

Collaborative Learning Activities For Form One Science A Guide For Teachers (Based On The KSSM Curriculum)

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Abstract: This book acts as an instructional support mainly for science subject teachers who are looking to implement collaborative learning for their students. The content of the book has been designed to help teachers in every aspect of collaborative learning with various descriptions, sample activities, ready-to-use materials such as two types of feedback forms, a template for a self-reflective journal entry and also a checklist for a collaborative learning lesson. The writers hope that teachers will be able to practise the collaborative learning approach more profoundly in Malaysian secondary schools with, the help of this book.

Keywords: Malaysian, sample, imolement, collaborative



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DEDICATION

We humbly dedicate this book to our parents and educators
who raised us,
cared for us
and taught us.

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AN OVERVIEW

Science subject textbooks for lower secondary following the KSSM curriculum in Malaysia show a great deal of emphasis on collaborative learning activities. With that in mind, this handbook is developed as a guide for science subject teachers looking to conduct science activities using the collaborative learning approach effectively. The simple and easy-to-follow descriptions of what transforms a simple group work activity into a multi-faceted collaborative learning activity are expected to encourage more science teachers to use the collaborative learning approach more profoundly for a core subject like science that is equally theoretical and practical. Here is a summary of the chapters that are written for this book:

I. Chapter 1 – Introduction to Collaborative Learning in School Science Education

This chapter aims to introduce readers to the collaborative learning approach based on the theories of Social Constructivism and Social Learning. The strategies of an effective collaborative learning activity to be elaborated in the upcoming chapters are visited briefly in relation to the KSSM Science curriculum.

II. Chapter 2 – Preparing for a Collaborative Learning Activity for KSSM Science

This chapter describes the strategies involved in the planning stage of a collaborative learning activity with examples. Readers are shown the methods of constructing activity objectives and grouping.

III. Chapter 3 – Conducting a Collaborative Learning Activity for KSSM Science

This chapter talks about facilitation, active interaction and the navigation of feedback and reflection in a collaborative learning activity. Templates for feedback forms and self-reflection journal entries are included for teachers to directly utilise in their classrooms.

IV. Chapter 4 – Assessing a Collaborative Learning Activity for KSSM Science

This chapter explores the methods of assessing a collaborative learning activity for its preparation and effectiveness based on a checklist provided. Next, student assessment is also discussed in terms of individual and group productivity.

V. Sample Collaborative Learning Activities

This section includes ten activities for Form One science subject that have been designed based on the collaborative learning strategies discussed throughout this book. The activities are expanded from the group works suggested in the Form One KSSM Science textbook.

We thank all our readers who decided to pick this book up and hope that it benefits you in every way it was intended to and beyond!

PREFACE

Greetings from the authors,

Thank you for picking up this book! Whether you are a teacher, student, parent, or researcher looking to deepen your knowledge about collaborative learning practices for lower secondary science using the KSSM syllabus, you have come to the right place!

With this book, we hope to provide instructional support to those who are looking to practice the *Pembelajaran Abad Ke-21* (PAK21) or 21st century learning using collaborative learning strategies that are backed by learning theories such as Social Constructivism and Cognitive Apprenticeship. Specifically, we hope to:

- expose science teachers to methods to conduct collaborative learning activities for the lower secondary level easily and effectively;
- support teachers with easy-to-conduct collaborative learning activities for Form One science based on the KSSM syllabus; and
- encourage teachers to use collaborative learning activities to assess students under classroom-based assessments (*pentaksiran bilik darjah*) for their scientific knowledge, skills and competencies, and values and attitudes.

With that, we hope to expand the body of knowledge on collaborative learning practices for science education in Malaysia. Stay tuned for more follow-up books from this team!

Thank you.

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The writers extend their warmest gratitude to family, friends and colleagues for their unconditional support in the process of designing and developing this book.

We thank Universiti Tun Hussein Onn Malaysia (UTHM) for providing the platform to share our humble work with targeted readers. Not forgetting the team of reviewers, evaluators and external editors who have contributed ideas to enhance the value of the book.

Finally, we thank God for this opportunity.

CHAPTER ONE

Introduction to Collaborative Learning in School Science Education

By the end of this chapter, readers should be able to:

- ✓ Define collaborative learning
- ✓ Describe the strategies involved in conducting collaborative learning activities
- ✓ Understand how collaborative learning elevates Science learning
- ✓ Realize the emphasis for collaborative learning activities in KSSM Science textbooks for the lower secondary level

1.1 What is Collaborative Learning?

Collaborative learning (CL) is a pedagogical approach that requires learners to learn collaboratively using appropriate strategies in a learning environment. Although the CL approach is most prominently utilised in teaching languages or arts-based subjects, 21st century instructions have started to integrate the working mechanisms of the approach even in critical, highly theoretical and practical subjects such as Science and Mathematics given its benefits. To understand this agenda better, let us first take a look at what is this approach all about according to some scholars and researchers.

- Collaborative learning is **a combined intellectual effort** by a group of students, with or without teachers to facilitate the

CHAPTER TWO

Preparing for a Collaborative Learning Activity for KSSM Science

By the end of this chapter, readers should be able to:

- ✓ Identify the steps involved at the planning stage for a collaborative learning activity
- ✓ Design activity objectives
- ✓ Understand the advantages and disadvantages of different grouping techniques
- ✓ Explore ways to work with different group sizes

2.1 Planning for a Collaborative Learning Activity

Any learning activity is usually planned based on a learning objective or more. A **learning objective** that describes what the student should be able to achieve at the end of the activity is ideally **simple, practical** and **measurable or observable**. Instructors may design short-term or long-term objectives depending on the **time** and **resources** available.

Gagné's (1984) learning investigators have sought to identify broader categories of learning outcomes in order to foresee to what extent their findings can be generalized. Five varieties of learning outcomes have been distinguished and appear to be widely accepted. These categories are intellectual skills (procedural knowledge work in categorizing learning outcomes based on three domains of human performance can be referred to at the planning stage of any type of activity, including

CHAPTER THREE

Conducting a Collaborative Learning Activity for KSSM Science

By the end of this chapter, readers should be able to:

- ✓ Understand the different methods of facilitation for a collaborative learning activity
- ✓ Identify ways to manage active interactions during a collaborative learning activity
- ✓ Utilise group and individual feedback forms for feedback sessions
- ✓ Help students navigate self-reflections at the end of a collaborative learning activity

3.1 Facilitating a Collaborative Learning Activity

To engage students in a collaborative learning activity, facilitation is required from the start till the end. Although students are working in groups, **teachers** need to step out of their traditional roles and **transform into a facilitator** who can drive group work. For science activities, teachers need to facilitate students with goals of:

- providing clear instructions for the activity to avoid accidents or misuse of laboratory apparatuses
- demonstrating an expected output for experiments or projects
- identifying and giving added attention to struggling students
- stimulating all students to apply scientific knowledge and skills

CHAPTER FOUR

Assessing a Collaborative Learning Activity for KSSM Science

By the end of this chapter, readers should be able to:

- ✓ Assess a collaborative learning activity plan based on the checklist given
- ✓ Choose the right assessment method for a collaborative learning activity

4.1 Assessing a Collaborative Learning Activity Plan: A Checklist

Based on all the strategies discussed in the previous chapters in terms of preparation and implementation of a collaborative learning activity, Table 4.1 presents a checklist that has been suggested for teachers to assess the activity plan before finalizing it.

Table 4.1: Checklist for a Collaborative Learning Activity Plan for Science Subject

	Teaching-Learning Strategy	Does the activity allow:	Included or not?
1.	Modeling	The teacher to: <ul style="list-style-type: none">• describe the experiment/group work/project?• show a correct model project/answer?	

SAMPLE COLLABORATIVE LEARNING ACTIVITIES

*** FOR FORM ONE SCIENCE**

*These activities have been designed based on the understanding of the collaborative learning approach grounded using the theories of Social Constructivism and Cognitive Apprenticeship.

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BIOGRAPHY



The author is a writer, researcher, and budding expert in the field of Instructional Design and Technology (IDT). She has a Bachelor's degree in English for Professionals from Universiti Sains Malaysia. For her Master's degree program from University of Malaya, she followed her interest in IDT by developing a Listening course for undergraduate students. Henceforth, she has worked on multiple research grants as a research assistant focusing on the areas of secondary school education and IDT. The author also has the experience of volunteering for an international NGO in Vietnam where she taught EFL to children and adult learners. Currently, she is working on developing a teaching support tool for secondary school science teachers.

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