lecturers provided her reason in the following:

I think I am young to adopt technology if looking at my age factor. Technology can help me facilitate my task quickly and save time. For example, I do not need to print documents for my students; I just upload them to the platform. So, they can go and download it by themselves. (Ub.L10)

Two factors induce lecturers to implement HTLE in the course regarding extrinsic motivation. First, **the COVID-19 situation** is a significant factor. COVID-19 pushes us to use online learning and distance teaching by using Google Classroom, Skype, Telegram group, and other applications. One of the lecturers stated, “COVID-19 forces institutions to use online learning through Google Classroom and Zoom” (Ia.L17). Another factor is an **institutional requirement**. Three lecturers said that “this is a requirement by the university, so we need to encourage students to use it” (Ub.L8, Ub.L13, Ia.L17).

8.1.2 Teacher Profile

The interview with 20 Cambodian lecturers indicated that they implemented HTLE based on their teaching characteristics. These characteristics included being like integrating technology into their course ($M=3.55$), more open to adopting innovation ($M=3.50$), self-confident in the use of technological tools ($M=3.30$), and having enough freedom to innovate teaching practices in their course ($M=3.20$). The result also revealed that they had insufficient time to prepare online/offline activities and received no incentive or rewards for their innovation practices (table 1).

Table 1: Frequency of teacher profile

	Strongly disagree	Disagree	Agree	Strongly agree	Total (N)	Mean
A You are self-confident to use technological tools in your course.		1	12	7	20	3.30
B You like integrating technology into your course.			9	11	20	3.55
C You are more open to adopting innovation.			10	10	20	3.50
D You have enough freedom to innovate teaching practices in your course.		1	14	5	20	3.20
E You have sufficient time to prepare online/offline activities for your course.		7	13		20	2.65
F You receive incentives or rewards (letter of appreciation, increase-teaching rate...) for innovation practices.	4	14	2		20	1.90

8.1.3 Implementing Support

As mentioned in the theoretical model (Depover & Strebelle, 1997; Ely, 1999), innovation requires support from stakeholder involvement. While implementing HTLE, some lecturers mentioned that they received some support from their institution, while others said they did not receive any support.

Regarding institutional support, they mentioned that their institution provides technical support to help them implement HTLE in their course. Their institution introduced technology to engage students and encouraged them to use Google classroom and Zoom. However, only have lecturers from University B prepared and provided support to lecturers. Five of the lecturers from University B mentioned they received welcome support from technical support and their department. One of the lecturers said, "Of course, there are some supports from the institution to use Moodle as a learning platform, training how to use Google Classroom, Google doc., email, conference classroom, and training online activity improvement" (Ub.L18). The other two lecturers have mentioned similarly, "I receive much support from the institution, especially from the teaching and learning department, and the IT office department while implementing HTLE" (Ub.L13). "Additionally, we have the training and a user manual for teachers to read and support. If the

teachers cannot understand and need more support, they can go to IT technical support” (Ub.L8).

Some of the lecturers addressed their institution orientation about implementing HTLE. The orientation includes how to check students’ attendance, how to upload documents, how to use Zoom, and how to put assignments for students. There is also a short training to use the tool to teach during the COVID-19 offering by the institution. One of the lectures stated that “lecturers and students get trained to use tools and applications for online learning. Some lecturers are old to catch up with technology. That is why they find it hard to adopt new technology. However, young generations can catch up with new technology more effectively” (Ib.L16). Similarly, another lecturer raised that “If lecturers have a question regarding the use of the tool, the institution will find a solution to help. The institution also helps recommend new applications to the lecturer, but no training is provided” (Uc.L14). Another lecturer described his response in the following:

The university calls for a meeting with lecturers to inform them that we will use online, but there are no technical or training support lecturers to implement online. University does not have a budget to provide training, while some universities confront bankruptcy during COVID-19. Additionally, lecturers need to download and use the unlicensed online application. University does not have any license tools to provide to lecturers. However, the university is considering buying the online application package so that all teaching staff will use the license application. Currently, the university bought Microsoft Teams for lecturers to use; however, some lecturers have not been familiar with using it yet {laugh....}. (Ua.L4)

As a reflection, some lecturers taught at the same university or institute but provided different perspectives regarding supporting innovative teaching and learning. Some lecturers mentioned that they received support, while others stated they did not get supported even though they taught at the same university or institute. There might be relevant assumptions to this issue. Firstly, most universities and institutes in Cambodia do not have an email account for lecturers, but they use Telegram Group to inform lecturers. The Telegram Group will produce lots of communication, which is hard to follow up on important information, unlike email. Secondly, the university itself failed to disseminate information about training or support to lecturers due to communication channels. Thirdly, it was related to the lecturers’ moonlighting (extra career); that is why they did not join the training due to the loss of opportunity cost.

8.2 *An Enhanced Model of Implementing Hybrid Teaching and Learning Environment*

A hybrid teaching and learning environment plays a crucial role in the 21st century of education. There are certain conditions that Cambodian lecturers implement HTLE in the following paragraphs and highlighted in our revised model (Figure 2). We added new information from our findings in the italic.

Profile of Lecturers. The lecturer's profile counts, such as *self-confidence to use ICT, integrating ICT into teaching, being open to adopting innovation, getting enough freedom to innovate, and having enough time to innovate*. The institution itself needs to provide enough freedom for lecturers to innovate their teaching methods. According to the interview, the result shows that lecturers have enough freedom to innovate teaching practices in their courses. However, they seem to have insufficient time to prepare online/offline activities and receive no incentive or rewards for their innovation practices. Therefore, universities or institutes should recruit full-time teaching staff and provide them adequate time to prepare teaching tasks and research. Another condition links to lecturers' English language proficiency to understand the instruction of using tools because most teaching tools have been developed using the English language as an instruction. Moreover, the lecturer's health and living standards should be considered. If a lecturer has good health and a living standard, he/she is more likely to invest in supporting, guiding, and engaging with students' learning outcomes. Other conditions might be considered, for example, the lecturer's motivation (**intrinsic and extrinsic motivation**) to integrate online and offline activities. Intrinsic motivation includes *engaging students, offering external learning to students, preparing students for the workplace, introducing a new way of teaching and learning, saving time and material, improving student self-study, and helping slow learners and absent students to catch up on the lesson*. On the other hand, extrinsic motivation includes *COVID-19 and institutional requirements*.

Profile of Students. This condition links to *pre-existing experiences or knowledge of students using ICT*. In this regard, applying technology to the classroom will become easier if students understand some primary use of ICT. The other condition is related to students' *independent learning and self-study*. This condition is essential because HTLE requires students to do more research independently.

Home Learning Facility. This condition is associated with a stable internet connection, teaching and learning devices (laptops, computers, smartphones), WiFi, and electricity. These conditions are taken into account in both lecturers' and students' home learning facilities.

Profile of University. This condition is linked to the supporting system from the university. The result shows that some universities provide technical support and orientation about using tools, while others fail to support their teaching staff. Therefore, those teach-

ing faculties get support from their peer and self-discovery. In this regard, the implementing conditions of HTLE are closely connected with the university's profile to provide support and training to lecturers struggling with technology to produce high-quality teaching delivery. These conditions concern facility and resources, openness to innovation, technical support team, budget to support innovation, willingness to enhance professional development, and designing a clear hybrid teaching and learning policy for internal use.

Challenges during Implementing. There were many challenges to take into account when implementing HTLE. These problems are a natural factor and an individual factor. Natural factor happens during the monsoon season, which causes heavy rain and lightning. As a result, it disturbed online teaching and learning. Individual factors include institutional challenges, lecturers' challenges, students' challenges, the nature of courses (inappropriate course syllabus, mixed-major of study), and home learning facilities. Institutional challenges deal with system errors and technical problems that cause challenges for people who hate technology. Lecturers also face challenges, such as difficulty monitoring students' learning during online teaching and having limited knowledge of using tools. Online teaching is more exhausting than a physical classroom, and lecturers need to modify teaching and learning assessments to adapt to the situation. Other challenges include privacy on sensitive online topics, adapting teaching methodology, time-consuming correcting students' work, wasting time when tool errors, responding to student's questions, and time on learning design.

Students also encountered challenges such as less participation during the COVID-19, being less active, and getting disturbed by the family. They also have limited knowledge of tools. An outsider sometimes joins the class. Other challenges include suspending study due to the financial crisis during COVID-19, no private room to study, forgetting the password, not getting used to self-study, lack of language proficiency to use tools, and getting more stressed than in a physical classroom. Both lecturers and students mentioned problems with their home teaching and learning facilities. These facilities include low internet, use of a smartphone instead of a computer, electricity-failed, and unstable internet connection.

Among these challenges, we attempt to select some considerable challenges to put into our enhanced model framework. They are system error, difficulty to monitor students' learning, knowledge of using tools (students and lecturer), techno-pedagogical skills (how to make interactive online learning and monitoring student's progress), preparation and management of virtual classrooms (more exhaustive), privacy on sensitive topics during online, and time consuming (correcting online work, wasting time when tool errors, responding students' questions, learning designed). The interview result indicated that lecturers have a challenge with time while implementing HTLE. One of the lecturers (Ib. L16) stated, "I find it hard to correct and take time because some students send a file as

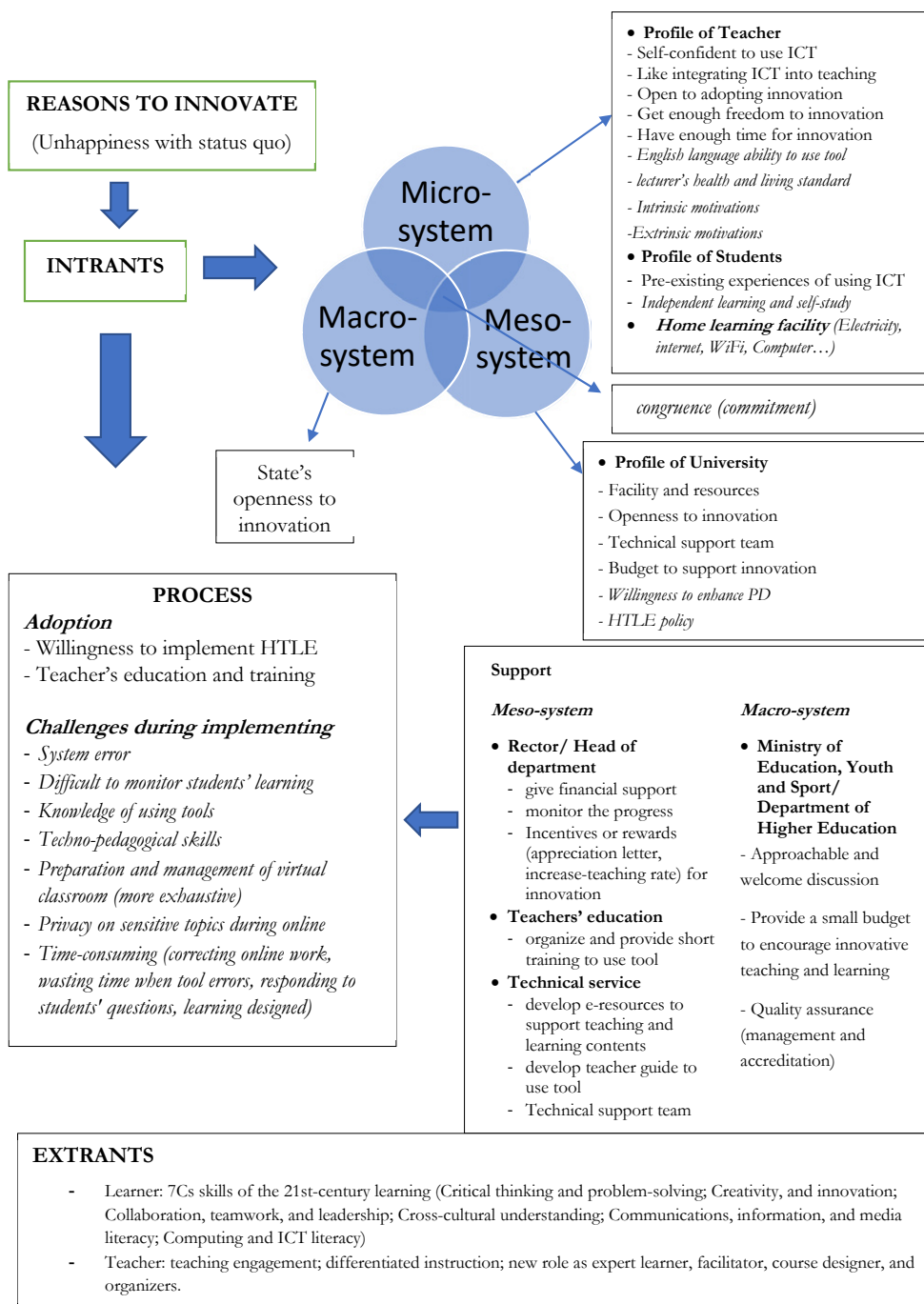


Figure 2: An enhanced model of implementing hybrid teaching and learning environment 2021 (credit author)

an image”. Another lecturer (Ia.L3) added about wasting time when tool errors “It is a waste of time when it is stuck or error while we are using it, interruption because of using unlicensed tools”. Three lecturers (Ua.L4, Ia.L17, Uc.L20) mentioned time-consuming responses to students’ questions. They stated the following:

Online activities make lecturers even busier than in a face-to-face classroom. For example, in the face-to-face classroom, you go to teach and finish; it finishes. However, for online learning, students keep asking questions almost every hour. Additionally, lecturers are busy when students submit their assignments and almost find no time to comment and reply. (Ua.L4)

There are some challenges, for example, “time” because we need to spend time checking, reading, and commenting on students’ online assignments almost every time and day after teaching. By comparing in class, we just do discussion and use verbal comments. (Ia.L17)

It is more time-consuming than before. For example, we spend three hours online streaming with students and extra hours supporting students through group chat and learning design. (Uc.L20)

The other four lecturers (Ub.L1, Ia.L5, Ua.L9, Ub.L13) underlined time challenges in learning design. For example, it takes time to prepare learning material compared to face-to-face learning, and time-consuming to design online tests or quizzes. It is also a new burden because lecturer needs to prepare online lessons and spend time learning to use technological tools. One of the lecturers stated the following:

I need a lot of preparation (material) on the LMS, which requires technological competency to prepare an online lesson. I also need to learn to build technological capacity for myself to produce qualified online materials for students. (Ua.L9)

9 Recommendation

Based on our analysis, some recommendations consider improving HTLE in Cambodian higher education. These consist of an institution, lecturer, student, and transitional period.

The institution needs to provide physical and technical support, including good internet connection and technological tools. The institution also needs to consider having HTLE policy and its own LMS. Institutions should not offer too many courses to lecturers so they have time to prepare lessons and do more research to improve their knowledge and teaching skills. Other things include paying regular salaries on time, increasing teaching rates, and revising the learning curriculum based on the student’s level. Additionally, lecturers themselves need to strengthen and develop technological skills. They need to have a strong commitment to follow the course syllabus, amend assessment and learning outcomes, create more interaction with students, and check students’ attendance regularly.

On the other hand, students need to read documents in advance, strengthen their knowledge of technology and turn on their cameras while online learning. However, it depends

on the individual economy of the students. The higher the economy, the higher chance, and resources they can access. Finally, we need to consider the transitional period by offering step by step implementation of HTLE.

Among these recommendations, we attempt to select firm recommendations to institutions and lecturers who wish to improve the quality of teaching and learning when applying HTLE in the enhanced model framework. Institutions should have a technical support team, provide techno-pedagogical training, have a good internet connection, have HTLE policy, and have their own LMS. On the other hand, lecturers should strengthen and develop their technology skills, commit to following course syllabus, amend assessment and learning outcomes, create more interaction with students, and check students' attendance regularly.

Covid-19 is a blessing in disguise. It alarmed Cambodian educators, policymakers, and MoEYS to re-design teaching and learning approaches and assessments for the 21st century of education. To re-design teaching and learning in post-Covid-19, Cambodian higher education institutions need to have their LMS, have university email accounts for both lecturers and students, adopt a flexible approach to synchronous and asynchronous and promote project-based and group-based learning. Additionally, rectors and educational leaders need to provide capacity building and support for teaching staff, faculty members, and students. For example, the university or institute can help lecturers improve their digital pedagogy and digital literacy of both students and lecturers, develop an e-community where students can seek support, and develop positive attitudes toward hybrid teaching and learning.

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