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TEACHERS' PERSPECTIVES IN CONDUCTING COLLABORATIVE LEARNING ACTIVITIES FOR SCIENCE IN MALAYSIAN SECONDARY SCHOOLS

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ABSTRACT

The Malaysian Education Blueprint 2013-2025 has increased emphasis on learning using projects and group work to support 21st century education goals in Malaysian secondary schools. In response to that, the current lower secondary science textbooks following the Integrated Curriculum for Secondary School (KSSM) have been revamped to include a majority of learning activities in the form of projects and group works. Since these activities are collaborative in nature, this study explores teachers' views in conducting science projects and group works using the collaborative learning approach. Twelve teachers teaching lower secondary science subject in Malaysian national schools were interviewed using a semi-structured interview protocol and their responses were analysed using the conventions of thematic analysis. Findings include revelations on teachers' understanding of collaborative learning, why teachers prefer collaborative learning activities for the lower secondary level, and classroom and instructional challenges in this matter. Recommendations have been made to better support teachers to deliver 21st century science education goals at the school level in similar contexts.

Keywords: *Collaborative Learning, Science Learning, Secondary School Education*

INTRODUCTION

Global agendas like the Education 2030 and Partnership for 21st Century (P21) Education Framework call for transformation in education to incorporate humanistic values in the teaching-learning of critical subjects like science and mathematics. This is important to create a science and technology-based workforce that is not only competent with knowledge and skills, but is also civic and responsible towards the community and nation at large (OECD, 2018). Among the shared collective action of Sustainable Goals for Development (SGD), the SGD for Education (SGD4), aims to "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." (DOSM, 2019, p. 9). One of SGD4's main targets is on skills acquisition; future workforce for the science and technology must be developed with high level work-specific skills, cognitive skills for information processing and transferable skills such as problem solving, critical thinking, creativity, teamwork, communication skills and conflict resolution that can be applied for all jobs (Johnston, 2016). This is to promote sustainable education that prioritizes development for human rights, gender equality, global citizenship, and appreciation for culture and diversity (Walker et al., 2011).

Malaysia had also committed to transform science education to suit global demands, especially the SGD4. The latest school science curricula for national schools focus on three domains of scientific knowledge and literacies, skills and competencies, and noble values and attitudes. The Malaysian Education Blueprint 2013-2025 has clearly stated that in Wave 3, more evidence-backed initiatives are to be deployed to support 21st century science learning while also promoting inclusiveness, diversity and unity through education (MOE Malaysia , 2018).

Following this, the lower secondary science textbooks especially saw a great increase in projects and group works that required more active and collaborative learning tendencies in the classroom for a highly critical and hands-on subject like science. Projects and group works in science learning are seen as drivers to involve lower secondary students in more classroom activities for skills acquisition and instil interest for science and technology early on (Razali et al., 2018). Furthermore, learning this way well complements the grading system for lower secondary level which is skills and classroom assessment-based, compared to the upper secondary level which follows a more exam-oriented structure (Nasri et al., 2020).

Science learning has grown beyond the four-walls of a classroom, involving the community at large to immerse students in a richer and conducive learning environment that shows them the importance and relevancy of science to daily life (Norlizawaty & Nurzatulshima, 2018). The blueprint expects collaborations not just among students in a class, but also among different schools, communities and organizations to ensure knowledge flow. In 2022, a shocking government report emerged, stating that almost 70% of secondary school leavers in Malaysia do not wish to advanced their education to tertiary level. This evidently threatens Malaysia's plans to be a high-technology nation by 2030 (Grapragasem et al., 2014). Chuan et al. (2022) linked this to academic stress, anxiety and fear for uncertain future in the science and technology industry among students. Kamsi et al. (2019) had also earlier reported that students expressed dissatisfaction towards traditional teaching styles still used by many science teachers in Malaysia. All these have caused students to shy away from science despite the curricula revisions undertaken to better engage students with science content.

Building on this, this study investigates the current teaching-learning practices for lower secondary science in Malaysian secondary schools pertaining to the latest revision in the curriculum that has depended heavily on projects and group works. By exploring this issue in depth, recommendations can be made to continue to make school science learning engaging and relevant for Malaysian youths. Findings of this study can be expected to encourage discourse on collaborative learning practices in science education in other countries with similar 21st century education goals as well.

Constructivism for Science Learning

The current goals for science education around the world that point towards the integration of scientific literacies with 21st century skills can be explained from the lens of constructivism. Constructivism is a theory that claims learners make sense of new knowledge by experiencing the world and reflecting upon those experiences (Burhanuddin et al., 2021). While there are many constructivist models, the main idea put forth is to allow learners learn in context.

This works particularly well for science education as reforms advocate for deep content knowledge through active intellectual engagement and authentic learning environments (Teeter et al., 2020). According to Barak (2017) and Tuerah (2019), constructivist models or approaches for science learning help to:

- create a student-centred learning environment
- generate more student perspectives in learning
- utilise students' background and experiences
- promote active engagement between peers and teachers
- foster guided inquiry, exploration and discovery; and
- support classroom learning and e-learning

In an experimental study by Granger et al. (2012), school students have been found to achieve more learning outcomes in a science classroom that is student-centred compared to teacher-centred. Dwiyanti (2017) reported that students who participated in knowledge sharing with peers through asking, explaining, elaboration, and posing problem regarding science topics were found to exhibit higher abilities of metacognition and learning. Mishra and Iyer (2015) too concluded that an instructional strategy becomes more effective when students pose problems or generate questions by themselves after reflection of a science topic. These examples show how constructivism creates a richer science learning experience for students when they get actively involved in meaningful collaboration with their peers and teachers.

***The Collaborative Learning Approach for Science Projects and Group* Work**

Projects and group works in the Malaysian lower secondary science textbooks generally require students to work collaboratively with peers and teachers to achieve the learning outcomes. While projects require students to develop an end-product as solutions to posed problems, group works on the other hand, are simpler and less rigorous activities done in pairs, small or large groups (Neumann & McDonough, 2015).

The Collaborative Learning (CL) approach is a branch of Constructivism that can guide science teachers to conduct projects and group works using a number of strategies such as active facilitation, interaction, feedback and reflection. Duran and Sendag (2012) have proven that high school students' critical thinking skills focusing on analysis, inference, evaluation, inductive reasoning, and deductive reasoning significantly increased when science teachers used the CL approach. Next, according to Sanina et al. (2020), discussions and co-creation opportunities during science learning is able to develop students' generic and professional skills.

However, Le et al. (2018) reported that some science teachers seem to lack understanding of the CL approach despite claiming to use the approach profoundly in their classrooms. Students were deprived of quality collaboration because teachers neglected collaborative aspects of CL in learning outcomes, instructions and assessments. In another study, Appavoo et al. (2019) reported that lack of awareness of the benefits of CL among both teachers and students caused students to miss out on the advantages of learning together.

This communicates that while the pros for using the constructivist-based CL approach for science learning are aplenty, teachers might actually not be exploiting its full potential due to insufficient information or lack of understanding. A gap has been identified between the understanding and the actual implementation of the collaborative learning approach grounded in constructivism.

METHODOLOGY

Research Question

The main objective of this study is to explore the current teaching-learning practices of lower secondary science in Malaysian national schools pertaining to collaborative learning. This qualitative research was guided by the following question: *What are Malaysian teachers' ideas and suggestions in conducting collaborative learning activities for lower secondary science?*

Data Collection and Analysis

The researcher had first obtained approvals from the Ministry of Education, Selangor State Education Department, University of Malaya Research Ethics Committee, and school principals to conduct this qualitative study in 5 selected secondary schools in Selangor, Malaysia. Next, twelve science subject teachers were recruited using non-probability purposive sampling to participate in individual semi-structured interviews based on the criteria: (1) Have at least 1 year experience of teaching lower secondary science using the latest syllabus, (2) Teaching at a school that is part of the *Program Transformasi Sekolah Selangor*, (3) Have conducted collaborative learning activities for lower secondary students, and (4) Willingness to participate. Data saturation was achieved with data from twelve teachers for this study.

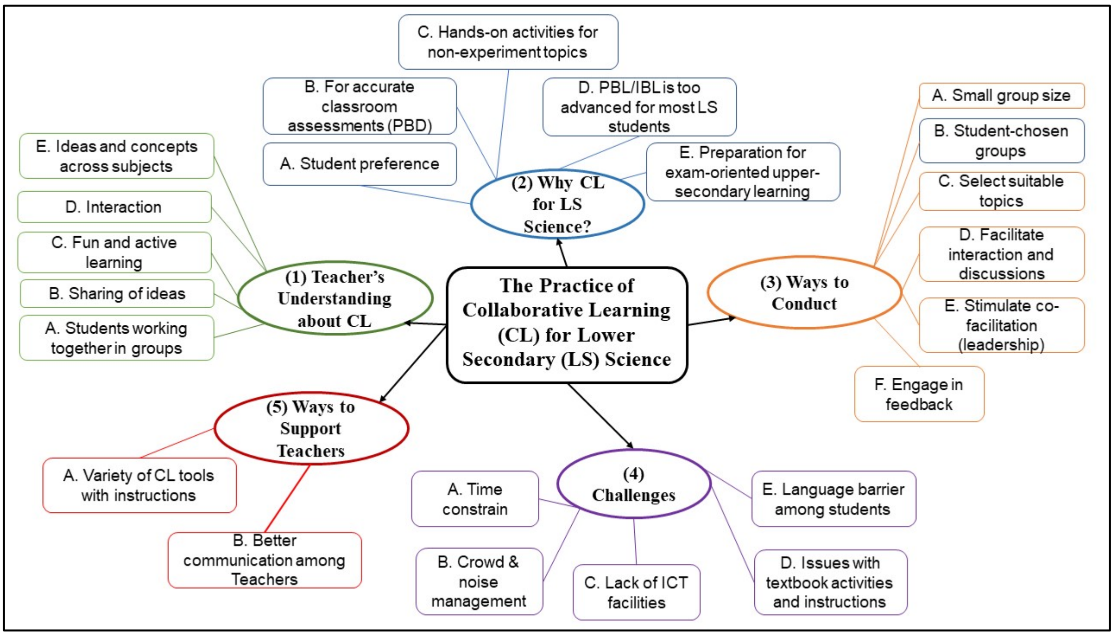
The teachers were interviewed by the researcher at school premises using a semi-structured interview protocol adapted from the study of Le et al. (2018). The adapted interview protocol containing 16 questions had been validated for content and reliability by two qualitative research experts. The interview protocol is attached in Appendix. Each individual interviews lasted for about 40 minutes. The interviews that were recorded following consent from the teachers were then transcribed manually by the researcher. To support thematic analysis, the researcher had used *Taguette*, an open-source software, to tag and code the scripts and identify themes. Blending inductive and deductive approach in identifying emerging themes has allowed the researcher to find both brand new information and also information inspired from pre-existing claims and conclusions from other related studies.

FINDINGS AND DISCUSSION

As theorized, while science teachers did admit to conducting collaborative learning activities, they did not offer any indication of utilising any particular approach, model or strategy in doing so. The specifics of why they use collaborative learning activities and how they use them are presented in the code tree as shown in Figure 1.

Figure 1

Code Tree of Analysed Teacher Interviews



This section presents discussions based on the themes derived from the code tree shown in Figure 1. Open tagging performed on twelve interview transcripts using *Taguette*, resulted in 5 dimensions upon cross-checking and refinement done following the guide for thematic analysis by Braun et al. (2020). They are: (1) Teacher's understanding about CL, (2) Why CL for lower secondary (LS) science, (3) Ways to Conduct, (4) Challenges, and (5) Ways to support teachers. Based on the dimensions expanded and visualized using a code tree, 5 themes emerged in relation to the research question of this study: *What are Malaysian teachers' ideas and suggestions in conducting collaborative learning activities for lower secondary science?*

The emerging themes related to lower secondary science teachers' ideas and suggestions are as follows: (1) Emphasis on collaborative learning and collaboration, (2) Teachers' understanding of collaborative learning, (3) The greater use of collaborative learning, (4) Ideal environment for collaborative learning, and (5) Supporting teachers to conduct collaborative learning. This study's limitations have also been declared in this section.

A. Emphasis on Collaborative Learning (CL) and Collaboration

Generally, teachers claimed that their exposure towards CL as an approach began during their bachelor's or diploma education. While a majority of them claimed that CL was a touch-and-go topic at seminars or workshops that they attend for professional training, Teacher 7 particularly shared that training programs conducted by the Ministry or State Education Departments now require science teachers to perform tasks for the programs in groups; "*we learn how to conduct group works from there and when we get back to schools, we try to replicate them in our classrooms*" she said. This shows the emphasis on CL as an active learning approach and collaboration as an essential learning and life skill.

Teacher 3 and Teacher 6 who were participants in the national STEM Ambassador Program by PETRONAS, shared how they were not only strongly encouraged to conduct collaborative STEM activities in science classrooms, but were also urged to collaborate with other subject teachers to show students how science is present in and useful for subjects as well. However, Teacher 3 claimed while collaboration across subjects is a good idea, it is extremely tough to implement in schools.

Supporting this, studies have shown that overlapping concepts in science and mathematics should be taught concurrently and teachers teaching different subjects should work more closely with each other (Treacy, 2018). However, this could also mean that teachers are more likely to learn and teach more subjects. As suggested by Weeden and Cornwell (2020) teachers who are put in such situations might end up feeling less confident or knowledgeable in areas outside their expertise, making it challenging to collaborate effectively across subjects. Secondly, the Malaysian national curriculum too does not offer that much of flexibility for integration and collaboration with other subjects (Ng, 2014). Each subject often has its own unique curriculum and learning objectives. Aligning these diverse curricula and finding common ground for collaboration can be complex, especially when faced with limited resources and time (Deák et al., 2021). Since collaboration across subjects is a floating idea in various teacher training programs in Malaysia, it is recommended for more research on this area.

B. Teachers' Understanding of CL

Teachers' understanding on CL is heavily influenced by how their students perceive project or group work activities. When asked about what they understand about CL, many of them repeated phrases like, "*fun*", "*interactive*", "*engaging*" and "*working together*", quoting their students. For Teacher 4, CL meant interactive and lively group activities that her students truly enjoy because "*they like to work with their friends*".

Teacher 6 claimed that she viewed CL as an "*umbrella activity*" that can fulfil the development of many 21st century skills such as communication, collaboration, inquiry and problem-solving all at once. On that note, Teacher 8 also quipped that project-based learning (PBL) works better combined with CL because it requires multiple tasks that can be completed faster and more effectively in groups than as individuals. "*My students enjoy gathering and sharing information for projects together rather than doing it individually*" she asserted.

Based on teachers' understanding of CL, it is evident that teachers view CL as an ideal platform for interactive and active learning that focus on engagement among students. This is supported by studies done by Almumen, 2020 and Deák et al. (2021) which claimed that engagement is key to students' active participation in classroom activities. In addition, teachers interviewed were also found to be more motivated to teach when their students appear happy during the activities. As asserted by Teeter et al. (2020), this may be because happier students show increased engagement in science learning activities, leading to higher sense of fulfilment among teachers. In this context, lower secondary science teachers are reassured that their efforts in planning and conducting engaging group works are making a positive impact on students' lives, and it validates their choice of using the collaborative learning approach for science learning.

C. Greater Use of CL Activities

The lower secondary level students are graded using formative classroom-based assessments (PBD) that are conducted fully by teachers. The teachers interviewed have been found to use CL as an assessment tool for PBD which allows them to observe and assess students for procedural knowledge and scientific skills. Teacher 11 expressed that a student's level of knowledge, skills for science projects and experiences, and his or her interest to learn can be easily observed using CL activities. Teacher 5 said, "*I use group works for assessments because pbl (project or problem-based learning) is too difficult for my students.*" She found it unfair to test students using activities that are way out of their skills set. According to Teacher 4 who seconded a similar opinion, weaker students especially should be tested using simple group works because they are not motivated to do individual activities, and also, they cannot coordinate tasks with peers for projects or case studies without guidance.

Research also heavily supports using projects and group works to assess the upcoming generation of students to capture their competencies more holistically. Since science often involves teamwork and collaboration, Kerans and Ngongo (2021) claim that by assessing learners through group work, they can be better trained to communicate their ideas, share responsibilities, and collaborate on scientific projects. Thu et al. (2021) also shared that it the science world, collaboration and interdisciplinary approaches are common; hence group work assessments provide learners with the opportunity to apply their scientific knowledge and skills in a practical context.

Secondly, teachers also use CL as an alternative for science topics that do not come with experiments. Teacher 3 explained that some topics such as Force or Thermochemistry can be taught using scientific experiments, which are great opportunities for students to learn to use laboratory apparatuses, chemicals and others. However, topics like Reproduction can still get students to work on hands-on activities without experiments, by putting them in [collaborative] case studies on reproductive problems faced by the current generation or engaging them with a debate on the ethical use of birth control. She concluded that for a highly practical subject like science, "*CL is useful to connect students with subject content apart from experiments*.". As seconded by Wester et al. (2021), collaborative science explorations enable learners to engage in meaningful discussions, challenge each other's ideas, and collectively arrive at more comprehensive solutions. This could also catapult the development of social and emotional skills among young learners using science; which is one of the main goals of the MEB 2013-2025 (MOE, 2018).

D. Ideal Environment for CL Activities

A majority of the teachers favoured small groups of 3-4 students for a CL activity so that "*it is easier to monitor their participation*" (Teacher 5) and "*they all get to equally contribute*" (Teacher 2). Research too support small group arrangement for CL activities as this arrangement promotes a more inclusive and participatory environment, where every student can contribute to the scientific inquiry process (Raymond & Choon, 2017).

Teacher 10 added that allowing students to choose their own group members works better so that communication is guaranteed during the group works. "*They do not want to communicate freely with those not from their cliques*.", she said. Her point was agreed by some other teachers as well. In contrast, Teacher 6 remarked that she assigns students randomly into a group based on the draw-lot system so that it is fair for all. This way, she claimed that, "*No one can accuse me of being biased, and at the same time, students get to work with different peers every time.*" In regards to grouping techniques, Muchiri and Njenga (2020) suggest that it is vital to consider the science learning objectives, collaborative learning objectives, desired outcomes, and the individual needs of students. While student self-selection can promote ownership and foster collaboration, random assignment can promote diversity and foster new relationships among students (Nhan & Nhan, 2019).

In terms of facilitation, interviewed teachers generally responded that they facilitate group works by monitoring students during discussions. However, when probed about specific strategies or methods of facilitation, most teachers were found to have mistaken 'interaction' for 'facilitation'. None of the teachers interviewed explained about instances where they demonstrate an output, describe the activity instructions in detail, scaffold their students, coach skills and competencies, or stimulate further exploration. Teachers' answers were limited to how they passively monitor students' self-direct discussions and how they are there to help students out when the students come to them with doubts about the activity. It is also to be noted that only one out of twelve teachers mentioned about feedback and reflection for CL activities.

This can be tied back to the part where teachers are not sufficiently exposed to the CL approach in training programs and workshops. Facilitation, feedback and reflection techniques which are major components of CL have been clearly neglected. Similar to an observation made by Zakaria et al. (2016), this study believes that teachers may have mistaken interaction for scaffolding. Interaction is the the direct engagement and communication among student-to-student and teacher-to-student, while facilitation by teachers involves guiding and supporting the group work process (Öberg et al., 2019). As much as communication is important, it is even more important for teachers to create a supportive learning environment, provide guidance, and ensure the smooth functioning of the group work using various facilitation strategies such as scaffolding, modeling or stimulation. In this case, science teachers may benefit greatly by gaining more clarity on techniques such as active facilitation, co-facilitation, active interaction, feedback and reflection as suggested in Constructivism by Vygotsky (2006).

E. Supporting Science Teachers to Conduct CL Activities

The challenges faced by teachers in conducting CL for the lower secondary level are aplenty. Beginning with instructional challenges, Teacher 5 claimed the current KSSM science syllabus is too advanced for some students. "*Some concepts that were previously in Form 4 Physics can now be found in Form 1 science!*". Teacher 1 shared a similar view and claimed that it was tricky to teach about human reproduction to Form 1 students as according to the latest syllabus. "*They [Form 1 students] are literally right out of primary school and they do not take the topic [Reproduction] seriously at all. It was perfect when this topic was allocated for the Form 3 in the previous syllabus*", she said. Due to this, teachers claim that they cannot conduct CL activities for topics that students found difficult to connect to and learn.

Secondly, the current Dual Language Program (DLP) is also hard on both teachers and students. Teacher 4 claimed that her school had switched from the Bahasa Malaysia instruction to English instruction for science to attract more student enrolment in the school. "*Our student enrolment only increased when we started teaching science and mathematics in English*. *Parents want it that way*.", she claimed. However, Teacher 8 said that teaching lower secondary science in English is challenging due to two reasons. Firstly, a majority of students, especially in the weaker classes find it challenging to communicate in English, causing communication breakdown during CL activities. "*They do not know how to share information and ideas with one another in English because it is neither their mother tongue nor daily spoken language.*", she concluded. Secondly, Teacher 1 who teaches science in Bahasa Malaysia, vented that her students are not able to gather adequate information for case studies or projects because most of the reading materials available on websites and YouTube are in English. This halts CL activities because students come to the class empty-handed with no materials to share with their peers. Since teachers have highlighted issues with both the Bahasa Malaysia and English instructions for science learning, this study recommends for more studies on bilingual-instruction policies for school science education.

Next, as for classroom challenges, time constrains and lack of ICT facilities have been highlighted. The bloated syllabus has left teachers with little to no time to conduct various CL activities for students as their main focus is in completing the syllabus. "*I simply do not have the time to sit and plan for so many activities because there's just too much to teach.*", Teacher 4 admitted. Teacher 2 also shared that her motivation to conduct CL activities goes low when it gets difficult to manage noise and crowd during the activities. "*Imagine having to monitor a class of 40 to make sure they are discussing the topics instead of just chitchatting!*" she exasperated. To counter this, Teacher 6 said that she maintains a strict personality with her students so that they take her seriously and actually complete the tasks.

Not having adequate ICT facilities is also a major problem in Malaysian secondary schools. A majority of the group works listed in the national textbooks require students to do multimedia presentations to share their findings with their class. "*My students are mostly from the lower socio-economic background. They do not have ICT facilities at homes, and they do not have it in schools either.*", quipped Teacher 9. Teacher 5 expressed that the curriculum designers may be out-of-touch with the reality of Malaysian schools, especially those in rural areas.

As suggested by Mahmud et al. (2018), science teachers in Malaysia require support in terms of visibility and variety. As for visibility, teachers need to be heard clearer and louder by policy-makers and curriculum designers so that the reality of teaching-learning practices in Malaysian secondary schools is taken into count before the Ministry churns out policies and initiatives. Teacher 5 advised for the feedback loop between schools and relevant ministries to be improvised. Teachers must also connect with one another to share activities that worked for their class for others to get inspired to follow suit (Lichtenberger-Majzikné & Fischer, 2017). For this, Teacher 3 suggested that better communication channels other than WhatsApp groups, Telegram groups or Facebook groups must be created to encourage teachers to share ideas among the teaching community.

On a final note, teachers also need to be supported with more variety of CL activities in the textbooks or teaching-learning guides that can be conducted with or without ICT. While the blueprint advocates for 'Education for All', it is imperative to consider all factors and students from all socio-economic backgrounds for more accessible learning opportunities. Teacher 8 claimed that CL activities commonly conducted in her school are limited to discussions and gallery walks only. Teachers and students may both get bored with repeated design of CL activities. As urged by Ghavifekr et al. (2016) issues related to limited accessibility and network connection and limited technical support must be looked into seriously in Malaysian national schools to encourage optimized use of national science textbooks.

Limitations

The main limitation for this study was the sample. While data saturation was achieved with just twelve teachers for this study, the sampled teachers were all from national secondary schools in the same state, all located within the radius of 3 kilometres from one another. It can be assumed that the teachers and students attached to these schools were from similar demographic and socio-economic backgrounds that may have affected their teaching and learning styles. Hence, the conclusions are restricted to this context. Future researchers who are looking to replicate this study to achieve conclusions that can be generalized, need to consider purposive sampling focusing on different socio-economic backgrounds of the sample.

CONCLUSION AND RECOMMENDATIONS

In conclusion, while it is a pleasant revelation that science teachers in Malaysian secondary schools enjoy conducting CL projects and group works for the lower secondary level, there are still many issues surrounding this practice. It is suggested that science teachers in Malaysia may greatly benefit from professional training targeted to teaching and learning using different collaborative learning models and approaches depending on classroom needs.

Based on the findings from this study, 2 recommendations are put forward for the attention of researchers looking to expand the body of literature on this topic and curriculum planners who have the capacity to revise the current lower secondary science syllabus pertaining to learning activities. They are:

- Recommendation 1: Involve more teachers in the syllabus design processes. Studies should be done on existing feedback loops between teachers, schools and the ministry and highlight areas of improvisions.
- Recommendation 2: Conduct more programs, workshops or seminars on collaborative teaching-learning practices for science. Teachers should be guided with different techniques of effectively conducting CL activities. Studies should investigate the effectiveness of these initiatives.

All in all, the ministry and education departments are strongly urged to look into supporting school teachers well so that they can help to deliver key visions of the blueprint and government policies for the secondary school science education.

While this study has been conducted in Malaysia, it is hoped that the findings can generate discourse on 21st century science education instructions in countries with similar goals, aspirations and commitment to the SDGs.

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Appendix: Semi-Structured Interview Protocol

Introduction

Thank you for agreeing to speak with me today to share your opinion about and experience in the teaching-learning practices of lower secondary Science. My research project focuses on developing a teaching support tool for Science teachers at the lower secondary level, with particular interest in collaborative learning. My study does not aim to evaluate your techniques or experiences. Rather, I am trying to learn more about teaching and learning first hand, and hopefully learn about the current pedagogical practices for Science. If you are ready, I would like to commence the interview.

A. Interviewee Professional Background
1. Would you mind telling me about yourself, in relation to your teaching experience?
2. Have you participated in any programs or workshops on collaborative learning (CL)?

B. Interviewee Experience in Conducting Collaborative Learning for Science
1. What do you understand about teaching Science using collaborative learning activities?
2. In your understanding, what is an effective collaborative learning group? (small/large/pair)
3. What do you think should be the goals of a collaborative learning activity, for teachers?
4. How about collaborative learning goals for students?

C. Implementation of CL for Science
1. In your opinion, what would be the best approach to teach Science for lower secondary students?
2. What are the strategies that teachers should consider in designing collaborative learning activities for Science subject?
3. Have you experienced any difficulties in conducting collaborative learning activities?
4. Could you describe any grouping techniques that you have used?
5. What skills do you think students need for collaborative learning to be successful?
6. In your opinion, canguided collaborative learning activities be beneficial for Science learning?
7. Do you perform any kind of group or individual assessments for collaborative learning?

D. Reflection on the Implementation of CL
1. What have you learned from your experience of using collaborative learning activities?
2. How do you think teachers can be encouraged to use more collaborative learning activities for Science learning?
3. Some researchers say that collaborative learning activities promotes more group think than independent learning tendencies among learners. What do you have to say about this?
4. Are there any challenges in using collaborative learning to teach Science particularly?

That would be all. Thank you for your time. Do you have any questions for me?

Post Interview Comments, Concerns and/or Observations (if any):

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End of Interview.