Distance Education in Hong Kong Preschools: Learning and Teaching During COVID-19 School Closures

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Abstract
The outbreak of the COVID-19 pandemic has led to widespread change in people's lives across the world. Indeed, such change is especially evident in the education sector, where this global phenomenon has arguably triggered some of history's most significant advancements. In this study, we explore how the Early Childhood Education (ECE) sector in Hong Kong has coped with schooling during this period. Furthermore, we investigate the extent to which players in Hong Kong's early childhood education scene had to adjust in light of dynamically changing local government guidelines and why that has led to long-term improvements. To derive meaningful conclusions from this study, we use a mixed-methods approach that relies on data collected from surveys, interviews, and case studies relevant to the topic at hand. This data is then analysed, and themes are formed through coding. We also explore teachers' feelings, technology adoption, and examples from practice to determine how schools have supported young children's education. The research demonstrates how early childhood education and care centres innovatively provide education during a crisis. Traces of success in making teaching and learning possible and meaningful are visible, even with children of a young age. Consequently, this research yields key lessons about ECE learning and teaching during crises.

Keywords: Early Childhood Education, Teaching and Learning, Distance-learning, Teaching Strategies

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Introduction and Literature Review

With the COVID-19 pandemic beginning to take hold on all aspects of life, its impact is being equally felt across the education sector. It is only now that we have started understanding the ramifications stemming from countrywide lockdowns, business closures and travel restrictions, all of which have made their mark on the delivery mechanisms of education around the world. With specific reference to Hong Kong, the local government here instructed the closure of schools in February 2020 (Bureau, E., 2020), with these schools adopting recommendations from the Education Bureau (EDB) to shift from face-to-face learning to delivering online education. Although working remotely has been widely established in a range of industries, distance learning has arguably been a new concept for the Early Childhood Education (ECE) sector. Distance learning refers to delivering the curriculum in a virtual manner, whereby educators and students are physically separated during instruction. In February 2021, the EDB gave kindergartens and schools in Hong Kong permission to resume face-to-face classes under the condition that school staff take regular Covid-19 tests. As a result, many kindergartens welcomed these regulations and continued on-site teaching practices (Moorhouse et al, 2020).

Kindergartens in Hong Kong

It is important to note that all kindergartens in Hong Kong are privately run and vary in their operations, curriculum and numerous other aspects. International kindergartens implement various worldwide curriculum frameworks including the British Early Years Foundation Stage (EYFS), International Baccalaureate Organisation (IBO) Primary Years Programme (PYP), Reggio Emilia and Montessori. In contrast, local kindergartens follow the Hong Kong local curriculum promoted by the EDB Hong Kong. Kindergartens are registered under the Education Ordinance and EDB inspectors make routine visits to all kindergartens to advise principals and teachers on curriculum delivery, instructional methods, and school administration.

Characteristics of Early Years Practice

Within the ECE sector, students should learn and acquire skills through play, and during the pandemic, educators have adapted and supported its development as effectively as possible, in order to enhance the students' development. There are numerous theorists associated with aspects of ECE, however, Dewey and Montessori can be regarded as pioneers in initiating the importance of child-centred learning (Mooney, 2013). Their child-centred philosophy influenced other theorists including Piaget, Vygotsky, Erikson and Freire, as they equally believed that “education should be child-centred; education must be both active and interactive, and education must involve the social world of the child and the community” (Mooney, 2013, p. 16).

In support of child-centred learning, the concept of play has been widely recognised as a vehicle that enhances a variety of skills, stimulating children’s exploration, creativity, imagination, social, emotional and physical development, as well as their level of independence (Pound, 2017). Vygotsky (1978) considered play to be of paramount importance, claiming that educators need to “adopt strategies that are not only student-centred” (Moore 2000:16). Developing the relationship between the educator and student through play is what determines the level of child development. Vygotsky referred to this as the zone of proximal development, “the distance between the actual development level as determined by independent problem

solving and the level of potential development as determined through problem-solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p.86).

In addition to the above, the environment plays a vital role in driving learning, so much so that it has been defined as the "third teacher" by Malaguzzi, with the first being the parent and the second the classroom teacher (Gandini, 1998). Consequently, creating flexible, interactive, play-based and collaborative environments that are responsive to the needs of young learners is crucial.

Recognising the importance of the above, ECE educators and families had to be mindful of their physical learning spaces (e.g. noise levels and general distractions), in order to enable young students to participate effectively during synchronous distance learning. Nevertheless, creating a rich environment and using hands-on resources was identified as a challenge. Indeed, Lau & Lee (2020) highlight how a lack of resources and equipment causes further distractions and difficulties for students.

Challenging the theory of child-centred learning, the COVID-19 pandemic and its ramifications led to a significant shift to a teacher-directed approach. Such developments possibly triggered a drastic reduction in children's autonomy and ownership of their own learning. Whilst arguably unfortunate, Dewey recognises advantages in teacher-initiated/ directed learning and claims that it provokes students' thinking because "the teachers' suggestion is not a mould for a cast-iron result but is a starting point to develop into a plan through contributions from the experience of all engaged in the learning process" (Dewey, 1938, p.72). In addition to this, Chiarotto (2011) contends that "teacher-directed instruction occurs in moderation, for the purpose of gently scaffolding students towards their learning goals, and in turn, to help students feel successful as learners" (Chiarotto, 2011, p.17).

Communication

As in many organisations, communication is indispensable to the integration of effective management functions. The channels of communication that are selected are instrumental in determining its effectiveness, and need to be aligned with modern requirements to drive a notion of personalisation, in order for school staff to maintain strong connections (Akinnubi et al., 2012). Moore (1990) outlines that communication structures and dialogue between educators and families are critical to the success of distance learning. Consequently, the closure of schools and educational settings highlights the need to collaborate and communicate effectively across the school community.

In fact, communication and collaboration with families strongly influences the success of distance learning. As per IBO (2018), "encouraging and nurturing positive relationships between home, family and school provides a strong basis for learning, behaviour, health and well-being" (IBO, 2018, p.10). Educators heavily rely on parental communication and participation. For example, the gathering of resources, setting up appropriate learning spaces, carrying out suggested learning at home and supporting students with the technology at hand can only be achieved in collaboration with parents. In addition to this, the IBO (2018) states that "technology has the power to bring the learning community close together and overcome boundaries" (IBO, 2018, p. 48). Similarly, Richardson et al (2020) refer to it as a mechanism for people to collaborate and connect locally and globally.

Technology Adoption

Quinn et al (2020) believe that technology can empower students to have ownership of their learning beyond the classroom and identify it as a means to accelerate motivation and engagement. Furthermore, it is the teacher's role to select the most suitable technological tools and ensure that students have the skills and capabilities needed to succeed in creating and obtaining new knowledge. Although the importance of technology in the modern world is widely recognised, research has shown that one of the main challenges during distance learning has been the adoption of such technology (Garrison, 2000). ECE educators' challenges with technology may stem from a discrepancy between the e-courses they were taught in their academic activities and the level of technology already in use and required to use in action (Kalogiannakis, 2010; Wetzel et al., 2004). Despite this discrepancy, educators must assume additional responsibilities that come with teaching online (Kalogiannakis, 2010), even when the prospect of utilising technology might seem demanding (Konca et al, 2016; Lindahl & Folkesson, 2012; Yurt & Cevher-Kalburan, 2011).

Research Questions

RQ1: What are the main challenges that ECE educators experienced whilst teaching during class suspensions?
RQ2: What are some successful teaching strategies ECE educators deployed and opportunities that arose during class suspensions?

Research Methodology

In this study, a mixed-methods approach is adopted. Both quantitative and qualitative data collection methods including case studies, survey questionnaires and semi-structured interviews are deployed. The case study approach is primarily used to gather richer practical experience from the field. The case study method was chosen to better understand a phenomenon or situation (Merriam, 1998). The selected cases can be people, students, or staff who are members of a school community (Creswell, 2011).

Case study data is used to describe a case in-depth in real-life comprehensively (Yin, 2012). Data collected through case studies has been triangulated with data collected from interviews and open-ended survey questions, in order to increase reliability and validity. Data was collected in stages, beginning with online surveys and then, conducting semi-structured interviews to get more in-depth information. The data was analysed according to standard protocols for assessing observation objects and indicators (Braun & Clarke, 2006).

Participants

63 Hong Kong-based teachers from local and international kindergartens participated in this study. Figure 1 indicates that 31 local (49.2%) and 32 international kindergarten teachers (32=50.8%) completed the survey questionnaire. The questionnaires were distributed online using Google Form.

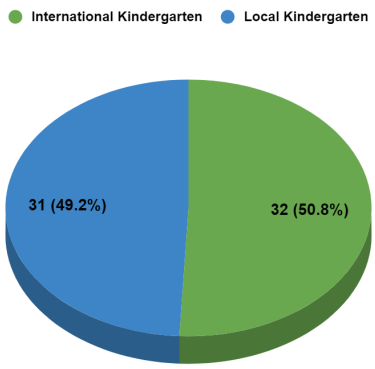

Figure 1: Participants' Teaching Institution

Figures 2, 3 and 4 highlight demographic characteristics such as gender, length of teaching experience, as well as teachers' level of education. Figure 2 implies that 93.7% of female and 6.3% of male respondents participated in the study.

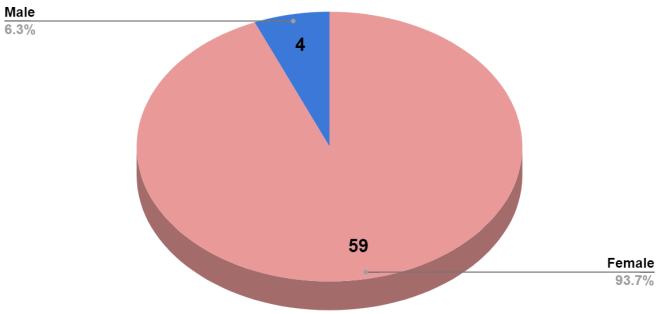

Figure 2: Gender Distribution

Figure 3 shows that the majority of teachers have 11-15 years of teaching experience, with over 65% of participants having taught for more than 11 years.

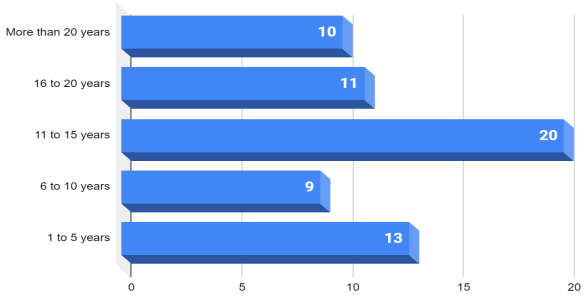

Figure 3: Length of Teaching Experience

Figure 4 indicates that the majority of participants in this study hold a postgraduate degree.

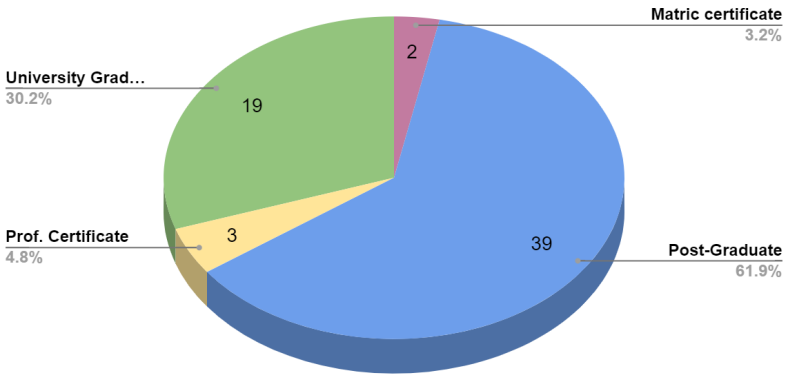

Figure 4: Teacher's Educational Level

Data Collection

Data was collected in two phases. The first phase included conducting a survey of classroom teachers in kindergartens across Hong Kong. The survey consisted of a total of 20 questions, with ten demographic and ten research-related short answers administered through Google Form. The questions were organised following the pertinent literature to the research's intent, which was to examine the classroom instructor's instructional, psychological, and social facets. The survey was conducted from 15th December 2020 through 23rd March 2021, with 63 respondents taking part. Following the collection of survey data, a transcript of each respondent's responses was developed, along with initial codes.

The second stage of data collection included interviewing 23 kindergarten teachers who responded to the survey using semi-structured, open-ended questions. The researchers created interview guides using the initial code extracted from the first stage results. The interviews were conducted to elicit more accurate results from January to March 2021, and interviews were conducted via the Zoom application online and lasted 30-45 minutes per respondent. Each participant was guaranteed confidentiality and given a pseudonym.

Data Analysis

Inductive and thematic analytics were used to define, assess, and create a theme shared by participants (Fereday & Muir-Cochrane, 2006). Each participant's responses, particularly in the first stage, were coded using keywords to avoid repetition. The NVivo 12 software was used to assist researchers with coding and categorisation. Nodes and Cases were used to organise data from surveys and interviews. Thematic maps demonstrate the arrangement of concepts at different levels, and possible connections between concepts were discussed. Following this, the research team addressed both codes and categorisations and the possibility of integrating codes to streamline these. This inductive technique enabled the identification of themes derived from participants' responses to the research questions (Fereday & Muir-Cochrane, 2006).

Findings

The survey findings comprise two parts based on our research questions. The following section discusses the challenges and opportunities educators have experienced and emphasises the teaching strategies educators have used to enhance their practice. Findings also compare and contrast practices from kindergartens following local and international curricula, prior use of technology integrated lesson delivery, and practice during the class suspension.

Tables 1 to 5 outline the five individual principles of effective distance learning and the main categories that were highlighted amongst survey and interview findings, and will be referred to throughout both of our research questions.

Table 1. Communication

Main Category	N, %	Representative Statements
Communication structures and strategies	74, 86%	"It is important to have structures in place that allow us to communicate with staff, students and families effectively. We spent a lot of time exploring different tools and refining our communication protocols".
Effective communication	73, 84%	"Regular contact with parents via email, including a weekly schedule which is sent out each Friday, giving parents time to prepare for the week ahead."
Dialogue between parents and educators	70, 81%	"We started calling parents more often than usual and try to make connections with families over the phone through emails, surveys".
Collaborating through communication	54, 63%	"Collaboration with staff and families is key to making distance learning successful. Technology and effective communication allow me to do just that".
Increased level of communication	46, 53%	"Parents were overwhelmed with the number of emails and links we were sending out at first. But we developed a system based on Google for education and try to keep it limited to weekly emails".

Table 2. Pedagogical Practices

Main Category	N, %	Representative Statements
Play	70, 81%	"Young children learn through play and digital play can't replace it. As an educator, I always try and put hands-on play to include in my online lessons too."
Authentic/ meaningful learning and teaching	64, 74%	"We can create meaningful learning opportunities for students even in distance education situations…This can easily be done by asking children to follow things at home for example I even had cooked with my students".
Student-centred vs teacher-directed approach	62, 72 %	"We started with sending direct teaching videos as asynchronous learning to the students, but soon realised from parent feedback that they lack interest … So we enhanced practice by having live story sessions and eventually smaller group interactive sessions".
Collaborative learning/ Level of interaction/ participation	57, 66%	"Our school has these Zoom sessions to enhance interaction. At first, it was challenging as we had whole class story sessions and sometimes it was not easy to open students' microphones as it was too noisy and difficult to listen to anything."

Table 3. Learning Spaces

Main Category	N, %	Representative Statements
Use and availability of resources	76, 88%	"We had very limited resources as we were not used to integrating technology in our curriculum or in school; So it was challenging to deliver this kind of teaching and learning".
Open-ended resources	64, 74%	"When we first started, we had only a few options such as producing videos but later we started thinking of sending resource bags home and can incorporate a lot of art & craft; cooking; and open-ended games such as taking turns, hunts etc."
Learning spaces and environment	56, 65%	"Setting up proper learning space at home is equally important for students. I noticed that my students behave differently while attending lessons from home."
Distractions	30, 41%	"Distractions has to keep minimum such as entire family working in the same room, or feeding student between lesson causes lots of disturbance".

Table 4. Partnerships		
Main Category	**N, %**	**Representative Statements**
Parental support	84, 97 %	"Parental support is a must to have successful online lessons for young learners. Parents are required to provide learning spaces conducive to online learning such as quiet space, support to access online resources, gathering resources if required to have in advance to participate in lessons, facilitating during zoom sessions".
Collaboration with parents	74, 86%	"We need to educate and collaborate with parents to fit them in their changing role as not only to support students but also to facilitate their learning, to be responsible to provide provocations as well as enhance motivation and student participation".
Collaboration amongst educators	64, 74%	"In this situation colleagues were the best collaborators, we all learned new skills and shared this with peers. Some were good at technological skills and some were very careful about ECE pedagogy and philosophy.
Partnerships with students	23, 27%	"It was necessary to let students develop independence and motivation for teaching and bringing student choice and voice to promote student-centred learning practices. Our school had a short and smart session with few students to talk to them and to just know their well being".
Partnerships with facilitators	20, 23%	"Helpers or grandparents were facilitating their learning at home. It was very difficult for these facilitators to help students to access learning at home as it might involve technical skills, passwords access and support to participate in activities…".

Table 5. Technology Adoption		
Main Category	**N, %**	**Representative Statements**
Challenges to adopting new technology	86, 100%	"At first it was very challenging to show our face and prepare video or conduct an online lesson on zoom but with this new normal we get used to amending videos, make the sessions more interactive for students".
Available tools	82, 95%	"We were using online portfolio, canvas and seesaw as regular tools to communicate with the parents prior to school suspension so it was easy to have few more tools like Padlet and Zoom to conduct online lesson".
Technical skills	79, 92%	"It was difficult for some teachers but eventually nowadays everybody has a smartphone and somewhat a little understanding of technical tools and their operations. So this helped to learn new tools like zoom, padlet".
Digital and pedagogical competence	64, 74%	"It was challenging to think about online lessons in kindergarten as I never delivered them before. So first we adopted new technology and gradually we moved to technology integrated hands-on learning".
Collaborative platforms	20, 23 %	"We used collaborative platforms such as Padlet where not only teachers but parents also were posting pictures, child voice or performances etc. as examples of learning at home. It was very helpful to develop collaborative learning opportunities in the school community".

Discussion

RQ1: *What are the main challenges that ECE educators experienced whilst teaching during class suspensions?*

When the announcement was made for schools to close, the majority of participants (n=74; 86%) recognised the need for clear and effective communication structures. However, participants were overwhelmed by the number of messages received amongst colleagues and parents, with one respondent stating that "the volume of emails was incredible". Communication channels were used in a disorganised manner and included a variety of platforms such as Whatsapp, email and Zoom. This led to high frustration levels and increased working hours until boundaries and clear expectations around communication were applied within organisations.

Likewise, participants (n=70; 81%) identified the implementation of Early Years pedagogy virtually as one of the main challenges during the pandemic. Due to the sudden closure of

schools and the lack of preparation that came with it, many educators changed their practice from student-centred learning in the classroom to a teacher-directed synchronous approach. This was due to factors such as the need to provide parents with structured timetables and the materials required in advance; therefore prohibiting educators to be flexible in the delivery of their daily practice and being responsive to students' interests and needs. However, this coincides with the fact that all students require some form of scaffolding in order to strengthen their learning, and 'teacher-directed instruction' (Chiarotto, 2011) is often used during face-to-face practice as well as virtual teaching and learning.

One participant stated that "with online learning, we can deliver some aspects of education but this can't replace play as a whole in early childhood education". Therefore, it was recognised that independent play, where students are able to follow their interest and develop new understandings through exploration, has been difficult to recreate during synchronous teaching.

With the decline of play-based experiences, collaboration has also been highlighted as an obstacle. Participants claimed that collaborative learning, where students have the opportunity to socially interact and engage with others, has been challenging during distance learning. Educators attempted to incorporate this into their daily practice and model the expectations during the likes of 'breakout rooms', where students have participated in some peer to peer and/ or student-educator learning. Data shows how one participant adjusted her practice by offering small group sessions, which consisted of 5 to 6 students, as well as whole class sessions. This relates to the notion that ECE educators should "involve the social world of the child and the community" (Mooney, 2013, p.16) as this enables young students to develop their social skills in an active and interactive manner.

Data shows that some educators offered a range of play opportunities through an asynchronous lens; for example, sensory forms of play. Although these opportunities were offered, the level of who accessed it and how students engaged with it varied largely, ranging from a child-initiated inquiry to an adult-directed approach. Examples include facilitators (i.e. parents, domestic helpers and other family members) taking the lead on behalf of the children and thus, not allowing them to explore freely. This coincides with the value of play, as not only does it enable students to develop their level of independence but it also stimulates their exploration, creativity, imagination, social, emotional and physical development (Pound, 2016).

Likewise, there are other participants who stated that delivering synchronous learning effectively was further challenged by a lack of the facilitators' understanding of play-based learning. Facilitators' limited experience and exposure to hands-on play and open-ended materials made it difficult to create rich learning spaces at their place of delivery. However, hands-on exposure and educators' modelling of good Early Years practice, supported facilitators in developing their conceptual understanding and value of play and the sessions that were being delivered.

The adoption of technologies designed to facilitate a virtual learning environment has been identified as a regular challenge faced by participants (n=86; 100%). Not only did ECE educators struggle to have access to devices, tools, internet connectivity and such, but the adoption of technologies was further complicated by an inherent limitation of technical skills, impacting children's motivation and learning. Although basic technology had already been incorporated into face-to-face instruction as a teaching tool in the past, the way technology now had to be applied was a new phenomenon to many and exposed educators' lack of experience more clearly.

One participant explained how their school relied on "free access and easily available tools" due to a limited budget. Despite such limitations, educators were still able to plan and deliver effective distance learning through easy-to-access platforms such as Zoom, Google Drive and others. Deploying and utilising technology represented a steep learning curve for educators and learners but once the tools were established, enhancing teaching and learning practices was more easily accomplished.

RQ2: *What are some successful teaching strategies ECE educators deployed and opportunities that arose during class suspensions?*

As highlighted in RQ1, the sudden shift to online education led to numerous challenges, forcing educators to rapidly rethink their practice and requiring them to adapt to new modes of delivering learning and teaching. Despite the severity of these challenges, RQ2 addresses significant advancements and innovation in the field of ECE. Data reveals that there is a repositioning in mindset from survival mode to thinking positively about how educators can deploy strategies, skills and competencies to enhance teaching and learning.

The establishment of clear communication structures has been crucial to effective distance learning. As claimed by one participant, "to communicate effectively, you have to establish routines, reinforce expectations and choose the most suitable tools". This is in line with Akinnubi et al (2012) who highlight the importance of selecting the most suitable channels of communication.

Data suggests a correlation between communication and collaboration. Through the use of the most effective communication platforms, educators developed the facilitators' knowledge and understanding of play, and equipped these with the skills to carry out synchronous sessions effectively. As a result, communication was strengthened through this collaborative approach, as facilitators and educators were able to work in partnership towards a common goal.

The need to offer support to parents and other facilitators was identified as one of the main factors to make distance learning successful. Educators offered regular one-to-one consultations, live workshops, pre-recorded tutorials and regular surveys, in order to gather data about the facilitators' satisfaction and suggestions in relation to distance learning. The level of support varied from setting to setting and was prioritised, particularly in international schools. One participant stated how the "school conducted online workshops for caretakers and parents to share the expectations" and emphasised how this led to a clearer vision of the facilitators' role during distance learning. Another participant claimed that "our school used regular check-ins and this is the time when every class teacher was available to answer questions from parents", leading to regular dialogue between parents and educators. This is aligned with the IBO's (2018) stance on the importance of developing strong partnerships with all stakeholders to impact learning positively (IBO, 2018).

Despite the challenges posed by the suspension of classes, educators found pockets of creativity to exploit. Strategies were based on the ability to deliver continued high-quality Early Years practice. In order to do so, educators planned experiences that were meaningful and relatable, empowering students to make choices, in order to increase engagement and motivation. As stated in the literature and referred to in RQ1, these included engagements that developed exploration, creativity, imagination, social, emotional and physical development, as well as their level of independence (Pound, 2017).

Many participants (n=70; 81%) designed and implemented hands-on experiences to enhance students' academic learning through play. These experiences ensured a balanced curriculum and allowed students to transfer skills and knowledge to different contexts. For example, one participant shared that students were given the opportunity to broaden their mathematical concept of measurement through baking and sensory play. Another participant developed the students' research skills and scientific knowledge through the planting and growing of seeds. To achieve such authentic learning experiences, resource packs created by educators were among the many mechanisms utilised to deliver continued learning opportunities for students. These resource packs were sent out on a regular basis and included items designed to meet the basic needs of distance learning, strengthening good Early Years practice in the process.

As a matter of fact, meaningful resources and authentic learning spaces have been highlighted as indicators for success. Bento & Dias (2017) as well as Muñoz (2009) suggest that educators be creative when using learning spaces. Indeed, participants showed a sense of such creativity by exposing students to the outdoors or facilitating online sessions from the beach, looking at patterns in nature. It was noted that varying spaces for asynchronous as well as synchronous teaching sparked interest and increased the level of enthusiasm. The use of open-ended resources and loose parts has also been highlighted as a means to stimulate imagination and creativity. Indeed, Daly & Beloglovski (2015) state that such resources not only stimulate children's curiosity but also "promote creativity and divergent thinking" (Daly & Beloglovski, 2015, p. 65).

Although technology adoption was identified as the main challenge, data suggests that it has also been the most effective tool to make distance learning effective and even possible. Without the use of technologies such as email, Google Drive and Zoom, educators would have not been able to make learning readily available. Findings indicate that parents who could not be reached via these channels still received printed working sheets and information.

Data suggests that technology has been the driver to help bring all the elements together and form a holistic platform. In this respect, one participant pointed out how technology enabled collaborative practices and stated that "learning platforms such as Padlet and e-portfolios play a key role in collaborating with students and families. These platforms enable us to get an insight into children's progress, interests and needs. They also allow me to give timely and regular feedback on learning". The IBO (2018) validates this notion, as it regards technology as the platform that connects the learning community (IBO, 2018). This implies that ICT-enabled learning allows students to connect to their curriculum, educators and peers, even when confined to their home environment. It can be argued that these linkages support children in retaining emotional well-being during times of crisis.

In response to these previously outlined challenges posed by a changing environment, educators, facilitators and those involved in the delivery of distance learning practices have shown increasing capabilities of being able to adjust to changes and to embrace emanating opportunities.

Conclusion

This study sets out to investigate how a small sample of ECE educators based in Hong Kong attempt to instruct children amidst the COVID-19 outbreak. In response to the first research question, the findings conclude that communication, collaboration, pedagogical practices, learning environments and technology adoption were deemed the most demanding issues with

regards to distance learning. Despite the seemingly overwhelming nature of these challenges, educators that participated in this study demonstrated that the deeper they go into resolving these, the more opportunity for effective teaching approaches they create.

In response to the second research question, the study observes various tactics applied as part of an iterative learning design process. These tactics are reflections of success stories that amplify the ability to deliver effective and high-quality Early Years practice. The strategies chosen by educators provide opportunities to deliver educational content and maintain a healthy level of contact with students, despite limited resources, a lack of training, and almost no prior experience in dealing with remote or distance education.

The research conclusively defines five key themes, namely Pedagogy, Environment, Partnerships, Technology and Communication. These need to be implemented by all educational organisations, in order for distance learning to be most effective. Table 6 outlines the theme, description and related pedagogical design dimension of ECE pedagogy.

Theme	Description	Related Pedagogical Design Dimension
Communication	Apply effective methods of communication	*Apply communication structures and strategies to:* ● Strengthen internal and external communication ● Strengthen collaboration ● Communicate clearly and coherently
Pedagogy	Apply different pedagogical methods to implement teaching and learning	*Vary pedagogical practices to:* ● Increase student engagement and participation ● Make teaching and learning student-centred ● Strengthen student choice and ownership
Environment	Set up environments to support the implementation of teaching and learning	*Create a learning environment to:* ● Promote interactive learning ● Make learning meaningful and fun ● Foster a sense of trust and safety
Partnerships	Strengthen partnerships to enhance good practice	*Form effective partnerships to:* ● Work towards common goals/ build shared understanding ● Strengthen capabilities of all stakeholders
Technology	Deliver teaching and learning through technology	*Leverage technology to:* ● Increase technological competence across all stakeholders ● Facilitate and amplify learning and teaching ● Connect and collaborate

Table 6: Emergent Themes & Their Relevance to the ECE Pedagogy

The key themes are accompanied by an iterative design process of designing, implementing, evaluating and modifying. Table 7 outlines the theme, description and related curriculum design dimension of each stage of the iterative design process.

Theme	Description	Related Curriculum Design Dimension (Specific to ECE)
Design	Design learning experiences and select appropriate resources	*Design and redefine learning in a crisis situation:* • Identify, gather and use available resources to teach remotely • Respond to the rapid change of practice, including planning and delivery • Incorporate '5 principles of effective distance learning' when designing learning
Implement	Implement planning through collaboration	*Implement instruction for meaningful teaching and learning:* • Pedagogy: Play into practice through a virtual lens • Curriculum coverage, including ongoing assessment • Routines and protocols
Evaluate	Reflect and evaluate teaching and learning practices	*Reflect and evaluate successes and areas of development to:* • Reflect on teaching practices - individual and collaborative • Gather data and feedback from multiple sources to inform next steps
Modify	Modify teaching and learning practices	*Modify and adapt the practice to:* • Build on successes and improve areas of development • Amplify teaching and learning

Table 7: Emergent Themes & Their Relationship to the Iterative Design Process

Based on the data and further findings from both research questions a theoretical framework referred to as the 5 Principles of Effective Distance Learning (Figure 5) emanated and was established. It is important to note that the 5 Principles of Effective Distance Learning derived from teaching strategies that progressive educators applied during the distance learning period. Nevertheless, the validity of this framework can and should be extended to face-to-face teaching and learning.

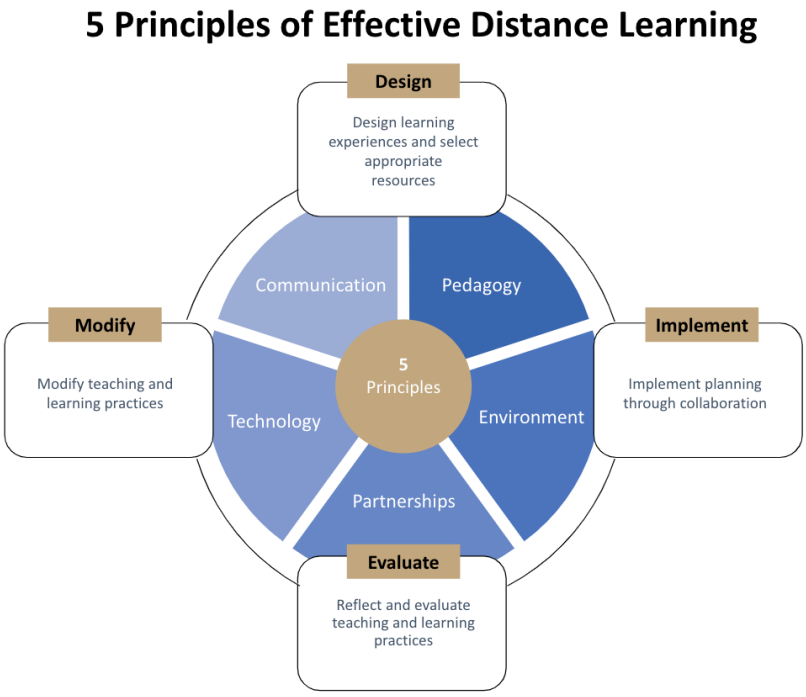

Figure 5: Five Principles of Effective Distance Learning

As this study utilises a small sample size to generalise findings, it is proposed that future research focuses on generating more detailed findings from educators across a multitude of disciplines, in addressing issues (such as those brought on by a pandemic) that appear to be beyond our current conceptions and experiences. Such in-depth research could give a practical perspective for assessing our educational trajectory in the future.

In addition to this, the study proposes that a focus on opportunity over external challenges should become a more critical focal point for educators. In other words, effectively dealing with unexpected change posed by external factors such as this pandemic, will ultimately lead to an accelerated progression in teaching practices.

In order to deliver a successful response to these external challenges, it is imperative to involve the whole school community in dealing with change. In that sense, the study points out that flexibility and open-mindedness towards new practices are key attributes to deploy if one is to successfully guide learning through unpredictable times. Furthermore, functional partnerships with families and other stakeholders are a critical component of such a response.

Finally, tools, strategies and systems deployed during times like these must serve as the building blocks for dealing with similar external uncertainties in the future. That is to say that this is unlikely to be the last pandemic or challenge educators have to face. In that respect, the longevity of new strategies has to be maintained.

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