

Teacher Learning Outcomes on Post COVID-19: A Review Based on Malaysia and other Asian Countries Perspective

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Abstract

The COVID-19 pandemic has significantly obstructed global education systems, fascinating educators to rapidly evolve to remote teaching and learning environments. This drastic change has interrupted predictable teaching methods and introduced unparalleled challenges. This case study delves into the experiences of educators in Malaysia and select Asian countries during and after the pandemic, highlighting the immediate implementation of lockdowns and the subsequent closure of educational institutions. Social distancing measures and movement restrictions further compounded the negative effects on traditional educational practices, necessitating adaptations in teaching approaches. The study aims to provide an overview of the pandemic's impact on education in Malaysia and other Asian nations, exploring the pre-pandemic educational landscape and the subsequent modifications and professional development undertaken by educators. This review is an integration of distant and hybrid learning modalities using a theoretical conceptual framework. The challenges presented include differences in digital resources, insufficient technological assistance, and a lack of experience in online teaching. The article also highlighted on the long-term effects of these changes and the future of education in the post-COVID era. In the midst of these challenges, educators demonstrated resilience and ingenuity by utilizing all of the resources at their access, collaborating with one another, and searching out chances for professional development to advance their techniques. Accessibility to technology, administrative support, and chances for further professional development are important elements that affect teacher learning outcomes after COVID-19. It assesses the efficiency of governmental initiatives and institutional support networks in fostering teacher learning both during and after the pandemic. Furthermore, this review contributes to the creation of a more robust and adaptable education system for the future by analyzing the experiences of educators in Malaysia and other Asian nations. It also offers insightful information on the prospects and difficulties in post-pandemic education.

Keywords: Teacher Learning Outcomes, Education Adaptation, Educational Resilience, Policy Implications, Teacher Support, Challenges

Background of the Study

The new coronavirus SARS-CoV-2 that produced the COVID-19 pandemic had a significant influence on education institutions across the globe. The government implemented controlled travel restrictions, closed non-essential companies and schools, outlawed outdoor sports and activities, and required visitors to Malaysia to undergo a 14-day mandatory self-quarantine in locations designated by the Ministry of Health (Kaur, 2020). The COVID-19 has altered the nature of education. Global disruptions caused by the COVID-19 pandemic have accelerated the transition to remote and hybrid learning models. In order to maintain educational continuity, educators have been forced to modify their pedagogical approaches, plans, and technological tools. But this sudden change has also brought attention to the necessity of teachers' ongoing professional development in order for them to successfully navigate the obstacles posed by the pandemic and beyond.

Education institutions continue to struggle with the global health crisis, and they must take into account a variety of online and hybrid teaching and learning strategies. Governments all throughout the world conducted massive closures of educational institutions, including colleges, universities, and schools, in an effort to stop the virus's spread. Although these restrictions were initially only temporary, they were frequently prolonged. Learning and teaching continue even in the event of an abrupt or forced closure of an educational institution (Watermeyer et al., 2020). In response to the COVID-19 epidemic, in-person instruction is rapidly ceasing, which has assisted teachers in comprehending the differences between in-person instruction and their other procedural methods. With all of the practical and practical issues it entails, and often without adequate practical assistance, educators refocused and reorganized to provide their approaches and methods in teaching and learning from home (Hodges et al., 2020). The COVID-19 epidemic has spread to other nations, and educational institutions now face the issue of maintaining continuous instruction while managing the possibility of extended closures (Ali, 2020).

The pandemic has highlighted the significance of providing educators in Malaysia and many other Asian nations with the skills and competences they need to effectively offer remote and hybrid education. While Malaysia has put in place a number of tactics to promote teacher professional development during the epidemic, including webinars, online training programs, and peer learning communities, it is crucial to evaluate the effectiveness and impact of these measures on online teaching and learning. This research will compare and contrast approaches to teacher professional development with those of other Asian nations, including South Korea, Japan, and Singapore, and look at the learning outcomes that ensue. A thorough examination of online teaching and learning in various Asian contexts would take into account variables including infrastructure, socioeconomic differences, government policies, and cultural settings.

Overview of the COVID-19 pandemic's impact on education in Malaysia and other Asian countries.

Due to the pandemic, there has been a significant shift in education, with schools closing unexpectedly and remote learning becoming popular very quickly. The sudden transition to

online learning presented difficulties for preserving the standard of instruction. Additionally, in order to acquire knowledge, traditional classroom instruction gave way to online instruction. This has implications for education's accessibility, quality, and equity. Several issues arose with remote learning, such as the "digital divide," which made it difficult for students without access to dependable internet or technology to engage in class. Furthermore, modifications to instructional techniques, student involvement, and assessment methodologies were frequently necessary for distance learning. Lack of face-to-face interaction and support caused learning loss or disengagement in certain students. The gap in educational attainment grew, disproportionately affecting underprivileged communities.

The integration of flexible learning assessments and the promotion of lifelong learning serve to reinforce these transformative endeavors within the Malaysian setting. Doucet et al. (2020) have explored the flipped classroom technique, which entails connecting students to YouTube, pre-filmed videos, and articles before class. This method has deepened discussions between students and professors during virtual sessions. In distance learning, also known as remote learning, the teacher and student are not in the same physical location and frequently interact with the material at different times (Kentnor, 2015). In 1950, the University of Houston, Texas, launched the country's first university-licensed radio station, KUHF-FM, to offer undergraduate courses, marking the beginning of a significant online learning experience in the country. Fisher (2012), Technology development has an impact on human lifestyles, but it has also altered the nature of education (She et al., 2019). One of the ways that teachers are keeping up with the latest technological trends to draw in the younger generations is through blended learning, which blends traditional classroom instruction with online learning. Since a few years ago, online education has gained popularity in the worldwide education sector, mostly among working adult students who are unable to attend classes on a full-time basis (Moore et al., 2011). The majority of pupils still choose going to traditional classroom settings. In order to communicate and learn efficiently, Austrian students still prefer face-to-face instruction, according to a study by (Paechter and Maier, 2010).

Students in the UK showed a comparable preference for using physical text materials over internet resources when learning, according to Orton-Johnson's (2009), findings. Nevertheless, the Covid-19 pandemic compelled governments everywhere to give online education top priority and shut down all educational establishments. That being said, since this study was conducted during COVID-19, the circumstances have significantly changed. A number of nations have implemented preventative measures in an effort to prevent anticipated future waves, such as closing colleges and universities and converting the coronavirus into an entirely online learning environment. This was a response to the World Health Organization's strongly recommended social distancing guidelines to stop the spread of COVID-19. This lockdown started in the middle of the spring semester, something neither the professors nor the students had anticipated.

Students lost out on important social connections and support systems when schools were closed. Numerous people reported feeling more stressed, anxious, and alone, which had an adverse effect on their mental health and general well-being. The literature also indicated that students found it extremely difficult to study at home since they felt responsible for

meeting their family's needs and obligations. Some kids felt responsible even though their parents might not have asked for their assistance with household tasks. According to the study, the majority of students experienced frustration when their parents failed to provide the necessary support and did not understand their struggles, instead making unpleasant remarks and passing judgment (Kamaludin & Sundarasan, 2023). To maintain fairness and support distant learning, policymakers and educational institutions had to modify their evaluation practices. The pandemic made socioeconomic disparities already present worse by making it harder for low-income families to get help and resources for their children's schooling.

In order to improve remote learning opportunities, educators and institutions experimented with novel teaching strategies and technological advancements. Long-term effects of the epidemic on education are probably in store, changing educational priorities, practices, and regulations. It brought attention to how crucial equity, flexibility, and resilience are to global education systems. To help students learn more effectively, an online backup plan was created to carry on with instruction and evaluation using a digital interface (Rapanta et al., 2020). After physical classrooms were shuttered, teachers and students quickly shifted to online learning. The effectiveness and accessibility of this transition varied widely, based on variables like socioeconomic position, internet connectivity, and technology availability.

Pre-COVID Education Landscape in Malaysia and Selected Asian Countries

The goal of the education system in Malaysia was to provide education from primary through tertiary levels, utilizing both public and commercial sectors. Through programs like the Malaysia Education Blueprint 2013–2025, which focused on increasing outcomes and diversity, the nation sought to improve the quality and accessibility of education. The Ministry of Education (MoE) is in charge of ensuring that all students in public schools have access to education due to Malaysia's highly centralized educational system (Zabidi & Adams, 2022). The Ministry of Education (MoE) oversees, plans, and leads the education transformation by establishing the Education Performance and Delivery Unit (PADU) to efficiently design the best possible education for every Malaysian. The five system ambitions of Malaysia—access, quality, equity, unity, and efficiency—form the foundation of the country's educational policies. But in the drive for better education, there have been gaps in the Malaysia Education Blueprint (MEB) 2013–2025's execution and aspirations (Zabidi & Adams, 2022).

As a strategic vision, the Cambodian Secondary Education Blueprint 2030 lays out agreed-upon tactics and initiatives that will significantly enhance secondary education and its numerous connections with other subsectors, the public and private sectors, and other subsectors (Chea, 2024). Singapore's Smart Nation vision of "transforming Singapore through technology" to become a competitive global metropolis that prioritizes using digital technologies to create a future-ready Singapore is expanded upon by the ICT-Education Masterplans (Singapore, 2021). Digital technology "unlocks a new realm of self-directed and collaborative learning," according to the Smart Nation Vision (Alemán de la Garza et al. 2019). In order to establish a comprehensive and favorable environment for learning, relationships between students, teachers, and parents are strengthened, as well as the capabilities of the physical infrastructure. Teachers can concentrate on the important job by automating repetitive and routine duties.

From Thailand educational perspective, a new era with a focus on developing a robust infrastructure to enhance human capital. Under the theme of “leaving no one behind”, the Thai Education to The Power of 2 (TE2S) education reform promotes excellence and sustainability (Rukspollmuang & Fry, 2022). The academic capacity of students will be improved, teachers will be equipped with 21st century skills and the concept of learning will become more flexible in order to fulfill the Education Eco-System. Through this approach, a plan has been structured to unlock, change and widen education to ensure human capital is strengthened for Thailand’s future. Prior to COVID-19, there were differences in Malaysia's and a few other Asian countries' educational systems' methodologies, policies, and structures.

Traditional Classroom Learning

Traditional classroom learning was the prevalent style of education delivery in Malaysia and other Asian countries before the COVID-19 outbreak. These educational systems varied in terms of curriculum, class sizes, and assessment methods, but they all placed a strong emphasis on in-person instruction and teacher-led learning. The majority of education delivery at all levels, from primary to university, took place in classrooms. This conventional method frequently depended on direct communication between educators and learners. The Malaysian education system was built on the foundation of traditional classroom instruction. Pupils followed prescribed curricula specified by the Ministry of Education, receiving instruction from teachers in physical classrooms. In public schools, class sizes vary but might be rather large. The curriculum included required classes including science, arithmetic, English, and Malay language along with electives that were chosen according on the students' prior academic performance. Students were prepared for tests such as the UPSR, PT3, and SPM through a progression of six years for primary education, three years for lower secondary school, and two years for upper secondary education (Magaswari, 2017).

E-learning, online education, and related courses were once widely regarded as components of non-formal education; however, current thinking holds that in the event of an emergency of any kind, such training can eventually take the place of the formal educational system (Aristovnik et al., 2020). An important component of the Singaporean educational system was traditional classroom instruction, which required pupils to attend classes. According to published research, Singapore's bilingual policy validates English as the language of instruction in all schools at all levels and for all subjects except mother tongues (MTs), as well as the language of governmental administration and interethnic communication (Curd-Christiansen & Sun, 2020). The curriculum placed a strong emphasis on fundamental disciplines including science, math, English, and mother tongue languages. Compared to certain other countries in the region, class sizes tended to be smaller. Academic achievement and demanding exams, such as the Primary School Leaving Examination (PSLE), GCE Ordinary Level (O-Level), and GCE Advanced Level (A-Level), were highly valued in Singapore's educational system (Ho & Lee, 2022).

The Japanese educational system was firmly rooted in the traditional classroom model. Students went to schools where they had face-to-face interactions with peers and teachers. With a focus on discipline and deference to authority, Japanese schools were generally well-regimented (Wolf & Avornyo, 2023). According to the Ministry of Education, Culture, Sport, Science, and Technology [MEXT] (Sato, Tsuda, Ellison & Hodge, 2020), teachers in Japan

receive specialized training for teaching at each stage of the educational system, including kindergarten, elementary, secondary, and special needs education. Numerous areas were covered in the curriculum, including science, arithmetic, social studies, Japanese language, and physical education.

Pupils took standardized tests like the National Assessment Test and the National Center Test for University Admissions. However, traditional classroom instruction played a significant role in South Korea's educational system as well. Students went to schools with demanding curricula that prioritized academic success. There was a lot of competitiveness and pressure to perform well academically in South Korean schools (Kim & Jung, 2020). The curriculum placed a strong emphasis on fundamental disciplines like social studies, science, math, and the Korean language. Class sizes can differ, and overcrowding is a problem at some schools. Pupils took part in standardized tests, like the National Assessment of Educational Achievement and the College Scholastic Ability Test (CSAT) (Shin & Cho, 2021).

Standard Examination Procedure

Standard Examination Procedure played a crucial role in evaluating students' academic performance and establishing their educational paths in Malaysia and other Asian nations prior to the COVID-19 pandemic. These tests have a significant impact on students' futures by determining their eligibility for postsecondary education and employment prospects. According to Alam and Mohanty (2023), standardized examinations were crucial in evaluating students' academic achievement and determining whether they would advance to further education or be admitted to esteemed schools. For students in Malaysia, exams like the SPM (Malaysian Certificate of Education), PT3 (Form Three Assessment), and UPSR (Primary School Evaluation Test) were significant turning points. Standard Examination Procedure was an essential component of the education system at several levels in Malaysia. Important tests included the SPM (Malaysian Certificate of Education), a high-stakes test taken at the end of secondary education (Form 5), the PT3 (Form Three Assessment), which assessed students' understanding of subjects at the lower secondary level, and the UPSR (Primary School Evaluation Test), which measured students' proficiency in core subjects at the end of primary school (Year 6). For students, the SPM findings were essential in determining their eligibility for postsecondary education pathways, such as enrollment in pre-university programs or vocational training. Another important component of Singapore's educational system was Standard Examination Procedure. For pupils finishing primary school (Primary 6), the Primary School Leaving Examination (PSLE) was a crucial occasion since it decided where they would be placed in secondary schools. In addition, the Singapore Examinations and Assessment Board (SEAB) offered national examinations to students at the conclusion of their secondary education, including the GCE Ordinary Level (O-Level) and the GCE Advanced Level (A-Level) (Lee & Ho, 2022). The eligibility of students for admission to universities and other higher institutions was determined in large part by these exams.

Standard Examination Procedure was very common in China since the country's educational system was very competitive. To get admission to universities and colleges, high school graduates took the most significant standardized test, known as the Gaokao (National College Entrance Examination) (Howlett et al., 2022). Since entrance to elite universities was very difficult and frequently dependent on examination scores, the Gaokao outcomes had a substantial impact on students' academic and career prospects. Standardized tests were also

a major component of the educational system in South Korea. Students in their senior year of high school took the College Scholastic Ability Test (CSAT), also referred to as Suneung, which was a high-stakes exam (Choi & Chun, 2022). Students' scores on the CSAT frequently dictated their future academic and professional pathways, and the results decided entrance to universities and institutions. Although Japan's educational system relied less on Standard Examination Procedure than in other Asian nations, national exams like the National Center Test for University Admissions were nevertheless administered to students (Bacquet, 2020). This test was a standard procedure for university admissions, and recommendations and assessments from the school were frequently added on top of it.

STEM (Science, Technology, Engineering, and Mathematics) Education

A number of programs were launched to encourage STEM education at all educational levels, from primary to university. For example, the "myMaster" initiative gave instructors specialized training with the goal of improving STEM instruction in elementary schools. In order to enhance STEM-related courses and activities at the secondary level, the STEM Education Blueprint was introduced (Halim et al., 2021). Furthermore, initiatives were undertaken to boost tertiary enrollment in STEM-related courses by offering incentives and scholarships. Singapore's approach to creating a knowledge-based economy includes a significant emphasis on STEM education. STEM courses are taught in the nation's school system starting at a young age. The goal of programs like the "Learning for Life Program" and the "Applied Learning Programme" was to provide pupils practical experience in STEM subjects. In order to foster talent in engineering and technology, Singapore has also made investments in STEM-related infrastructure and institutions, such as the Singapore University of Technology and Design (SUTD) (Yan et al., 2024).

As part of its plan to create a knowledge-based economy, Singapore gave STEM education a lot of attention. STEM courses were introduced into the curriculum of the nation's educational system at a young age. Aiming to give students practical experience in STEM subjects, initiatives like the "Applied Learning Programme" and the "Learning for Life Programme" In order to develop talent in engineering and technology, Singapore has also made investments in STEM-related infrastructure and institutions, such as the Singapore University of Technology and Design (SUTD) (Yan et al., 2024). China's attempts to become a global leader in science and technology have included a focus on STEM education (Li & Li, 2023). The government made significant investments in the construction of STEM resources and infrastructure, such as research centers and labs. The national curriculum now incorporates STEM education, with a focus on computer science, physics, and mathematics. According to Sun et al. (2020), China has additionally encouraged industry-academia ties in order to enhance knowledge transfer and creativity. According to Masura and Nakamura (2021), Japan has placed a strong emphasis on STEM education in order to tackle issues like an aging population and maintaining economic competitiveness. The goal of the nation's educational system was to develop students' capacity for creativity, critical analysis, and problem-solving in STEM subjects. Programs like "Super Science High Schools" were designed to improve STEM education by offering possibilities for research and specialized courses. In order to foster STEM education and innovation, Japan has also promoted cooperation between academic institutions, businesses, and schools (Yamada, 2021).

Integrating Digital Technologies

In an effort to improve teaching and learning, Malaysia and other Asian nations have been progressively incorporating digital technologies into their educational institutions. Infrastructure for digital learning, training for educators to use digital tools successfully, and technology infrastructure for schools were all attempted to be provided (Hover & Wise, 2022). Government regulations, the development of infrastructure, and cultural attitudes toward the use of technology in education all had an impact on the degree of digital integration, however it differed throughout nations (Rana & Rana, 2020). Although the degree of digital technology adoption varied greatly, they were becoming more and more integrated into the educational system, particularly in the more developed Asian countries. Learning management systems, e-books, and multimedia materials were used by certain colleges and universities in addition to conventional teaching techniques.

Malaysia was progressing in the assimilation of digital technology inside its educational framework. The government started programs like the 1BestariNet project, which sought to give schools all throughout the country access to digital learning materials and high-speed internet (Cheok et al., 2020). In order to support digital learning, several schools were outfitted with laptops, iPads, and interactive whiteboards. Furthermore, the introduction of the Virtual Learning Environment (VLE) platform facilitated online collaboration and resource sharing between educators and learners (Raj & VG, 2022). In the area, Singapore's educational system led the way in digital integration. Modern technology infrastructure was installed in schools, including learning management systems, interactive screens, and digital textbooks. The government started programs like "FutureSchools@Singapore" to encourage cutting-edge, tech-based education methods (Natarajan et al., 2021). From an early age, the curriculum included computational thinking and digital literacy with the goal of preparing pupils for the digital economy.

Since many of its schools have multimedia learning tools and smart classrooms, South Korea was also leading the way in digital integration in education (So et al., 2023). The use of online learning environments and digital textbooks to augment conventional teaching techniques was encouraged by the government. With projects like the "Smart Education" project aiming to transform classrooms into dynamic and engaging learning environments, South Korea's robust ICT (Information and Communication Technology) infrastructure facilitated the adoption of digital technologies in education (Kang & Yoon, 2020). China was making significant infrastructure and resource investments in digital education. The government started programs like the "Smart Campus" project to incorporate digital technology into schools (Wang, 2023).

Digital content producers and online learning platforms were thriving, providing a vast array of courses and instructional resources. In particular, digital learning solutions were more easily adopted in distant and underserved areas of China due to its vast population and increasing internet penetration (Xiong et al., 2021). Though success varied across different regions and institutions, Japan was gradually adopting digital integration in education. The degree of digital integration varied among schools, but many of them had computers and internet connections. Traditional teaching methods were highly valued in Japan's educational system, but efforts were being made to improve learning opportunities by incorporating

digital technologies (Ashida, 2022). The goal of initiatives like the "Digital Textbook Initiative" was to encourage the use of digital textbooks in classrooms.

Private and Supplementary Education

Driven by family expectations for their children's academic achievement and the competitive character of the school systems, private tutoring and supplemental education were essential parts of the educational landscape in Malaysia and other Asian countries. These supplemental education services gave pupils more encouragement and assistance, which helped them succeed academically and meet their learning objectives. In many Asian nations, including Malaysia, private tutoring, or tuition, was commonplace. In order to enhance their academic performance and supplement what they learned in the classroom, parents frequently looked for extra tutoring for their kids (Bray, 2023). In Malaysia, private instruction, sometimes referred to as "tuition," was very common (Nawawi et al., 2021). In order to enhance their children's academic performance and augment what they learned in the classroom, many parents looked for extra tutoring, particularly for topics like English, science, and math. A variety of services were provided by tuition centers and private tutors, including as homework help, exam preparation seminars, and individual or group tutoring. The belief that paying tuition may help students succeed academically and obtain greater prospects for higher education contributed to its popularity.

In Singapore, where there was fierce academic competition, private coaching was also common (Ng, 2020). After school or on the weekends, many students attended tuition sessions to get additional help and encouragement for their academic work. Specialized instruction in subjects like English, science, and mathematics was provided by tutoring centers and private teachers. Exam preparation for national standardized tests like the GCE Advanced Level (A-Level), PSLE, and GCE Ordinary Level (O-Level) was also provided (Lee & Ho, 2022). Parents who wanted to help their kids develop talents outside of the classroom also looked for enrichment activities. "Hagwon," or private tuition, was a fundamental part of South Korea's educational system (Exley, 2021). Hagwons provided a broad range of extracurricular activities, test preparation, and academic tutoring as supplemental education services. In order to gain additional teaching in areas like mathematics, science, and Korean language, many students visited hagwons after regular school hours, sometimes well into the evening. Hagwons' contribution to students' preparation for the fiercely competitive College Scholastic Ability Test (CSAT) and other standardized tests was noteworthy (Heathco, 2023).

In China, private tutoring was common, especially in cities where academic competition was intense. Several parents made significant financial investments in private tuition to enable their kids to thrive in China's fiercely competitive educational system. Individual or group instruction in disciplines including mathematics, Chinese language, and English, as well as preparation for national exams like the Gaokao (National College Entrance Examination), were provided by tutoring facilities and private tutors (Liu & Helwig, 2022). As a convenient way to obtain tutoring services and educational information, online tutoring platforms have also become more and more popular. In Japan, supplemental education was still widely used, even though private tutoring was less frequent than in several other Asian countries. Many students went to "juku," or cram schools, to get extra help and study for exams outside of the regular school day (Lowe & Mizukura, 2021). According to Zhang (2023), Juku provided specific programs for university entrance tests in addition to rigorous instruction in disciplines

including English, mathematics, and Japanese language. Additionally, some parents paid private tutors to provide specialized training in particular topics or to meet the requirements of individual students.

Vocational and Technical Education

The value of vocational and technical education in giving students real-world skills and career pathways was acknowledged by Malaysia and other Asian nations. To make sure that graduates were well-prepared for the workforce, efforts were undertaken to increase options for vocational education, modernize training facilities, and improve cooperation between educational institutions and business partners (Hamdan et al., 2021). As students were being prepared for the workforce, more and more people realized how important vocational and technical education was. A lot of nations, including Malaysia, have made investments in projects and programs for vocational training to give students real-world experience and competencies. In order to solve the skills gap and advance economic development, Malaysia placed a high priority on vocational and technical education. According to Aziz and Subramaniam (2023), students in secondary and post-secondary education had access to a variety of programs and courses within the Technical and Vocational Education and Training (TVET) system. Students in secondary school have the option to include vocational studies in their curriculum, which can result in certifications like the Sijil Vokasional Malaysia (SVM) or the Sijil Kemahiran Malaysia (SKM). Moreover, polytechnics, community colleges, and vocational colleges were only a few of the public and private establishments in Malaysia that provided technical and vocational education. These schools offered instruction in a range of subjects, including engineering, automotive technology, hospitality, and medicine.

The education system in Singapore has placed significant emphasis on vocational and technical education, as a means of producing a skilled labor force and bolstering economic growth (Chalapati & Chalapati, 2020). Students who wanted a hands-on learning environment could enroll in vocational programs offered by the Institute of Technical Education (ITE). Technical education was offered by ITE in fields such as computer technology, engineering, and culinary arts (Varaprasad, 2021). Furthermore, diploma and advanced diploma programs in specific disciplines were provided by the Polytechnic sector, preparing students for employment in business, journalism, engineering, and other fields. Offering a variety of technical and vocational programs at the secondary and post-secondary levels, South Korea has a well-established system of vocational education (Kim, 2021). Specialized instruction was offered by vocational high schools in areas like electronics, mechanics, design, and tourism. In addition to academic courses, students had the option of choosing occupational tracks that would result in credentials such the Certificate of Occupational High School Achievement. Additionally, South Korea has institutes and colleges of vocational education that provide advanced programs for occupational certification and training (Oh et al., 2023).

China realized the value of technical and vocational education in bolstering economic growth and solving the skills gap. Infrastructure for vocational training was upgraded and chances for vocational education were increased by government investment. Programs in fields like computer technology, manufacturing, construction, and healthcare were available at vocational schools and colleges. Students' employability in the job market was improved by China's vocational education system, which offered routes for them to get occupational degrees and certificates. Japan has a long history of providing vocational education and

training, and its system of vocational schools and colleges is highly established (Хасанова, 2020). Vocational high schools prepared pupils for jobs in manufacturing, engineering, healthcare, and services by providing specialized instruction in technical and industrial sectors. Students have the option to select academic subjects in addition to occupational pathways that lead to certifications like the National Certificate of Skills. There were also higher education vocational colleges and institutions in Japan that provided certification programs and advanced vocational training.

The Internationalization of Higher Education

Internationalization of higher education has been vigorously promoted by Malaysia and other Asian countries in order to improve their global competitiveness, draw in talent, and promote cross-cultural exchange. In an attempt to meet the demands of a multicultural student body, efforts were undertaken to form alliances with overseas academic institutions, hire staff and students from other countries, and publicize English-taught courses. Malaysia is among the Asian nations where higher education has become more globally integrated. More cultural exchange and diversity on campuses can be attributed to the numerous colleges that formed alliances with foreign organizations, provided international degree programs, and drew in foreign students. According to Abdullah et al (2022), Malaysia made a concerted effort to position itself as a hub for education in the region, drawing in students from both nearby nations and overseas. The government promoted partnerships with overseas organizations and the opening of international university branch campuses. The University of Nottingham's Malaysia campus and Monash University's Malaysia campus are two notable examples. Furthermore, Malaysian universities actively took part in internationalization efforts such as collaborative research projects, student exchange programs, and academic alliances with universities across the globe (Wittkorn, 2022).

The presence of overseas students enhanced the campuses' cultural diversity and enhanced Malaysia's standing as a top location for higher learning. Singapore's higher education market was quite globalized, drawing teachers and students from all over the world to its many well-regarded universities (Lu, 2022). Strong international reputations and research partnerships with international partners were hallmarks of universities like Nanyang Technological University (NTU) and the National University of Singapore (NUS). According to Jinhe et al (2022), Singapore has also pushed programs like the Singapore Scholarship for International Students to entice bright people to pursue graduate studies there. Singapore's standing as a worldwide hub for education and knowledge in Asia has been facilitated by the presence of international academics and students. The globalization of South Korea's higher education industry is noteworthy since numerous universities are actively seeking out overseas faculty members and students. Universities like Yonsei University, Korea University, and Seoul National University drew students from a variety of backgrounds with their English-language programs, financial aid, and interchange possibilities between cultures (Kim, 2023). Universities in South Korea also forged alliances with foreign establishments for cooperative degree programs, research cooperation, and student exchanges. Higher education's globalization aided South Korea's attempts to foster intercultural awareness and increase its competitiveness on the world stage (Adoui, 2023).

China has become a significant force in the global higher education scene, drawing an increasing number of international students and seeing its top colleges rise in the rankings.

Academic institutions like Tsinghua University and Peking University were well-known for their robust research output and global collaborations. China's government made significant investments in programs like the "Double First-Class University Plan" in an effort to improve its institutions' standing internationally and draw top students from all over the world (Bhardwaj & Kumar, 2023). China attracted international students because of its wide range of academic offerings, reasonably priced tuition, and chances for cross-cultural learning. The Japanese higher education industry embraced internationalization with the help of projects like the Global 30 Project, which promoted English-taught programs at Japanese institutions and attracted overseas students (Poole et al., 2020). Universities like the University of Tokyo and Kyoto University set up programs and foreign offices to assist new students and promote intellectual cooperation. A major factor in Japan's standing as a hub for cutting-edge research and innovation is its strong participation in global research alliances and exchanges.

Challenges Faced by Teachers on Online Teaching during Post-COVID-19

The COVID-19 pandemic has caused more than 850 million pupils to miss school worldwide, causing a disruption to the original lesson plans of educational institutions across all nations and regions (Chen et al., 2020). After educational institutions were physically closed in March 2020, the shift from in-person instruction to virtual instruction picked up speed (WHO, 2020). A major problem for many institutions, including universities and other higher education establishments, throughout the COVID-19 pandemic has been the accessibility and usability of the online platform. The majority of teachers have come to terms with the use of e-learning systems, although, thanks to their comprehension of how ICT is being adapted and the primary difficulties encountered during the teaching and learning process. According to a US study, many teachers are starting to switch from traditional face-to-face teaching methods to online teaching environments, but they are encountering a number of difficulties. This rapid shift towards an online setting also presents challenges for students and teachers (Hixon et al., 2012; Simamora, 2020).

According to Granena and Yilmaz (2019); Singh and Thurman (2019), online teaching and learning have discovered issues related to distance, geography, and numerous other causes of inefficient teaching and learning. However, because of the COVID-19 epidemic's unanticipated development, the majority of the department's faculty members are dealing with issues and challenges like a lack of background in online teaching, lack of job support for learning technology related to lesson plans and teaching resources like audio and video material and technology support, or a lack of experience in teaching in a virtual environment (Bao, 2020). According to one study, one of the biggest challenges in implementing and adjusting to virtual learning is gaining access to ICT resources, since e-learning depends heavily on these resources (Arthur-Nyarko & Kariuki, 2019). Since the Internet, and particularly 3G networks, are not the same everywhere, there is an ICT enrollment pattern among various student locations, households, and regions (Lembani et al., 2020). Due to ICTs' incomplete integration into the teaching and learning process in the majority of institutions, ICT-related issues are prevalent not only among students and fields but also among teacher managers. General Education Department (Ghavifekr et al., 2016). This is clearly demonstrated by the difficulties with ICT and e-learning in both high-income and low-tech nations (Sahito & Vaisanen, 2017).

Indeed, established and developing nations face dissimilar challenges, problems and issues during the COVID-19 pandemic. The key transformation is the willingness of students and teachers to adopt and use online learning systems to make meaningful progress (Almaiah et al., 2016). Previous literature has highlighted many of the challenges of online teaching and learning, which are classified into four categories such as individual challenges, course challenges, teaching challenges, and cultural challenges that vary from country to country due to the diversity of contexts and preparations (Sahito & Vaisanen, 2017). The use of e-learning in underdeveloped countries has been hindered by several fundamental issues, including low computer skills, content delivery, and ICT literacy among students (Aung & Khai, 2015). Another issue is connectivity. According to Kanwal and Rehman (2017), scholars have identified three primary problems that the Pakistani education system must overcome in order to successfully digitize: internet literacy, system emergence, and IT efficiency.

As per Arthur-Nyarko and Kariuki's (2019), utilizing ICT resources appropriately is a challenge when it comes to virtual learning, since e-learning depends heavily on its accessibility. According to Lembani et al (2020), there exists a pattern of ICT enrollment across various student locations, homes, and regions due to variations in the Internet, especially 3G networks. The lack of comprehensive integration of ICTs into the teaching and learning process in most institutions makes ICT-related issues frequent across fields and students alike, including teacher managers (Ghavifekr et al., 2016). Rahayu and Virza (2020), found that while an Indonesian study polled instructors about their good attitudes regarding the usefulness and simplicity of use of online learning during the pandemic, older educators found it difficult to create, share, and express their thoughts through an e-learning system. As the epidemic has progressed, university students have realized that the flexibility provided by online learning environments for instructors has proven beneficial (Chakraborty et al., 2021). In Bangladesh, university instructors have also faced challenges with virtual instruction because of a lack of infrastructure and technology, a costly and slow internet connection, and a lack of resources (Ramij et al., Sultana, 2020).

Instructors have spent a great deal of effort and time developing popular online courses related to conservative courses. According to Jacques et al (2021), there is a mismatch between online learning and education that involves precise laboratory tools and real work and projects. However, because of their discontent with the institute's support and training, college teachers have a negative opinion of distance learning. Virtual classrooms, in their opinion, would lead to a rise in teacher unemployment and are unable to replace the intense bond that has been formed between students and teachers in traditional classrooms (Kulal & Nayak, 2020). According to one study, access to ICT resources is a barrier to virtual learning, since e-learning depends on these facilities being available (Arthur-Nyarko & Kariuki, 2019). According to Lembani et al (2020), there exists a pattern of ICT enrollment across various student locations, households, and regions due to variations in the Internet, particularly 3G networks. Due to ICTs' incomplete integration into the teaching and learning process in the majority of institutions, ICT-related issues are prevalent not only among students and fields but also among teacher managers. Globally, the COVID-19 virus has been spreading quickly (Ghavifekr et al., 2016).

Education has suffered greatly as a result of the sudden closure of colleges and universities and the forced adoption of ill-prepared online learning, which alters the dynamic between

students and instructors (Graham & Sahlberg Pasi, 2020). Records indicate that teachers face difficulties in teaching online courses because of students' disinterest, low involvement, and a lack of technological expertise. Teachers find it difficult to identify the true cause of the numerous excuses given by students (Yusnilita, 2020). The research also highlights the ways in which teachers' perspectives shift while moving from traditional classroom instruction to online learning, including how to actively engage students and motivate them to participate in the learning process. generating high-quality educational content and implementing online teaching and learning initiatives. There are certain technical difficulties, such as weak internet connections, download problems, app connection problems, login ID problems, unintelligible speech and video, etc (Tandon, 2021).

While some professors find it difficult to conduct experiments and teach practice, the Faculty of Medical University of Pakistan believes that online learning encourages student-centered learning during the lockdown (Mukhtar et al., 2020). During COVID-19, teachers from Uttarakhand University said that students are more engaged in virtual learning and that teachers generally have a positive opinion of online education. Moreover, educators now possess better comprehension and practical abilities thanks to e-learning. As art expertise is necessary for the advanced teaching aids of interactive programs, this lengthens the teaching hours and creates a communication gulf between students and teachers (Dubey & Singh, 2020). According to Pellegrini et al (2020); and Byun et al (2020), the difficulties associated with accessing e-learning are lessened when educators and students have a singular chance to work together and experience educational technology tools like online, computer, and mobile learning.

From a linguistics perspective, Prensky (2001), notes that students are entirely different from their archetype because they are natural speakers of this technique. About the difficulties associated with English proficiency through relevant lessons, including the speaking, writing, and reading challenges. For language instruction such as phonology and phonology challenges, the instructor must impart phonemes, synonyms, morphemes, and other concepts in person. Some students experience issues with their networks and do not have access to high-quality educational resources. Positive perceptions of online learning experiences have been documented in prior research. Numerous studies have also highlighted the shortcomings of e-learning, including poor time management, incapacity to use technology effectively, lack of self-control, inability to use a home computer, stressful and time-consuming computer exposure, insufficient opportunities for team member communication on this subject, and a lack of prompt response (Jeong & Frazier, 2008). Some drawbacks to online learning include increased workloads, fewer opportunities for face-to-face interaction, a tendency toward inattention and sleepiness, a lack of English proficiency to identify expensive online learning resources for intense workloads and group discussions, the inability to freely express opinions and a decrease in interaction, and less cooperative synchronous technology functions (Martin et al., 2018).

Theory of Transactional Distance in Post COVID-19 Online Teaching

According to Falloon (2011), one of the most popular hypotheses in research on remote learning and education is the transaction gap theory. This theory describes the recognized nature of the transaction between educators and students and has been presented in relation to perceptions of cognitive and communication barriers. Three variables, namely structure,

dialogue, and autonomy, need to be taken into consideration in online distance learning and education (Moore, 1997). Falloon (2011), suggests Moore's theory is a useful theoretical "prism" for analyzing online learning activities, but its viewpoint would need to be reexamined in light of the trend in online distance learning toward the use of synchronous communication tools. According to Moore (1997), students experience a greater sense of being confined to a course that is more organized. As students engage with each other in digitally taught courses, these advancements deepen the transactional gap, particularly in the psychological space between teachers and students.

In order to better understand how to integrate online teaching and learning into university pedagogy during the coronavirus disease 2019 (COVID-19) pandemic, a study was done at the University of Zambia (UNZA). Moore's Theory of Transactional Distance was applied in the study to better understand the pandemic's effects on the UNZA School of Education (Lufungulo et al., 2021). The findings showed that before the COVID-19 crisis, lecturers predominantly taught in a physical, face-to-face setting. However, following the crisis, lecturers were obliged to switch to a virtual, online learning environment. Although most lecturers are slowly becoming more receptive to online learning, their initial attitudes about it were negative. The instructors expressed that their involvement in remote learning was both required and uncomfortable, despite the fact that the unpleasant experiences outweighed the necessary ones. Scholars identified that instructors were compelled by the epidemic to switch from their traditional face-to-face teaching methods to cutting-edge online techniques, guidelines, and pedagogies that encourage student autonomy and minimize the enormous transactional gap between them and their pupils. Furthermore, despite their initial negative views on online instruction, lecturers eventually warmed up to it and have now fully embraced it despite its difficulties. Moore concluded by pointing out that when a course has better discourse but less regulation, student autonomy is realized (Moore et al., 2006).

A new paradigm for understanding how initiatives connected to national education policy are perceived, as well as virtual classrooms, virtual instructors, and virtual students. A conceptual framework for the post-COVID teaching and learning environment is shown in Figure 1, whereby instructional technology is used in interactions between teachers, students, communities, and programs according to time constraints, suitable techniques, accessibility, and approachability (Moore et al., 2006). As a result, the pandemic offers a number of potential changes, including the possibility that it will contribute to a paradigm shift in how people view the idea of learning and assessment facilitation. Following the implementation of technology-based teaching, learning, and research initiatives, performance-based evaluation systems are implemented at various academic and educational levels in the post-COVID environment.

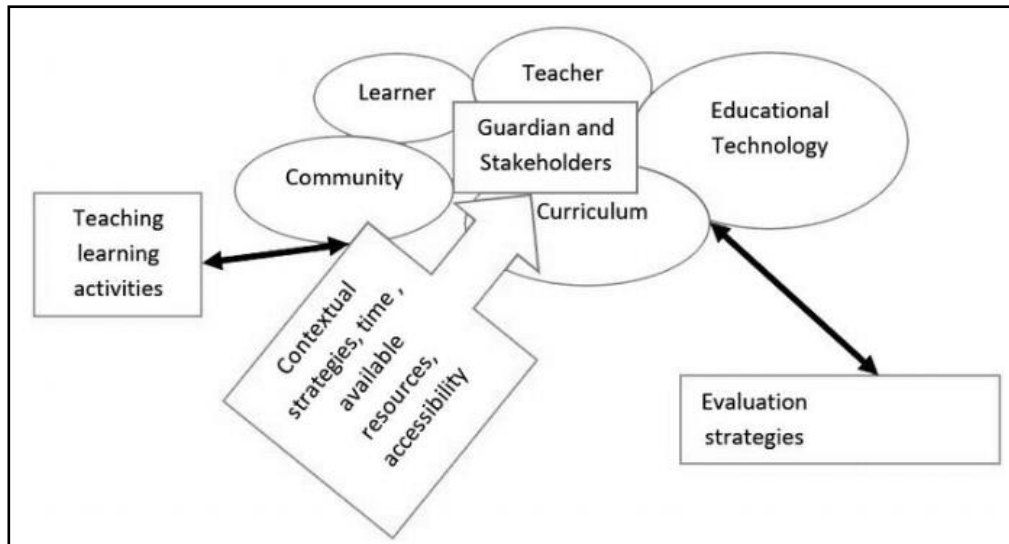


Figure 1: A theoretical structure for managing teaching and learning after COVID-19.

Recommendation

In reaction to the COVID-19 epidemic, educational institutions have been using online learning since the beginning of 2020. In reaction to the COVID-19 advancement over the course of these two years, the pandemic and the complete online transition to mixed or hybrid modes are still in use. Above all, the teachers are experienced and are learning how to create content that is suitable for online instruction. From a Malaysian perspective, more research is advised to carry out a collaborative study that integrates interpersonal interactions between teachers and students in higher education with post-COVID-19 online teaching and learning approaches.

Conclusion

In the post-pandemic environment, teaching and learning practices need to be prioritized by educators, parents, stakeholders, and all students. In general, students are glad to be back in school, although others are anxious about peer interactions or worry about school safety. The ability of teachers to engage more directly in physical instruction, which enables them to be more focused, is one of the main benefits of physical instruction that students frequently note. The majority stated that their emotional, physical, and mental health was either improving or remained the same. Students and teachers are still dealing with health issues as a result of the pandemic's negative consequences. Students identify the main causes of worry and stress as being behind in their academic work and the unpredictability of the school calendar. Students should also think about how their families are struggling financially. Studies show that social anxiety among peers and concerns about family dynamics are symptoms of a lack of social support for some people. Most students are happy with the encouragement and support they have gotten from parents, instructors, and schools since classes resumed, despite the challenges. A great deal of people express gratitude to parents and teachers for their assistance in getting back to school.

References

- Abdullah, D., Wan, C. D., & Sirat, M. (2022). International students in Malaysian higher education. In *International student recruitment and mobility in non-Anglophone countries* (pp. 235-251). Routledge.
- Adoui, A. (2023). Soft Power and International Higher Education: The Role of Higher Education in Promoting Cultural Understanding and National Identity. In *International Higher Education and The Rise of Soft Power as Cultural Diplomacy: A Comparative study of Morocco and South Korea* (pp. 129-144). Cham: Springer Nature Switzerland. <https://doi.org/10.21107/sml.v6i1.19256>
- Alam, A., & Mohanty, A. (2023). Cultural beliefs and equity in educational institutions: Exploring the social and philosophical notions of ability groupings in teaching and learning of mathematics. *International Journal of Adolescence and Youth*, 28(1), 2270662. <https://doi.org/10.1080/02673843.2023.2270662>
- Alemán de la Garza, L., Anichini, A., Antal, P., Beaune, A., Crompton, H., & Tsinakos, A. (2019). Rethinking pedagogy: Exploring the potential of digital technology in achieving quality education.
- Altoum, R. (2021). *Relationship Between Attending STEM Extracurricular Programs and Aspiration Toward STEM Careers*. Walden University.
- Ashida, A. (2022). The role of higher education in achieving the sustainable development goals. In *Sustainable development disciplines for humanity: Breaking down the 5Ps—people, planet, prosperity, peace, and partnerships* (pp. 71-84). Springer Nature Singapore.
- Aziz, F. A., & Subramaniam, N. (2023). TVET in Malaysia: Current situation, challenges and recommendations. *Penang Institute*. <https://penanginstitute.org/publications/issues/tvet-in-malaysia-current-situationchallenges-and-recommendations>.
- Bacquet, J. N. (2020). Implications of summative and formative assessment in Japan—A review of the current literature. *International Journal of Education and Literacy Studies*, 8(2), 28-35. <http://dx.doi.org/10.7575/aiac.ijels.v.8n.2p.28>
- Bhardwaj, A., & Kumar, M. (2023). The incremental role of higher education in the soft power Milieu: Impressions from China and India. *International Journal of Chinese Education*, 12(1). <https://doi.org/10.1177/2212585X221144924>
- Bray, M. (2023). Shadow education in Asia and the Pacific: features and implications of private supplementary tutoring. In *International Handbook on Education Development in the Asia-Pacific* (pp. 159-181). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-19-6887-7_10
- Chalapati, N., & Chalapati, S. (2020). Building a skilled workforce: Public discourses on vocational education in Thailand. *International journal for research in vocational education and training*, 7(1), 67-90. <https://doi.org/10.13152/10.13152/IJRVET.7.1.4>
- Chea, C. (2024). Teaching Practicum in the Teacher Education Institutions in Cambodia: A Cross-Case Analysis. *Journal of Teacher Education and Educators*, 13(1), 49-69.
- Cheok, M. L., Wong, S. L., Ayub, A. F. M., & Mahmud, R. (2020). ICT integration in Malaysian education scenario. *ICT in Education and Implications for the Belt and Road Initiative*, 119-132.
- Choi, Y., & Chun, J. (2022). Test review: French examination of the College Scholastic Ability Test in Korea. *Language Testing in Asia*, 12(1), 49.

- Curdt-Christiansen, X. L., & Sun, B. (2020). Nurturing bilingual learners: Challenges and concerns in Singapore. In *21st Century Pre-school Bilingual Education* (pp. 87-103). Routledge.
- Exley, S. (2021). Private education in South Korea: lessons for the West from past mistakes. In *Welfare Reform and Social Investment Policy in Europe and East Asia* (pp. 61-84). Policy Press.
- Foi, L. Y., & Kean, T. H. (2022). STEM education in Malaysia: An organizational development approach? *International Journal of Advanced Research in Future Ready Learning and Education*, 29(1), 1-19.
- Graham, A., & Sahlberg, P. (2020). Schools are moving online, but not all children start out digitally equal. *The Conversation*, 26.
- Halim, L., Nam, L. A., & Shahali, E. H. M. (2021). STEM education in Malaysia: Policies to implementation. In *STEM Education from Asia* (pp. 33-48). Routledge.
- Hamdan, N. H., Yunus, J. M., Lai, C. S., Ibrahim, B., & Munastiwi, E. (2021). Measuring the level of agreement on the development of sustainable framework for tvet teacher education program in malaysia. *Journal of Technical Education and Training*, 13(2), 53-60.
- Heathco, G. J. (2023). *High Stakes Assessment Preparation Experiences in South Korea: An Interpretive Phenomenological Study* (Doctoral dissertation, The University of West Florida).
- Ho, J., & Lee, Y. J. (2022). Primary and secondary education in Singapore: Bringing out the best in every learner. In *Education in Singapore: People-Making and Nation-Building* (pp. 49-68). Singapore: Springer Singapore.
- Hover, A., & Wise, T. (2022). Exploring ways to create 21st century digital learning experiences. *Education 3-13*, 50(1), 40-53.
- Howlett, Z. M., Khanna, T., & Szonyi, M. (2022). The National College Entrance Examination and the myth of meritocracy in post-Mao China. *Making Meritocracy: Lessons from China and India, from Antiquity to the Present*, 206.
- Idris, R., & Bacotang, J. (2023). Exploring STEM education trends in Malaysia: Building a talent pool for Industrial revolution 4.0 and society 5.0. *International Journal of Academic Research in Progressive Education and Development*, 12(2), 381-393.
- Jinhe, Y., Haoyi, Z., & Zhilong, X. (2022). Research on the Strategy of Introducing International Students Based on Talent Structure--Taking Singapore as an Example. *Journal of Human Resource Development*, 4(1), 29-35.
- Kamaludin, K., & Sundarasan, S. (2023, February). COVID-19 and online distance learning in Malaysia: A blessing or a curse? In *Frontiers in Education* (Vol. 8, p. 1062219). Frontiers Media SA.
- Kang, M. J., & Yoon, S. (2020). The process of developing ICT-enhanced education in Korea. *ICT in Education and Implications for the Belt and Road Initiative*, 73-98.
- Kim, H. (2021). Intergenerational mobility and the role of education in Korea. In *Human Capital Policy* (pp. 12-53). Edward Elgar Publishing.
- Kim, S. K. (2023). *Constructing student mobility: How universities recruit students and shape pathways between Berkeley and Seoul*. MIT Press.
- Kim, Y. C., & Jung, J. H. (2020). What makes South Korean students world-class learners? Postcolonial analysis of their academic achievements and learning culture. In *Transnational education and curriculum studies* (pp. 41-54). Routledge.

- Lee, Y. J., & Ho, J. (2022). Basic education in Singapore. In *International Handbook on Education in South East Asia* (pp. 1-25). Singapore: Springer Nature Singapore.
- Li, X., & Li, Y. (2023). Individualized and innovation-centered general education in a Chinese STEM University. *Education Sciences*, 13(8), 846.
- Liu, G. X. Y., & Helwig, C. C. (2022). Autonomy, social inequality, and support in Chinese urban and rural adolescents' reasoning about the Chinese college entrance examination (Gaokao). *Journal of Adolescent Research*, 37(5), 639-671.
- Lowe, R. J., & Mizukura, R. (2021). Japan: Forms and functions of shadow education. In *Theorizing Shadow Education and Academic Success in East Asia* (pp. 122-140). Routledge.
- Lu, L. (2022). Applying a 'glonacal' framework: the education choices of academically elite students in Singapore in relation to state scholarships. *Globalization, Societies and Education*, 20(3), 324-336.
- Lufungulo, E. S., Mwila, K., Mudenda, S., Kampamba, M., Chulu, M., & Hikaambo, C. N. A. (2021). Online teaching during COVID-19 pandemic in Zambian universities: unpacking lecturers' experiences and the implications for incorporating online teaching in the university pedagogy. *Creative Education*, 12(12), 2886-2904.
- Magaswari, U. (2017). *Private tutoring participation among form three students in Malaysian rural and urban schools/Magaswari Ubbudari* (Doctoral dissertation, University of Malaya).
- Matsuura, T., & Nakamura, D. (2021). Trends in STEM/STEAM education and students' perceptions in Japan. *Asia-Pacific Science Education*, 7(1), 7-33.
- Moore, R., Arnot, M., Beck, J., & Daniels, H. (Eds.). (2006). *Knowledge, power and educational reform: Applying the sociology of Basil Bernstein*. Routledge.
- Natarajan, U., Lim, K. Y., & Laxman, K. (2021). A national vision for information and communication technologies in education: reflections on Singapore's ICT technologies Masterplans. *International Journal of Educational Management*, 35(5), 943-954.
- Nawawi, N., Abd Hamid, N. A. D. I. A. H., Yusop, R., Ghazali, N., & Rashid, N. (2021). Challenges of home tutors in complying with Malaysian tax requirement. *The journal of contemporary issues in business and government*, 27(2), 42-51.
- Ng, P. T. (2020). The paradoxes of student well-being in Singapore. *ECNU Review of Education*, 3(3), 437-451.
- Oh, J. R., Park, C. H., & Baek, K. (2023). Toward the sustainable development of corporate universities: the case of South Korea. *European Journal of Training and Development*.
- Pellegrini, M., & Maltinti, C. (2020). 'School Never Stops': Measures and Experience in Italian Schools during the COVID-19 Lockdown. *Best Evid Chin Edu*, 5(2), 649-663.
- Poole, G., Ota, H., & Kawano, M. (2020). Tracing the developments of the "global education effect" in Japanese higher education: Discourses, policy, and practice. In *The Global Education Effect and Japan* (pp. 33-60). Routledge.
- Raj, N. S., & VG, R. (2022). Early prediction of student engagement in virtual learning environments using machine learning techniques. *E-Learning and Digital Media*, 19(6), 537-554.
- Rana, K., & Rana, K. (2020). ICT Integration in Teaching and Learning Activities in Higher Education: A Case Study of Nepal's Teacher Education. *Malaysian Online Journal of Educational Technology*, 8(1), 36-47.

- Rukspollmuang, C., & Fry, G. W. (2022). Overview of Education in Thailand. In *International Handbook on Education in South East Asia* (pp. 1-31). Singapore: Springer Nature Singapore.
- Sahito, Z., & Vaisanen, P. (2017). Effect of ICT Skills on the Job Satisfaction of Teacher Educators: Evidence from the Universities of the Sindh Province of Pakistan. *International journal of higher education*, 6(4), 122-136.
- Sato, T., Tsuda, E., Ellison, D., & Hodge, S. R. (2020). Japanese elementary teachers' professional development experiences in physical education lesson studies. *Physical education and sport pedagogy*, 25(2), 137-153.
- Selvaratnam, V. (2022). Education: The Past and the Future. In *Malaysia's Leap into the Future: The Building Blocks Towards Balanced Development* (pp. 183-213). Singapore: Springer Singapore.
- Shin, D., & Cho, E. (2021). The National English ability test in Korea and its legitimizing discourses. *Journal of Multilingual and Multicultural Development*, 42(6), 537-550.
- Singapore, S. N. (2021). Transforming Singapore through technology. URL: <https://www.smartnation.gov.sg>.
- So, H. J., Jang, H., & Kim, M. (2023). Trends and Issues of Digital Learning in Korea. *Trends and Issues of Promoting Digital Learning in High-Digital-Competitiveness Countries: Country Reports and International Comparison*.
- Sun, Y., Zhang, C., & Kok, R. A. (2020). The role of research outcome quality in the relationship between university research collaboration and technology transfer: empirical results from China. *Scientometrics*, 122, 1003-1026.
- Varaprasad, N. (2021). Technical and Vocational Education Trends and Issues in Singapore. *Trends and Issues in International Technical and Vocational Education in the Indo-Pacific Region*.
- Wang, Y. (2023). Report on smart education in China. In *Smart Education in China and Central & Eastern European Countries* (pp. 11-50). Singapore: Springer Nature Singapore.
- Wittkorn, P. (2022). *International Partnership Program Development: A Case Study at a College in Malaysia* (Doctoral dissertation, Lamar University-Beaumont).
- Wolf, S., & Avornyo, E. A. (2023). Cultural considerations in defining classroom quality: Ghanaian preschool teachers' agreements and disagreements with standards-based instruments. *Comparative Education Review*, 67(1), 188-210.
- Xiong, Y., Ling, Q., & Li, X. (2021). Ubiquitous e-Teaching and e-Learning: China's massive adoption of online education and launching MOOCs internationally during the COVID-19 outbreak. *Wireless Communications and Mobile Computing*, 2021, 1-14.
- Yamada, A. (2021). Japanese Higher Education: The Need for STEAM in Society 5.0, an Era of Societal and Technological Fusion. *Journal of Comparative and International Higher Education*, 13(1), 44-65.
- Yan, X., Yu, T., & Chen, Y. (2024). Global Comparison of STEM Education. In *Education in China and the World: Achievements and Contemporary Issues* (pp. 389-443). Singapore: Springer Nature Singapore.
- Zabidi, Z. M., & Adams, D. (2022). Education transformation in Malaysia: Equity, funding, and strategic partnership. In *Education in Malaysia* (pp. 234-247). Routledge.
- Zhang, W. (2023). *Taming the wild horse of shadow education: The global expansion of private tutoring and regulatory responses* (p. 171). Taylor & Francis.
- Хасанова, Г. X. (2020). General and professional education systems of Uzbekistan and Japan: a comparative analysis. *Иностранные языки в Узбекистане*, (1), 83-97.