

Connecting Teachers during a Global Crisis: A Knowledge Building Professional Development Approach to Embracing the New Normal

Alwyn Vwen Yen LEE* & Chew Lee TEO

^{ab}*National Institute of Education, Nanyang Technological University, Singapore*

*alwyn.lee@nie.edu.sg

Abstract: A global crisis such as the COVID-19 pandemic has disrupted almost every industry and the field of education is also affected with safe distancing measures and minimal face-to-face interactions between teachers, students, and their families. However, new opportunities and technologies have emerged for teachers to utilize and work with students and their parents. We investigated a case study of a community of pre-school teachers who continued their professional discussions on a virtual and asynchronous discussion platform throughout the lockdown period caused by COVID-19. The teacher community planned for and conducted lessons using the knowledge building approach. This paper reports the considerations and implementation of a community-based professional effort through times of immense disruptions and have shown evidence that the knowledge building approach can propel a community of learners to construct collective inquiries and solutions to deal with emerging problems through the lockdown period. The knowledge building approach can potentially enculturate teachers towards noticing new and emergent ideas in their classes and thereby elevating the awareness of teachers to design and build new knowledge of their practice. Such teachers' professional culture is conducive for tackling the constant change and disruption in the educational landscape, such as the one brought about by the COVID-19 pandemic.

Keywords: Knowledge building, Knowledge Forum, new normal, COVID-19

1. Introduction

A localized crisis tends to affect a geographic region, requiring quick thinking and adaptability by impacted stakeholders to react with actions that might not be persistent in the long term. Conversely, during a global and modern crisis such as the COVID-19 pandemic, almost every industry and country are affected, along with their goals and profound implications on its relationships with its stakeholders (Bundy, Pfarrer, Short, & Coombs, 2017). Teachers and students are affected by school closures reported in an estimated 188 countries, affecting more than 90% of enrolled learners worldwide (UNESCO, 2020). Such global crises are unexpected and rare in nature, as such needing quick assessment and responses from educators that can lead to "erroneous inferences and resistance to learning" (Lampel et al., 2009, p. 840). For example, on the one hand, when faced with the need to switch to completely online interaction with their children with a short turn-around time, teachers may revert to practices that are easy to implement, e.g. students watching videos or completing online worksheets, but ones that lack in-depth thinking and creativity (Veil, 2011). On the other hand, technological advancements have afforded appropriate teaching pedagogies and approaches for teachers to embrace the new normal to design meaningful interactions with their students.

In this paper, we investigate a case study of pre-school teachers who planned and conducted a series of lessons, based on the knowledge building approach (Scardamalia & Bereiter, 2006) that was introduced to the teachers about four months before the Home-Based Learning (HBL) sessions and continued on a voluntary basis throughout the COVID-19 lockdown period. We report the teachers' adoption of this approach and the guiding principles, along with how the teacher community engaged and connected virtually in place of minimal face-to-face contact. The impact of this knowledge building

approach on the teachers becomes part of a new normal, in which we believe will aid and potentially replace some existent ways of teaching and learning for pre-school students.

2. Participants, settings, and equipment

2.1 Participants

A total of six pre-school teachers were involved in this study and the teachers' first engagement with knowledge building was in December 2019. The teachers, also known as early childhood educators, were trained and certified in early childhood education and care. The teachers were new to the knowledge building approach. Weekly school-based discussion (one-hour each) was held as an ongoing professional development programme. There was a change of two teachers during the study but due to proper handover and the teachers working together as a community, there was minimal impact on our findings.

2.2 Settings

The pre-school is based in Singapore and the curriculum of the pre-school is wide-ranging, designed by the Ministry of Education (MOE) to guide the work of early childhood practitioners. The teachers chose to integrate knowledge building into the Discovery-of-the-World (DoW) component, one of six key learning areas proposed by the "Nurturing Early Learners" (NEL) framework (Bautista, Ng, Múñez, & Bull, 2016). This DoW component poses three goals: children should (1) show an interest in the world they live in, (2) find out why things happen and how things work through simple investigations, and (3) develop a positive attitude towards the world around them. Two topics from this component were chosen for discussion, namely, "The Amazing Human Body" for 5-year-old students and "Science in Everyday Life" for the 4-year-old students.

We engaged the pre-school teachers before the COVID-19 pandemic set in at the beginning of the year 2020. Singapore underwent a "Circuit-Breaker" period that was similar to a lockdown from April to June 2020, where teachers have to work from home and students were to engage in HBL. Essentially, former practices and face-to-face lessons that were critical for engaging students were no longer viable and teachers have to look at alternative online technologies to aid teaching and continue connecting with students and other teachers. Contingencies planned before the lockdown were mostly designed to be short-term ranging from days to weeks and therefore new plans have to be designed and implemented for an extended period in terms of months and also in a sustainable manner.

2.3 Equipment and schedule

The teachers possess basic computer literacy, but these literacies varied according to their personal experiences with digital technologies and not specific professional development on ICT related to this study. The teachers meet weekly and used their own mobile phones or school-distributed computers to access meetings held on Zoom. Access to the internet at the pre-school was prevalent, which allowed the teachers to be able to access online conferencing and Knowledge Forum (KF; Scardamalia, 2004), an asynchronous online discussion platform for supporting knowledge building. Teachers involved in the Knowledge Forum are provided with a space for discussion with options to spatially reflect their practices, recognize and build on each other's ideas, while using scaffolds to aid each other in the sharing and rise above of ideas.

3. The process of embracing a new normal

Although there was an urgent need to address the myriad of administrative and operational issues that emerged during the period, it was noted that there were three phases that the community of teachers

generally underwent in embracing the new normal. The three phrases are (1) getting the ball rolling, (2) persistent efforts in reaching out and connecting with students' parents, and (3) connecting discussions during HBL to discussions held when students returned to school. We illustrate the manifestation of these phases in the following segments and discuss the value and challenges of such teachers' knowledge building work during the lockdown period.

3.1 Getting the ball rolling

For a start, two pages, also known as KF views, were created and hosted in a virtual space on the Knowledge Forum for the respective topics of "The Amazing Human Body" (see Figure 1) and "Science in Everyday Life". KF views are conceptual spaces to hold discussion notes relating to certain topics. Sub-topics and the connections from each topic were mapped and placed as background on the KF view. Teachers post their lesson ideas, new resources, students' artefacts, and updates from their lessons asynchronously. They also reflected on the knowledge building theories; how they understand the theories; and how they see the theories manifested in their class (Scardamalia, 2002). The six teachers then met weekly to discuss what they posted about knowledge building principles and their lesson progress. They also use this time to analyse students' drawing and students' responses during the small group of whole-class discussion. This weekly meetup started three months before the lockdown and persisted throughout the lockdown period when all schools were told to switch to HBL.

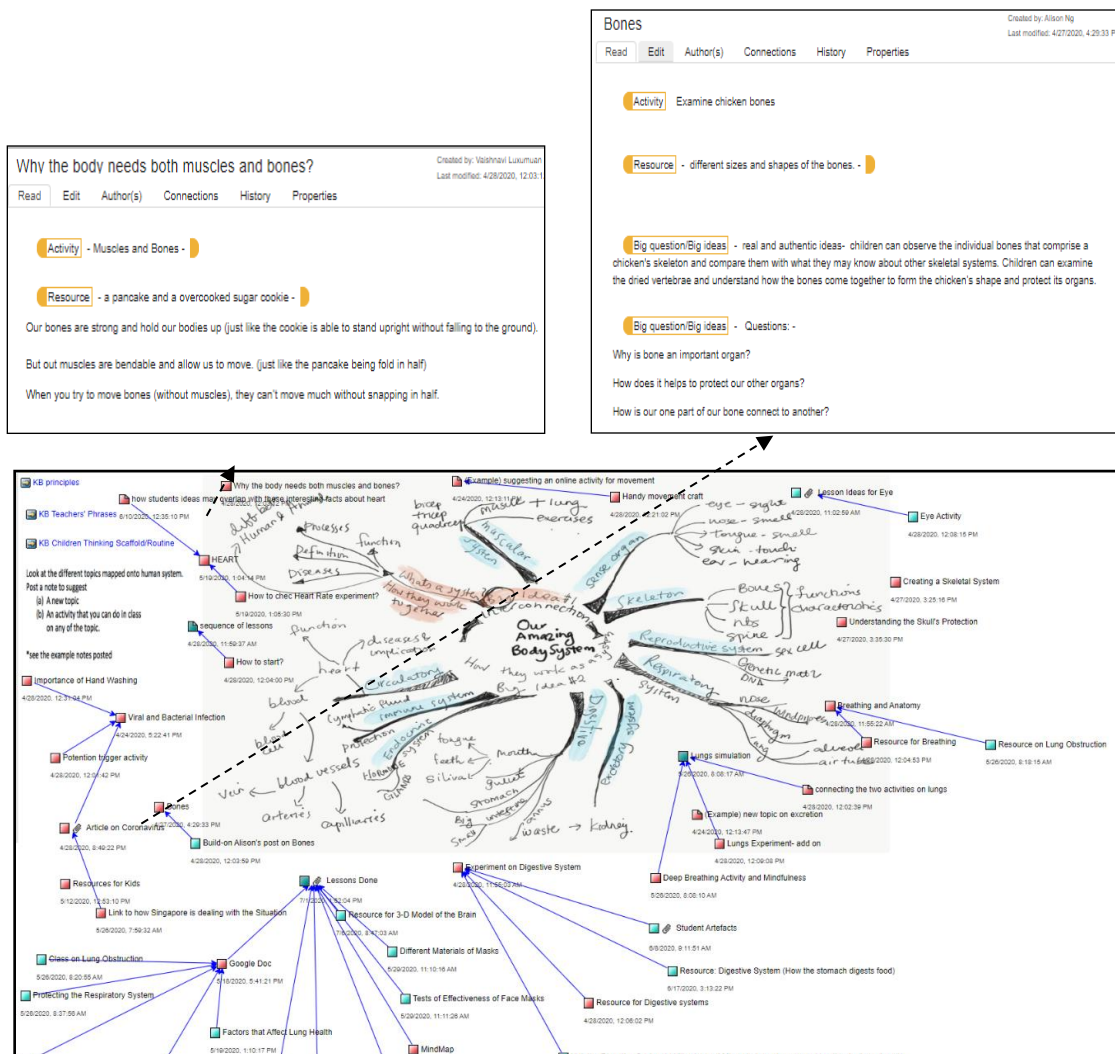


Figure 1. A screenshot of the teachers' knowledge building view and two sample notes (expanded) that explored activities, ideas, and principles on "Our Amazing Body System".

The pre-school teachers decided to continue with the weekly meeting via Zoom. The Knowledge Forum notes became the object of discussion at each synchronous zoom meeting. Figure 1 shows a screenshot of the teachers' knowledge building view that reflects a mixture of lesson ideas and resources (e.g., "Why the body needs both muscles and bones?" and "Bones"). Teachers also described their enacted lessons in the note (e.g., "Test of effectiveness of facemask"), their initial and evolving ideas ("How students' ideas overlap with these interests?"), and their reflections on discussions on knowledge building principles (found in another KF view).

There were indications of individual and collective knowledge-building as teachers navigated the online and offline discussion on knowledge building classroom. One of the teachers (Teacher 1) posting an interesting note (see Figure 2) using scaffolds that appear in angle brackets (e.g., <scaffold>). This teacher had an idea of how to teach the concept of bones to students, based on her prior experience on the topic, but shared at the meeting that she initially did not view the ideas in a broad or "big-idea" manner.

Resource – Different sizes and shapes of the bones:

<Real and authentic ideas> Children can observe the individual bones that comprise a chicken's skeleton and compare them with what they may know about other skeletal systems. Children can examine the dried vertebrae and understand how the bones come together to form the chicken's shape and protect its organs.

<Big question/Big ideas> Why is bone an important organ? How does it help to protect our other organs? How is [does] our one part of our bone connect to another? Is there any reason why our bones are form in a particular way?

Figure 2. A Knowledge Forum note titled "Bones" posted by Teacher 1, suggesting how the concept of bones can be taught to the students, relating to the big ideas.

Teacher 1 later elaborated on her note (Figure 2) through an online synchronous meeting, commenting that she would want the students to examine the shapes of chicken bones and find the connections so that students may relate this information with the human body structure and how bones may help to protect human organs. The following are parts of the teacher community transcript between the teachers and one of the researchers, who was also an active participant, detailing the teacher's elaboration.

Teacher 1: Previously... ..I allow children to examine chicken bones, different sizes and shapes of bones, also for them to look at how the bones are connected... ..to relate, somehow relate it back to our own body system, bones. So, this is one activity that I done it before, so I just share it. So, I thought it'll be good for children to observe bones and how they can protect the organs and stuff like that- yeah.

Researcher: Ok, so what will be the things that will be covered when they do this activity. What are the ideas you hope to...?

Teacher 1: So how they can link... ..understand how these bones come together to form different shapes so kind of correlated to what our body is and how these bones are formed to protect certain organs like the ribs and stuff like that. So, this is kind of a way to get them to relate to our body. Yeah, because it's easier for us to get chicken bones rather than you know the other kind of bones (laugh) so I thought this is one way...

Continuing from her elaboration, Teacher 1 was further questioned on what kinds of preparations she had in mind for the upcoming lesson.

Researcher: Let's say we have to do this activity. What kind of knowledge building talk would you design or facilitate? ... Like you were saying maybe we can get students to talk about, have some questions, because they are touching and feeling it. So, what kind of knowledge building talk, I wonder what is like the starting question of the knowledge building talk? Any thoughts?...

Teacher 1: I think it will be good if you start off with a, maybe a book storytelling on bones. Something like that and after that get them to share their thoughts, after reading the book and then this can be the main lesson or the next lesson to, kind of, like get them to connect, you know. So, I think can start off with book or video or something like that to get them to observe and then they learn from it from that particular topic and then this could be the next lesson.

Teacher 2: So maybe we can start off by saying you know, we are going to talk about your body. Who can tell me what's in your body? So, let them name all the different things in their body; skin, bone, organs whatever. And then from there, can [we] dive deeper into the different areas. You know like what do you think bones is [are] for? How is [are] bones helping you and all that kind of things and also talk about like um- um- what makes strong bones so from there you can you know expand a little bit more about the body and then in particular the different structures of the body.

Researcher 1: So Teacher 1 is [and] Teacher 2 is [are] making us think like, which part of the lesson I'm going to do this activity, [and] will very much determine on what I am going to do in the knowledge building talk and then Teacher 1 and Teacher 2 are saying that maybe there needs to be something else before this activity to get them [students] interested.

Teacher 1 eventually realized the need to consider some "big ideas" apart from the initial foray in using the related scaffold in her first note, but the notion of 'big ideas' is still vague. The researcher then asked the other teachers in the Zoom meeting to elaborate more on any attempts at investigating big ideas. Another teacher (Teacher 2) started explaining her method of involving students to think about big ideas, using an experiment on the topic of digestive systems.

Researcher: ...We have a note on [the] experiment [that you did] ... do you want to talk about it? Uh yeah, experiment on digestive system.

Teacher 3: So for me, I thought that this should be a follow-up lesson because once we introduce the students the digestive system, the overall picture and idea of it, I think they will be more likely to understand if you show them an experiment on how the different parts, erm, the process of the digestive system, so this activity is actually an experiment that I saw on YouTube. So yeah, it will actually show a brief process of how the digestive system works like how they will use crackers and bananas and smash it together and then they will cut holes and squeeze through a stocking to show the process of how the large intestines work, yeah.

Researcher: And say a little bit about how you put up the big question, the big ideas. I actually quite like it.

Teacher 3: So, I was just thinking how children would be more likely to link the topic into the digestive system itself. So usually we talk about food and going to the toilet and so I wanted to relate it to them. Such as, with questions like 'Why do we need to eat and drink first? Then, if you ever had stomachache, how did you feel or what usually causes the stomachache? So, from there, it will lead into it being in the digestive system and

probably the food that they intake or not being able to digest... ...if they eat too much of candies.

The note in Figure 2 was actually picked up through Knowledge Forum by Teacher 2, who considered the idea and built on it with an elaboration of an experiment related to the human digestive system that she was considering conducting. She then listed several YouTube videos and "big ideas" that she intended to introduce to students. These big ideas were part of a concept in knowledge building that students were investigating, allowing them to raise questions and pursue the answers in a collaborative manner. In doing so, the learning process becomes self-actualized and appreciated. We see a deliberate consideration for 'big ideas' in subsequent discussions and lesson designs. Examples of such big ideas that will frame her activities in class are as follow:

1. Why do we need to eat and drink?
2. How does food move through our bodies?
3. What do our bodies get from the food we eat?

Teacher 3 reflected on the knowledge building principles as the basis of her teaching moves and decisions:

Researcher: Nice, nice. And you also picked idea diversity [knowledge building principle], could you just share why you picked this...

Teacher 3: I went to, I went to read about diversity, and it talks along the lines of how children will be able to explore and understand the topic. Something about understanding the idea around that topic, so like what I mentioned, digestive system is very advanced and is pretty complex with all the different organs and the different process that takes place in one system itself. So, that's why I classified it under idea diversity, so that through this experiment, at least they would be able to understand the process and the idea around it.

Teachers took comfort in knowing that other teachers were also thinking along the same lines for planning and teaching of online lessons using diverse ideas to initiate discussions on various topics. In such a blended professional discussion, teachers have more time to read through each other's notes on the Knowledge Forum, they could build on and share queries and ideas on the Knowledge Forum before considering the sequencing of the lessons. In the subsequent teachers' meetings, there was a greater sense of idea-sharing and idea-building among the teachers on the two mentioned topics and teachers were able to work together and to review lesson progress in a meaningful and effective manner, supported by the Zoom platform and Knowledge Forum.

3.2 Persistent efforts in reaching out and connecting with students' parents

In the weeks that followed during the lockdown, the teacher community further explored the idea of home-based-learning. One teacher pointed out that the viral infections (COVID-19) could be a very good trigger to kick-start the discussions following students' interests and inquiries on breathing and lungs. There were discussions on whether parents could be involved in students' learning outside of classes since the teachers were already conducting home-based learning with the students. This idea prompted the teachers to deliberately involve parents in their subsequent knowledge building lessons. This process of getting parents to be involved in learning consequently brought greater awareness to parents of what students were working on with their teachers. Considering the enforced circumstances that the lockdown has imposed on the pre-school community, the teachers and the school leaders were able to adapt to dynamic and changing conditions, even thinking out of the norm with considerations of using authentic situations to trigger thinking and involving parents in activities that otherwise would be impossible to conduct on pre-pandemic situations.

Midway through the lockdown, the group of teachers continued to explore ways to involve parents and they collectively agreed to share a copy of the knowledge building scaffolds. They hope to encourage parents to engage their children in knowledge building at home. Parents were requested to work with students on a document that was embedded into the Knowledge Forum. This home-based learning activity on "The Amazing Human Body" got parents to work with and document how students could use reusable materials such as straws and plastic bags to create a model of the human lungs. A consistent communication channel was also set up between the teacher community and the groups of parents and students to discuss about their prototype lung model.

3.3 Connecting discussions during HBL to discussions held when students returned to school

Singapore exited the lockdown in June 2020 to a phased resumption of daily activities, including allowing pre-school students returning to the classrooms to resume their education. The teacher community then consolidated the online discourse on Knowledge Forum and printed the online mind map that captured the students' ideas and questions onto a large physical poster (see Figure 3) that was displayed in the pre-school, so that students on returning to the school could relate to the activities that were conducted during the lockdown. Returning students were quick to identify and point out the questions that were raised during the home-based learning activities and were able to continue knowledge building with the teacher community in the physical classroom.

Among the lessons that were brought up, a prominent example was about how knowledge building was used as an approach for 6-year old students to start a discussion related to the pandemic, such as identifying the job scopes of frontline and essential workers. Overall, it was a gratifying experience for all stakeholders and there will be ample opportunities for knowledge building to continue during school lessons, home-based learning, and when working with parents in homes.

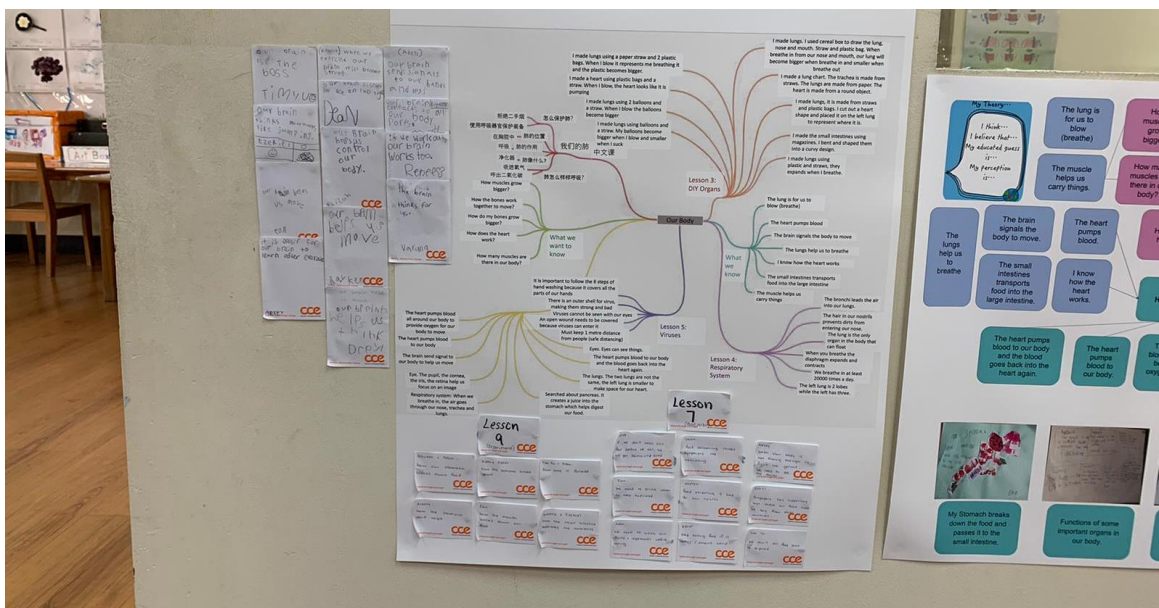


Figure 3. The online discourse from the Knowledge Forum was consolidated into a physical poster and displayed on the wall of the pre-school for students' reference.

4. Conclusion

The COVID-19 pandemic and social-distancing measures that were put into place may have created physical distance and minimal face-to-face interactions between teachers, students, and their families.

The knowledge building theory has helped to forge a greater sense of communal belonging among teachers and also helped to assemble a community of learners who constructed collective inquiries and solutions for authentic problems and responded to emerging situation and needs. The onset of the pandemic may well have elevated teachers and students' awareness of the need to use knowledge building as a promising foundation for a responsive and progressive approach to teaching and learning. This study has provided evidence that even through trying times, teachers and students in schools are reinvigorated and stimulated to continue striving towards a new normal that involves greater integration of technology for interaction and collaboration in schools. Knowledge building has also provided the opportunity for newer perspectives of classroom practice and teacher professional development that supports the deviation from a common norm of working with students and their parents.

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