

Collaborative Research and Development (“Seed”) Project 2019/20

NT0819

**Developing Students’ Creativity, Collaboration and  
Problem Solving Skills through Creating A Makerspace in the  
Secondary English Language Classroom**

Native-speaking English Teacher Section

16 February 2019

# What is **HOT** in 21st Century Learning?

Foundational literacies  
(language + STEM)

Ability to make connections  
between different concepts  
and issues

## Constellation of Skills

Broad intellectual resources  
to draw on

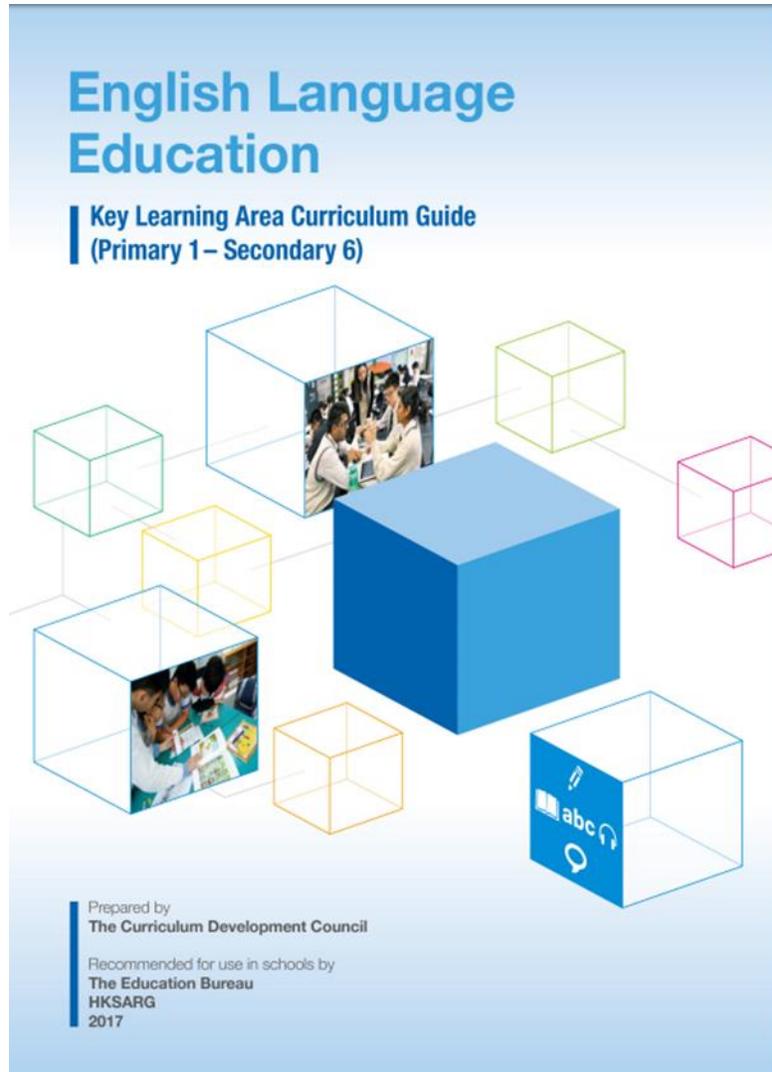
Less tangible creative and  
analytical skills, e.g.  
leadership and  
entrepreneurship

Source: The Economist Intelligence Unit (2017).  
Worldwide Educating For the Future Index: A  
Benchmark for the Skills of Tomorrow.

“The world doesn’t need more graduates with good grades. What the world needs is voracious, self-directed learners with the creative capacity to see the problems of the world as puzzles, and the tenacity to work on them, even in the face of adversity.”

Gever TULLEY, founder of Brightworks School, a San Francisco school that focuses on hands-on education

# Curriculum Links



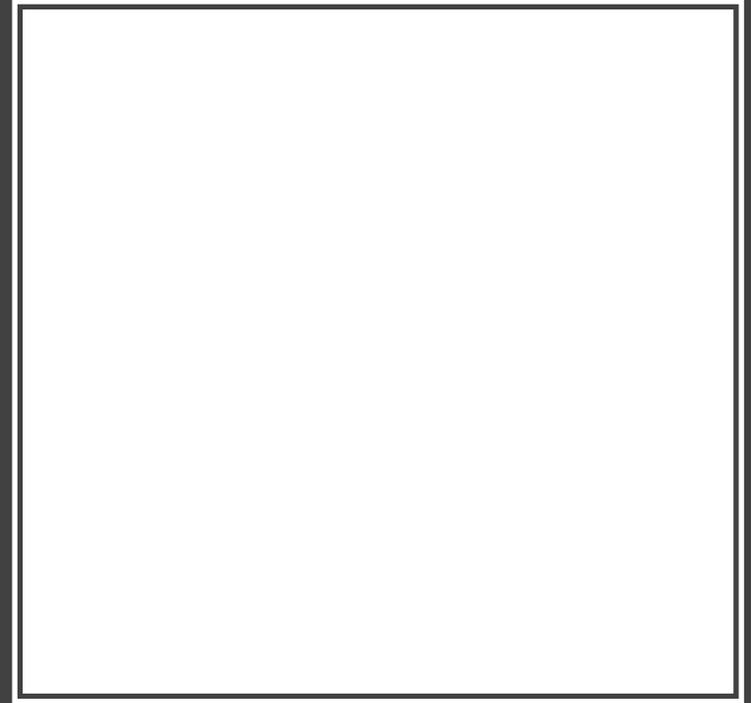
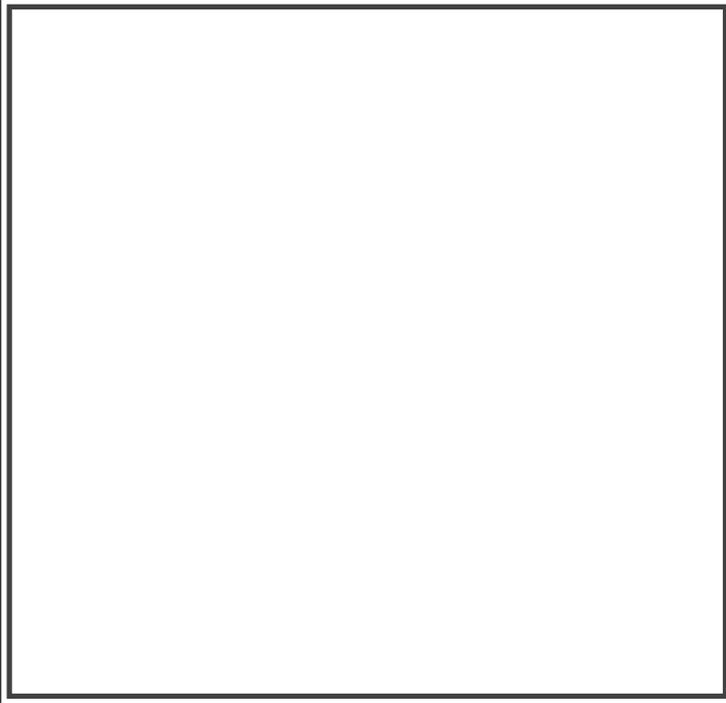
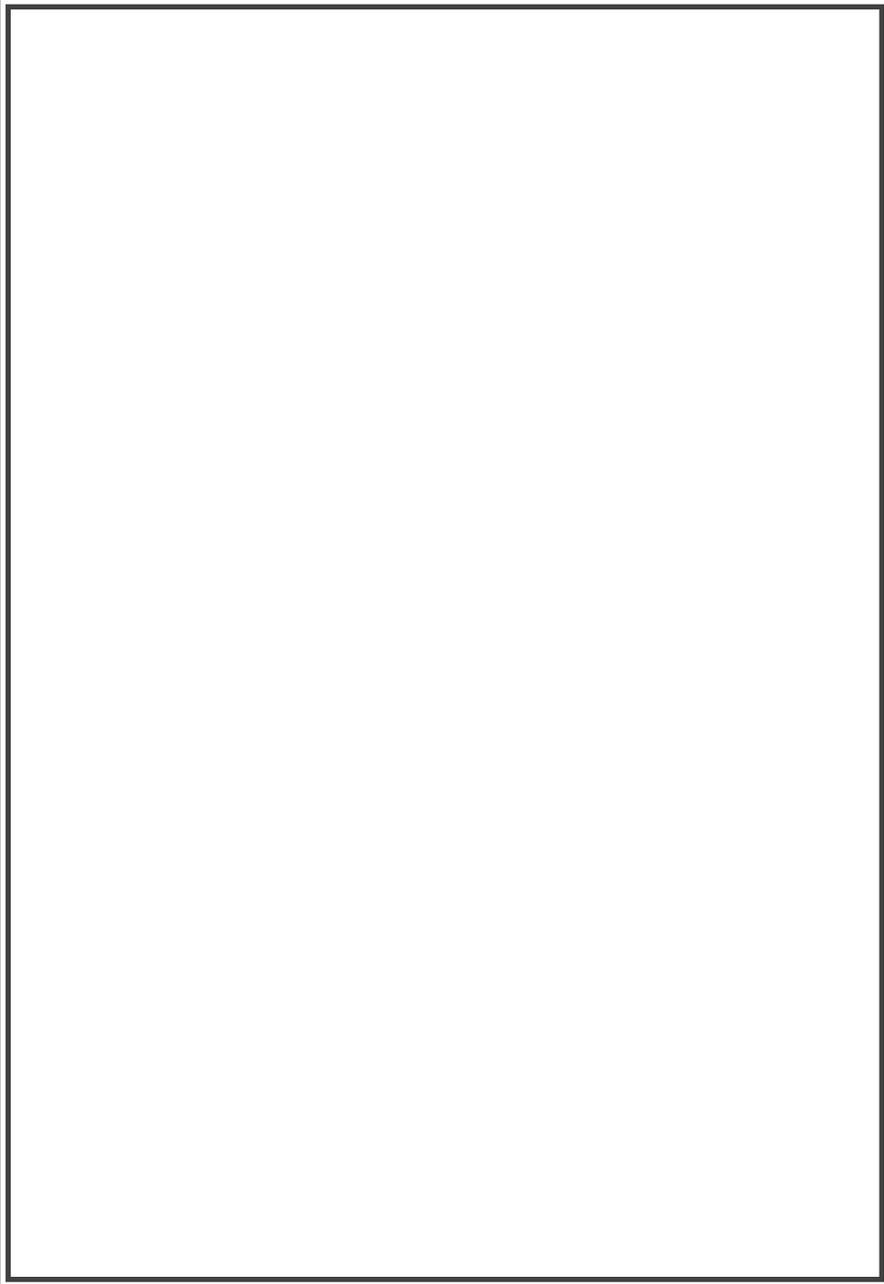
## Major Emphases

- **Use of IT to:**
  - ✓ develop new literacy skills
  - ✓ enhance collaboration and interaction
  - ✓ motivate self-directed learning
  - ✓ develop information literacy
- **Promotion of Reading/Language across the Curriculum to help Ss:**
  - ✓ connect learning experiences
  - ✓ broaden Ss' knowledge base
  - ✓ strengthen their ability to integrate and apply knowledge and skills
- **Use of generic skills**



# The Maker in You and Me



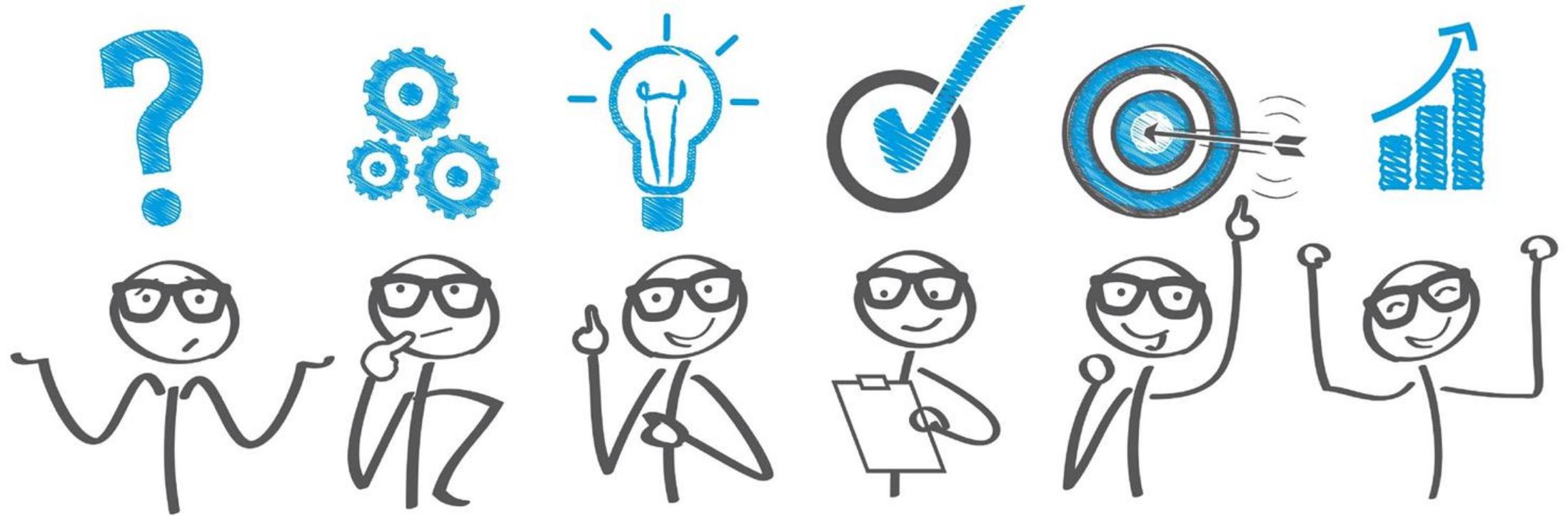


A Maker is Someone  
who Engages in **the Act of Making.**

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**Making involves...**

# Problem Solving



# Sense of Agency

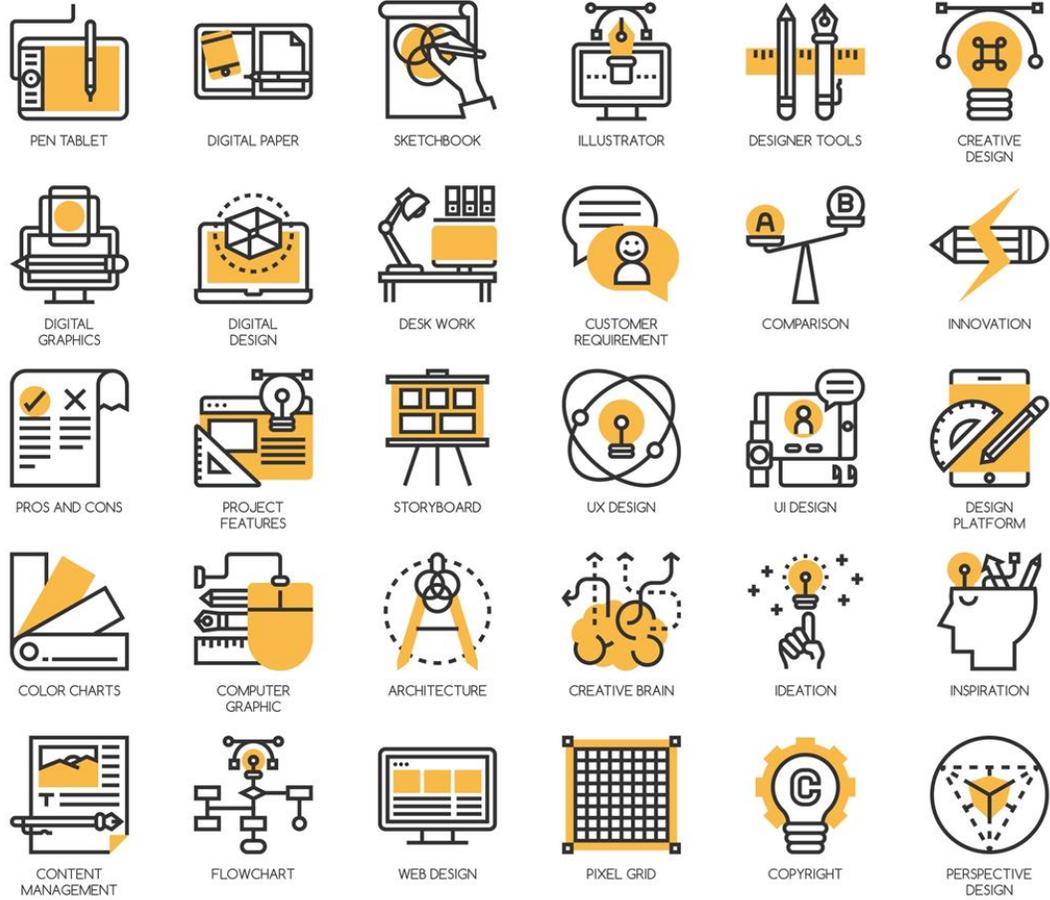
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graph TD; A[Sense of Agency] --- B[Choice]; A --- C[Intention]; A --- D[Action];
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**Choice**

**Intention**

**Action**

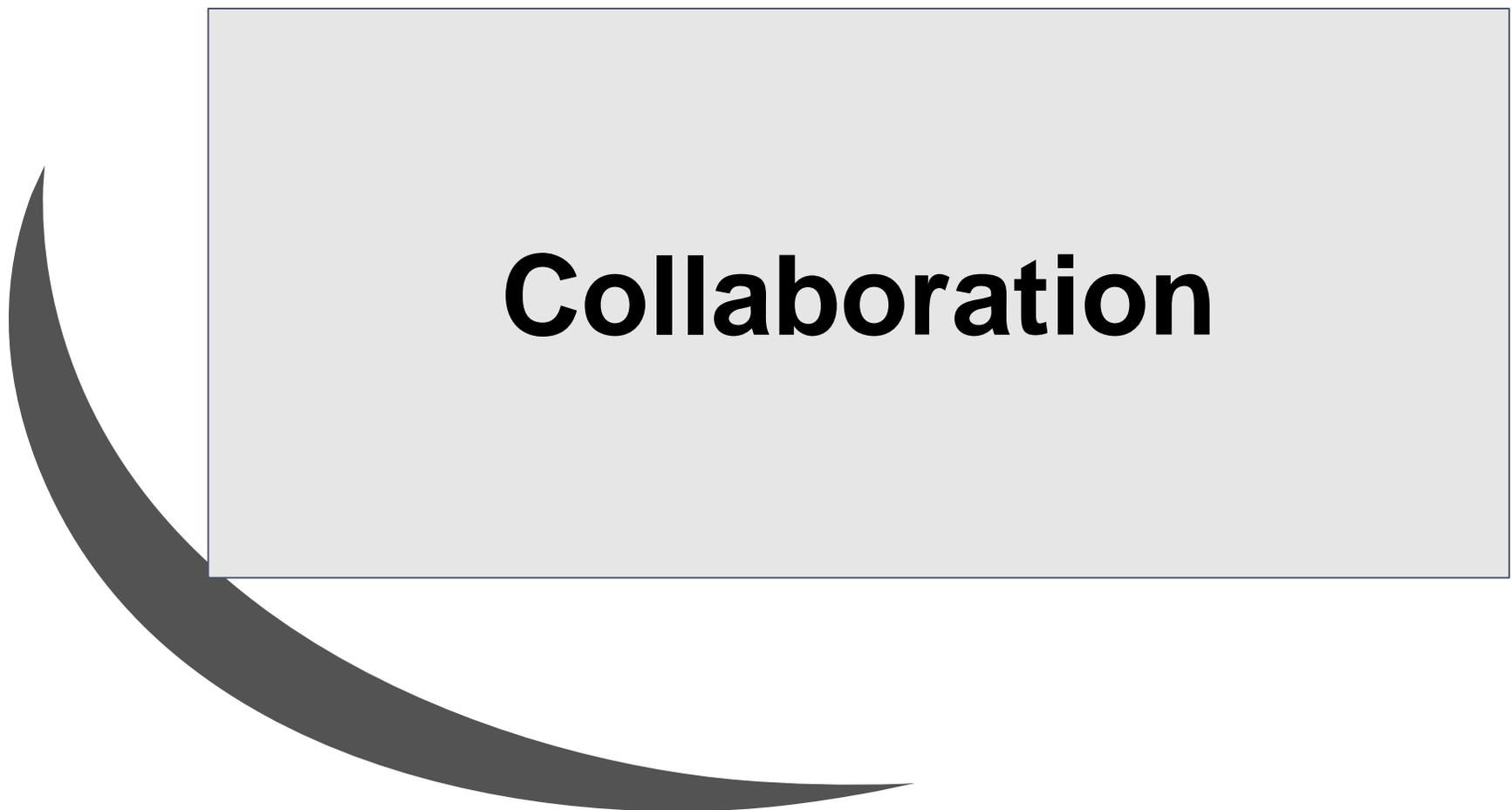
# Design Thinking



Looking closely

Exploring complexities

Finding opportunities



**Collaboration**



# What does a Makerspace look like?



**Student Interaction with  
“Tools as Teachers”**

**Students as Teachers**

**Sourcing information  
online**

**Co-inspiration & Co-critique**

**Knowledge sharing by  
students**

**Students figuring it out**

**Student collaboration  
facilitated by teachers**

Makerspace

&

English Language  
Classroom

**Are they an odd couple?**

**Meaningful and purposeful communication in English**

**Applying language knowledge and skills to exercise one's creativity, collaborate with others and solve problems**



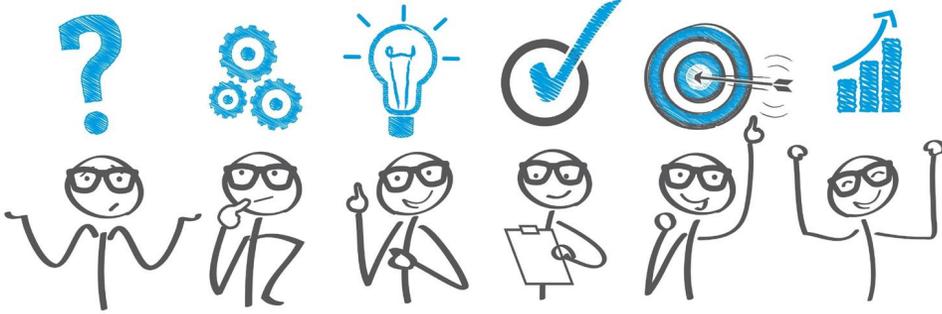
The English Language  
Classroom as a Makerspace?



**NOT** a physical  
replication of a  
STEM/STEAM-  
related Makerspace!

BUT it is a classroom which promotes the following:

### Problem Solving



### Design Thinking

**Looking closely**

**Exploring complexities**

**Finding opportunities**

# The Makerspace / Maker Spirit

**Sense of Agency**

**Collaboration**

The Maker Tools in the English language classroom are made up of  
**Thinking Routines**

# Project Objectives

explore **the place of Makerspace** and the development of related skills in the English Language Education Key Learning Area;

develop English language teachers' capacity to identify opportunities in and outside of the classroom where the **Makerspace spirit can be cultivated**;

develop teachers' capacity to design **English language learning activities** that support **tinkering, experimentation, discovery, creation** and **problem solving** by students, in addition to the development of a range of language skills;

identify effective **learning and teaching strategies** that empower students to **tinker, experiment, discover, create** and **solve problems** in English language learning; and

develop teachers' ability to **assess students' English language learning and Maker-related skills and attitude** in the Makerspace context.

# Research Questions



- What are some of the key characteristics of the English language learning environment under which a Makerspace spirit can thrive?
- What are the possible outcomes of an English language classroom steeped in a Makerspace spirit?
- What kind of pedagogical designs can support the promotion of the Makerspace spirit in the English Language classroom?

# Thinking Routines to Support Learning in a Makerspace

**Parts Purpose Complexities**

**Parts People Interaction**

**Empathy: Think Feel Care**

**Tinkering: Imagine If...**

## Parts Purpose Complexities

Focus on an object or system and ask:

- What are its parts?
- What are its purposes?
- What are its complexities?

## Parts People Interaction

Focus on a system and ask:

- What are the parts of the system?
- Who are the people connected to the system?
- How do the people in the system interact with each other and with the parts of the system?
- How does a change in one element of the system affect the various parts and people connected to the system?

## Empathy: Think Feel Care

Focus on the people within a system and then step inside each person's Point of View. Consider:

- **Think:** How does each person understand this system and their role within it?
- **Feel:** What is each person's emotional response to the system and to their position within it?
- **Care:** What are each person's values, priorities, or motivations with regard to the system? What is important to this person?

## Tinkering: Imagine If...

Consider the parts, purposes and people who interact with an object or system, and then ask in what ways it could be made:

- more effective?
- more efficient?
- more ethical?
- more beautiful?

Opportunities to practise and apply language items, e.g.:

- Use of adjectives to describe objects, people, systems, roles, etc.
- Use of the to-infinitive clause to indicate a purpose
- Use of the relative clauses to provide details
- Use of the second conditional to indicate a hypothetical situation

**Parts Purpose  
Complexities**

**Parts People  
Interaction**

**Empathy:  
Think Feel Care**

**Tinkering:  
Imagine If...**

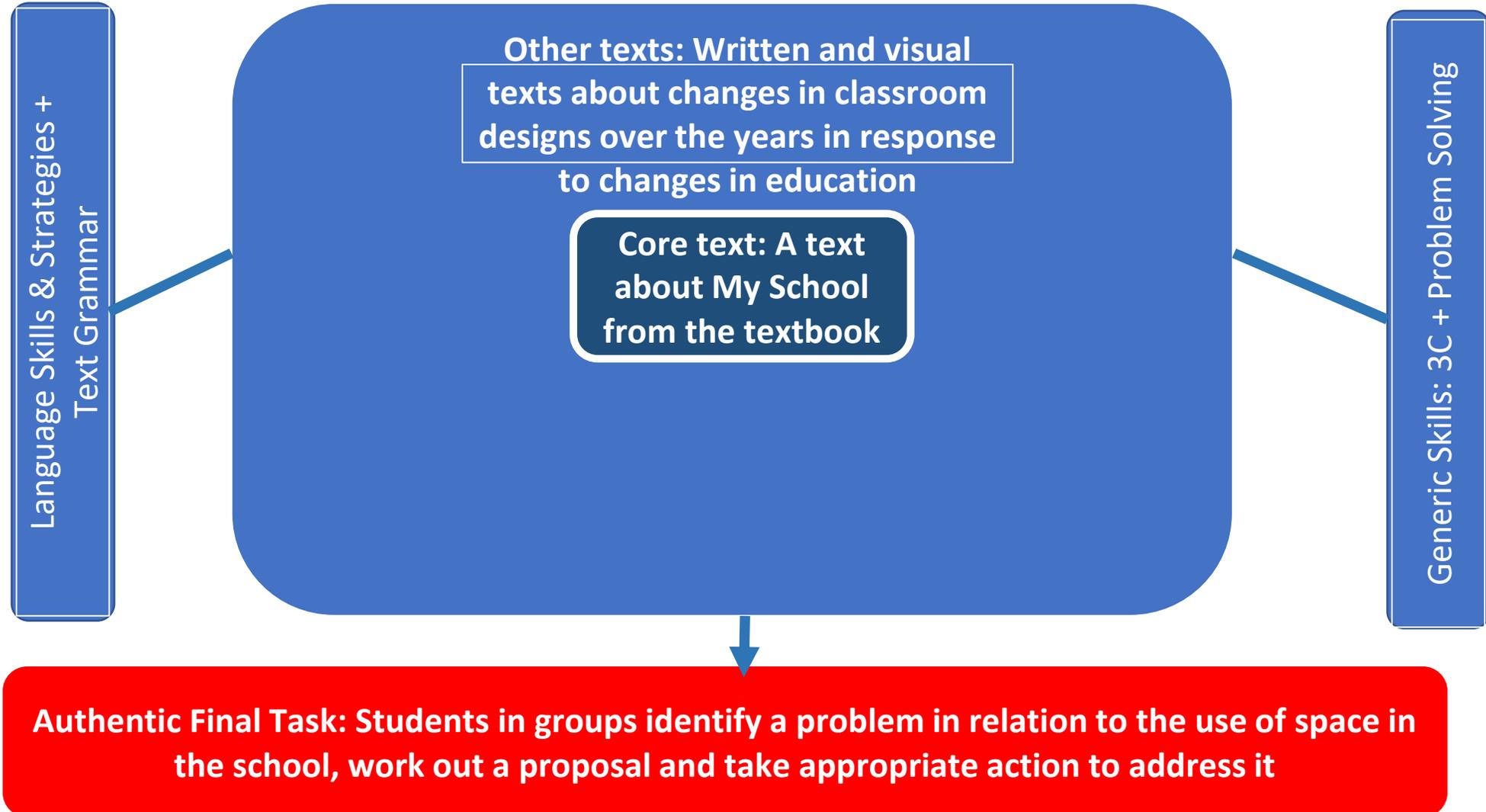
Opportunities to practise and use generic skills, e.g.:

- Critical thinking skills
- Creativity
- Communication
- Collaboration
- IT skills

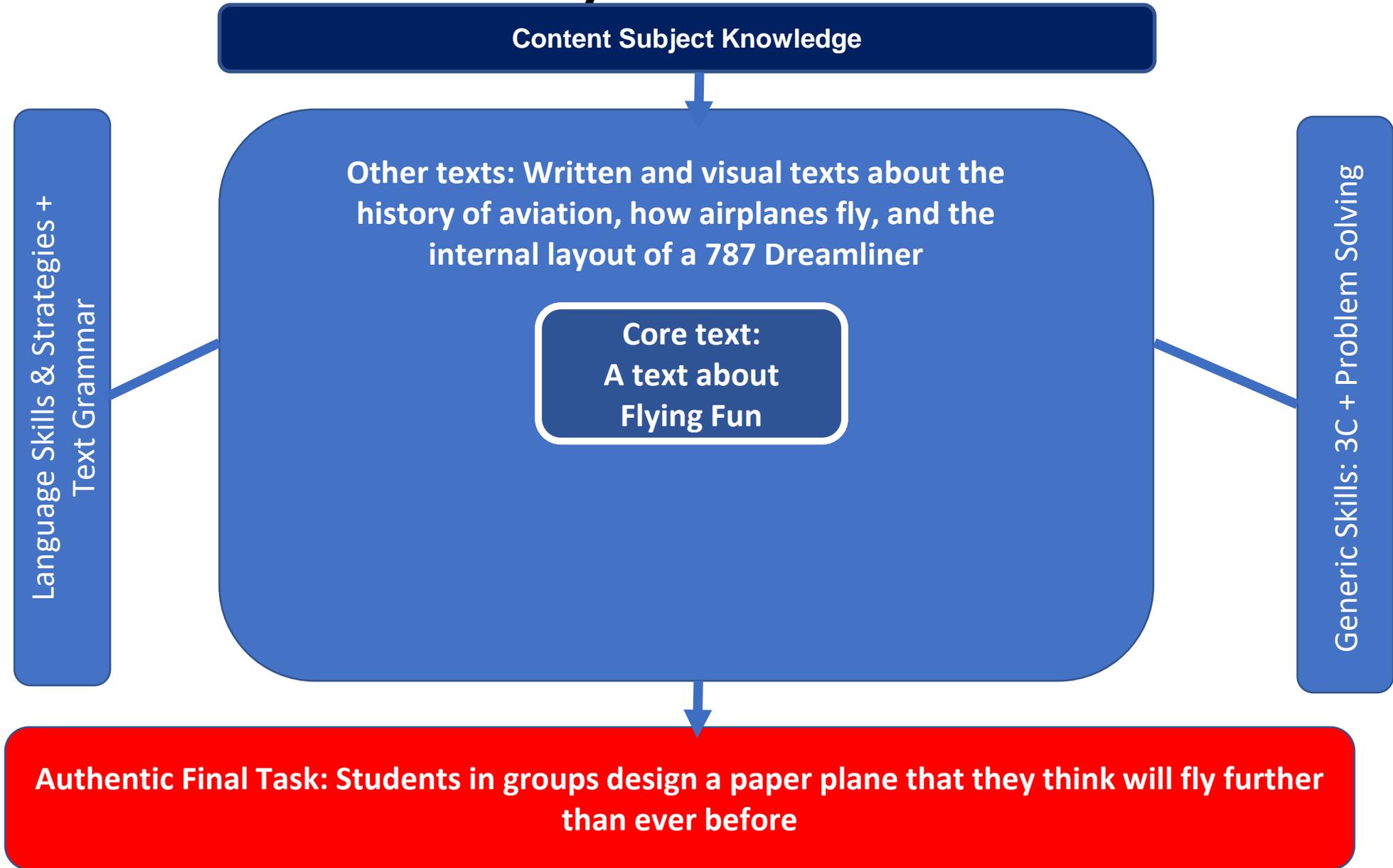
Opportunities to practise information literacy skills, e.g.

- Researching information about objects, people and systems and perspectives
- Evaluating the information gathered

# What a Project Unit May Look Like



# What a Project Unit With Cross-departmental Collaboration May Look Like



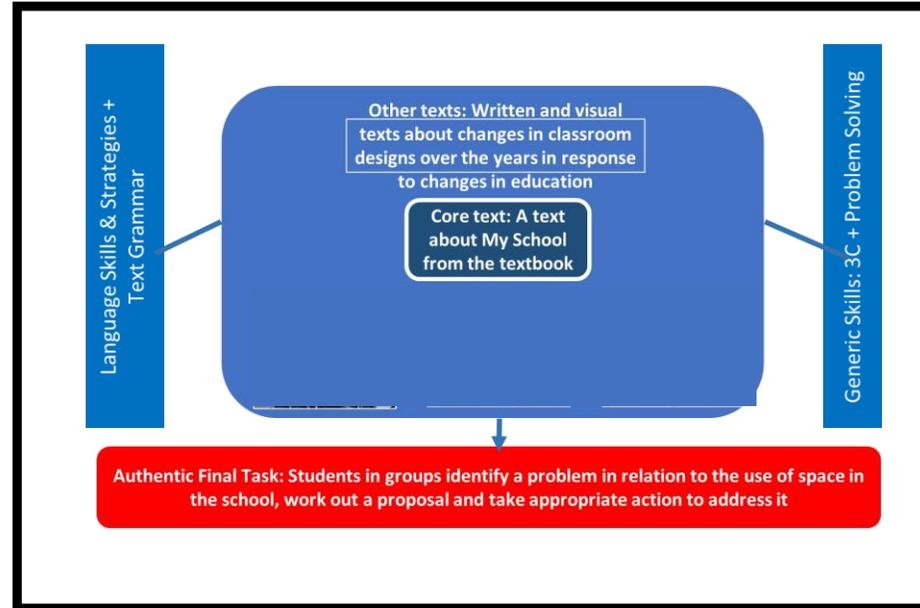
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Students as Teachers

Sourcing information  
online

Problem Solving

Agency



Design Thinking

Co-inspiration & Co-critique

Knowledge sharing by  
students

Students figuring it out

Student collaboration  
facilitated by teachers

Thinking Routines

Collaboration

# Project Timeline (2019/20)

**Jun - Jul 2019**

**Setting up the support**

**Sep - Oct 2019**

**Professional development  
Baseline observation and data collection**

**Nov 2019 - Mar 2020**

**Infusing the thinking routines into the everyday English lessons  
Co-planning for a unit of work**

**Apr - May 2020**

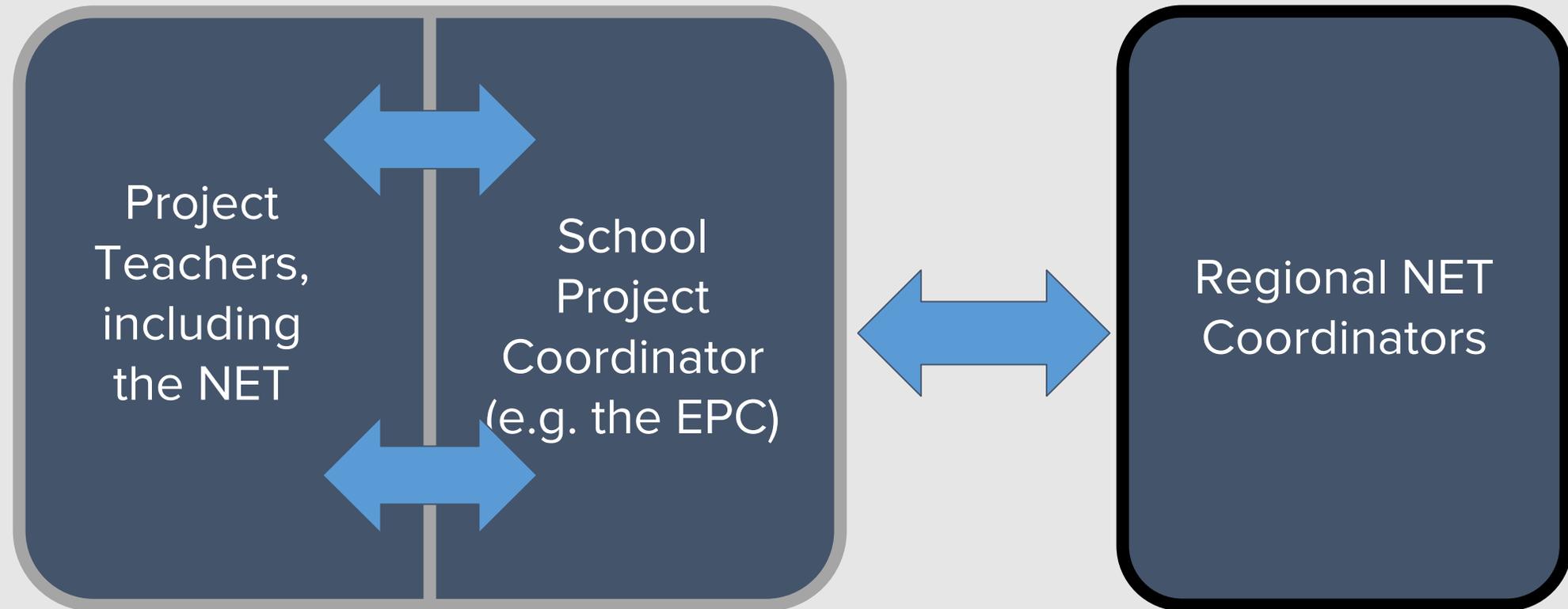
**Implementation**

**May - Jun 2020**

**Review  
Evaluation  
Data collection**

# Personnel Involved in the “Seed” Project

## Support from the School Senior Management



# Project Proposal

**Appendix C** of the EDB Circular Memorandum No.5/2019

**Deadline for submission of application:  
5 March 2019**

School Application Form to be completed in duplicate by School Heads and sent to:

**EDB Human Resources  
Management Unit at 4/F,  
East Wing,  
Central Government Offices,  
2 Tim Mei Avenue, Tamar**  
(Part IV does not need to be completed.)

# Enquiry

## **General**

Ms Christy NG

(Life-wide Learning Section)

Tel: 2892 5824

## **Project-related**

Mr William CHENG

(Native-speaking English Teacher Section)

Tel: 3549 8339

**You don't have to have a 3D  
printer to have  
an awesome Makerspace.**

**Let's Hack Our Classrooms!**  
**Let's Disrupt Our Classroom Practices!**