Preschool Teachers' Knowledge Building Community During a Crisis: An Integrative Culture, Identity, and Practice

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Abstract. We examined the integration of knowledge building community culture within a group of preschool teachers and its impact on their identities and practices. We traced how this group of preschool teachers came together as an online knowledge building community (KBC) and explored knowledge building (KB) practice during home-based learning caused by the COVID-19 lockdown. This KBC aimed to generate diverse ideas and encourage knowledge creation among community members. The study spanned three months during the lockdown period. Three aspects of the KB culture were expanded in this study: (a) idea improvement, (b) knowledge building discourse, and (c) collective and shared responsibility. We present the case studies of four teachers in the community, the transformation in their identities and practice derived from discussions in the KBC weekly meetings, interviews, and their posts on the Knowledge Forum (KF), an online discourse forum designed to support KB. Findings show trends in the transformation of teachers' identities and the way they thrived on diverse ideas from the community, alongside their openness towards novel ways of teaching practice and their willingness to approach and take on challenges. The potential and limitations of the KBC on community-based professional development are also discussed.

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1 Introduction

The changes we must embrace are far more significant than we can imagine. The global impact caused by the coronavirus disease (COVID-19) across education is long-lasting. In education, it is estimated that school closures due to COVID-19 caused long-term losses and occurred in all aspects of student learning, especially in deeper understanding and collaboration (Hanushek & Woessman, 2020). Countries continue to strategize and prepare for potential waves of infections that affect current teaching and learning plans, including remote and home-based learning. Teachers have to adjust their resources and practices to keep up with this new norm. Teachers are in for steep learning curves in the face of uncertainties brought about by the COVID-19 pandemic. Furthermore, many teachers' professional development had to be replaced by online meetings and workshops (Abdelhafez, 2021; Ahadi et al., 2021; Sadler et al., 2020). To better support teachers in their professional development, there are recommendations to enhance online and blended learning (Philipsen et al., 2019).

However, there is also a need to reconsider the identities and potentially the pedagogies and professional development approaches that support teachers' growth. Knowledge building (Scardamalia & Bereiter, 2003), as a theory, pedagogy, and technology, has often been put forward for teachers' professional development, especially in developing teachers' design capabilities (Ma & Scardamalia, 2020). With Knowledge Forum (Scardamalia, 2004), teachers can collaborate synchronously and asynchronously to develop knowledge and practices.

In this study, we recognize the importance of an integrative KB culture that encompasses teachers' identities and practices in a teacher community. Through an educational lens, it aims to understand the influence of such integrative KBC culture on teachers and the impact of the online KF environment (Penuel et al., 2012). We use the case study method to investigate the research question: "How did the preschool teachers' identities and practices transform as they participated in the KBC?"

2 Literature Review

We first briefly describe how KB, as a principled pedagogy, is being practiced within communities, thus forming knowledge building communities. Knowledge Forum, as a technological discourse platform, is used in this study and supports the use of KB and hosts online spaces for communities to interact with each other to discuss real ideas and authentic problems.

2.1 **Knowledge Building, Knowledge Building Communities, and Knowledge Forum.** Effective online professional development for teachers has become increasingly critical and urgent in the current pandemic (Laferriere & Cox, 2021). Beyond the pandemic, researchers in the field of the Learning Sciences have responded to the demand for effective online professional development sustained using networked technology and Computer-Based Systems (Sawyer, 2008; Powell & Bodur, 2019; Yoon et al., 2020). The more we can heighten the social situatedness of teachers, the higher the change for deep learning and transformed practice (Brown et al., 1989; Lave & Wenger, 1991).

Knowledge building, as a theory, describes what a community of learners, or teachers in this study, need to accomplish to create knowledge and addresses the need of the emergent knowledge age society, where knowledge and innovation are seen to be prevalent and pervasive (Scardamalia & Bereiter, 2003). Knowledge Forum (KF) is a readily available discourse environment for the KBC that is structured around theory development activities. It supports KB activities and archives participants' contributions in a shared virtual workspace. It breaks the physical environment's constraints, enables situated learning and increases opportunities for teachers as learners or researchers to collaboratively work on real-world tasks (Dede, 2009; Linn, 2000; Wang et al., 2017).

2.2 **Teacher Discourse, Identity and Practice.** Reeves (2018) has identified discourse as one factor that shapes the construction of teachers' identities. The other factor is the practice that they engage in. Creating space for discourse among teachers empowers them to improve their practices through collective decisions. This discourse space, in turn, would impact teachers' abilities to navigate and improvise their practices and change how they view their identities. A teacher's identity defines how a teacher is recognized as being in their school and classroom (Gee, 2000, p. 99), and identity has both reflective and active dimensions. The reflective dimension relates to a teacher's professional commitment is manifested in his actions and practices. Studies have shown that teachers' identities are closely coupled with their core beliefs about teaching and how these beliefs can be transformed over time through experiences and interactions in their work environment (Walkington, 2005).

Considering how these discourse, practice, and identity concepts are intertwined, professional development often foregrounds these components. These components are essential in a KBC where the goal is to let the members advance the community knowledge. As teachers interact with one another in the KBC, teachers are exposed to diverse approaches to hone their teaching practices. They are given more creative freedom to advance their teaching practice and how they perceive their roles and practices. These aspects can be transformed through exchanging ideas with colleagues with different expertise. Therefore, our study intends to address how a KBC that engages in weekly online meetings affects the development of teachers' identities and practices.

2.3 **Culture to Support the Transformation of Identity and Practice.** A culture that supports deep professional learning provides teachers with the opportunity and support to play an active role in their professional growth and in their own classrooms (Fullan, 1982, as cited in Fleming & Kleinhenz, 2007, p.13). Such culture is found to be closely related to the kind of professional discourse within the community (Flemming & Kleihenz, 2007).

In this paper, we refer to culture as an evolving cognitive structure that influences the way a member behaves in a group and how the person interacts with one another and with the environment (Savard and Mizoguchi, 2016). Such culture also determines the expression of the settings, its people, and their beliefs, all of which characterize the group's relationships, interactions, and processes (Vujičić and Tambolaš, 2017). When we consider how members in a community negotiate the context and culture as they develop a sense of belonging (Lave & Wagner, 1991), it generally results in a reconstruction of the identity, a changing habit of minds (McCune and Hounsell, 2005), new "ways of being" (Gee, 1996) and changed behavior. An example of this is the exchange of values and socio-cultural meanings through frequent communication of shared goals, assumptions, discourses, and practices (Lave and Wenger, 1991; Lea and Street, 1998; Zhao, 2014).

2.4 **KB Principles as the Basis of Shared Culture in the community.** Having a culture of authentic knowledge creation is critical to establishing healthy communication among members in a KBC. This culture of authentic

knowledge creation comprises cultural conditions and community norms that a KBC needs to be productive and successful, with the KB principles forming the basis of this culture of authentic knowledge creation.

There are 12 KB principles that support KB as a principle-based pedagogy, and these play a critical role in evolving a school culture supportive of KB (Zhang et al., 2011). Studies have shown that a focus on KB principles can transform processes against the backdrop of didactic educational culture (Chan, 2008). The principles can also be expressed through the scope of members' roles, collaborative strategies, and practices (Scardamalia & Bereiter, 2010); becoming the basis for rationalizing decisions about design and enactment within the KBC. By giving community members different ways to contribute and help each other develop their styles and skills, the members begin to see themselves offering something unique to the community. For example, teachers constantly rationalize their practice according to the principle of real and authentic ideas by discussing, "Is what I do authentic to the students or authentic to me as a teacher?". "How do I make it more authentic to the students?". In doing so, the teachers continually check, test, and adjust their personal and professional beliefs, ideas, and experiences with other teachers in the community. Stahl (2000, p. 71) talks about how the personal beliefs "enter into a mysterious social process of interaction with other people and with our shared culture." This shared culture will then shape the thinking and the motivation of an individual. This is how the KB principles form the basis of shared culture in the community.

However, such KB culture for community-based professional development in an online environment is non-trivial, especially if it was to be sustained in practice. The success of the community greatly relies on an individual member's contributions and learning, and the interactions of these members in their everyday activities of a community (Hutchins, 1995; Lave, 1988; Scribner & Cole, 1973; Suchman, 1987). Resources, manpower, and mandates are useful but not enough to drive teachers' intrinsic motivation (Seo & Han, 2013).

In recent years, technology has become a dominant factor that shapes the culture of a community of people (Masemann, 2013). A closely connected concept of culture to practice is the notion of a context of practice, where context is defined as a series of environmental circumstances that frame related events (Savard & Mizoguchi, 2019). KF, as a KB environment, is useful not only because it minimizes the geographical distance but it also transforms the guidelines during the post-pandemic era into new ways of communication and collaboration. More importantly, it serves as an asynchronous discourse medium (Chan & Chan, 2011), allowing teachers to practice a new form of discourse – KB discourse – as a social practice (Scollon, 1999) and to conduct intercultural communications from multiple perspectives within the community of practice. Teachers begin this process, also known as a knowledge creation process, by emphasizing individual learning acquisition as much as collective knowledge advancement.

3 Methodology

3.1 **Research Design – Introduction of Knowledge Building Community.** The concept of a KBC was introduced into the preschool setting to deepen teachers' collective understanding of KB practice as an idea-centric practice. Teachers were initially introduced to the 12 KB principles and were asked to identify and list on KF several KB principles that they related to and the ones that they wanted to explore. As a result, there were three KB principles that were mostly discussed and relatable to the teachers. During the weekly KBC meetings, teachers shared their lesson ideas, brought in their students' artefacts, shared challenges, and their ways of overcoming such challenges. We proceed to discuss the various aspects of the KBC and how it was intended to function within this study.

3.1.1 **KB Principles Involved in the Design of KBC.** Within this study, we focus on three KB principles that were selected by teachers, namely, improvable ideas, knowledge building discourse, and community knowledge, collective responsibility (see Table 1), which served as the foundation in designing the KBC meetings. Using a more principled method, we anticipate that the community will not rely on procedures and structures and will have the opportunity to increase the fluidity in the orchestration of the discussions for collective improvement of ideas.

Table 1. KB principles as the basis of shared culture in the community: rationalizing the design, translating to strategies and actions, and examples

Rationalizing the KBC design using the following KB principles	Strategies and actions common in KBC meetings
KB principle of *Improvable ideas* –	Teachers practiced digitally archiving their lesson designs, teaching practices, and students' artefacts (e.g.,

Focusing on idea generation and idea development on KF and in classroom discussion. It is not about the best KB lesson but the incremental move to make it more student-centric	drawings, scale models) on KF. Teachers are encouraged to trace their lesson progression using students' artefacts. Teachers read and listened to each other's lesson progression and contributed to building the resources for subsequent lessons. Teachers focused on understanding how their lessons progressed more than the success of an isolated lesson. "What led to this?", "What's next" are as important as "What happened in the lesson?". A curriculum map (Figure 3) showing the connection of thematic sub-topics was created and uploaded onto KF. Teachers overlayed the digital curriculum map with students' ideas and lesson ideas and focused on expanding the curriculum map with students' ideas. Lesson ideas generated by the community were archived and traced on KF. Teachers reflected on KF where they shared their upcoming lesson designs with each other in addition to suggestions and feedback on improving their KB and teaching practices.
KB principle of *KB discourse* – Developing KB discourse through the focus on idea improvement during the weekly KBC meetings.	Synchronous discussions at weekly KBC meetings gave teachers a space to share what happened in their class. Teachers took ownership to explain the advancement and challenges faced and what they planned to do next. More time was devoted to exploration and brainstorming then to provide immediate answers to questions. Focus on the interchange of ideas in the community rather than the correctness of KB practice. Focus on interdisciplinary collaboration. For example, the teachers teaching different subjects (science and Chinese) were able to come together to design lessons because they saw a natural connection across the students' ideas that emerged in both classes.
KB principle of *Community knowledge, collective responsibility* – Valuing ideas and sharing individual and collection of reflections on a common workspace.	Acknowledge the value of the ideas and the knowledge built within the community by creating a model of practice unique to the school. Emphasize the generation of ideas of value and share them with the larger community. KBC meetings provided socio-cognitive and emotional support to all as the teachers explored KB practices and shared individual reflections. Everyone - novice, expert, teacher, or administrator is a valued contributor who produces ideas and suggestions to the team. For example, despite the teachers' varied expertise in different subjects and varied experience in

KB, they were able to work together, offer constructive feedback and suggestions for each other's upcoming lesson design.

3.1.2 **Knowledge Forum, Embedded Functions, Tools, and the Zoom Platform.** The KF platform provides technological affordances and acts as an online medium for teachers to discuss, contribute, and exchange ideas (see Figure 1). When posting on KF, teachers utilized embedded build-on functions that were more flexible than traditional linear threaded discourse forms of reply. Teachers who typed their responses (also known as notes) in KF often detailed class events, contributed ideas, and provided resources to help fellow teachers decide on subsequent pedagogy moves. The notes spread and branch out to create a spatial overview of the queries and replies, constituting a higher level of idea organization and concept construction (Scardamalia, 2004). Scaffolds provided on KF (see Figure 1) acted as sentence starters to facilitate teachers in sharing their ideas. Teachers also posted reflections on their practices based on different KB principles (see examples in Figure 2).

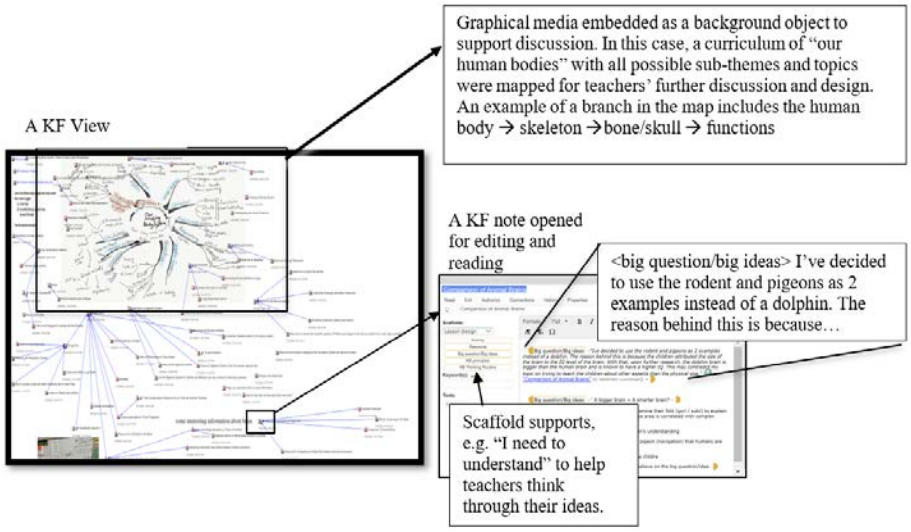

Figure 1. A Knowledge Forum (KF) view (left) can be used as a collaborative space to host graphical media that serve as backdrops, and KF notes containing scaffold supports (bottom right) for teachers to share ideas, questions, and information.

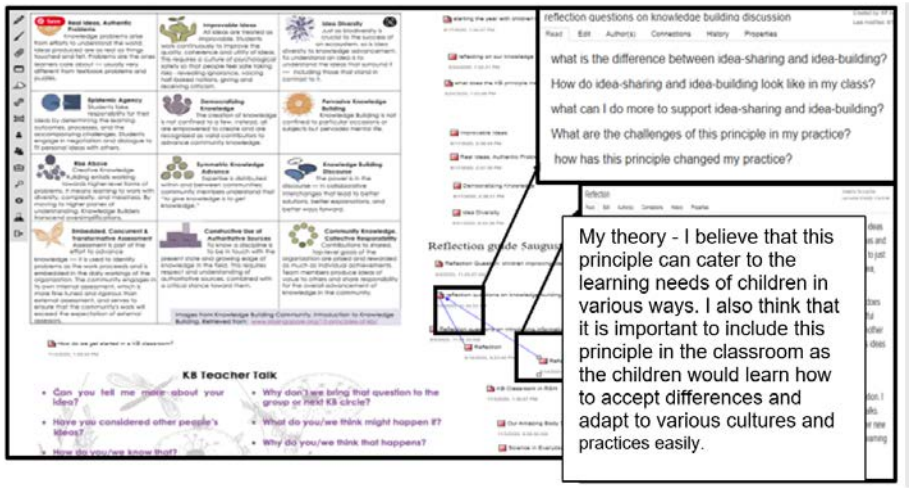

Figure 2. Teachers' Reflection Notes on KF.

KF allows the embedding of media object on the KF view which can serve as an object of discourse. Figure 3 below shows a visual of a curriculum map on the theme of the human body which was used as the background of the KF view. This visual serves as a crucial common object for both synchronous and asynchronous discussions (Figure 4). Teachers continued to build on this curriculum map with lesson ideas and learning artefacts. Teachers posted notes based on the work done in the classroom onto the curriculum map, allowing the community to trace the progression and connect the knowledge built. In this manner, teachers could visualize the potential and possibilities of student's questions as they tried to map students' questions and ideas onto the content, strengthening the connection across isolated topics.

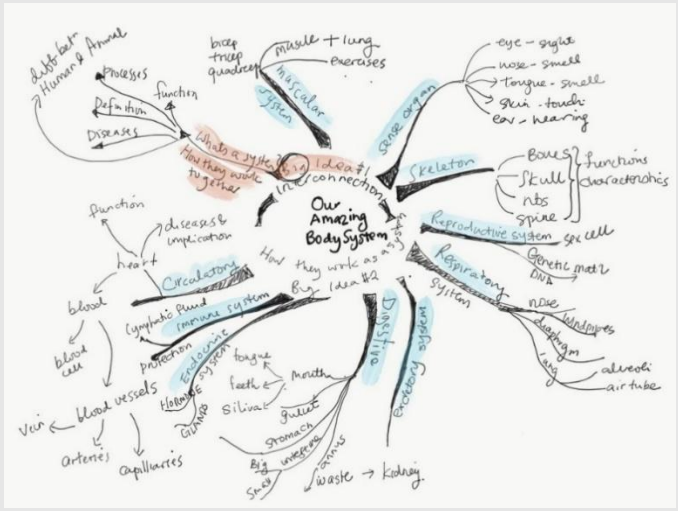

Figure 3. A curriculum map placed into the background of the KF discussion platform.

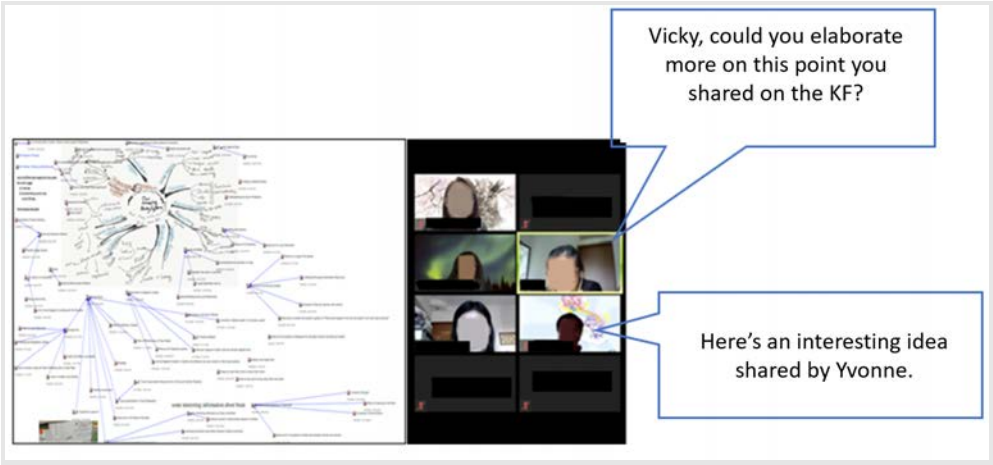

Figure 4. Synchronous meeting on Zoom to discuss ideas that teachers have shared on KF.

3.2 **Data Source.** Due to the enforced move to home-based learning, teachers were mostly engaged in remote and online teaching. Apart from the teachers' active participation in posting their lesson progression and the students' artefacts on KF, the teachers also met on a weekly basis via Zoom to share updates within their classrooms and their upcoming plans. One researcher was always present during the weekly Zoom meetings to facilitate and record data from the meetings.

This research examined three sources of qualitative data: six hours of teachers' interviews, eight hours of teachers' weekly meetings which were recorded and transcribed, and 154 teachers' notes on KF for the transformation of teachers' identities and practices. These data were collected over 12 weeks.

3.3 **Participants and Settings.** Participants include six teachers from one preschool who volunteered to practice KB and participate in the KBC. Two more teachers resigned from their positions during data collection, so they were excluded due to incomplete data collection. The remaining four teachers who participated throughout the whole data collection process ranged from school administrators to class teachers and they taught different subjects and levels. The KB experiences and transformations that these four teachers underwent were then reported using case studies to address the research questions. The profiles for each of the four teachers are shown in Table 2. Two researchers, who are considered KB experts and practitioners between three to ten years of experience, are mostly in contact with the four teachers to aid their KB processes for the duration of the whole study.

Table 2. Teacher participants' profiles, roles in the schools, and experience with KB practices.

Teacher participants	Grade Level (age of students)	Roles in the school	Experience with KB
Vicky	Kindergarten 2 (6 years)	New KB teacher who joined the school	Beginner (no experience in KB)
Cindy	Kindergarten 1 & 2 (5 and 6 years)	New Chinese language teacher (converses only in Mandarin)	Beginner
Betty	Kindergarten 1 (5 years)	Teacher with prior experience in KBC and practiced KB before home-based learning	Intermediate (some prior experience in KB)
Yvonne	N.A.	School administrator and curriculum coordinator	Intermediate

3.4 **Case Study Design and Data Analysis.** The case study method was used, and each case study was investigated using the dataset from KF notes, KBC meetings and teacher interviews to explore similarities and differences which led to the generation of findings. We followed Yin's method of case study research (2002) for various dimensions of interests, by firstly defining the boundaries of a case study in this paper as an empirical inquiry that investigates a case, which is considered a contemporary phenomenon within a real-life context. We addressed the "how" and "why" questions by combining both quantitative and qualitative evidentiary sources, and gathering data (i.e., documentation, archival records, interviews, direct observations, participant observation and physical artifacts). We then conduct data analysis by examining, categorizing, tabulating, testing, and recombining both quantitative and qualitative evidence to address the initial propositions of the study. Patterns of similarities and differences reported as findings.

In short, this paper conducted a detailed study of teachers within the KBC during the home-based learning period to understand how various aspects of the KBC supported the shifts in individual teachers' identity and practice. This method allows us to explore the phenomena we observe in the teachers' community and understand the underlying factors that led to the transformation of identities and practices within respective contexts. To further understand how such community-based approaches, as the literature suggests, can motivate a group of teachers to embrace the changes and challenges they faced during the pandemic and ensuing home-based learning, we subsequently analyzed the trajectory of four teachers within the KBC and observed a pattern of shifts in identities and practices the four case studies. Interestingly, these teachers cited similar features of the KBC that helped their growth. We then drew qualitative relationships between the KBC culture and the teachers' growth (refer to Table 3). Finally, we examined the impact of KBC culture on various aspects discussed in this paper.

4 Findings

This section details the case studies from each of the four teachers, with comprehensive comparisons consisting of similarities and differences in teachers' identities and practices. The four case studies will show that although each

teacher demonstrated different changes in their identities and practices, there were overlaps. There is also a strong indication that active participation in KF supported the shift in teachers' identities and practices in the KBC. The insights gained from the case studies allow us to study the impact of KBC culture on preschool teachers' growth. This is noteworthy as we further explore the potential of a community-based approach, such as the KBC, in advancing teachers' professional development.

Further, from the case studies, three themes regarding teachers' identities emerged, namely, (a) teachers as contributing members of the community, (b) appreciation of diverse ideas from the community, and (c) distributed leadership within the community. Similarly, the case studies surfaced themes regarding their practices, namely, (a) practices became more idea-centric, (b) practices moved towards KB discourse, and (c) how uncertainties were embraced in practice. The details of these themes are further elaborated and discussed in sections 4.5 and 5. The specific culture inherent to the KBC which are mapped to the various findings in the case studies will also be discussed in section 5.

4.1 **Case Study One – Beginning KB Teacher, Vicky.** As a teacher who was new to KB, Vicky appreciated the diverse ideas posted on KF by the KBC as the diversity was critical in initiating her into the KB culture. She soon understood her roles as contributing members of the community and thrived on the diverse ideas coming from different members. As a beneficiary of diverse ideas in her early days, she gradually became an active contributor on KF as her confidence in the KBC grew and she saw herself as a leader in the community. Being open towards accepting KB as the approach for teaching also meant that her practices became idea-centric and moved towards KB discourses as a matter of course.

Identity. Although Vicky recently joined the school during the home-based learning period, she joined the cross-school KBC where she gained a new understanding of KB from the bigger network. The community shared many ways on "how they used their children's interests and learning." Vicky gained concrete ideas on KB activities that could be adapted into her own classroom when a teacher shared that her children sent postcards to thank front-liners who were fighting the pandemic and Vicky went on to do the same in her class. More importantly, she contributed to the community's understanding of KB by sharing her student's growth in her KB classroom. She reflected that "I think they had a better understanding of actually it's not too late to start, you know, they can start as early in preschool as well."

Vicky also started to see how members of the community could play multiple roles in the KBC, where everyone had something to contribute. She was able to identify the differences between working in a regular community and KBC, in which she reflected that "as [a] researcher, doesn't mean you don't contribute (to) other things or just because you're a teacher you don't contribute to the research; we help one another a lot compared to outside when there are different meetings." Vicky was able to further articulate the difference between a KBC and other school meetings as teachers in other school meetings were "segregated in a way that [is] limited to what [they were] talking about or what [they were] focusing about." In essence, Vicky felt she had a more consistent role in terms of providing her own ideas, with the freedom to choose the flow and kind of lesson for her class.

As an active contributor, Vicky read most of her colleagues' notes (202 notes) and created numerous notes or "build-ons" (28 instances within 1.5 months) within six weeks. Vicky's interactivity on KF is shown in Figure 5 and her active participation on KF seemed to have impacted her understanding of KB.

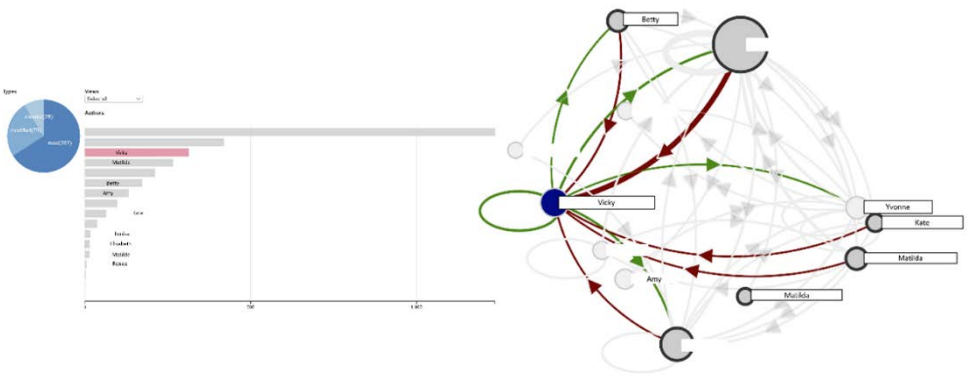

Figure 5. Vicky ranked 3rd in contributions (highlighted pink, left) and her connections extended to community members across the school, as shown in the network of notes (right).

Practice. Vicky began to appreciate the community's shared goal in helping her tackle the challenges of home-based learning. To her, KF was critical in initiating her into the KB culture. She appreciated the diverse ideas posted on KF and understood her role in the KF and the KBC. From her perspective, "KF was like a giant whiteboard to play with" and she found it very interesting that the KBC had so much input for her to draw on to help the children understand a topic better. More importantly, she started to see herself as a contributor to the community via KF:

> *In KF I am a contributor, so I contribute lessons [that]) I've already done and I'm also a researcher. So, I research new things that I can help with either K2's [preschool year 2] or also K1 [preschool year 1] classes because we can look at cross-class KF.*

Vicky was very much intrigued by the branches of ideas using the curriculum map (see Figure 3) placed on KF. She found that KF allowed her to view a lot of ongoing content from different sources and there was always, in her own words, "something new to look forward to, something new to learn." Hence, with Vicky's experience on KF, she wanted to design classroom lessons innovatively and was able to visualize the use of KB with her students in other contexts, creating a collaborative mind map on Coggle, an online mind-mapping web application, to capture her students' questions, ideas, and growth in knowledge on the theme of "Our Amazing Human Body".

Vicky also demonstrated exceptional openness and confidence in accepting the new norm of virtual teaching using new approaches with young students and learning about KB pedagogy. She shared that she "loved doing KB at home… they [children] get to do the process from scratch, like from the start to the beginning, all by themselves, so they each have their own unique take on how the experiment went, whether it failed, whether it was a success, and they're able to say what went wrong."

Besides the continuous and active engagement with students in their ideas and participation in the KBC, Vicky reflected on the nature of interactions with her students and learnt that "there is no wrong answer" in KB, and she should not always "look for the correct answers" but rather listen more to each other. As Vicky developed her understanding of KB practice, she seemed more focused on understanding her students and their ideas and trusting that they had interesting ideas to share.

> *If you actually listen to conversations between you and a child, or between two children, they actually have a lot of underlying knowledge even though they don't use the right scientific words, or even though they don't know the proper terms, their ideas are really very fresh, very authentic ideas…*

Vicky articulated the connectedness across ideas and appreciated the way ideas expanded and "really all linked up" in her KB class. She reiterated, "It all really links… there's a really nice flow to how everything works."

Being initially unfamiliar with science and having to put in extra effort to familiarize herself with the subject through KF and the KBC, Vicky started off with a lack of confidence as she feared that she could not answer the children's questions. However, the ideas generated during the KBC gave her the courage to pursue ideas further as she saw herself playing the role of bridging children to the knowledge in the KF notes. Over time, through her participation in the KBC, Vicky also developed the capability to identify improvable ideas given by the children:

> *[the KBC] really opened my mind because sometimes the ideas that I have might not necessarily be going on the right track, so just the communication of [KBC] was very important .... all these kinds of thinking are something I wouldn't have been able to think of—it's something that [KBC] brought up…*

As she engaged more in the KBC, Vicky also started to share strategies and tips to help others appreciate children's diverse ideas. She advised Teacher Betty, "... you can get the kids to try out the experiments that they watched at the homes, because they might have different drawings, different materials and then they can just start sharing with you their experiment [during the lesson]." The KBC discussion impacted her view on what she could do in class by focusing on the change and growth in children's ideas.

Summary. Based on all the data presented above, Vicky, as a new teacher, was open to new ideas and child-centred practices. Her identity as a preschool teacher continued to shift as she engaged with the KBC within and beyond school. In terms of practice, Vicky was more focused on the growth of her students' ideas, and she became more confident in the subject matter as she embraced KB and thrived on the diverse ideas shared by the community. She gradually recognized the KBC's impact of peer communication and mutual support on her professional development while contributing actively to the KBC to improve her professional development and teaching practices.

4.2 **Case Study Two – Chinese Language Teacher, Cindy.** Cindy, the sole Chinese language teacher in the community who conversed in Mandarin, conducted Chinese lessons in Mandarin. In this paper, researchers fluent in Mandarin translated Cindy's quotations from Mandarin into English before presenting it in the paper. Cindy overcame the language barrier to become an active contributing member in the KBC who was open to share her KB practices and challenges. Her practice moved towards KB discourse and became idea-centric over time as she was open to new approaches and willing to actively engage children's ideas. Her case study is also particularly instructive in demonstrating how uncertainties of KB were embraced as she adapted her practice to integrate science lessons into her Chinese lessons.

Identity. Cindy explained that she was initially a passive participant during KBC meetings who mainly listened and took notes while she thought of what to say and contribute. Subsequently, with help from her bilingual (English and Mandarin-speaking) colleagues and translation devices, Cindy became more active in the KBC meetings and KF despite her language barrier with the rest of the community. Over time, she gradually transformed from a hesitant participant in the community to a more active member who embraced and understood KB with assistance from colleagues and by referencing contributions from the weekly KBC meetings. Cindy commented on the KBC's benefits on her:

> *Benefits? Many! [Being in the KBC] introduced different methods to us and guided us, so we don't get lost or veer in the wrong direction. The meeting is an excellent time for us teachers to discuss and think about the next step to take in our lessons.*

Practice. When the school integrated the KB pedagogy in the science curriculum, Cindy was unsure how those science topics might work out in her Chinese language classes. During several KBC meetings, she listened to lessons conducted by the science teacher and realized students spoke up more often when discussing the overlapping topics in both Mandarin and science lessons. Therefore, Cindy planned for students to use Mandarin to communicate their ideas about science topics and did not insist on using traditional rote learning methods for learning Mandarin. Cindy explained that since both Mandarin and science curricula were aligned in terms of teaching goals, it was beneficial to tap on that alignment and encourage the students to explore the world around them in that manner.

Furthermore, she extended the discussion of the science topics to her Chinese language classes as the science "topic does not conflict with [her] teaching aims." Hence, Cindy began adapting to her students' needs so that they remained motivated to investigate science topics while using Mandarin. Over time, her efforts paid off as the children who were used to talking to her in English began to use a "combination of English and Mandarin to answer [her] questions" as they "had a chance to talk about things there were interested in." This was demonstrated in a science-related activity named 'build a parachute', where Cindy used her reflective mindset and capacity in her Chinese language class for students to collaborate and create possible iterations of parachutes that could slow down a fall. She further encouraged her students to discuss the concepts of gravity and air resistance in Mandarin. The following reflection from this lesson shows her open-mindedness in adopting the KB approach:

> *I wanted my [students] to think about how they can reduce the speed that things fall... They tried out their ideas to reduce the speed of the object falling, raised their wonderings and also used KB scaffolds like "I know, I learnt, I saw" (in Mandarin). [Students] also were encouraged to draw and share what they have learnt, [related] to things they see in their daily lives. KB gives [children] the opportunity to talk rather than the teacher directing the [lesson].*

Cindy also encouraged her students to share their ideas to help everyone in class keep pace with KB. She worked creatively around the different schedules of students who were in school (some students were on a full-day program while others were on a half-day program) by giving students on the full-day program opportunities to share

their ideas and drawings with students on the half-day program. She noticed that the students spoke much more in Mandarin when she gave them more opportunities to discuss their ideas. She reflected how adopting students' ideas and questions across different lessons increased their motivation to collaborate and speak up more in their Chinese language lessons. The students became, as she described, "more responsible of their learning and they were livelier in answering questions based on the ideas and questions shared by their classmates." For example, when one student asked about Newton and the falling apple, which was also the topic they did in English class, students were willing to share with their friends what they knew about things falling downwards compared to things floating upwards.

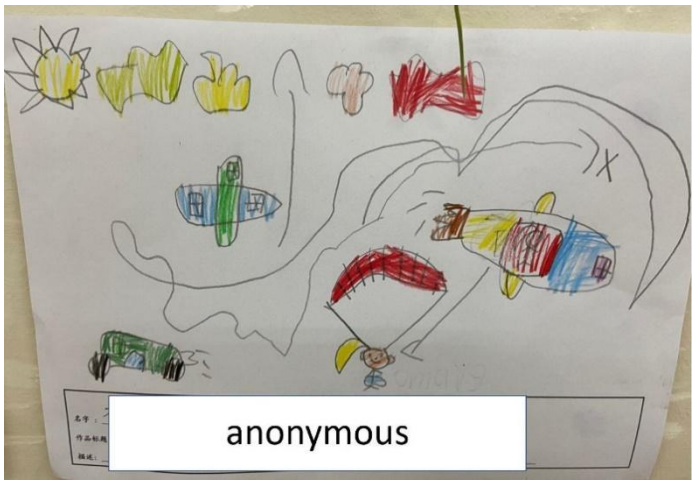

Figure 6. Cindy encouraged her students to express and share their science-related ideas on parachutes using drawings and in Mandarin.

After that active engagement of ideas, Cindy became more intentional in bringing students' ideas and questions into her classroom, and in asking students to share their ideas. She introduced rules for the children to share ideas and gave them different modes to express their ideas. Before the start of every KB talk, she enforced a "rule that the children should share ideas with their friends" and some children who were shy were asked to draw their ideas and share their drawings instead.

Cindy also began to adopt a more flexible teaching approach and changed her teaching style to focus more on interacting with children. She likened KB to a game. To her, "KB teaching and learning is like playing a game… different from practicing KB in English but implementing it in a Chinese classroom could be viewed as a different way to play this game." Her reflection made it clear that she was starting to focus on the children's ideas.

In one of the KF notes that she posted, Cindy shared her deliberate efforts to let the children talk more by asking them questions to spark KB discourse:

> *Now I encourage my[children] to talk more with their friends. ...I would rather throw the questions back to them…my [children] tried to answer…KB helps me to build a closer relationship with my children, my children and I learn together.*

Cindy further shared that children are "creators of knowledge/ideas, the new ideas in class came from them." She seemed to have developed a robust concept of how young children could be responsible for improving their own ideas and contributing to the advancement of the community's ideas and knowledge as a whole. In the following two activities designed by Cindy, she was able to play her role as a facilitator of a collaborative learning and KB process.

i. Encouraging an open copy-culture. Instead of viewing the "copying of friends' ideas and drawings" in a negative manner, Cindy regrouped the children such that they had to interact with friends whom they were unfamiliar with in their groups. By doing so, she gave them more opportunities to connect with other children as they interacted across various groups, while copying interesting or unfamiliar ideas from each

other. In doing so, she had expanded children's ways of thinking, encouraging a healthy and open "copy-culture", which was part of KB work.

ii. Getting children to share their ideas to help everyone in class keep pace with KB. Cindy worked creatively around the different schedules of the children who were in school (some children were on a full-day program and some on a half-day program), to optimize the time she spent with them on KB. She would squeeze in time to ask the children on the full-day program to share their drawings and ideas with the children who were on the half-day program.

Summary. As Cindy engaged in KBC meetings, we observed her continuous efforts to deepen her understanding of KB and her openness in sharing her KB practices and challenges in the KBC. She was willing to embrace the uncertainties of KB and saw a purposeful integration of the science curriculum with her Chinese language curriculum. Moreover, she was able to adapt her approach to suit her students' varying competencies in the language. Through this "KB journey", Cindy observed that her students were more willing to communicate in Mandarin where their confidence in sharing their diverse ideas in Mandarin and their sense of responsibility to support each other in the class also increased.

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4.3 **Case Study Three – Teacher who Started KB Earlier, Betty.** Betty's case study shows how her identity and practice transformed as she benefitted from the community knowledge and collective responsibility of the KBC. As she became more open to share her struggles and challenges in KB practice, she appreciated ideas from the KBC. While being continually engaged in the KBC until the end of the home-based learning period, she was observed to have progressed in her understanding of KB and her implementation of KB lessons. Her practice transformed as she learnt to embrace uncertainties and maintained a reasonable level of openness to the new pedagogy, and continued her efforts to create hands-on experience and experiments to trigger the children's interest and curiosity.

Identity. Even though Betty has joined the KBC for almost a year before the school implemented home-based learning during the lockdown, she showed a shallow understanding of KB and a higher level of frustration in dealing with the switch to home-based learning. She explained that "patience and acceptance" were two qualities of a teacher in delivering KB lessons and she also saw a need for teachers to be resourceful and to "come up with different ways to support their learning." However, Betty did not seem to be able to practice what she preached. To her, KB seemed to connote elaborated learning journeys and hands-on experiments which were only suitable for specific topics. Here is how she explained a misfit between the theme of "clothes" with the KB approach:

> *...I am holding back on [the topic of] clothes with KB. I am very scared to embark on that... there is only so much we can talk about. We cannot bring them to a clothes factory.... where do we bring them?*

That concept of KB caused her a high level of anxiety during home-based learning because to her, KB was simply not possible with home-based learning. She complained that she could not plan KB lessons on the topic of friction as "a lot of it is experiments and hands-on" and she could not demonstrate the concept of friction from home.

To help her cope with that challenge, the community of teachers encouraged Betty to use everyday experiments, for example, getting the children to rub their hands together to feel the heat or use a simple chopstick in rice demonstration to show friction. However, the idea was rejected outright as she said that she did not have uncooked rice at home to demonstrate the chopstick in rice experiment. She seemed to attribute responsibility for coping with difficulties extrinsically.

Betty contributed less than the other teachers in this study. As she already knew the benefits and functionalities of KB, it was interesting that she displayed lower activity in reading (77 instances), creating (12 instances), and modifying (46 instances) notes on KF. Betty likely took a back seat for the other teachers to get more acquainted with KB, and her notes were only built on twice while she herself posted five notes to build on other teachers' notes in the community.

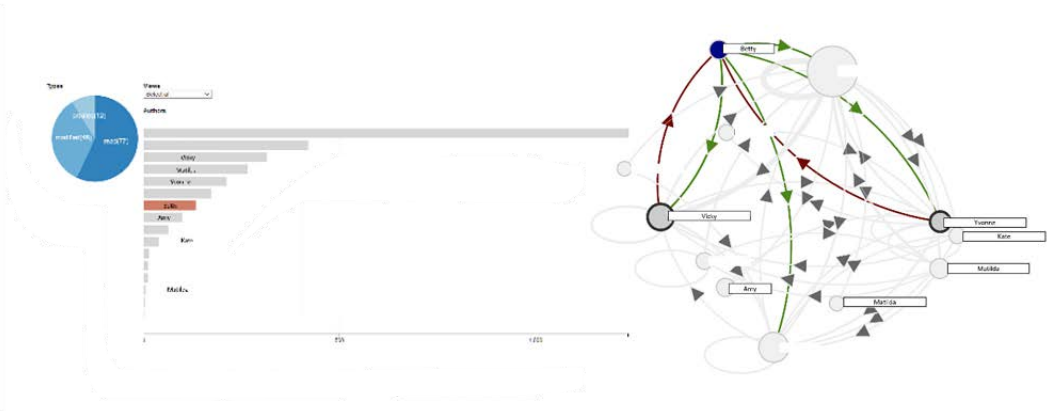

Figure 7. Betty's contributions on KF (left) and her connectivity on KF (right)

Practice. It was noted that Betty, overall, was more focused on identifying procedures and setting explicit goals than working with emerging ideas from students. In comparison with other teachers, Betty explicitly stated that she preferred procedures and explicit goals to guide her teaching to uncertainty in something new:

> *For me, I still don't know what's at the end of the tunnel. I'm still following being guided by you [the interviewer/researcher]. I don't know what the end results would be, so when you ask me, I am like totally in darkness.*

Betty constantly emphasized the need for her to explain concepts to the students, unlike the more exploratory stance taken by Vicky. Betty disclosed that she preferred to explain to students in a stepwise manner while she demonstrated the experiments, rather than asking students about their thoughts. Even though Betty had certain negative impressions about KB, she managed to maintain her participation in the KBC and was willing to keep trying during home-based learning period after being encouraged by the community. Midway through the data collection, she adopted a few of the lesson activities shared by the community. For example, she told her children to rub their hands together and asked them, "What do you feel? Why do they feel warm?" and attempted to bring different ideas into the home-based discussion. Betty also practiced capturing children's ideas in class while interacting with them in an online lesson. This move allowed her to share more of this episode at the KBC meeting.

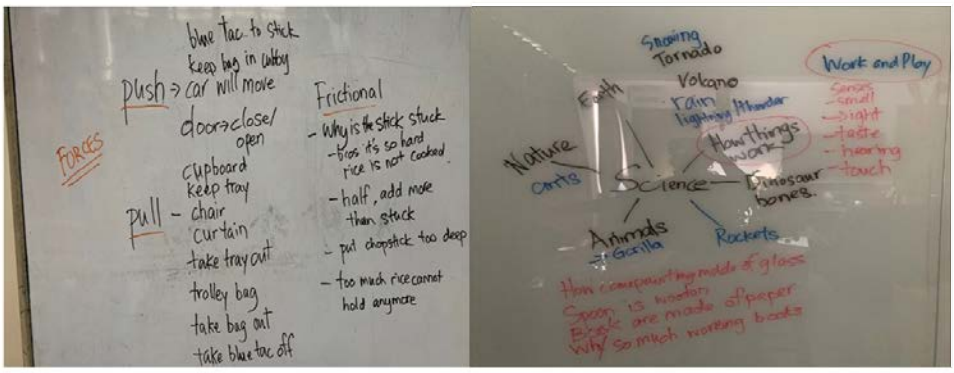

Figure 8. Betty captured students' ideas and questions during online home-based lessons

Over the duration of the study and with some efforts, Betty stayed in the KBC meetings and shared how she conducted experiments to probe the children to observe and think more while she waited for their responses before providing an explanation. This holding-back was different from the teacher-explains-it-all approach that she shared earlier:

> *...And then they (children) started to talk! One (a child) said because I put the chopstick too deep that's why it can bring the whole bottle up. Another one said "too much rice, so cannot hold anymore" so that's why the stick is stuck or something like that. There's one boy, when we were talking about push and pull, he said something about falling into the pool and "I go down, down, down." So, I said "Ah, Ok! That's something else we need to talk about later on. That's another force."*

When Betty shared her efforts to find relevant resources to adequately prepare for her science-related KB lesson, she was prepared to let the children "discuss in theory but do it practically" to get children interested to figure out "science in everyday life."

Summary. At the beginning of the home-based learning period, Betty's understanding of what was expected of her as a KB teacher seemed locked in a traditional teaching context. She focused more on procedures rather than trying to understand her student's ideas and questions. However, Betty's attitude and perceptions towards KB changed as she joined the KBC and there was a willingness to try different ideas shared by the other teachers through KB discourse.

4.4 **Case Study Four – School Administrator, Yvonne.** Yvonne's case study illustrates how she grew to appreciate the role of KF in teachers' professional development – an identity shift - when she started to value her teachers as contributing members of the community. That further led to a shift in her management practice as it became more idea-centric when she created a supportive and collaborative culture for KB in her school.

Identity. Yvonne was the fifth-most active contributor to the KF discourse as she read 153 notes, created 15 notes, and modified 33 notes. Although that did not place Yvonne as one of the largest contributors of KF notes, her notes were seen to be the most centric within the network of notes, as shown in Figure 9, where the contents she contributed were often built on to other ideas or built on by other members of the community.

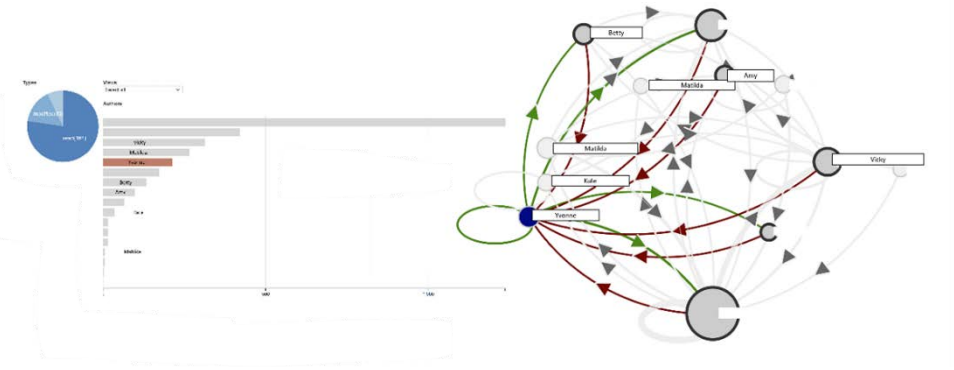

Figure 9. Yvonne's contributions on KF (left) and her interactivity on KF (right)

After attending a cross-school KB network session that brought in teachers from the secondary, primary, and preschool levels, Yvonne recognized how KB could be related across different education stages. Yvonne was able to gain an overview of how different teachers could come together, share, and build on each other's ideas. Thus, she became more sensitive towards the challenges that KB brought about within the classrooms:

> *This was very fascinating to see how different [larger-scale network meeting] is across different levels and also made us realize how limited it is in preschool. It's also very motivating to see how these teachers actually are inspired to conduct their lessons… there are things that we can adapt from their teaching practices.*

Yvonne understood the need for teachers to be engaged in a KB process similar to what the students underwent, "if we want children to be engaged, teachers themselves have to be engaged first." Therefore, Yvonne personally

conducted a few KB lessons and gave feedback to the teachers to guide them. In her engagement with parents, Yvonne made plans to reach out to the parents as "to figure out what…will be more attractive to parents in order to engage [KB] with their children at home."

Further, Yvonne articulated how important it was for the teachers to be empowered using KF and being part of the KBC: "I think teachers, when they see people [other teachers] contributing their lessons [on KF], they will feel more empowered." She continued to explain two important ways that KF contributed to the teachers' professional development:

i. Using KF made the teachers' KB journeys and their thoughts visible. On KF, when teachers viewed how other teachers were contributing and helping each other, it allowed teachers to track their progress and encouraged a growth mindset. Yvonne could visualize the teachers' thought processes, and it was also a good reflection of how the teacher planned out the lessons or evaluated their own lessons.
ii. KF was a suitable collaborative environment. Incoming new teachers specifically benefitted from the KBC as there were many in the community who contributed their ideas. These contributions from the KBC encouraged and spurred idea growth in the community and brought out the communal efforts of KB.

The above two factors that Yvonne raised showed how she valued each teacher's contribution to the community as she continuously engaged the teachers on KF and in the KBC meetings. The focus was on facilitating teachers to discover KB practices through the same KB experiences they were designing for the students.

Practice. Yvonne was key in bridging the connections between the Mandarin and English-speaking lessons and teachers. Apart from putting in additional effort to bring the science teacher and Cindy together to understand the progress of each other's lessons, Yvonne also aided the translation of the science teacher's lessons for Cindy so that she could interchangeably use "materials [that have been] used in English lessons to teach and expand from there." Yvonne's efforts were instrumental in ensuring that the KB approach could be implemented in the two offered languages at the preschool. Furthermore, Yvonne's view of preschool students' active engagement significantly changed as she shared the impact of experiencing KB:

> *…before adopting KB, I would think that children [students] will have to be more obedient. I feel that teachers should be in control of the environment of the children… but then [after KB] I realized that if you want children to be active, to be engaged, this has to come from them [students] so teachers should not be in too much control.*

Summary. Yvonne gained a more holistic understanding of the impact of KB within and beyond the school, even to the extent of regarding the teacher community as part of a broader community where parents were also involved. Therefore, through enculturation, Yvonne was able to understand the importance of collaboration in the KBC and realized that teachers could be empowered only if they started taking agency and responsibilities for KB. Often, Yvonne offered tremendous support to reinforce the collaborative KBC culture, by providing resources, coordinating meetings between the science teacher and Cindy, reading and building on KF notes, and sharing teaching ideas during the weekly meetings.

4.5 **Similarities and Differences in the Case Studies.** Across the four case studies involving Vicky, Cindy, Betty and Yvonne, we provided a thematic overview of the stories that were being told across cases. In essence, the preschool teachers have shown multiple similarities in their shifts of identities and practices, and further developed a common strand of identity and a range of practices. We attribute this to the ongoing discussions where teaching practices were exchanged while building a KB teaching practice that was unique to themselves. As a result, the teachers were continuously improving their KB practices while enhancing their understanding of KB as a community.

The most prevalent similarity was that teachers identified themselves as active contributors on KF and within the KBC, where they showed conscious efforts in their KB practice to support the community's understanding of KB. The teachers did not limit their contributions (such as strategies and ideas) to the KBC but instead kept an open mind towards the different perspectives and ideas from the community while designing their lessons. The repertoire of "shared strategies" was a sign that teachers had a sense of ownership and wanted to adapt ideas to their own lessons. They provided opportunities and space for students to share and explore their wonderings. This phenomenon was often observed in Vicky, Cindy and Betty's lessons, where the teachers would scribe students'

ideas and put them up in class, before bringing the episode back to the KBC for further discussion with other teachers.

Differences were observed where some teachers were able to excel in their unique roles. Vicky, who was relatively new to KB, was a teacher who was able to embrace being a teacher-leader and a teacher within the KBC; while continuing to provide support as an administrator and design curriculum and activities for her own classroom. Vicky was able to contribute to her peers' practices by sharing lesson design ideas and adapt other practices to enhance her own development and design innovative activities that brought students' ideas to the fore. Chinese language teacher Cindy took a different approach to adapt KB; by aligning her practice with the interspersed use of Mandarin vocabulary during students' ongoing discussions of scientific concepts. Within the KBC, Vicky and Cindy interchanged the use of language and science concepts with the same group of students to deepen students' understanding and their use of different languages. These activities were further supported by Yvonne, highlighting the importance of her role as a school administrator in facilitating communication between the English and Mandarin-speaking teachers in designing KB lessons. In contrast to Vicky and Cindy, Betty was more focused on students following fixed procedures to achieve explicit goals. We have associated these similarities and differences with the various aspects of KB and shown them in detail in Table 3.

Table 3. Mapping aspects of KBC culture to observed transformations of teachers' identities and practices.

Aspects of KBC Culture	Shift in Identities	Shift in Practices
Focusing on idea generation and idea development on KF. It is not about the best KB lesson but the incremental move to make it more student-centric (KB principle of *Improvable ideas*)	Teachers were open to diverse ideas coming from different members in the community. Teachers understood their roles in contributing ideas and suggestions to the community. Teachers thrived on the diverse ideas coming from different members of the community.	Teachers shared and embraced new activities and ideas to test them out in their classrooms. Teachers worked through different ideas in the process of deciding what to do in their classes.
	Teachers, regardless of years of experience, supported each other in generating and developing KB lesson ideas.	Teachers took greater ownership of their practice, e.g., doing their own research to support the KB practice Teachers shared resources generously within the community.
Developing KB discourse through the focus on idea-improvement during the weekly KBC meetings. Teachers are encouraged to facilitate similar KB with their students. (KB principle of *KB discourse*)	The teacher saw the need to understand the different ideas and appreciated the weekly discussions. Through the engagement, we saw a clear move away from "just tell me what I should do". Teachers put in effort to understand students' ideas through note-taking and active listening in their classroom discussions.	Teachers actively engaged students' ideas in their lessons. Teachers valued students' ideas more. They deliberately scribed students' ideas during discussions and brought them back to the community. Teachers shifted their management practice; focusing more on responding to students' ideas and questions rather than directing the discussions.
	Everyone understood their roles in contributing to the community's understanding of KB and helping each other learn about KB.	Teachers were open to new approaches and constantly looked for new ways of doing things. One teacher even created

	Teachers, once enculturated into KBC, seemed to develop strong identities within the community and their contributions to the KBC were not bounded or constrained by their own identities as teachers or researchers.	time for students and parents to conduct experiments at home and shared their findings via an online documentation platform. Teachers adapted their practices to integrate the Mandarin and science lessons and motivated students to practice their Mandarin.
Valuing ideas and shared individual and collection of reflections on a common workspace. (KB principle of *Community knowledge, collective responsibility*)	Teachers posted their reflection notes on a shared space. Through such sharing, there was a higher sense of responsibility to help each other develop their KB practice. Teachers connected with members within and across schools to learn about KB pedagogy and adapted their curriculum. Teachers became more open to share struggles, challenges in KB practice. Teachers developed as leaders. Teachers began to recognize that they were contributors in the KBC when they shared within and across the community. Their confidence in the community grew and they saw themselves taking more leadership roles in the community.	Teachers were willing to contribute and share their lesson ideas to help each other in developing their KB practice. Teachers saw how KB could work across different levels or schools in cross-community interactions and became more confident in their own practice.

5 Discussion

In this paper, we began by laying out the design, activities, and the integrative culture of a KBC in a preschool setting. We wanted to understand how such community-based approaches, as the literature suggests, can motivate a group of teachers to embrace the changes and challenges they faced during the pandemic and ensuing home-based learning. We analyzed the trajectory of four teachers within the KBC and observed a pattern of shifts in identities and practices among the four case studies. Interestingly, these teachers cited similar features of the KBC that helped their growth. We then drew qualitative relationships between the KBC culture and the teachers' growth, as seen in Table 3. Finally, in this section, we examine the impact of the KBC culture on various aspects that were discussed in this paper.

5.1 **Education and Culture.** First and foremost, there is a definite impact of KBC culture on the way the teachers learn and practice, and what they value about their work. Like how learning and education are most effective when they connect with a person's culture and is relevant to their experiences, teachers can connect with what they have learnt about KB from the community and also develop a culture for deep professional learning, which they are more engaged in and allows for better comprehension of KB. A truly transformative professional development experience would need to involve the introduction of a new cultural context that is vastly different from traditional norms and practices, especially in times of inevitable crises.

Contrary to an existing practice that claims to work by integrating as much new changes into the existing system as possible to avoid a resistance towards the add-ons, we propose that to establish a new culture, there is a need to seek break-through in the status quo of the community in an explicit manner. This can be done by getting teachers to see the gaps in their current practice or to build towards a clear understanding of the difference between the “add-on” and the existing practice.

In this paper, we adopted an educational perspective rather than a sociological perspective: by focusing on the teaching and learning aspects of culture. For our discussion, we extracted three facets of KBC culture (norms, language, and values) which motivate continuous innovative practice through challenging times. We drew the discussion of these three facets of KBC culture through the process and development of shared practices within the community and the way the teachers rationalized their professional and social experiences in the KBC as seen through the case studies. The consistent positive shifts we found in the qualitative analysis served to inform us on ways in which a community could support the teachers to adapt and innovate their practices to ride out uncertainties and challenges. We also discuss the potential and usability of community-based professional development for teachers through critical times and to bootstrap innovative practice in a sustainable manner.

5.2 **A New Norm.** We defined norm as the actions and behaviour of the community. From the interviews, teachers were able to differentiate between the discussions held within the KBC and regular meetings with other teachers. From the case studies, we observed KF playing a distinct role in this enculturation process. Teachers saw themselves as active contributors of KB practice, possibly attributed to the fact that teachers were encouraged to bring in-class ideas and questions that students shared to the KBC meetings (examples in Figures 6 and 8), and those ideas were made visible on KF. Subsequently, teachers also experienced working with those ideas through their weekly interactions in the KBC where their own ideas were valued and appreciated by the community.

During KBC meetings, the teachers were assured that artefacts need not be the finalized or polished products. In fact, capturing initial ideas and students' drawings at the midpoint of lessons was a welcoming development. As teachers were constantly encouraged to share ongoing classwork specific to KB discourse, they developed an appreciation of diverse ideas and questions. This is evident when teachers valued and brought students' ideas - consisting of photos of students' ideas and questions scribed on the whiteboard- to the KBC.

5.3 **Knowledge Building Language.** The development of a shared language helps to connect and build a community, improving the understanding of ideas and conversation within the community (Cortazzi and Jin, 1997; Zhao, 2014). We noted that with the use of KB scaffolds, teachers' engagement on KF consolidated this shared language and allowed teachers to share their ideas in a productive manner. Many a time, the teachers at the KBC took turns to interpret and paraphrase what the researchers shared at the meetings. Those interpretations not only served to bring useful information to the community, they also bridged information gaps between researchers and the teachers within the community. Within the community, phrases suggesting, and praising students' potential were often heard, and they became more common over time. The positive shift we see in the teachers' identities and practices is likely shaped using KF and the KB language together with suitable supports from the KBC within KB classrooms; which reinforces the community's KB goals and support innovations in the community.

5.4 **Values.** There was a familiar sense of increased collaboration and collective identity as KB teachers came together to share their ideas, resources, and support each other within the KBC. They also comforted each other when under stress and suggested viable KB activities that could be implemented even with limited resources or physical constraints. That encouragement and the community's openness towards novel ideas and methods provided an environment where every member of the community understood that everyone had a role to play in the community. This shared responsibility also allowed individuals in the community to reach out to one another, be less judgmental and be more willing to help one another overcome challenges.

6 Limitations

6.1 **Vulnerabilities of a Community.** Despite the observed shifts, the cultures of a community are ever-changing and dynamic; it orientates the community in multiple ways. Moreover, many other factors, such as incoming and departing teachers, can disrupt the new culture. Despite these challenges, it was a pleasant surprise to see that the KBC culture generally predicted the behaviors and interactions of the members within the community throughout the pandemic. Even when teachers deviated from KB practice and returned to more didactic practices due to the stress of implementing home-based learning, they were generally aware when they were not conducting KB and constantly sought ways to use KB principles and practices to guide them in their teaching.

6.2 **Culture and Conflicts.** As described earlier in the paper, communities that come together do so with existing norms and culture in place. Hence, teachers who come together as a community will eventually face conflicting ideas regarding their current practices and identities. These conflicts can happen anytime and the moments that these happen vary from one member to another. The sources of these conflicts could also be unrelated to the work in the

community. However, regardless of its source, such conflict can have detrimental effects on the community. For example, one of the teachers abruptly rejected an idea for a KB activity and cited lack of resources as a reason. It subsequently transpired that the conflict was attributed to other personal events and was not due to deficiencies in planning or resources. These situations do occur and, while inevitable, highlight the greater need for a supportive KBC.

In having a collective KBC culture, teachers are supported in constructing realities of KB practices, which in turn can be tapped on to overcome various levels of doubts and uncertainties in individual teachers. The KBC culture can also mediate uncertainties through the possibilities and encouragement generated from the community. Through this collective culture, the limits of an individual teacher's cultural experiences can be broken down, fostering an improved understanding of the role in generating shared meanings and actions.

7 Conclusion

...there is nothing new under the sun.
—King Solomon, Book of Ecclesiastes

We have reached a point where it is apt for us to rethink "What is new in a teachers' community?" The idea of "community" was fast becoming a convenient prefix to education initiatives. For example, in the Singapore system, we have various top-down teacher-community initiatives, namely Learning Designers Community – a virtual community to explore information and communications technology in classrooms. Rather than seeking novelty in the concept of community-based professional development, this paper addresses the relevant question of what differentiates a "community" from a group of teachers gathered in a meeting.

This paper expounds on the transformative power of the KBC as the main differentiating factor. We hope that this study explains the value of learners and teachers' communities in sustaining ground-up and community efforts in existing school systems in addition to the mandated communities sprinkled across the local system. It is hoped that a concrete theoretical rationale coupled with strong design rationale, and a detailed study of the KBC's impact on teachers could inform the ground on the practice of community-based professional development. The current study may not be able to address every single change in the ecosystem, but it paints a possible route to support a consistent professional learning community through a principled approach. The current study is a three-year study, and we hope to unveil more critical components of principles, design, and practice through a longitudinal methodology and approach.

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