



Home-based learning during school closure in Singapore: perceptions from the language classrooms

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Abstract

The outbreak of the COVID-19 pandemic in Singapore has resulted in the adoption of home-based learning (similar to remote or distance learning' worldwide) due to periodic school closures in Singapore. The media and academia have diverse views on the effectiveness of this alternative mode of education. This study draws data from teachers' interviews and students' focus group discussions of an ongoing large-scale baseline study on mother tongue education to reveal teachers' and students' perceptions of home-based learning. Findings showed that the participating teachers generally mimicked physical lessons online during home-based learning, and they faced difficulties in monitoring students' tasks online. Though students enjoyed the freedom of doing their learning tasks at their own pace, they were concerned with the lack of teachers' support and the social-emotional support from peers. With the feedback and reflections from teachers and students, it was observed that despite the availability of technology and online infrastructure, teachers need readiness for transiting between physical teaching and online instruction, whereas students need readiness for self-directed learning. From students' feedback, it was also noted that parents need readiness for educational technology and support for their children. To better prepare teachers, students, and parents for home-based learning, it is recommended that the developers provide more dedicated resources that take into consideration the different characteristics (e.g. orthography) of each language subject. Parents should also assume a greater role in monitoring their children's learning on behalf of the teachers for better effect in home-based learning.

Keywords COVID-19 pandemic · Home-based learning · Readiness · Mother tongue education · Primary school

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1 Introduction

Since the outbreak of the COVID-19 pandemic, many societies and sectors have been impacted and pressured to make adaptations on short notice. Many daily routines, such as work and education, are severely disrupted by lockdowns and social distancing measures (OECD, 2020a; Tumwesige, 2020). While adapting to these measures, many schools, from preschool to tertiary level, have explored alternative approaches to conducting teaching and learning so that students can continue learning at home during lockdowns. Concerns about the impact and effectiveness of these alternative approaches were raised, as schools, teachers, students, and parents seem to lack readiness to handle and effectuate such alternative approaches in this emergency (Doghonadze et al. 2020; UNESCO, 2020a).

Singapore has taken a practical perspective to advocate the blending of home-based learning¹ (hereafter HBL) with physical schooling as a “new normal” given the unstable COVID-19 situation (Ministry of Education, 2020). It is believed that this initiative is deemed possible as Singapore has invested 20 years of time and resources in a series of Information and Communication Technology (ICT) Master Plans since 1997 (Koh & Lee, 2008), which holistically covered infrastructure development for schools, training for teachers and device availability for students. With these maturing ICT-based learning affordances, the periodic school closures in 2020 and 2021 due to severe COVID-19 situations accelerated the implementation of HBL and put the nation’s ICT investment to the test.

Upon this test, adverse feedback was reported in the media. Some media reported that Singapore’s HBL during its school closures has been well accepted by stakeholders (Davie, 2020; Lee, 2020), while other media reported concerns about parenting pressure over students and the conduciveness of the home environment for students’ learning, especially if HBL is to be implemented over a longer period (Lim, 2020; Yong, 2021). Besides media, some studies have attempted to reveal the impact of school lockdowns and HBL in Singapore from the teacher or student perspectives. For example, Tay et al. (2021) found that Mathematic teachers are prepared for HBL, but the switch between physical and online learning has posed challenges to engagement with students. While hearing the diverse voices about HBL, the Ministry of Education revised its earlier stated position and decided to leave HBL as the last option for the pandemic, as they found such an arrangement disruptive to students, parents, and teachers (Ang, 2021; Sim, 2021).

From the diverse views, the impact of HBL during school closure in Singapore has yet to be revealed. As previous studies have uncovered the effect of HBL on mathematics teachers, this paper aims to reveal teachers’ and students’ views on HBL in language subjects during the nationwide school closure. This paper chose to focus on language teaching and learning during HBL because we wanted to know how teachers and students adjusted to language activities that depended heavily on face-to-face interaction. Through interviews with teachers and focus group discussions (FGDs) with students enrolled in language classes, specifically, in the mother tongue language (MTL) classes, this paper will reveal what teachers focussed on during HBL and students’ feedback on their experience learning MTLs online. This paper shall surface teachers’ and students’ challenges, discuss their readiness, and provide recommendations for future HBL if it remains an option in

¹ Home-based learning is a form of teaching where teachers and students are in different locations, time zones, or both in the teaching and learning process. It is similar to remote learning or distance learning implemented in other parts of the world (World Bank Edtech team, 2020).

Singapore due to the pandemic or other circumstances that prevent physical schooling. Specifically, this paper aims to answer the following research questions.

1. What activities were conducted during HBL for language subjects, and how were these activities carried out?
2. What are language teachers' perceptions of HBL?
3. What are students' perceptions of HBL?

Though specifically focussing on the case of Singapore, this paper believes that the experience of Singapore HBL for language subjects would also shed light on similar implementations worldwide in search of a new normal for language teaching and learning under the uncertainty of future emergencies.

2 Home-based learning, technology and readiness

Home-based learning, or HBL (or full home-based learning, or FHBL), is a term more frequently seen in the media after the outbreak of the COVID-19 pandemic in Singapore, and probably in Malaysia. This concept differs from homeschooling or home education, which refers to the education of school-age children at home rather than in a school or similar setting (Rothermel, 2015). The concept of HBL to be discussed in this paper is indeed similar to remote learning or distance learning implemented in other parts of the world (World Bank Edtech Team, 2020; UNESCO, 2020a), whereby teachers and students reside in different locations, time zones, or both in the teaching and learning process (Doghonadze et al. 2020). Though similar to remote or distance learning in terms of the non-face-to-face approach of teaching and learning, HBL differs from these two types of learning for its short-term, temporary, and alternative nature, while remote and distance learning are established modes of learning for learners of different locations, time zones, or both. In HBL lessons, media and technology are often used to enable communication and exchanges between teachers and students (UNESCO, 2020a). HBL is indeed not entirely new. Many tertiary institutions have advocated for and implemented alternative modes of learning (such as online or e-learning) as components of their mainstream education programmes to promote and immerse students in various modes and objectives of learning in order to ensure effectiveness and exposure in their tertiary education (OECD, 2005). With the outbreak of the COVID-19 pandemic, these modes of learning are no longer a privilege among tertiary learners but have become an essential mode of education for preschool, primary, and high school students to ensure the continuation of their education in their home environment in many countries during school closure (World Bank Edtech team, 2020; UNESCO, 2020a).

2.1 The focus of technology in home-based learning

With many governments imposing social distancing due to the COVID-19 pandemic, minimal or non-physical means of communicating are becoming a new normal. The conventional approach of physical face-to-face teaching and learning has to give way to alternative educational modes. Countries with fewer networks and online facilities (such as Nepal and Uganda) have resorted to broadcasting lessons over radio stations or television channels (UNESCO, 2020b; Tumwesige, 2020), whereas countries with more network and online

facilities (such as China, Germany, Ghana, Singapore) have resorted to contact-free and efficient technology as a solution for education to continue under such adverse situations (Owusu-Fordjour et al. 2020; König et al. 2020; Ng, 2021). Therefore, HBL during this time of pandemic is often associated with online learning or e-learning (Mansor et al. 2021; UNESCO, 2020a). During HBL, teachers and students have to teach and learn the usual curriculum via a combination of synchronous and asynchronous online services or applications, such as video-conference services (e.g. Zoom, Tencent Meeting) and learning management systems (LMS). The video conferencing services typically provide synchronous support to allow teachers to deliver lessons virtually, as in traditional classroom teaching, whereas LMS platforms typically provide asynchronous support for students to access learning resources and complete learning tasks, while teachers manage, monitor, and assess their performance on the platforms (World Bank Edtech Team, 2020). With its intensive reliance on technology, home-based learning, to a large extent, shares the properties, benefits, and challenges of online learning.

Though HBL seems to be equated with online learning or e-learning, it should be noted that there may be a fundamental difference in the perspective on the use of technology in HBL and online learning. For HBL, technology is used as an alternative to physical teaching and learning, mainly to least disrupt education; whereas for online learning, technology is used with careful deliberation of technological affordances to enhance the teaching and learning effect (Toquero, 2021). During HBL, schools will tap on any available technology and implement any workable plans to ensure the continuation of teaching and learning during school closures. Many studies on the effectiveness of using these emergency modes of learning have revealed both benefits and challenges (Zhao et al. 2020; Vu et al. 2020; Rasmitadila et al. 2020; Lin et al. 2021). While discussing the challenges in HBL, many studies have pointed out that the readiness of teachers, students, and parents is critical to the effectiveness of these emergency responses to alternative education measures (Fedina et al. 2017; Ferri et al. 2020; Kaden, 2020).

2.2 Readiness for home-based learning

As mentioned previously, the use of online learning as the mode of remote or HBL is a timely move by many developed countries, but yet a “no-choice” solution as well, given the need for social distancing to prevent the spread of the COVID-19 pandemic (Ng, 2021). Due to the emergency nature of the implementation of HBL, unprecedented challenges were observed in the adaptation to change among countries. Many studies have surfaced the issue of readiness among teachers, students, and parents in this sudden shift of educational modes (Doghonadze et al. 2020; Mansor et al. 2021; Oraif & Elyas, 2021; Toquero, 2021). In the discussion on readiness, the studies have highlighted various challenges, which broadly reflect technology readiness and stakeholders’ readiness. For technology readiness, studies were concerned about the coverage of the Internet, the availability of learning devices, and the sufficiency of online learning resources, whereas for stakeholders’ readiness, these studies showed concern over teachers’ pedagogical preparedness to teach lessons online, students’ preparedness to learn with restricted and limited support, and parents’ (or caregivers’) preparedness to support their children on behalf of their teachers (Ferri et al. 2020; Kaden, 2020; Phan & Dang, 2017; OECD, 2020b; UNESCO, 2020a).

Between the two aspects of readiness, stakeholders’ readiness is a key concern, and the studies mainly research the attitudes and behaviours of teachers and learners towards the change in education mode during the pandemic. Through methods such as surveys and

case studies, studies on teachers' readiness found that teachers may be less prepared for the design and facilitation of online lessons and the overall transition of school education into a remote or home-based environment (Ferri et al. 2020; Jing & Zhang, 2020; Kaden, 2020; OECD, 2020b).

As for studies on students' readiness, they found that tertiary or high school students were generally ready for online learning and were satisfied with the learning experiences (Caliskan et al. 2017; Hung et al. 2010; Zhao et al. 2020). However, some studies also found that tertiary or high school students lack the capability to source, select, and learn from the vast resources online (Owusu-Fordjour et al. 2020; Doghonadze et al. 2020). Furthermore, in surveys of primary and secondary students, both younger and older students stated that they lacked self-directed learning abilities and would require the physical learning environment of schools, as well as parental support at home (Jing & Zhang, 2020; Oraif & Elyas, 2021; Wei, 2020).

For parent readiness, some studies found that parents are only familiar with technologies they used for their daily encounters and are indeed unfamiliar with the use of the educational technologies used by the children. Furthermore, parents also lacked the pedagogical knowledge to guide their children in the learning process. As such parents will have to improve their knowledge and skills in guiding their children and collaborate with teachers to support and monitor their children's learning (Fedina et al. 2017; Owusu-Fordjour et al. 2020; Wei, 2020).

In summary, HBL is largely associated with online learning, where virtual lessons and task performance over digital platforms are the main activities of teaching and learning. Due to the state of emergency closing down schools, teachers deploy technologies mainly with the motive of a *quick-fix* solution to carry on daily teaching and learning. In response to the sudden change in the mode of education, students and parents have little time to understand and familiarise themselves with the technologies deployed. This change in educational mode will impact the ongoing routines and bring about uncertainties (or even chaos) before new routines are formed (Vu et al. 2020). It will be necessary to study what teachers, students, and parents have experienced to seek solutions to their adaptation issues and form strategies for future changes or emergencies. A framework of HBL readiness is drawn up with reference to the above literature in Fig. 1 to guide the analysis and discussion of this study.

3 The context for mother tongue education and online learning initiatives in Singapore

In Singapore, all ethnic Chinese, Malay and Indian students are required to learn Chinese, Malay and Tamil languages as their MTL, respectively (MTLRC, 2010). These students will read their MTL under a centrally developed curriculum from primary to secondary level. At each level, students are banded by their proficiency levels and will study textbooks suitable for their proficiency (Curriculum Planning & Development Division, 2005). In the MTL lessons, some common activities include verbal interaction, reading aloud text passages and writing composition with teachers' guidance. However, during HBL, these daily practices have to be redesigned and conducted online, as reflected in the teachers' interviews and students' FGDs of this study.

As pointed out by Ng (2021) and Tay et al. (2021), this transformation from physical lessons to online HBL in Singapore did not begin from scratch. Indeed, the Ministry of

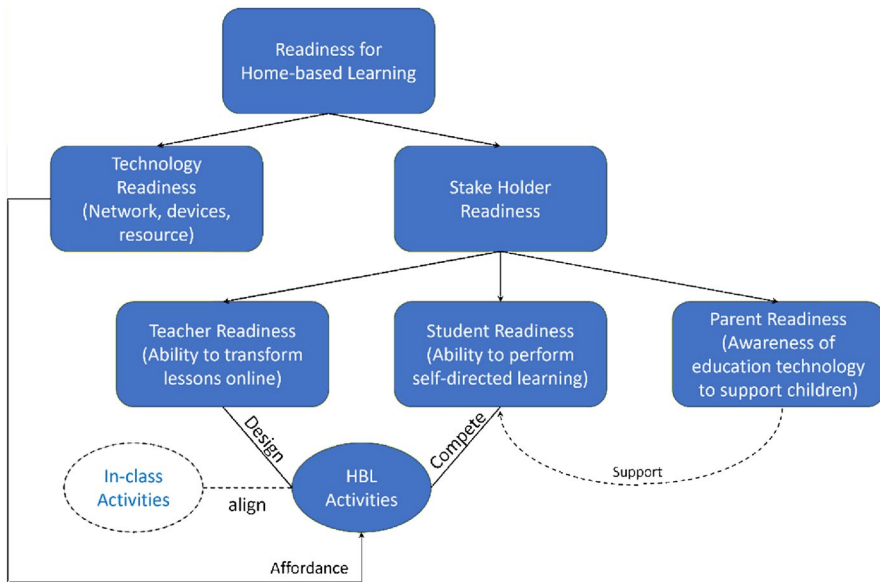


Fig. 1 HBL readiness framework

Education has invested more than 20 years of resources to build the ICT infrastructure and train educators to design and conduct ICT-based lessons in all subject domains over four ICT Masterplans since 1997 (Ministry of Education, 2021).

In addition, the Ministry of Education has also launched nationwide resources and platforms, such as the *Interactive Mother Tongue Language* platform and the *Student Learning Space* (SLS), which allows teachers to design, disseminate and evaluate the learning tasks of students. Other than these platforms, more ICT savvy teachers also explored other applications such as *Google Classroom*, *Quizlet*, *Padlet*, *Mentimeter* and *Kahoot*, before the pandemic. Although the ministry has provided adequate infrastructure and training for teachers to conduct e-learning, the abrupt shift from physical to online lessons seems to reveal issues about teacher and student readiness in the upcoming analysis.

4 Sources of data and methods

This study draws data from an ongoing project, which aims to collect and analyse baseline data on the teaching and learning of MTLs in Singapore to provide information for future MTL education policy and curriculum development. While the project gathered data in 2020, the COVID-19 pandemic caused school closures and the implementation of HBL for all schools and institutions nationwide for about 2 months. The project hence included HBL as part of its data collection after schools resumed in July 2020, to investigate the impact of HBL on teachers and students when learning their MTL. Thus, this study uses the preliminary data on HBL that teachers and students gave in interviews and FGDs to outline how different stakeholders perceive HBL in mother tongue learning.

4.1 Participants

This study drew interview transcripts on HBL-related questions of 14 teachers who taught in different classes at different government elementary schools from the said project to understand what happened during HBL. These teachers are female teachers who teach MTLs at the primary five level (equivalent to grade 5) in 2021. Among them, there are six Chinese teachers, four Malay teachers, and four Tamil teachers. These teachers teach different curriculums in different classes within their respective MTL that corresponded to their students' level of mother tongue proficiency. As of their experience in teaching the primary five mother tongue curricula, six teachers have less than one year of experience, six teachers have one to six years of experience, and two teachers have seven or more years of experience (for the illustration of the different curricula taught by teachers, see "Appendix 1"). The curriculum they taught was developed centrally by the Singapore Ministry of Education, and most of the activities are designed for face-to-face teaching in class. During HBL, some of these activities had to be adapted for online teaching, and most of the teachers had to adapt these activities on their own in their schools.

Besides teachers' interviews, the said project also conducts student FGDs with five students chosen at randomly from each class of these teachers. Each student is only enrolled in a class taught by one of the 14 teachers; hence, there will be no situation whereby a student could participate in more than one FGD. For this study, the FGDs of 70 students were extracted for analysis of their responses to HBL-related questions. There were five questions about HBL in the students' FGDs, but not all students responded to the five questions. As a result, the number of responses to each question differs (for the number of students involved in each question, see "Appendix 2").

4.2 Teacher interview and student focus group discussion protocol

As stated, the data for this study were extracted from responses of teachers and students on HBL in the said project's interview and FGDs. Teachers were interviewed at a time of convenience for 60 min, while a sample of five students per class was selected for the 45 to 60 min FGDs after lesson observation. Both the teacher interview and the student FGDs were structured with 8 to 11 key themes, and HBL is one of them (see "Appendix 3" for the questions on HBL in the interviews and FGDs).

4.3 Data processing and analysis

For this study, the responses of teachers and students were extracted from their interviews and FGDs transcripts for exploratory qualitative data analysis using corpus-based processing and content cloud visualisation (Cidell, 2021; Kuo et al. 2007). Data from the above-mentioned sources underwent the following corpus processing for analysis and content cloud generation:

- i. Gather and save responses from teachers and students to each interview and FGD question into separate text files. Each text file is treated as a corpus when processed.

- ii. Clean data by removing speakers' IDs, transcribers' notes, and symbols for non-transcribable events or expressions. Stutter words are also removed to prevent duplicated counts of keywords.
- iii. Correct misspelt words and standardise variations in phrasal terms, such as 'home based learning' and 'home-based learning' to "HBL"; 'mother tongue' to 'mother-tongue', 'wake up to 'wake-up'.
- iv. Create the *stop-list* to filter high-frequency words not related to the focus of the interview or focus, such as maybe, sometimes, something, feel, paper, and instead. For each interview and FGDs question, a different stop-list is created.
- v. Generate a content cloud using an online word-cloud generator and make sense of the high-frequency words in the transcripts to form codes and themes for analysis.
- vi. To form a description of the data, excerpts of transcripts were drawn with reference to the codes and themes.

This study used the word-cloud generator of TagCrowd.com, created by Daniel Steinbock of Stanford University. This generator was selected as it presents a simple form of visualisation without complex options. When generating the content clouds, this study pasted the processed text into a textbox on the webpage for analysis. This study has set the generator to display the first 30 words on the cloud after filtering words in the *stop-list*.

5 Findings

5.1 Activities during home-based learning

Eleven of the 14 teachers interviewed shared specific activities they did during home-based learning. Most of these teachers stated that they used videos during HBL. These videos are either self-recorded teaching episodes of how they will teach the topic in class or cultural videos created by vendors or found on the Internet. These videos were either posted on the Ministry of Education's Student Learning Space or uploaded to Google Classroom for students to view. Most of these videos include quizzes or tasks that students must complete and submit for review or marking by teachers. Figure 2 depicts keywords in the teachers' responses, and Table 1 illustrates the theme and excerpts of teachers' responses on the activities they conducted during HBL.

The students who responded about the activities they had during HBL indicated that they were engaged in a variety of activities, including exercises, recordings, games, and composition writing. Students recalled having classic assignments like those in the



Fig. 2 Keywords among teachers regarding HBL activities

Table 1 Themes and excerpts regarding HBL activities from teachers' interview

Themes and Codes	Excerpts from transcripts
Task	CLT1: <i>For every lesson, I really still record and make a video of how I teach in class, the method is the same</i>
Video	CLT2: <i>...Then, the individual part will be asking them to read aloud a passage, and then they record it for me. Then, I assess for them, then I will give feedback to them</i>
Record	CLT3: T: <i>There are many different types of question settings in SLS, so for our teaching content, other than recording teaching videos with PPT, we will also design questions for students' feedback/response. We also added a lot of videos of language knowledge and cultural knowledge for students' viewing. ... We also have Google</i>
Type	<i>Meet or Zoom, where students can communicate with and give feedback to teachers face to face</i>
Assess	MLT4: <i>I like to put videos online then I get them to give their views and then also multiple choices based on the textbook and workbook</i>
Platform	TLT2: <i>I told them (the students) "once you find the answers, it can be even in English. Just type for me and send it to me"</i>
SLS	
Google	
Zoom	

physical lessons. Some students recalled having a game in which they had to unlock levels by answering questions. Students also recalled that teachers would give them passages of text to read and record online. Concerning compositions, students reflected that their teacher would prepare materials when writing a composition in class, and they would understand the composition more easily; however, during HBL, they must complete the composition on their own. Figure 3 depicts keywords in the students' responses, and Table 2 illustrates the theme and excerpts of students' responses on the activities they conducted during HBL.

In summary, daily activities to read and write in the mother tongue lessons are adapted and posted online to students during HBL. Though some assignments appear as a simple digitised version of the paper version, some teachers have tried to create a game-like version of the assignment to engage students. Reading-aloud practices that are common in physical language lessons were adapted as online recording tasks in which students were required to record and upload their reading of texts with proper pronunciation and intonation. Among the activities, the teaching of writing (i.e. composition) was most difficult. They used to get more help from their teachers in class when doing such tasks, but such assistance was not available to them during HBL, as their parents were unable to assist them like their teachers.

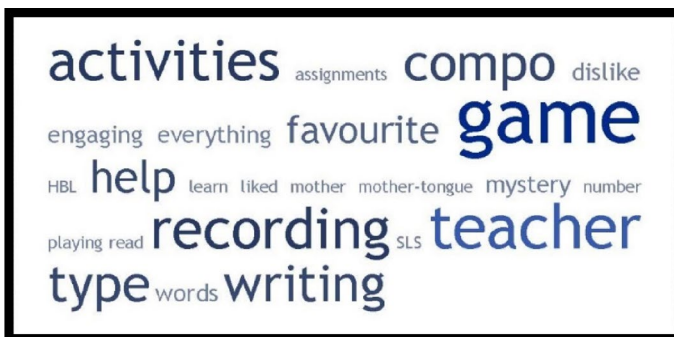
**Fig. 3** Keywords among students regarding HBL activities

Table 2 Themes and excerpts from students regarding HBL activities from students' focus group discussion

Themes and codes	Excerpts from transcripts
Task Record	S17: <i>It's always just classic plain old assignments, just like classic assignments. Everything is like same</i>
Composition Games Type	S9: <i>...There's a door game where you have to get the number at the end after answering 10, for example, 10 MCQ. And then there's a number at the end and maybe after 3 of those, you get 3 numbers and you put it there. And then after that, there will be like a lock. And then, you just click open and then it will show you win, like that. I liked it</i>
Feeling Like Dislike	S19: <i>recording is usually sometimes she (the teacher) gives us shortly which is easy, I read, and I tell. But then the long passages she gives, I read the whole thing, I can read it correctly but in between, I pronounce some words wrongly. And only like when I think that my recording was good, I keep it and I will also have to ask help from my mother to check if I have any mistakes</i> S10: <i>I dislike when we start writing the compositions in class, we have, the teacher prepares for us and then you get to understand the composition more easily. But during HBL, we have to print it by ourselves without asking for any help unless our parents help us</i>

5.2 Teachers' perceptions of home-based learning

For the perception of HBL, all teachers primarily focussed on the homework assigned to students. Half of the teachers had difficulty monitoring students' learning because not all students completed assigned homework. They discovered that high-ability students² were more responsive to submitting homework, whereas mid- and low-ability students were less responsive, and teachers had to remind them or their parents of the homework. Generally, the teachers believed that the level of family or parental support is critical to the completion of homework. While some teachers emphasised the importance of parental support, other teachers were sceptical of HBL's learning effect given the excessive parental support that students receive when doing homework.

Besides concerns about the effect of parental support, some teachers have observed that the level of device availability and technical support provided at home impacts HBL. Teachers noted that some students have to share one learning device among many siblings. Chinese and Tamil teachers recalled that students cannot type in Chinese or Tamil when doing homework. Teachers of these two languages had to provide other ways, such as guiding students to use a virtual keyboard or letting them send pictures of handwritten homework.

Furthermore, teachers shared their experiences in lesson preparation and assignment marking during HBL. They recalled that a significant amount of time and effort was required before and after their lessons, namely from planning and designing each lesson and posting them online, to correcting errors or mistakes made by students on the learning platforms. Among the teachers interviewed, a quarter of them specifically shared post-HBL issues that they had to reteach or recapitulate the content students learnt during the HBL, as they felt that not all students had mastered the content. Figure 4 depicts keywords in the

² High-ability students are students who display higher learning ability. Many Singaporean teachers will differentiate their students into high ability (HA), middle ability (MA), and low ability (LA).

teachers' responses, and Table 3 illustrates the theme and excerpts of teachers' responses on the activities they conducted during HBL.

In summary, teachers' perception of HBL is indeed in the form of "mixed feelings". From the above-said experience, it is obvious that teachers see more challenges during home-based learning. They are concerned with the progress of students as they find it difficult to monitor progress online. They are well aware of challenges faced by students from technical issues during login and typing in their mother tongue. They also noted the limited resources students have at home if parents or family members are not able to support learning at home. Regarding teachers' enactment during home-based learning, they reported spending extensive time and effort planning and designing activities for their students during school closure. Some teachers also urged the creation and sharing of more HBL resources among schools. However, teachers did not only see the challenges posted by home-based learning, but they also see opportunities in exploring different types of activities to engage students, and they noticed that their students had more time to learn and complete their work at home during home-based learning. The affordance for students to view and review the taught content online during HBL is also an advantage that physical classroom lessons cannot afford. Teachers, in general, believed that these advantages would be manifested among students of higher ability and with self-directed learning capabilities.

5.3 Students' perception of home-based learning

For the perception of HBL, students had a variety of responses. More than a quarter of the students enjoyed HBL, while more than half did not, and about one-fifth had mixed feelings about their experience. For students who enjoyed HBL, they recalled that they could *sleep late* and complete homework at their own pace. In between studies, they can also take *short breaks* to *watch a video* or *eat some snacks*. They feel less stressed during HBL because the lessons are generally shorter and there is less homework. For students who disliked HBL, they preferred to study in school because they could clarify and receive feedback from their teachers. They expected their teachers to monitor their work and help them improve. Besides teachers' support, many students miss the social-emotional support and motivation from their peers.

Other than perceptions of HBL, many students also share challenges during HBL. Some challenges are technical, such as the images of the video shown by teachers during synchronous lessons appearing blurry on the students' screens. Some challenges

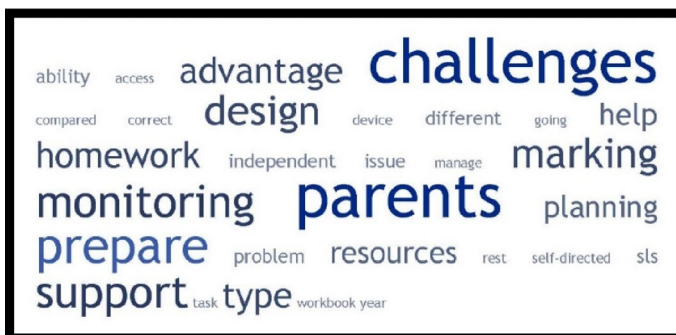


Fig. 4 Keywords among teachers' perceptions of HBL

Table 3 Themes and excerpts from students regarding teachers' perceptions of HBL

Themes and codes	Excerpts from transcripts
Challenges	CLT1: <i>I guess it really depends on the student. Whether they have the support at home. Because I have students, whatever HBL assignment I give them, they do it really well and perfect. Then, some of them just give me a very general answer. Some of them don't even bother to do. So, it really depends on family support at home. Also depend on the student itself... I have students who told me that they cannot record, because of their laptop problem or whatever. I have students who tell me they cannot type Chinese words, because they don't know how to switch the language function to Chinese</i>
Monitoring homework	TLT1: <i>Definitely tracking of their learning. It was a big challenge I would say. Even though they might have completed but you see they're in a home environment we don't know who's supporting them, we don't know how much they are actually internalising the aims of the lesson you know</i>
Parent support	TLT2: <i>Okay advantages is that if the child is a self-directed learner and needs very little supervision and the child is able to do and IT savvy, yeah the child will do. But the challenges is most of the time, because when the parent also needs to use the same laptop and they have other siblings who also need to do the work, so during live lessons I won't have that child present because the other child is also using the same device for another live lesson with the teacher... I'll usually tell them after doing your work, just take a picture send to my WhatsApp or send to my email</i>
Teaching online	CLT4: <i>The advantage of HBL is that once the learning resources are designed or recorded, students can study or view (the resources) repeatedly. For students with better (learning) ability and initiative, HBL will be very efficient. But there will still be situations where knowledge points will be missed out (by students). Teachers notice that mid or weak (-ability) students did not learn much during the Circuit Breaker period, (when) they lack face-to-face knowledge transfer, feedback, and confirmation. Teachers must review (the knowledge/content) all over again.... The marking of Chinese (homework) involves not only the correctness of answers but also the marking of strokes for each character. Limited by the software functions (I use google classroom) and existing equipment, I had to hold the mouse and slide the mouse to indicate where every error of the student was and how to write it (correctly). I also had to ensure that the student correct the character. Until the errors are completely corrected, every student's homework would have been revised three or four times, back and forth (on the platform)</i>
Technical issues	MLT2: <i>... it was really a challenge because like I said, we had to digitised all the curriculum online. So things on the workbook, we had to somehow shift it there (online), ... So we had to read a lot, explore a lot, try different acts, for us to deliver the lesson. ... A lot of time is needed to plan, because we don't just teach one level, we have a few levels, a few classes. So trying to move everything online was a big challenge. ... In terms of marking also, it's, it's a challenge because it's different when we have to mark online than on paper</i>
Marking homework	
Opportunities	
View repeatedly	

are personal, such as being disturbed by siblings, being bored at home for a long time, *feeling tired after staring at a computer or phone screen for hours*, or *feeling lazy at home and procrastinating* on their homework. Figure 5 depicts keywords in the students' responses, and Table 4 illustrates the theme and excerpts of students' responses on the activities they conducted during HBL.

6 Discussion: readiness for home-based learning

As previously stated, the implementation of HBL is a statewide measure that changes the mode of education for all Singaporean teachers and students in response to the COVID-19 pandemic. Though some e-learning practices and resources existed before the HBL, teachers and students had to reveal challenges adapting to this change in the mode of education, raising concerns about their readiness for HBL. In previous studies on readiness, technology readiness and stakeholder readiness have been identified as two key aspects, and this study will discuss technology, teacher, and student readiness in light of the aforementioned findings.

In terms of technology readiness, responses from teachers and students in their interviews and FGDs revealed that they have been provided with adequate technology because they can access the conferencing application (such as Zoom or Google Classroom) for synchronous teaching and learning and the learning management system (such as the Student Learning Space) for asynchronous teaching and learning. This finding is consistent with Ng (2021) and Tay et al. (2021), who highlighted the impact of a 20-year ICT master plan that included ICT resources and infrastructure at all academic levels in the nation's public education. However, some students continue to struggle with device availability because they share devices with siblings or parents. For the Chinese and Tamil languages, teachers highlighted language-specific technical challenges in language input and assignment marking. As such, the authorities would need to resolve device availability among students and provide language-specific technical support to improve technology readiness for HBL.

Though technology and online infrastructure are made available through the nationwide ICT master plans, the interviewed teachers reported spending significant time planning and designing activities during HBL. According to student feedback, these activities were similar to in-class assignments. This feedback appears to agree with previous studies (Ferri et al. 2020; Jing & Zhang, 2020; Kaden, 2020; OECD, 2020b), that teachers were less prepared for the design and facilitation of online lessons, as well as the overall transition of school education into a home-based environment. To improve teachers' readiness for future HBL, authorities can create HBL-oriented resources for teachers so that teachers need not spend excessive time sourcing materials and adapting

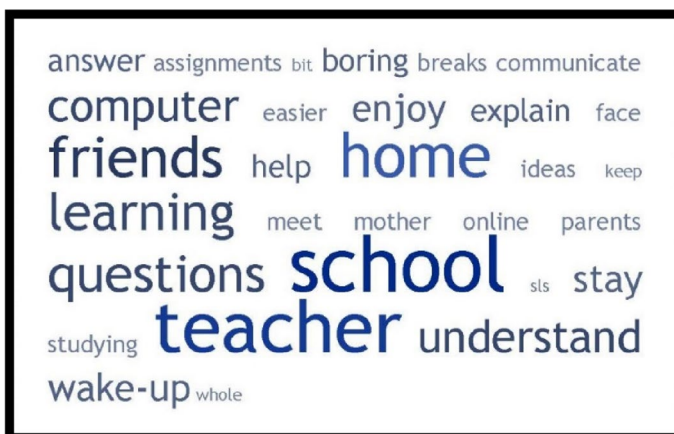


Fig. 5 Keywords among students' opinions on HBL

Table 4 Themes and excerpts from students regarding students' opinions on HBL

Themes and codes	Excerpts from transcripts
Like HBL	S2: <i>Sometimes, what I like about home based learning is that we don't have to wake up that early. And if it's just like paper work, we can do it at our own time, because teacher won't be there to tell us like, "you have to finish it by this time, unless it's SLS." But, what I don't like about it is, instead of, we can like communicate with our friends, we are like, just stuck at home.</i>
Freedom for breaks	
Sleep late	<i>So, like, our health won't be...there's...that good anymore, because we are like, maybe the whole day staring at the computer. And then, we will have to like...there won't be any small group discussions, and we won't be able to ask our friends for help. So, it will be like, more of racking your brains</i>
Shorter or simpler learning	S4: <i>I enjoy home based learning, as once you are done, you can like walk out here, go to YouTube and watch videos</i>
Dislike HBL	S5: <i>Well, I enjoy it. Because I can like, start anytime and end anytime. I prefer home-based learning because sometimes, home based learning can also be shorter than regular school</i>
Feel bored or lazy	S16: <i>I don't like home-based learning, because like all of our student tools and we have to stay at the computer for a very long time. It's very boring after we finish all of it. Because we have no other work to do</i>
Need teachers' explanation	S18: <i>I don't like, because (in school) teacher say it like in front of us... we can ask questions to her, and then she will like, tell us the answer and explain more. But, for online, she won't be there the whole time and cannot explain it to us</i>
Staring at computer	S20: <i>What I like about it is that, I can wake up anytime I want and I don't, and I don't really, I don't really need to wake up around six o'clock</i>
Missing (school, friends)	S23: <i>It is fun but annoying at the same time. Because since you have siblings and then they also have HBL for some, they're going to bring a lot of distraction to us while we are studying or doing HBL</i>
	S27: <i>I prefer school learning because the teachers can keep track on what we have done. We (will) have, motivation to learn, and at home, (we) will feel more lazy</i>
	S29: <i>I prefer studying in school because I don't really like to type. I prefer to write on paper instead. And, in school, after we have done with work, sometimes we communicate with friends beside us. And the feelings wise, because I feel motivated like when in class, because for me, I'm very competitive with my friends, we'll finish the work fast and instead of bringing it at home</i>
	S31: <i>I also enjoy school learning because at home my siblings keep disturbing me and one of them almost wrote on my paper so I don't want that to happen again</i>
	S34: <i>I don't really like HBL because sometimes when teacher show like a video, it's kind of blur. Like, I can't cope. But when I come to school, our teacher ask question, I can answer</i>
	S36: <i>I enjoy HBL because I didn't need to stress myself for homework and its quite a short period everyday</i>
	S47: <i>yeah I would rather pick HBL because it is more comfortable for me to be in my own house and I can just do my work via my laptop. And usually there's no one to see and tell me that I'm not supposed to do this. And I can take small breaks or snacks in between my studies</i>
	S55: <i>Yeah, but, I don't prefer HBL... for another reason because we have the time to do it. Some of us, we procrastinate and because of that when we come to school to hand up our homework, many of us don't</i>

technologies, which may not be effective for their students. More research and training on the effective transition between physical and online lessons should be explored. Such training should pay specific attention to the needs of MTL teaching and learning,

and the agility to transit between physical and online lessons, as teachers have to switch between these two modes depending on the pandemic situation while keeping track of the content progress and language skill development prescribed by the curriculum. To ensure agility between physical and online lessons, teachers and resource developers may consider using “seamless learning” principles (Looi et al. 2019) to align home-based and in-class activities so that both online and offline learning can complement better learning outcomes.

While students enjoy the freedom of learning at home, most of them do not like HBL due to technical issues and the loss of social-emotional support from their peers in class. These reflections differ from previous studies that found students ready and satisfied with remote learning (Caliskan et al. 2017; Hung et al. 2010; Zhao et al. 2020). A possible explanation for this disparity could be the difference in the ages of the students. The subjects of previous studies were mostly tertiary students, whereas the subjects of the current study were primary school students. Younger students may require more technical and emotional support during HBL. Furthermore, teachers were concerned about students’ learning progress during HBL, particularly students of medium and low ability, as they are less able to complete tasks on time with satisfactory quality. This teacher’s concern points to students’ lack of self-directedness in learning, which has been highlighted in numerous previous studies (Jing & Zhang, 2020; Oraif & Elyas, 2021; Owusu-Fordjour et al. 2020; Wei, 2020). This self-directed learning capability is critical for students during HBL because teachers have limited monitoring and facilitation tools when they are not physically present to observe, evaluate, and support their students.

Many previous studies have emphasised the involvement of parents during HBL to supplement the role of teachers (Fedina et al. 2017; Jing & Zhang, 2020; Oraif & Elyas, 2021; Owusu-Fordjour et al. 2020; Wei, 2020). However, based on the student FGDs, only 29.6% of the students had support from their parents, 29.6% did not receive support from their parents, and the remaining students sought help from friends or siblings when they encountered problems during HBL. With these findings, the parents of the participating students did not provide much support during HBL, which highlighted parents’ unfamiliarity with educational technologies used by their children and their lack of instructional capabilities to facilitate their children’s learning.

7 Limitations and future research

As described in the methods section, this study focussed on the HBL perceptions of a selected sample of primary-level teachers and students in an ongoing project; thus, the findings in this paper will be more exploratory than conclusive for the final dataset. The interviewed students are 11-year-olds who are younger learners, and hence may contribute to the lack of readiness and greater need for support during HBL. The findings might be different with older students, such as teenagers in high school.

As this study only looked at MTL subjects, it would be more informative if the experience and impact of HBL could be explored across different subjects. Due to the differences in demands on instruction, interaction, and practice, subjects such as science or history, and subjects such as language and mathematics, may encounter different opportunities and challenges. Teachers and students may need to be ready for different levels of demand when online HBL is used.

8 Conclusion

Many facets of personal life and society have changed due to the COVID-19 pandemic, and education is one of them. HBL or remote learning has been the typical alternate mode of instruction during school closures as a response to pandemic preventive measures. In Singapore, and many developed countries, HBL is done online, and the key consideration in such emergencies is mainly to get the curricular content across (from teachers to students) through technology to least disrupt learners' progress. Such HBL should be seen as a part or variation in the usual face-to-face schooling, as the eventual objective is to resume physical schooling whenever possible. As such, applying the conventional e-learning lens to analyse and assess the HBL's process and the outcome may be less relevant.

In this study, though cherishing the advancement and convenience of technology, the assimilation of physical instruction digitally seems to face some challenges for the mother tongue subjects, especially student readiness in accessing and using the input methods in Chinese and Tamil, which are critical to online learning of the languages. Apart from language-specific challenges, teachers and students also faced general technical issues such as system bugs, login time-outs, and device availabilities. Other than technical issues, they also shared common challenges articulated in past studies, such as difficulties in the monitoring of students' progress and a lack of autonomy or self-directed capacities among learners.

In response to these challenges, it is suggested that more engaging HBL activities and tasks, which can also be used to complement physical schooling, be co-created by teachers and the central curriculum developers. The authorities should further look into the technical issues and needs in mother tongue teaching and learning and provide solutions for the to-and-from transitions between physical and online means of education, especially on mother tongue pedagogical needs to assignment marking. Parents shall work collaboratively with teachers during times of HBL to ensure support and monitoring of students' learning progress. Both teachers and parents should also work together to cultivate self-directed learning among students to enhance the effect of home-based learning.

As all countries adjust to the new normal of the ongoing COVID pandemic, education may continue in the hybrid of physical and virtual learning. With the findings of this study, HBL readiness must be further explored and developed to provide teachers, students, and parents with the capacity to effectively implement HBL.

Appendix 1: Demographics of selected teachers

The following table illustrates details of the selected teachers.

Gender	Language teaching	Course teaching*	Type of school**	Years of experience teaching P5
Female	Chinese	Higher MT	Government-Aided	< 1 year
Female	Malay	Standard MT	Government	< 1 year
Female	Malay	Higher MT	Government	4–6 years
Female	Chinese	Standard MT	Government	4–6 years
Female	Malay	Standard MT	Government	7–9 years
Female	Tamil	Standard MT	Government	1–3 years

Gender	Language teaching	Course teaching*	Type of school**	Years of experience teaching P5
Female	Chinese	Foundation MT	Government	< 1 year
Female	Tamil	Standard MT	Government	4–6 years
Female	Chinese	Standard MT	Government	< 1 year
Female	Malay	Standard MT	Government-Aided	< 1 year
Female	Chinese	Standard MT	Special Aided Programme	< 1 year
Female	Chinese	Higher MT	Government	4–6 years
Female	Tamil	Standard MT	Government	30–34 years
Female	Tamil	Standard MT	Government-Aided	4–6 years

*At the primary five (P5) level, students will be banded into the foundation, standard and higher MTLs based on their proficiency as assessed by their schools. At the P5 level, students will focus more on sustained reading and writing of texts, as compared to the focus of listening, speaking and learning of language building blocks (such as characters, vocabulary and grammar) in their earlier years of mother tongue education.

**The primary schools in Singapore are comprised of 138 government schools and 41 government-aided schools (Ministry of Education, Number of Schools by Level and Type, 2019). Among these two types of primary schools, there are 15 schools with a Special Assistance Plan (SAP). These SAP schools are treated as a separate type of school by the CORE 3 Research Programme: Baseline Investigation of Mother Tongue Pedagogies in Singapore's Primary and Secondary Classrooms (C3MT) project as they run special programmes for mother tongue languages and their student profiles for mother tongue subjects are unique as compared to other schools. The proportions of school type coverage in Table 1 are hence explained by the number of government, government-aided, and SAP schools illustrated here.

Appendix 2: Number of students involved

The following illustrates the number of students involved in the study of this paper and the number of students who responded to each question. The number of respondents to each question will facilitate the understanding of the findings of this study, especially on findings that describe the proportion of students engaged.

	No. of students	Percentage of respondents
Respondents to Question 1	46	65.7
Respondents to Question 2	20	28.6
Respondents to Question 3	18	25.7
Respondents to Question 4	30	42.9
Respondents to Question 5	35	50.0
Total number of students in the selected FGDs	70	100

Appendix 3: Interview questions for teachers' Interview and students' FGD

Teachers' Interview

- a. What are your views about Home-Based Learning (HBL)? What are the advantages and challenges of using HBL?
- b. What kinds of activities have you designed for HBL lessons?
- c. How are students reacting to HBL? Are there any challenges they face?

Students' FGD

- a. Do you like home-based learning? If yes/no, why do you enjoy/not enjoy? Do you prefer home-based learning or usual in-class learning? Why?
- b. What tasks or activities did you do during home-based learning? Among these activities which you like most and which you dislike most? And why?
- c. If the home-based learning will carry on in the rest of your learning, will you look forward to it and why? What form of learning activities do you think you like to do in home-based learning other than those you have engaged?
- d. Did your parents like the arrangement of home-based learning? What have they said to you about home-based learning so far?
- e. Did your parents help you in the home-based learning activities? How did they help you?

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Data availability The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Declarations

Conflict of interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical approval All procedures performed in this study involving human participants were in accordance with the ethical standards of the institutional research committee. Nanyang Technological University, Institutional Review Board—IRB-2019-12-011.

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