Institutional Best Practices Amidst and Beyond the COVID-19: The Case of Higher Educational Institutes in Sri Lanka

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Abstract *- COVID-19 is a blessing for the higher education industry in developing nations since it has accelerated the digitization of higher education. Education is essential to transforming people into human capital. The COVID-19 restrictions on physically entering educational institutions gave boost to the biggest educational disaster in the world. The objective of this study is to investigate the best practices employed by the Higher Education Institutions (HEIs) in Sri Lanka to enhance university academic role both amid and beyond the pandemic. The technique of nonprobability purposive sampling was employed, and the results were then analyzed thematically. Best practices in academic research and knowledge dissemination fields, and teaching have been recognized by the study from the viewpoint of the HEIs. Beyond the pandemic, virtual laboratories, concurrent delivery, and hybrid deliveries are still in use, while academic research and knowledge dissemination are being digitalized and exposed to a global audience. The shift from traditional classrooms to the distance learning environment in developing nations has accelerated the process of meeting the sustainable development objective of high-quality education by 2030. As a result, policymakers in these nations can emphasize digitally enabling the higher education sector.*

Keywords**:** COVID-19, Higher Education Sector and Institutional Best Practices.

I. INTRODUCTION

The coronavirus pandemic, also known as COVID-19, created an uncertain lifestyle for every person living on the planet and served as a trigger for the subsequent global economic downfall. In addition to the pandemic's disastrous consequences, the main industrial sectors underwent a digital revolution as moving to virtual platforms became the only way for the corporate survival in the face of lockdowns and social isolation. Even though COVID-19 is a global pandemic, its effects on workers and workplaces vary depending on the nation. Sri Lanka reported a higher rate of infected patients and deaths as the country was severely impacted by the highly transmittable delta form of the third wave of the pandemic. As a result, corporate entities in Sri Lanka continually utilize Work from Home (WFH) to ensure their survival. Schools and universities also must unexpectedly and without warning persuade their staff members to participate in WFH (Afrianty et al., 2021; Alipour et al., 2021; L. Bao et al., 2021; Birimoglu et al., 2021; Georgiadou et al., 2021; Guler et al., 2021; Hallman et al., 2021).

To overcome uncertain circumstances such as economic crisis, it is crucial to have highly educated and skilled individuals since they can create novel, workable solutions that would normalize the uncertain circumstances. According to Fasihharry et al. (2020), human capital can track and assess the demands of change in the rapidly changing business climate that blends with cutting-edge technologies. Human capital theory (Becker et al., 1990) classifies persons as human capital when they acquire knowledge and skills. To fall under the category of human capital, people must strive hard to gain both knowledge and skills throughout their lives. New crisis management

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strategies were required to completely redesign the educational process because education is so important in turning individuals into human capital (Linney, 2020).

The pandemic eventually led to the creation of an online platform for academic careers, including online enrolment, online lectures, and the detection of online defenses to online exams through Learning Management Systems (LMS) (Strielkowski, 2020). Therefore, it is possible to observe a rapid digital transition in educational institutions in terms of e-learning, online teaching, and the introduction of LMS with increasingly sophisticated capabilities (Sulkowski, 2020). Although undergraduate students in developing nations had limited access to the technology infrastructure, academic activities were unexpectedly discontinued at the beginning, creating an unclear future (Rios-Campos et al., 2021). The foundation of the education sector is human capital because it is a service sector that employs both academic employees who carry out essential operational tasks and non-academic staff who play a supporting function. One of the most practical solutions to close the skill gap to adapt to the changing circumstances in a dynamic environment is to offer reskill programs for academic staff (Kandri, 2020).

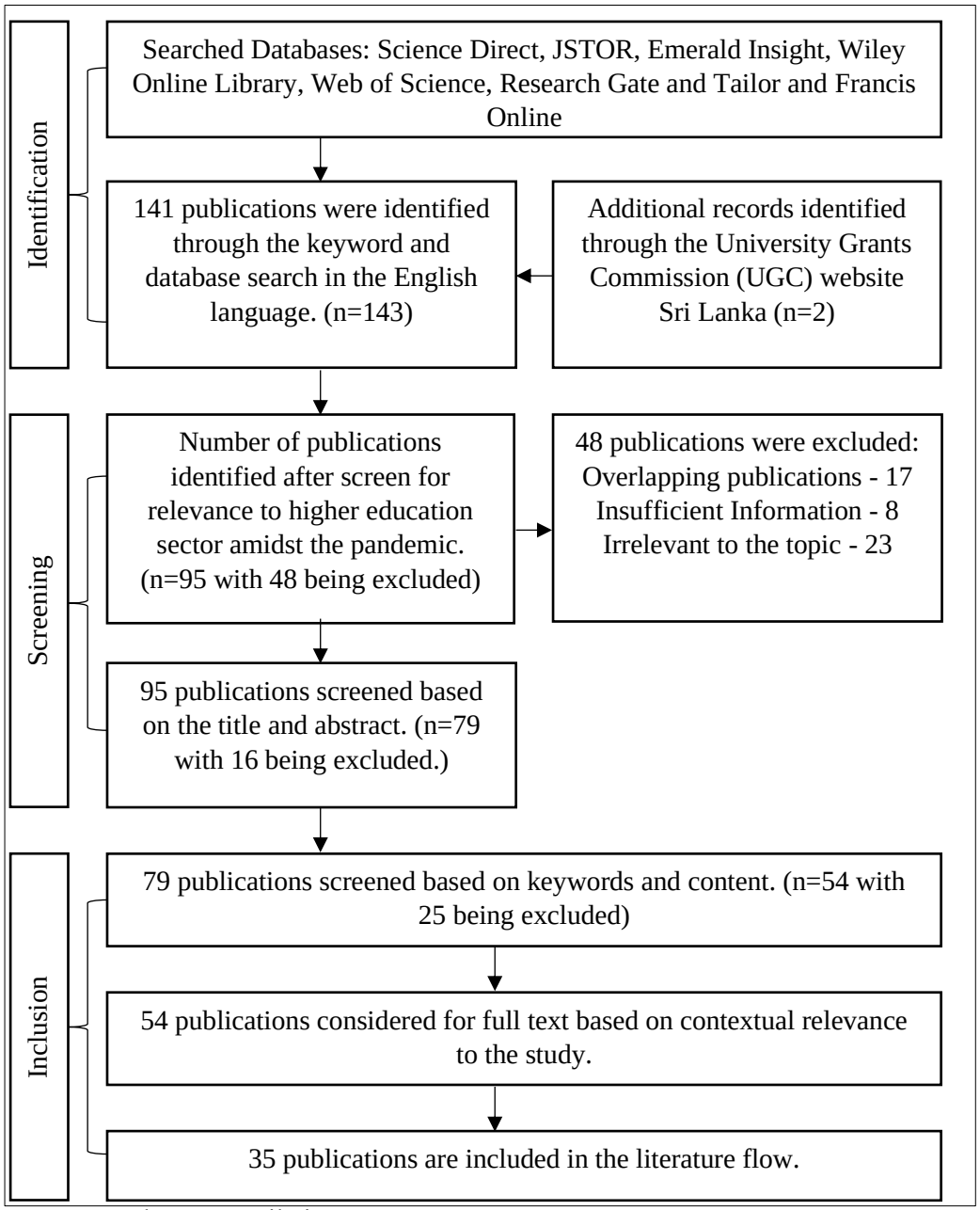
In mid-April 2020, when the first wave of the pandemic was at its peak due to nationwide closures over 190 nations, more than 90% of the world's student population was affected, according to the UNESCO Institute for Statistics (Abayasekara, 2020). Due to the COVID-19's restrictions on physically attending schools and institutions, the largest educational crisis in the world emerged. The education industry was given technological empowerment as a remedy by offering hope for the entire world. Academic staff members were initially hesitant to embrace electronic tools, but they gradually became comfortable with them. The three main areas where academics contribute are teaching, community service/knowledge dissemination, and research (Almaghaslah & Alsayari, 2020). However, some academics are more interested in one of the three areas than the others. Furthermore, Higher Education Institutions (HEIs) are required to assist academics in carrying out their duties in accordance with the rules and regulations.

To deal with upcoming uncertainty, the pandemic's lessons from the HEIs' perspective will be crucial. Therefore, recognizing the best practices that have been used and that will be helpful in future growth is vital. Global research on the effects of COVID-19 on academic outcomes is lacking (Mseleku, 2020), and the pandemic's effects on educational institutions in Sri Lanka are still unknown. As a result, this study fills the research gap based on Sri Lanka's higher education sector by exploring the best practices used by HEIs to address the health crisis as a piece of fresh knowledge. Thus, the overall goal of the study is to address the following research question: How do universities facilitate enhancing the role of university academics amidst and beyond COVID-19 pandemic?

The introductory section of this article gives some basic information about the research problem. The literature based on HEIs best practices is then reviewed in the second section. Section three of the paper covers methodology. The results and discussion are included in section four. The implications are discussed in section five, and limitations and future research recommendations are presented in section six. The seventh section finally provides a summary.

II. LITERATURE REVIEW

Figure 1. Literature Source Flow Diagram



Source: Authors' compilation.

At first, 141 papers were found by searching many reputable electronic databases, including Science Direct, JSTOR, Emerald Insight, Wiley Online Library, Web of Science, Research Gate, and Tailor and Francis Online. Academic, lecturers, higher education, teaching, research, knowledge-disseminating, university educators, and territory education were used as keywords to identify publications, which were then

further filtered, as illustrated in Figure 1. The literature centered on the academic domains, including teaching, research, and knowledge dissemination. At the beginning of COVID-19, HEIs in 61 countries, including those in Europe, Africa, America, Asia, and the Middle East, were closed (UNESCO, 2020). After that, most HEIs switched to an online method of service delivery (Mahmood, 2021). However, in the context of developing countries, such transformation became a large operation and a major alteration in the entire educational system. Significantly, COVID-19 has accelerated teacher and student adoption of online learning compared to prior times (Rajab et al., 2020). Additionally, academics have adopted other technologies from third parties or web-based service providers, including Zoom, Google, YouTube, Google Classroom, and Google Meet (Simamora et al., 2020).

A. The Role of Teaching and Academic Development

Beyond the consequences of the worldwide pandemic, nearly all universities forced academics to offer online education without the appropriate infrastructure, skills, or knowledge (Barnes, 2020). To provide a smooth transfer of educational services, HEIs should offer a user-friendly virtual platform to students as well as educators (Yusuf & Ahmad, 2020). Understanding the concurrent use of information and communication technologies in online teaching practices is crucial for undeveloped nations to provide degree programs more effectively (Tortorella et al., 2021). Regarding COVID-19's online lecture delivery practices, different nations achieved varying degrees of success. At the beginning of the online delivery, the majority of HEIs had employed training and other forms of support. The Pakistan Higher Education Commission advised all institutions in Pakistan to employ internet-based online training to train their academic staff and enhance their ability to teach during the pandemic (Mahmood, 2021). In addition, the Pakistan higher education commission encouraged universities to offer the required tools, equipment, and a data package to maintain uninterrupted distance learning (Mahmood, 2021).

The global pandemic offered opportunities to switch from conventional educational delivery to online delivery, even though there are several barriers to online education (Toquero, 2020). Universities in the Philippines were suggested to offer academic staff suitable training programs because they think that doing so would help the online delivery work properly (Toquero, 2020). Effective online distribution must have reliable and strong information technology solutions (Lu et al., 2020). According to Bao et al. (2020), various steps must be taken to increase the depth and degree of student involvement in online classrooms. To support online classes in more practical subjects like Engineering, more sophisticated hardware and software is needed. According to USA research, the academic staff has observed that online platforms frequently lack essential software, resources, and technology (Asgari et al., 2021). According to the research findings, developed countries also struggle with a lack of cutting-edge technology while conducting online sessions, whereas underdeveloped countries struggle more with appointing such cutting-edge technologies than developed nations. Lack of technical support, a weak network signal, and a lack of digital skills are the key obstacles that academics have encountered in Bangladesh and Pakistan as they migrate to online education (Shrestha et al., 2022).

The Virtual University of Medical Sciences (VUMS) provides authentic learning resources and educational content to Iranian medical institutes (Tabatabai, 2020). Innovative techniques must be introduced to educators in the practical disciplines

(Iwanaga et al., 2021). According to fourteen best practices reports gathered from Chinese medical schools, technical training, motivation, ethics, counseling, and adjustments to evaluation are useful in online education installation (Z. Jiang et al., 2021). Utilizing multi-mode deliveries can be more efficient than relying just on one (Vielma & Brey, 2021). Although incorporating technology into the classroom might be challenging, it can have a positive influence on academics' performance through fostering the professional growth of academic staff via the utilization of digital resources (DeCoito & Estaiteyeh, 2022). Poor network and other network access concerns are the main obstacles to online education. The higher education commission may operate collaboratively with the telecommunications industry to address those problems (Mahmood, 2021). Considering this, the Telecommunication Regulatory Commission and University Grants Commission (UGC) and telecommunication service providers have come to an agreement to grant institutions free access to LMS throughout the COVID-19 pandemic (Gamage et al., 2020).

Online evaluations were a major problem during the pandemic, as well as online education since it is necessary to evaluate student performance prior to moving on to the following semester at the conclusion of each semester. Therefore, the implementation of the most recent online assessment method significantly supported the teaching of academic subjects. As a result, academics were interested to learn more about "Gradescope," a semi-automatic grading method (Asgari et al., 2021). Thus, even during a pandemic, technology helps with both teaching and evaluation. However, it is crucial to adhere to academic quality requirements while performing both teaching and evaluations online. Standards, procedures, and indicators that guarantee the quality of online programs from beginning to end have been established by "The European Association for Quality Assurance in Higher Education" (Gamage et al., 2020). In their future careers, students, and professors both expect that the experience they obtain through online education will be useful (Sepulveda-Escobar & Morrison, 2020).

To improve their digital literacy abilities, academics should consistently participate in professional development webinars, events, and open online courses (Korkmaz & Toraman, 2020). Another study conducted in Mexico stated that they were unable to identify the emergency online teaching patterns from the perspective of the institutions, and that was a major weakness that opened the door for future research (Zapata-Garibay et al., 2021). Universities must consider academics' career development to educate them about effective teaching techniques that can be used even in the absence of technology (Rapanta et al., 2020). Academics and students should be encouraged to constantly use online resources for the improvement of the teaching and learning process when classes resume after the pandemic (Pokhrel & Chhetri, 2021). Like this, Egyptians are constantly using e-education for all their future higher educational practices (El Said, 2021). However, the continuance of a successful mixed teaching and learning environment also requires the use of hybrid teaching mechanisms (Müller et al., 2021). The Italian research (Appolloni et al., 2021) has demonstrated the necessity of resilience for sustaining higher education during and after the pandemic.

B. The Role of Research, Scholarly and Creative Work

The ability to access recorded lectures at any time helps students with self-regulation when lectures are delivered online. On the other hand, because students could self-regulate, online education saves academics time by avoiding them from attempting to solve specific problems connected to the lecture material that has already been provided

(Vielma & Brey, 2021). Online technology also makes it unnecessary to repeat the same courses for different student groups and provide thousands of students, simultaneous access to an online classroom and multiple viewings of recordings. Since the digital transformation in the education sector prevents academics from wasting time when they are teaching, they may use the extra time on research (Jandri et al., 2021).

During lockdowns, educators and researchers were still able to conduct their jobs remotely without compromising their importance to the education industry (Williamson et al., 2020). Even amid the pandemic, there was a notable advancement in research and funding for COVID-19-based projects in Canada (El Masri & Sabzalieva, 2020). As a result, Canada's research projects based on COVID-19 have received investments worth more than $325 million (El Masri & Sabzalieva, 2020). As a result, academics have additional opportunities and funding to advance their scholarly work and demonstrate their subject-matter knowledge amid the pandemic. Research-based universities have demonstrated a higher level of involvement in COVID-19-based research efforts to develop practical solutions for the worldwide pandemic (Mackert et al., 2020). Considering this, academics must adapt their roles to reflect the general trends of the pandemic period (Nguyen & Chung, 2020).

C. The Role of Dissemination of Knowledge

HEIs must participate in the transfer of knowledge while also satisfying the expectations of the stakeholders (Toquero, 2020). Therefore, by engaging in more productive research activities, academics should play a role in disseminating new information to the society that has a substantial social impact. As a result, there is a demand in society for more COVID-19-based research on many socio-cultural topics. The government must develop and implement the strategic policies essential to boost higher education's standing to handle difficulties and possibilities for social empowerment efforts during the pandemic (Saleh & Mujahiddin, 2020).

University librarians in developing countries face several obstacles when converting to an online platform, including a lack of digital literacy, a slow network, and a drop in the use of online library resources (Rafiq et al., 2021). These obstacles also have an impact on scholar work and knowledge-sharing initiatives. The academics shown amazing creativity, a strong feeling of community, and dedication during the pandemic despite the limited resources available (Noor et al., 2020). Fake information without any scientific research or experiment basis can be spread in society and have an adverse effect if scientific knowledge based on academic research and experiments is not shared in society. Until scientific information is produced to close the gap between society and literature, this cannot be avoided. For instance, COVID-19 saw misleading knowledge sharing since social media users were given incentives to network, share information, and seek for knowledge (Apuke & Omar, 2021).

Numerous studies have been conducted about university online education and the support given from the perspective of institutions. However, there is a lack of study on how each academic field was supported by HEIs during Covid-19 from the perspective of the institutions. As a result, from the perspective of HEIs, there are significantly fewer studies in the literature that examine how support was provided to university academics to carry out their teaching, researching, and knowledge dissemination activities during the COVID-19. In addition, no prior studies have used thematic analysis to search for institutional best practices. As a result, our study contributes to literature in both a methodological and an empirical sense.

III. METHODOLOGY

The research design's primary goal is to provide a framework for the investigation (Sileyew, 2019). As the study aims at uncovering novel information and ideas, the focus of the current study could be described as exploratory (Akhtar, 2016). The current study's research strategy could be classified as interpretative since interpretivism requires researchers to interpret study components by incorporating human interest into the study (Walsham, 1995). Rahi (2017) defines sampling as the process of choosing a subset of the target population for the research under study. The target population is made up of the people or objects being examined. Accordingly, there are 7 private universities and 15 state-run institutions of higher education in Sri Lanka (Sisira Kumara & Sachithra, 2021). The nonprobability purposive sampling strategy was used as the sampling methodology in the current study since it best matched the objective of the investigation.

There is a long history of debate about the simplicity and complexity of purposive sampling (Campbell et al., 2020). Researchers aimed to select deans of faculties from public and private universities in Sri Lanka to identify best practices for academics during and after the COVID-19 pandemic. The dean should have been in their duties since March 2020, as Sri Lanka reported the first COVID-19 case on 11th March 2020 (Erandi et al., 2020). Universities have been unexpectedly closing without providing a date for restarting courses until further notice (Rameez et al., 2020). The selected deans should have had full exposure to the pandemic from the beginning to the date. The researchers chose a purposive sampling technique for the qualitative study, considering all prerequisites and interview requirements. Even though it is time-consuming and expensive for the researchers, data was solely acquired from primary sources to meet the primary objective of the study (Hox & Boeije, 2005). Institutional best practices in higher education institutions during and beyond the pandemic need to be analyzed from the perspective of decision-makers. The university's academic decision-making hierarchy has a Vice Chancellor at the top, who oversees operations. Faculty deans implement teaching, research, and knowledge dissemination facilitation decisions. Deans have a better understanding of how they have facilitated academics with different practices based on the discipline they engage in. To cover these types of exposure, semi-structured interviews with deans from Sri Lankan higher education institutes can be conducted. This will help understand how institutions have facilitated academics to perform their roles and support them beyond the pandemic. From the perspective of institutional decision-makers, semi-structured interviews are a flexible and adaptable method for examining institutional best practices to support academic roles during and after the pandemic (Kallio et al., 2016). As a result, 30- to 45-minute online face-to-face interview sessions were held utilizing the Zoom platform.

According to Kallio et al. (2016), the researchers followed five stages for conducting semi-structured interviews using an appropriate interview guide. Thematic analysis was used to examine the collected data. It assists in recognizing the codes and themes appearing in interview transcripts (Braun & Clarke, 2006). The six stages Kiger & Varpio (2020) outlined for the thematic analysis are used in the current study.

IV. RESULTS AND DISCUSSION

Five deans from state institutions and four deans from private universities participated in the interview. Due to reaching a saturation point with a total of nine participants, the interviewing procedure arrived at the end. The point at which no new data are being

revealed or new themes are emerging from the data is known as the saturation point. Additionally, according to Guest et al. (2006), the idea of data saturation influences the purposive sampling size. The participant's demographic profile is shown in Table 1.

Similar to the validity and reliability of a quantitative study, credibility, transferability, dependability, and confirmability are the factors that influence the research's trustworthiness (Nowell et al., 2017). According to Tobin and Begley (2004), credibility is the alignment of respondents' opinions with how the researcher represents them. Peer debriefing, which is done in the current study, can increase credibility (Nowell et al., 2017). The researcher has an obligation to give thorough justifications so that others who desire to apply the findings to their own situation can do so and the transferability of the qualitative findings is acknowledged (Lincoln & Guba, 1985). Considering that the researcher was unaware that the results may be transmitted on the sites. Dependability may be assured if the study methodology is reasonable, well-documented, and traceable (Tobin & Begley, 2004). Dependability has been attained since the current study has carefully documented, transcribed, and recorded every interview. Confirmability is also proven once the study has attained dependability, credibility, and transferability (Guba & Lincoln, 1989). As a result, the validity of the current study has been guaranteed.

In accordance with the first phase of the thematic analysis, all interviews were recorded with the participants' prior agreement, and transcripts were produced to familiarise researchers with the data. Initial codes were identified, then they were divided into preliminary themes by grouping them together based on common characteristics as per the Table 2.

Table 1. Demographic Profile of the Participants

Participant	Gender	Faculty	Participants' HEI	Participant Label
1	Male	Business/Management	Private	DPV1
2	Male	Humanities & Social Science	Public	DPB1
3	Male	Business/Management	Public	DPB2
4	Male	Science	Public	DPB3
5	Male	Education	Public	DPB4
6	Male	Engineering	Public	DPB5
7	Male	Humanities & Social Science	Private	DPV2
8	Male	Engineering	Private	DPV3
9	Male	Information Technology	Private	DPV4

Source: Authors' compilation.

Table 2. Searched Themes for All Three Academic Domains Based on the Code

Teaching and Academic Development	
Identified Codes	**Created Themes**
• Availability of a backup plan prior to the pandemic • Availability of open distance learning method prior to the pandemic • Smart Classrooms availability prior to the pandemic	Pre-preparation for an uncertain future

• Providing hardware for engaging with online teaching • Providing software for engaging with online teaching	Support with IT infrastructure
• Shift to the online teaching	Migrate Courses Online
• Uploading documents, recorded lectures • Conducting online live lectures • Difficult to do practical with online mode	Multiple modes of delivery
• Lecture delivery platforms via ZOOM, Webex, Microsoft Teams • Unique recorded lectures uploading portals • Lecture materials uploading portals	Online teaching management tools
• Mobile apps for communicating students' examination results • Using LMS and other official websites for communicating notices to the students • Using official email and WhatsApp group-based information sharing	Effective communication
• Online Assessment Methods • Open book examinations • Take-home assignments • Introduce separate portals for conducting examinations (Online quizzes, structured examinations with proctoring)	New assessment methods
• Training programs/ Induction programs for online delivery methods • Creating centres for training and workshops • Continuous training programmes	Support and training for online course delivery
• Regular Monitoring of online lecture deliveries and giving instructions • Giving feedbacks for the lecturers based on recorded videos	Online education quality standards
• Adopting to a concurrent teaching practice • Adapting to fully physical operation beyond the pandemic • Blended/hybrid teaching options • Virtual Laboratories • Continuing open distance learning	Teaching strategies beyond the COVID-19 pandemic

Research, Scholarship and Creative work	
Identified Codes	**Created Themes**
• Research workshops/ Online Webinars for research • Training programmes for enhancing research • Simulation programmes for junior staff • Research Council • Establishing centres and committees for encouraging research	Support and training for research
• Mini grants • Utilization of research grant and funds • Faculty budget allocation for encouraging research	Allocating funds for research
• Online research conference • Publishing success stories of the staff members on the website and on the social media • Virtual research award ceremonies • Online research Meetings/discussions • Significant involvement in the research	Engaging in research activities with virtual appearance
Dissemination of Knowledge	
Identified Codes	**Created Themes**
• Conducting webinar/workshops for public • Inter-university teaching via online • Engaging with different local institutes for doing research	National development activities
• Coordinating activities • Student Counselling • Interfaculty teaching via online	University development activities
• Signed online MOUs with international universities • Presenting research findings to foreign conferences via online • Conducting research with foreign scholars • Inviting for international scholars to deliver guest speech • Host international conferences online	International Collaborations

Source: Authors compilation.

A. HEIs best practices to enhance academics teaching role amidst COVID-19 pandemic and beyond.

1) Pre-preparation for an uncertain future: Before the COVID-19, some HEIs in Sri Lanka already had a backup plan in place to ensure that their academic activities functioned well despite any potential uncertainties. The respondents said that the unexpected lockdown of campuses occurred after the Easter bombing in Sri Lanka occurred. Vice chancellors were then encouraged to create a strategy in advance for such emergency scenarios in the future. Moreover, academics exposed to smart classes and the recording and uploading the sessions to the portal. Smart classes are environments where information is shared in an intelligent manner using cutting-edge web and network technologies along with hardware and software (Chen et al., 2017; Saini & Goel, 2020).
"I must say that after the Easter attack, our vice-chancellor advice to have a backup plan for business continuity plan, if we have a similar type of attack or country shutdown situation." (DPV1)

HEIs do not suffer from discontinuing academic activities even for a day since they have a plan in place, but they are worried about how well the students will take the unexpected changes in the delivery methods. The institutions then conducted a brief survey and started their transformation activities.
"Before taking the decision, what we did was we assessed the students' capability and the students' accessibility, and most of our students, it means 90% of our students have smartphones, which means at least they have some devices" (DPB4).

Those HEIs without a pre-planning process had to stop their teaching activities and spend more time to begin them with different plans.
"Impact beginning of course we were wondering how to start teaching because we had examinations, but we postponed examination for a while and then decided to continue to lecture" (DPB2)

According to the facts, it is best practise for HEIs to prepare ahead for future uncertainty with a long-term perspective because having a backup plan won't prevent business from considering other options. Even if such practices are already in use in developed nations, they are new to developing nations, and to combat the pandemic, developing countries are quickly adopting these practices.

2) Support with IT infrastructure: The main concerning aspect of online delivery is the need for hardware and software to support digital platforms. But practically all HEIs provide academics with the necessary software and hardware for online delivery by spending a sizable amount of funding. Academics at universities highlighted a lack of IT infrastructure in the context of industrialised countries like the USA as well (Asgari et al., 2021). Asgari et al. (2021) claims the same as the problem of limited access to the equipment and software required for online education could be resolved by devoting a sizable amount of funding for their provision.

"When we shifted traditional method to virtual method, I set up each department should have one room with internet facilities and the cameras for one specialization. (DPB5) "We purchased, cameras, laptops, software like Camtasia purchased for some lecturers". (*DPB1)"...And in the meantime, I wanted to give laptops to all the staff members to continue this particular exercise". (DPV1)*

According to the points of view, all HEIs have provided all academics with the software and hardware they need to effectively carry out their academic roles throughout

and beyond COVID-19. As a result, one of the best practices used by HEIs to help academics who are teaching online during the epidemic is providing IT infrastructure.

3) Multiple modes of delivery: Utilising various delivery mechanisms is more efficient than relying just on one (Vielma & Brey, 2021). Because there is less face-to-face connection between the teachers and the students when classes are delivered online, students are less focused on the teachings. The disadvantages of relying solely on internet-based education might thus be overcome by utilizing several delivery methods. So, prior to the lecture session, they made lecture materials available. Additionally, to overcome the difficulties of just relying on online delivery, the lectures were also made available to the students in recorded form. *"We advised lecturers to upload relevant material to each session. Scanned notes, book chapters to refer to the students" (DPB1).*
"Some of the students do not have the facility to connect to the online lectures there. Were we asked them to connect as much as possible after the lesson recorded version made available LMS and on a YouTube page, we upload the recorded lectures to the YouTube channel so that students can get access" (DPB2).

Since the lectures were recorded, students could further refer to their questions, which saved academics' time from having to address each student's issue independently. As a result, academics now have more time to devote to research and information dissemination. Depending on the course's subject content, it might be challenging to conduct totally online sessions in the STEM fields: science, technology, engineering, and maths. Therefore, using a variety of methodologies is the best approach for teaching STEM-related subjects. According to the available information, examples include home lab kits and lab experiment recording (Asgari et al., 2021). Online delivery may be made in engineering experiments to a certain level, and then virtual lab sessions can be used for the experiments (Tabatabai, 2020). As a result, using a variety of delivery techniques can successfully improve the academic function of teaching.

4) Support and training for online course delivery: The HEIs held a lot of webinars and seminars to aid academics in making a quick transition to the online environment. Even those who had a pre-planning strategy conducted academic training sessions. Some HEIs have included technological assistance for distance learning into their teacher training courses. Additionally, a few of universities have developed teacher training centres and have appointed a separate director for the facility. *"...from our side we gave the training from the induction on how to develop and deliver the online teaching" (DPB4).*
"....and the meantime our lecturers we trained them through our teacher training program as well to deliver these online lectures" (DPV2). "When we were starting to do this, I was established an institute called "Centre for digital education and professional development". After that appointed a director to the institute. I assigned her to take the responsibility on this side" (DPB1).

One American university started moving all its offline lecture delivery methods online. Individual professors were received support and training for delivering online courses (Vielma & Brey, 2021). University professors must learn how to create an online course curriculum or get more familiar with Zoom's capabilities (Asgari et al., 2021). Most faculties have made significant efforts to improve the academic role considering and beyond the epidemic. As a result, academics might use the information they acquired via the training programs to develop their careers.

5) Online teaching management tools: Tools are available to manage online delivery in a manner that attractive to the audience and helps to effectively engage the audience. According to the respondents, Zoom is the platform that is most frequently utilised in Sri Lanka. Other technologies, like as Microsoft Teams and Webex, are also used by some HEIs in addition to Zoom for distance learning.

"We introduced using Microsoft Teams as the lecture delivery plat form, because per batch student count is very high and easiness of the using features to the lecturers as well as students" (DPV4). "*We purchased cameras, laptops, software like Camtasia purchased for some lecturers.* (DPB1). "*We were given Zoom platform by the UGC free of charge, so lecturers given the accounts and they were able to teach to the students". (*DPB2)

Another study has stated that university professors are expected to get deeper knowledge of Zoom's capabilities (Asgari et al., 2021). Moreover, as some academics like various multimedia programmes like Kaltura Capture, Camtasia, or Snagit, which help them improve their multimedia abilities, HEIs have also invested in these programmes to speed up the online teaching process (Asgari et al., 2021).

6) Effective communication: Due to the lack of actual meetings on university premises, communication between the university and academics as well as between the academies and the students was fragmented. According to the interviewers, official common notices are therefore provided for the students via LMS and the university website. Additionally, new attempts to communicate exam results, such as the SMS system, are being developed. Additionally, universities have created several efficient communication tools to raise awareness among the many stakeholders. "*We published all notices via LMS for students related to each module*" (DPB2). *"All the information is digitalized. As the dean of the faculty, I take care of the University website. We managed a university students' SMS system where one's results is received; they can receive a SMS. I would like to thank COVID because the system was shifted from traditional mode to the modern mode"* (DPB5). *"Apart from that, we developed a lot of systems inside the faculty. Developed apps, we created a mobile app for the students to students to login to the app and see the semester results"* (DPB1).

Asgari et al. (2021) have also stated that to close the gap and bring academics and administrators back together, effective communication is essential. Academic communication also underwent digitalization throughout the pandemic in the above methods.

7) New assessment methods: The university system has adopted new evaluation techniques in place of on-campus exams. The HEIs also give academics the opportunity to use new assessment techniques to effectively complete evaluations at the conclusion of their teaching roles. According to the responses from the respondents, in addition to the conventional close-book exams, the HEIs have also offered open-book exams.

"...But very unfortunately most of our friends don't get it, and still, they like tuition-type lectures at the university and spoon-feed them. I think that must be stopped and we have to start open book examinations" (DPB3). *"We were planning to get the assignments done by students with open book questions and submitted to the LMS or send via postal"* (*DPB1*). *"Normally, we had closed book exams, and we changed it to open book, online exams, and quiz, which is developed online. So, that assessing methodology is changed by giving the basic training to the faculty". (*DPB4)

Students and academics have benefited more from new exposure because of the implementation of new assessment practices. A USA study has stated that the primary issues with online exams include impersonation, cheating, and other academic misconducts, which university policy makers must address by randomly generating questions and online proctoring (Asgari et al., 2021). Meanwhile, the online evaluations save more time for the academics.

8) Online education quality standards: While some institutions have focused on quality standards, others have not, maintaining quality may enhance the academic teaching function in many ways. Therefore, both during and after the epidemic, it is excellent practise to uphold quality standards for both physical and online teaching sessions.
"…lecturers where you know that without the video, they tried to deliver but we specially told that I think facial expressions and the body movements hand gestures and everything also important". (DPV1) "At the very beginning and even top management of the institution also check all these videos from the beginning how these are going on". (DPV4)

A study has stated that it is crucial to create institutional quality standards for online education (Asgari et al., 2021) while the European Association for Quality Assurance in Higher Education states that online teaching courses can be included in institutional policies that cover quality elements like course structure, course development, institutional support, required e-learning training for new faculty members, teaching and learning, technological infrastructure, and student assessments (Gamage et al., 2020). In the Sri Lankan environment, it is also essential to uphold the quality requirements.

9) Teaching strategies beyond the COVID-19 pandemic: Most universities intend to expand the role teaching based on exposure to new experiences. While some HEIs conduct experiments, others make decisions on the future of teaching in the context of the new normal. Therefore, rather than immediately rejecting the new experience, the majority of HEIs are continuing the new exposure as hybrid lectures. *"We are planning to use both traditional and online teaching method further"*. **(**DPB1) *"We will continue the existing practices, and this is great opportunity to transforming the open distance learning and improve based on this opportunity and will continue further"***.** (DPB4)
While this is going on, other academic institutions plan to effectively advance online learning by delivering lectures concurrently with several other innovations, such as virtual labs. *"Then the second stage, we improved it uhh this teaching practices. And then we come to the re started you know that period then we introduce this concurrent delivery. That is both types (Online/On campus) of students available"* (DPV1). *"Currently we are testing and planning to introduce virtual lab facility for the students, and they can have the particular lab facility through their laptop from home"* (DPV4).

Another faculty member, who is uninterested in online teaching and evaluation methods and prefers to remain with the traditional status, provided the other viewpoint. Additionally, they discovered that internet delivery is not entirely effective.
"Impact with the zoom or the online teaching as well as examination what we have practiced during may be last 1 or 2 year we have realize that is not successful as such because mostly examinations realize performance of most students are not up to the expected level because may be online platform lecturing not the effective because they have not associated use to materials uploaded to the LMS."(DPB2).

Similarly, several previous studies have illustrated the importance of virtual labs. Virtual laboratories, remote control labs, or video-based labs are good solutions when students aren't physically on campus (Gamage et al., 2020). Students can benefit from the usage of virtual laboratories and remotely accessible labs, where the experiment setup is on campus and students use tools for remote control and administration of the setup (Asgari et al., 2021; Vielma & Brey, 2021). However, the COVID-19 pandemic has significantly affected clinical education and caused considerable disruptions in clinical evaluation (Tabatabai, 2020). Through virtual education, simulation-based technology is being used to maintain the integrity of clinical education (Tabatabai, 2020).

B. HEIs best practices to enhance academics research, scholarship, and creative work amidst COVID-19 pandemic and beyond.

1) Support and training for research: According to the respondents, the HEIs offered online training sessions, simulation programs, and workshops to help researchers carry out their duties. Even throughout the epidemic, academics have been motivated to provide superior research results. The faculties have also established research institutes to effectively coordinate research activity. Additionally, the other HEIs have appointed research coordinators to support research efforts. Others, meanwhile, are carrying on their research endeavours through the university's already-established research councils. *"We gave research grants, we did not stop during the pandemic situations and the conferences, and journal publications even awards*". "*We have a research coordinator for each faculty and bring the people and share the outsider's expertise and knowledge with our staff and workshop sessions"* (DPV1) *"I established an international center for multidisciplinary research. Within this centre all the research activities will be conducted both lectures and students research activities linked with this centre". (*DPB1) *"We have a research council to handle all the reach-related activities"* (DPB3).

Another study has stated that academics had to carry out their jobs during the pandemic while staying at home with less interactions, but HEIs still support them by providing all the necessary online resources (Abidah et al., 2020). Therefore, HEIs have a big obligation to help academics to develop excellent research results for the benefit of the community, nation, and global.

2) Allocating funds for research: Research activities need enough money to pay for experiments, data collecting efforts, and other supplies that need to be acquired. Furthermore, some journals charge article processing fees for being allowed to publish the research articles. In addition to the university level, the faculty level provides financial assistance by providing a portion of the faculty budget. To encourage academics to generate even better outcomes, the institution additionally pays the expense of proofreading. Financial support is provided by the faculties for innovative and creative activities in addition to scholarly work. "*We make lot of financial support for our staff members".* (DPV1) *"We are giving mini grants from the faculty level and conducted training"*. (DPV3) "*Faculty reimburse particular cost related to research publication"* (DPV1). *"Innovations related funds also giving to the academic staff*" (DPB1).

According to Hicks (2012), university professors are strongly motivated to do well in their research output and to continue the same practises they had in the previous environment. This is because funding is distributed depending on how effectively they conduct their research.

3) Engaging in research activities with virtual appearance: Without interrupting any academic activity because of the pandemic, all supervisor meetings and research discussions were held online. To make academics' internet presence more useful, services like an electronic library system have been made available. Numerous virtual events have been planned by universities with the goal of improving academic researchers' research performance. Additionally, institutions have improved academics' research output by encouraging them with rewards like recognition and reputation. Additionally, the HEIs have hosted online conferences and journal launches with the involvement of both domestic and international participants. However, research publications are also expanding rapidly during the pandemic. "*Final year, they have a research component. The normal scenario is the students come and take the advice. Here Zoom meetings were conducted in groups and individual's basis." "We started the first international conference organized by the faculty online and we invited Prof. Kotler to be the keynote speaker",* (DPB4) *"We have introduced e-library system"* (DPB3). "*We have organized virtual research awards ceremony"* (DPV3).

With the use of online facilitation technologies, higher educational institutions can maintain all the assistance that they had started providing before the pandemic (Abidah et al., 2020). Through the outbreak, people virtually appeared to one another with the use of digital means. The digital revolution allowed for collaborative research to be done electronically while being at home in the educational sector (Alawamleh et al., 2022).

C. HEIs best practices to enhance academics knowledge dissemination role amidst COVID-19 pandemic and beyond.

1) National development activities: Therefore, in collaboration with professional organizations, academics are contributing to the growth of higher education in society. Additionally, cooperation with diverse parties is a crucial element in the growth of the country. Furthermore, HEIs are providing academics with even leaves to write scientific books to assist them in disseminating information. "*Actually, we have no barriers we encourage all our staff members to make connectivity with outside*" (DPV1) *"So, we have given actually two half days per faculty, then two staff members can go outside and teach in other universities and come back"* (DPV4) "*Even we are giving you know that sabbatical leave as well to write scientific books*" (DPV1). "*Some institutions also send us requests to do some sessions for their institutions. For example, Sri Lanka Police, Sri Lanka Army, Parliament invites for sessions and for engaging with some research".* (DPB1)

The area of knowledge being disseminated at COVID-19 is continuously changing (N. M. Rathnayake et al., 2022). Academics in the field of health sciences have a significant obligation to share the appropriate information with various stakeholders at the appropriate time. To improve communication between doctors and patients, chemists are also crucial (Sami et al., 2021).

2) University development activities: Academics must contribute to the advancement of the institution, which is crucial for promotions and professional growth, while also enhancing their own abilities. *"Usually in the academic promotion too consider about inter faculty teaching. Therefore, we normally facilitate for the inter faculty teaching".* (DPB1) "*Every academic or the department members are playing different roles like*

Directors, Coordinators, looking after the centres etc." (DPB5) *"We arranged a special counseling program for students with the support of our academic staff*." (DPB1)

The literature has mentioned the same as most institutions are providing student counselling throughout the pandemic with the assistance of their professors since they are constantly concerned about the requirements of their students (Hu, 2020). Academics have given their students access to this counselling facility using digital platforms like WhatsApp, Facebook, Instagram, or social media, as well as Zoom, Webex, Google Meeting, or Hangout (Supriyanto et al., 2020).

3) International collaborations: With the pandemic, developing nations have a tremendous potential to get worldwide exposure, and academics have an even bigger opportunity to advance their skills and knowledge via exposure to other cultures.
"We have an international honorary professor network, and staff members can connect to the honorary professor network for doing collaborative research or other types of knowledge-sharing activities". (*DPV1)* "*We are doing lot of trainings for the academic staff on procumbent, conducting research sessions by inviting foreign professors virtually".* (DPB1) "*From university's point of view, we had a conference with Asian Association of Open Universities online".* (DPB4)

Academic skills must be updated, and developing nations must connect themselves with global exposure. It has been claimed by another study as between developed and developing countries, there was a knowledge and technological gap that pandemic has closed (Gamage et al., 2020).

Out of the three domains, Sri Lanka's higher education sector has received priority for the teaching function. Teaching is therefore the part of Sri Lanka's higher education industry that is most noticeable. The center of the higher education system, around which the other two domains operate automatically, is teaching. Therefore, academics are concerned about the rest of the domains for their chances for career development.

While there are many studies on online teaching and learning in higher education, there is a significant knowledge gap in university practices for academic research activities and knowledge dissemination. Additionally, no studies have explored best practices with thematic analysis in higher education institutions. The current study bridges both methodological and empirical gaps in the existing literature.

V. IMPLICATIONS

The evolution of the human capital theory could not be considerably influenced by the heterogeneity of the higher education system (Alam & Parvin, 2021; Bruni et al., 2020; Marginson, 2019). The higher education system in Sri Lanka is similarly heterogeneous (Herath et al., 1997). According to the study's findings, many HEIs have various opinions about the future of online education. However, the heterogeneity of the higher education system can be reduced through online learning and other digital advancements (Evers et al., 2020; Harrison, 2020). Bangladesh, an Asian nation, was able to create a policy framework for integrating internet technology into their higher education system (Alam & Parvin, 2021). Another research (Alam & Asimiran, 2021) supports the necessity for a regulatory framework to ensure the continued sustainability of the higher education industry in times of crisis. Accordingly, the results of the current study can help create a regulatory framework by identifying university best practices that were applied during the pandemic and are planned to be applied in the future.

VI. LIMITATIONS AND FUTURE RECOMMENDATIONS

Future researchers might survey the identified best practices, as the current study did not use quantitative tools to validate the practices. Additionally, the current study did not capture the opinions of academics and students on best practices that had been put into place. Therefore, future researchers may inquire of them for their opinion on the university policies that are intended to be put into place after the pandemic.

VII. CONCLUSION

COVID-19 was a blessing for developing countries as the higher education industry in these countries quickly became digitalized because of shifting to online platforms, which was the only viable option for the survival of the HEIs. In relation to each of the three dimensions of the academic role, the present study revealed best practises used by HIEs in Sri Lanka. A substantial advancement in the teaching field could be seen in the increased use of online management tools, together with associated software and hardware, and in the fact that HEIs continue to train academic staff long after the epidemic with the aim of advancing digital technologies. Therefore, beyond the pandemic, virtual labs, concurrent delivery, and hybrid deliveries are still being used. Along with global exposure, academic research and information dissemination, areas have also gone digital. As a result, new avenues have opened for developing countries to learn about global best practices outside. As a result, policymakers in developing nations may concentrate on enabling digital empowerment in the higher education sector.

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