Instructional Design for Self-directed Learning Using E-platforms

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Overview of this session

- Instructional Design for Self-directed Learning
- Setting Up E-platforms with STEM Project Exemplars
  - Google Classroom
  - WordPress

Instructional Design for Self-directed Learning

https://www.youtube.com/watch?v=Erm2Kokx8Ro

Basic Concepts of SDL

- Learning is a process of **personal** construction of knowledge
- Help learners understand how they **learn best**. Make connection between effort, learning strategies, and use of information.
- **Externalize** the self-directed learning process for teacher assessment, peer discussion and self-reflection.
- Teacher as a **facilitator** of learning

Using E-Platforms for SDL

Efficient Management

- Monitor students' participation, while student can review their progression of learning
- Assessment can be cloned, modified and even marked automatically
- Tools: Checklist, Online Test or Quizzes, E-portfolio, Automarking…

Using E-Platforms for SDL

Improved Co-operation

- Facilitate communication and collaboration in class or outside the class
- Upload and share content, ideas or files
- Tools: Forum, Co-working platform, Instant Messaging, Peer assessments system…

Using E-Platforms for SDL

Up to Date and Immediate Content

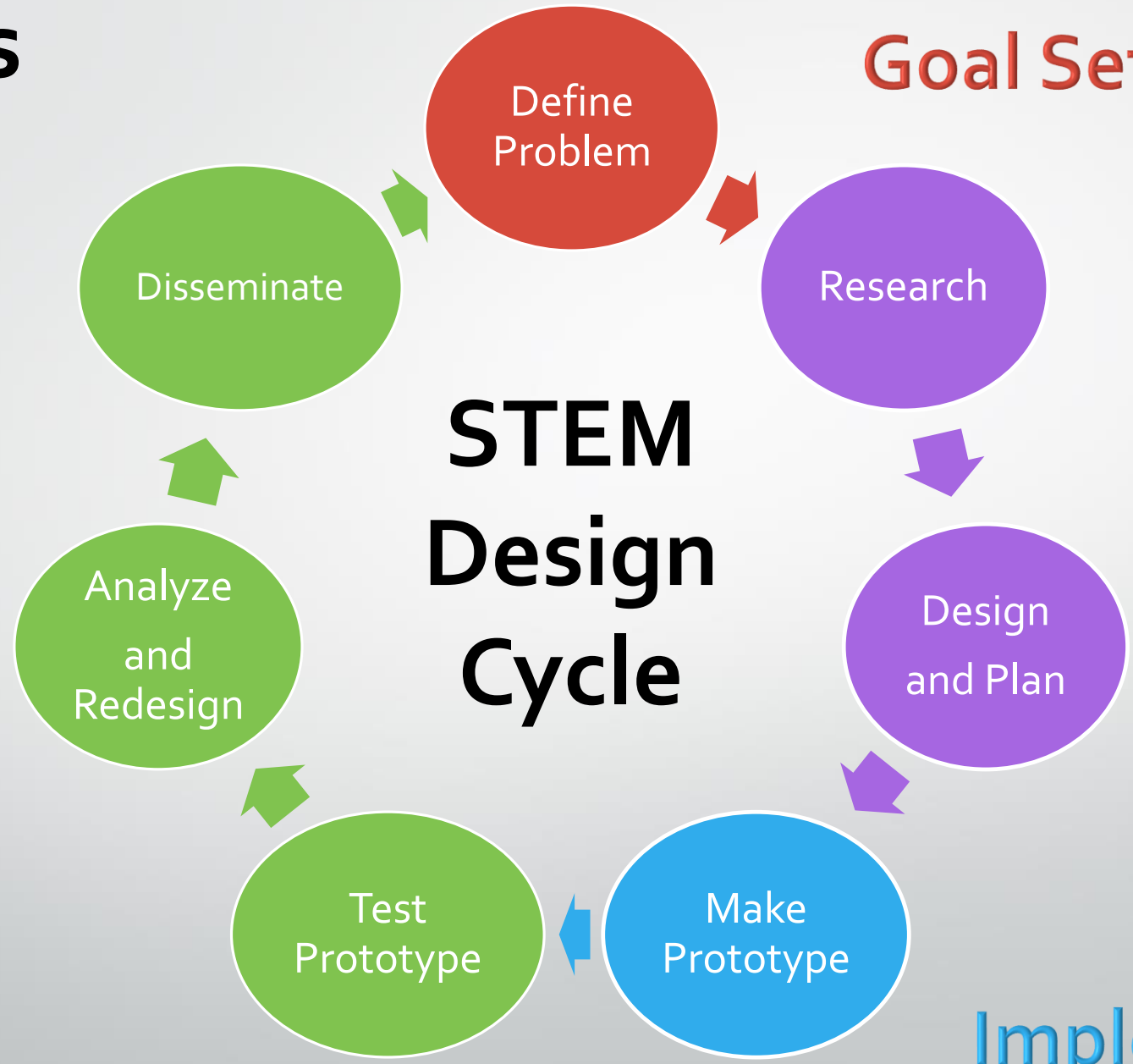
- Instant access to update the content of courses
- Add materials and resources for students for immediate access
- Tools: Posts wall, Announcement, E-calendar, Polling…

Using E-Platforms for SDL

Assess of Information and resources

- Centralize the lesson materials and be accessible for students anytime.
- Link up varies powerful learning tools to enhance the student learning
- Tools: Online Data Storage, Hyperlink, Plug-in function…

Stages of SDL



Goal Setting

Planning

Implementing

Reviewing, Evaluating, Reflecting

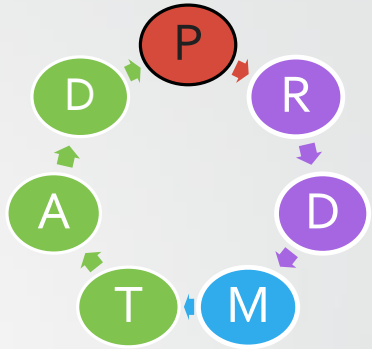
STEM Design Cycle

Instruction through PBL

Student Works

Features Provided by E-platform

Define Problem



Goal Setting

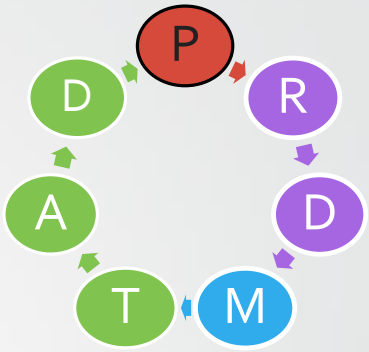
Instructions

- What do you understand about the problem?
- What are the criteria for the solution?
- What are the constraints in solving the problem?

Student works

- Set the goal for the project with self-reflection

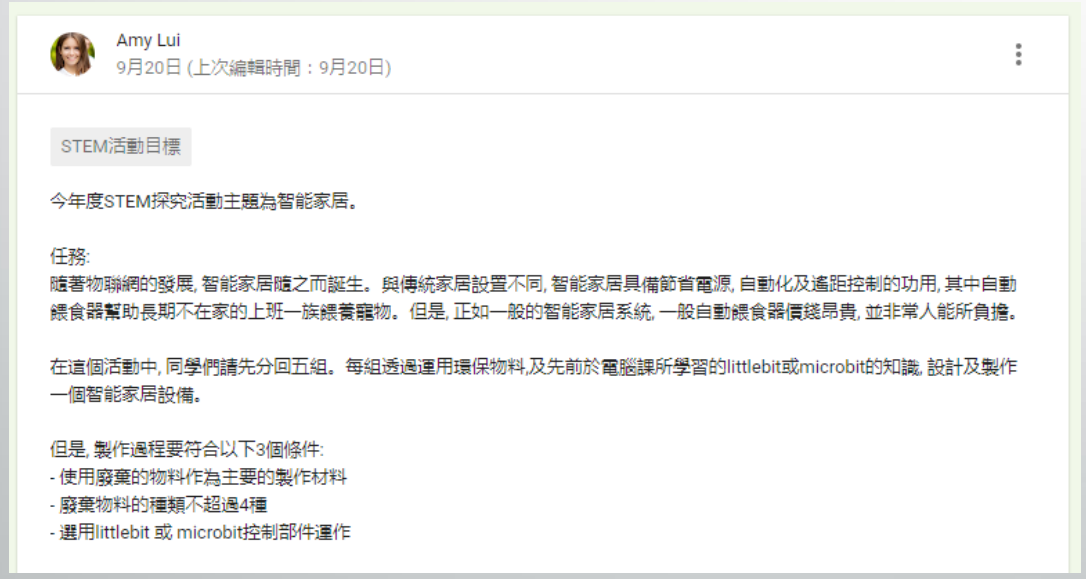
Define Problem



Goal Setting

Features provided by E-platform

- Posts Wall
- Online Questionnaire



Amy Lui
9月20日 (上次編輯時間：9月20日)

STEM活動目標

今年度STEM探究活動主題為智能家居。

任務:
隨著物聯網的發展, 智能家居隨之而誕生。與傳統家居設置不同, 智能家居具備節省電源, 自動化及遙距控制的功用, 其中自動餵食器幫助長期不在家的上班一族餵養寵物。但是, 正如一般的智能家居系統, 一般自動餵食器價錢昂貴, 並非常人能所負擔。

在這個活動中, 同學們請先分回五組。每組透過運用環保物料,及先前於電腦課所學習的littlebit或microbit的知識, 設計及製作一個智能家居設備。

但是, 製作過程要符合以下3個條件:
- 使用廢棄的物料作為主要的製作材料
- 廢棄物料的種類不超過4種
- 選用littlebit 或 microbit控制部件運作

問題 回覆

訂定目標

參考以老師給予的提示，思考一下你選擇的項目的行動計劃

你想達到甚麼？

長答案文字

你怎麼知道自己已經達到目標？

長答案文字

你可以怎樣達到目標？

長答案文字

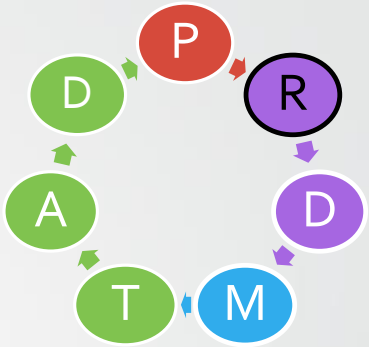
這個目標值得你努力去完成嗎？為甚麼？

長答案文字

你預計需要多少時間達到目標？

長答案文字

Research



Planning

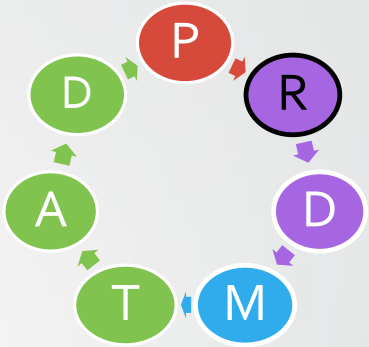
Instructions

- What do you know about how to solve the problem?
- What knowledge do you have that could help solving the problem?
- What New Knowledge do you have to learn?
- How could you learn the knowledge Required?

Student works

- Make a record of the information collected that are useful
- e.g. Scientific/ Engineering/ Mathematical Concepts, existing designs/ solutions in the form of photos, etc.

Research

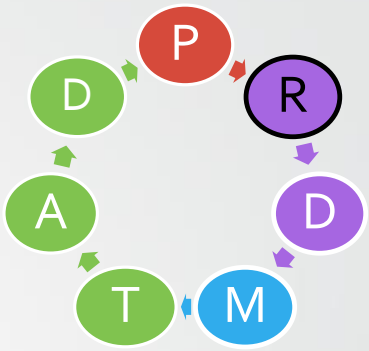


Planning

Features provided by E-platform

- Allow students to post the information to designated areas in the form of hyperlinks, pdf files, photos, videos, etc.
- Provide an additional channel for groupmates to share the information they have collected
- Allow the teacher to monitors students' progress and offer help if needed
- Allow teachers to provide supplementary information to students (in the form of hyperlinks, etc.)
- Allow students to consult the teacher when in need

Research

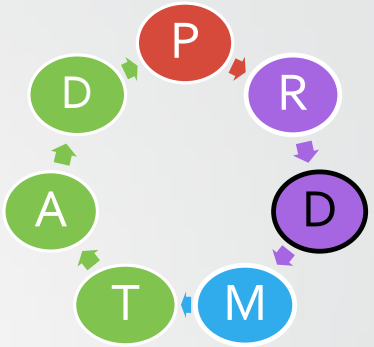


Planning

- Embedded Multimedia
- Open Learning Resources

Ref: https://simbucket.com/circuitbuilder/

Design and Plan



Planning

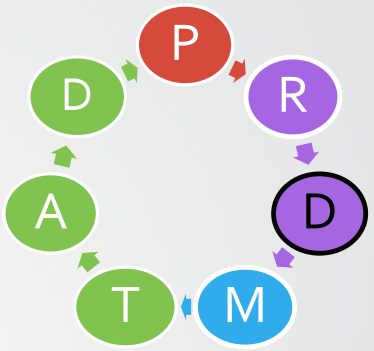
Instructions

- What ideas could you generate about the solution based on knowledge you have gained?
- How to pull together ideas in your group and come up with a feasible design?
- What does your design look like?

Student works

- Annotated drawings of the design (by individuals or groups)

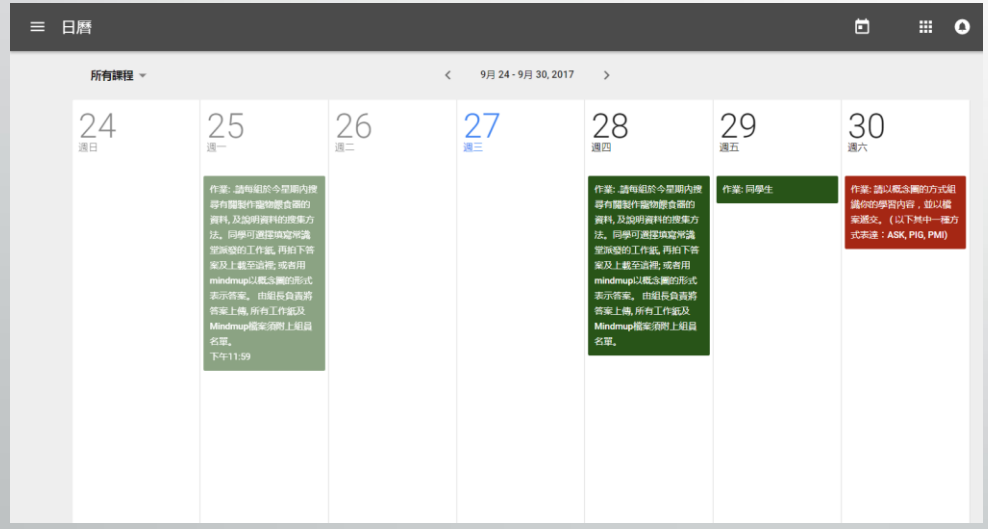
Design and Plan

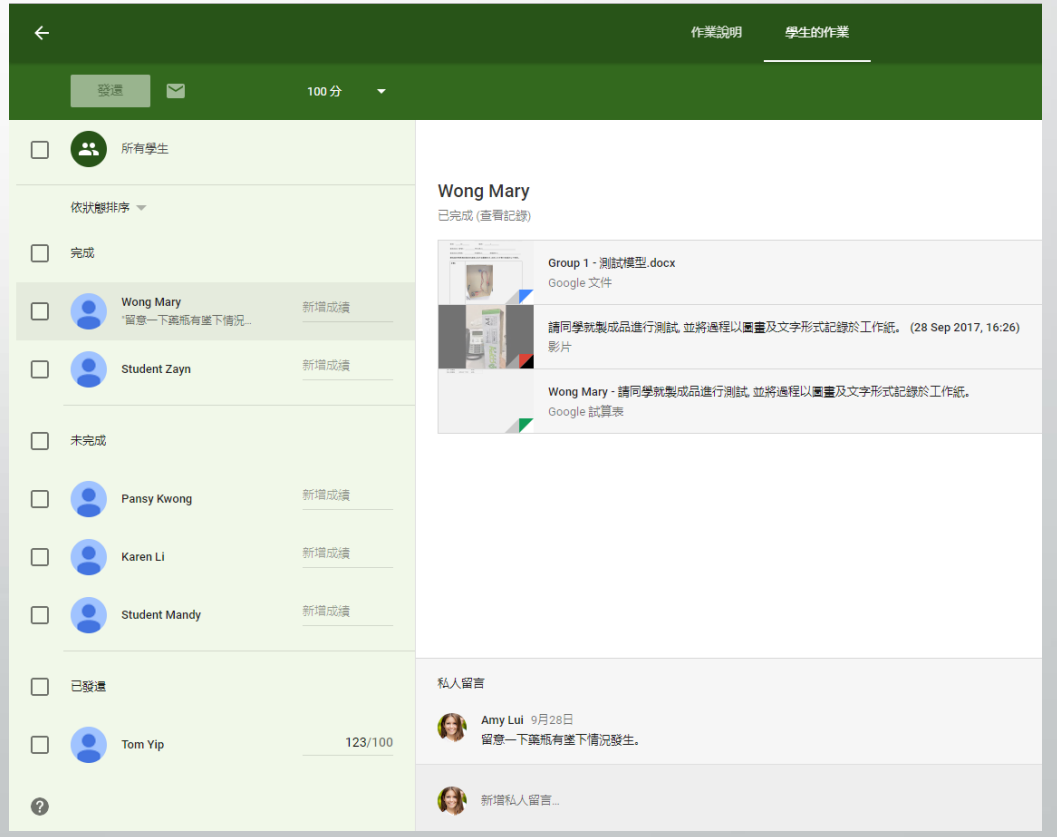


Planning

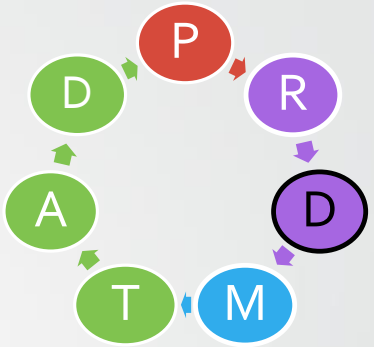
Features provided by E-platform

- Allow the teacher to monitor students' progress and offer help if needed
- E.g. E-Calendar, Online Feedback System





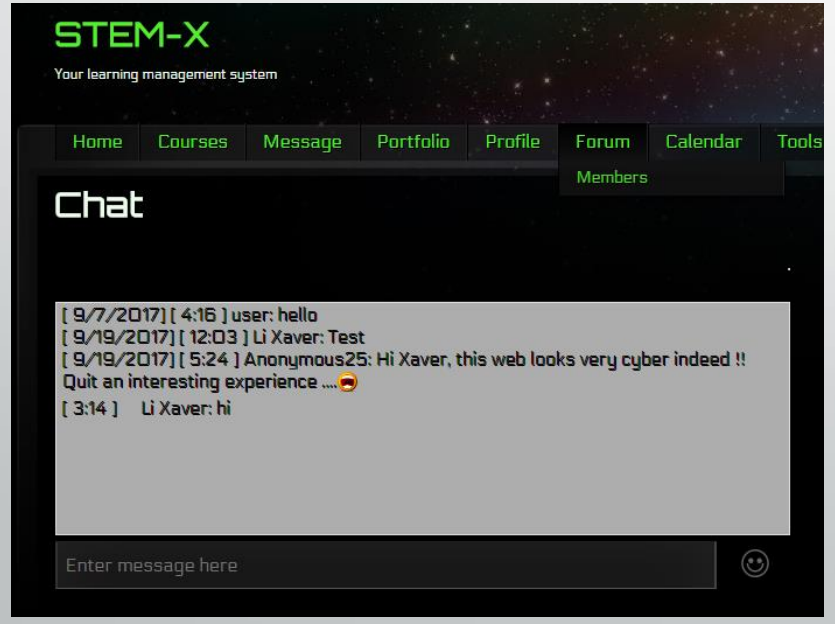
Design and Plan

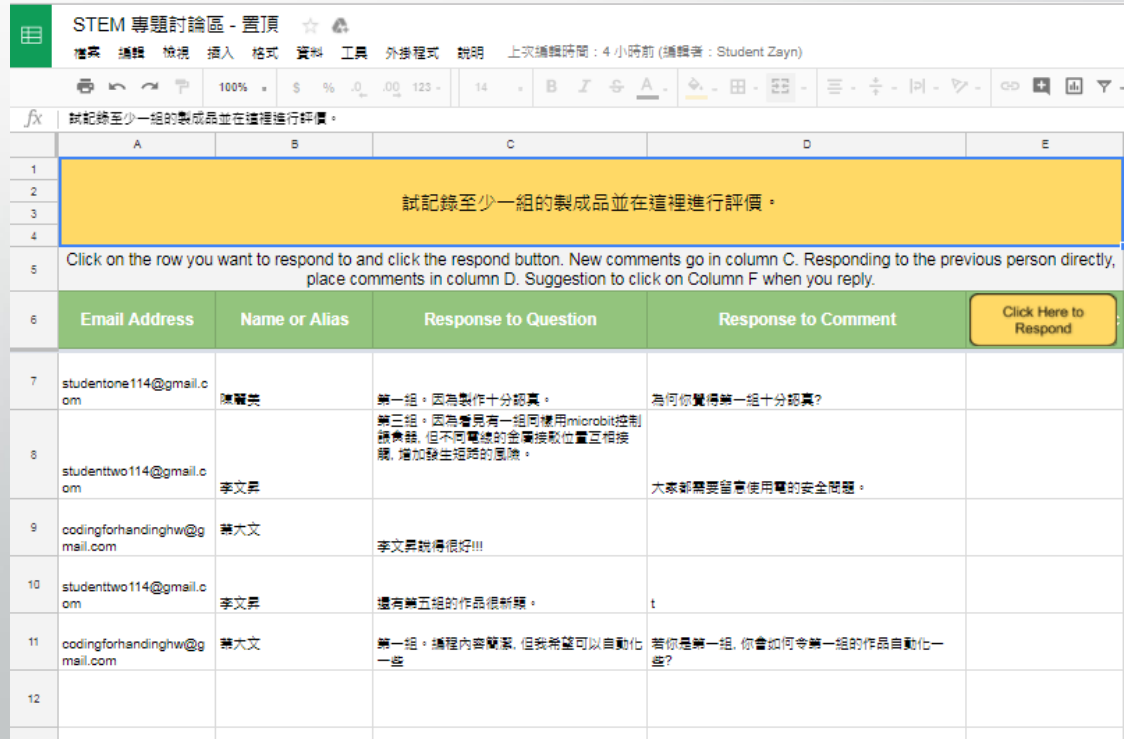


Planning

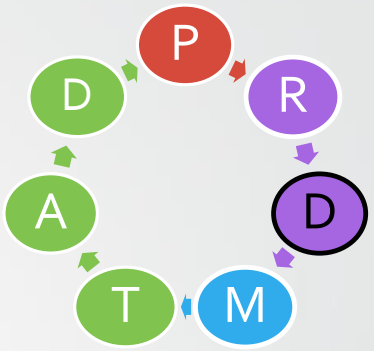
Features provided by E-platform

- Provide an additional channel for students to share their design ideas within the group
- Allow teachers to provide feedback on students' design
- E.g. Discussion forum, Co-working platform





Design and Plan



Planning

- E.g. File Upload, Peer Assessment Table

Peer Assessment_Electricity_Plan

File Edit View Insert Format Data Tools Add-ons Help All changes saved in Drive

100% HK$ % .0 .00 123 Arial 10

	A	B	E	F	G
1	Student Name	Files	Derek		
2	Amy	獵鷹X行動方針_Amy.docx	如果以聲音來傳遞訊號，會否讓敵方偵察到呢？		
3	Pansy	獵鷹X行動方針_Pansy.docx	設想很周全，而且能夠運用數學科的工具來處理問題		
4					

同儕互評表

題目：_____

班別：_____ 組別：_____

組長姓名(學號)：_____

組員姓名(學號)：_____

請每組同學參考其他組別的作品，並選擇其最少一組同學的製成品進行評價。同時，請思考一下如何優化自己組別的設計。

1. 試就一至三組同學的設計進行評價，並在下方作出紀錄。

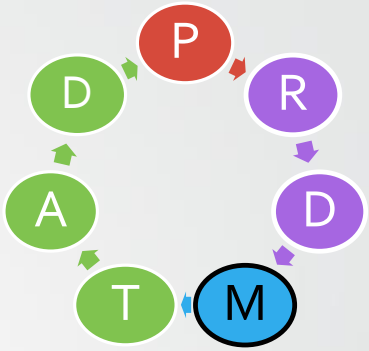
我們看過第____組的設計，因為：

	(評分，圈出分數，5為最高，1為最低)
配合科學原理程度	1 2 3 4 5
實用性	1 2 3 4 5
創意	1 2 3 4 5
安全性	1 2 3 4 5
容易操作度	1 2 3 4 5

及第____組的設計，因為：

	(評分，圈出分數，5為最高，1為最低)
配合科學原理程度	1 2 3 4 5
實用性	1 2 3 4 5
創意	1 2 3 4 5
安全性	1 2 3 4 5
容易操作度	1 2 3 4 5

Make Prototype



Implementing

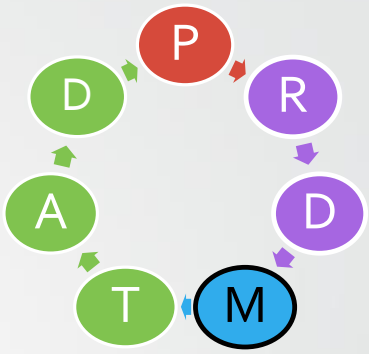
Instructions

- What Resources/materials/tools/instruments do you need to turn the design into a prototype?
- How to get those resources, etc?
- If these Resources are not available, what alternatives will you use?

Student works

- Annotated prototype made by students (in the form of photos, videos showing how the prototype operates)

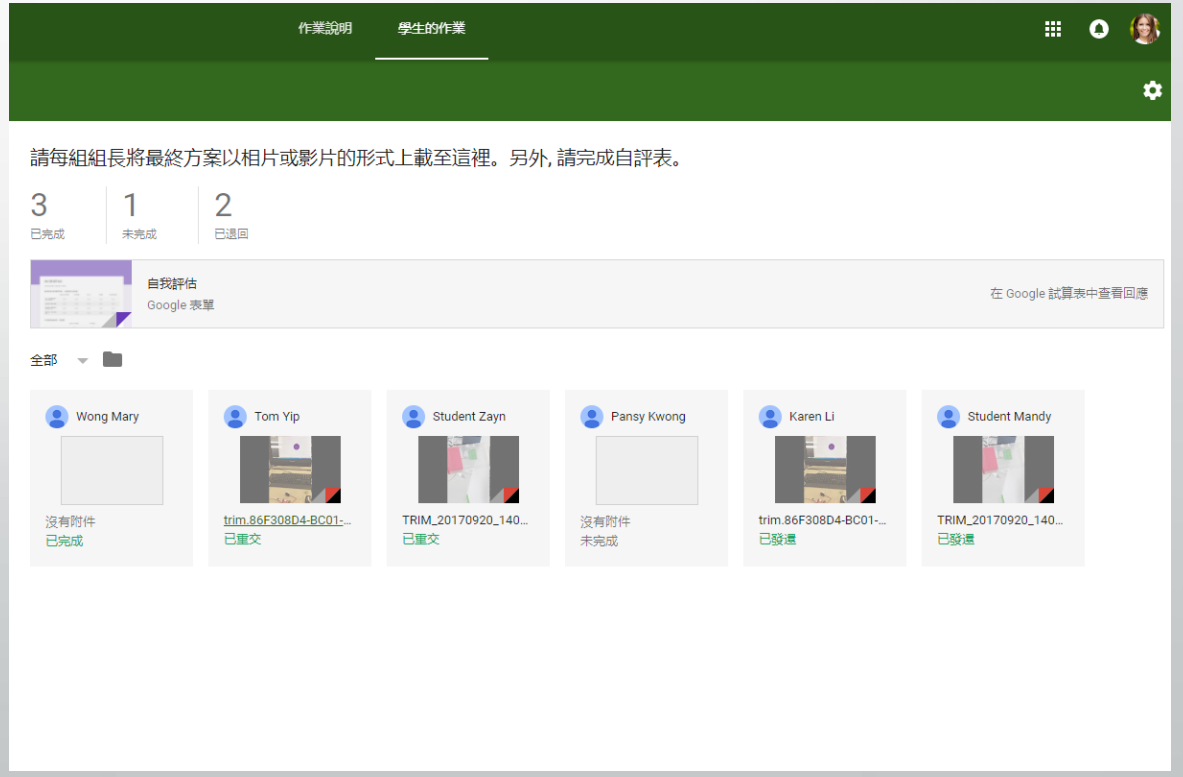
Make Prototype



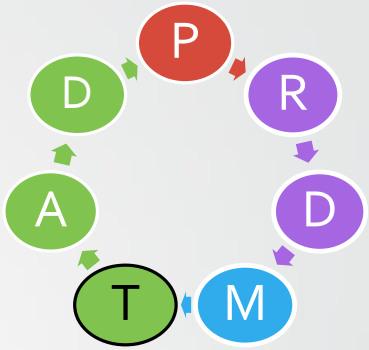
Implementing

Features provided by E-platform

- Allow students to embed videos to explain how their prototype operates



Test Prototype



Reviewing, Evaluating and Reflecting

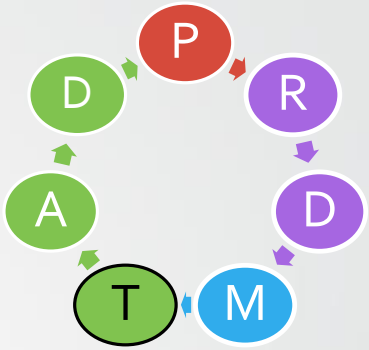
Instructions

- How to test the effectiveness of the prototype against the criteria?
- What parameters do you need to measure?
- How to Measure? What measuring instruments should be used?
- How to present the results?

Student works

- Result of the tests in the form of tables, charts, etc.

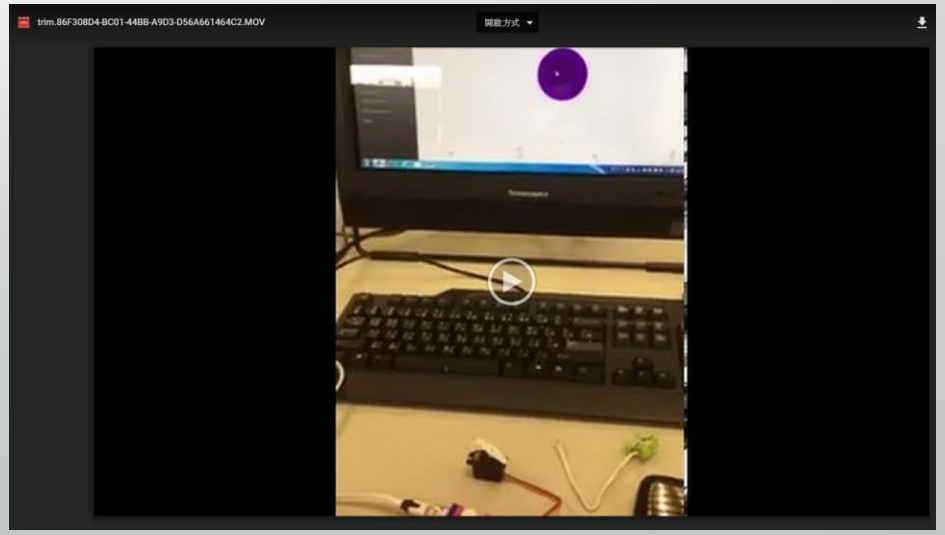
Test Prototype



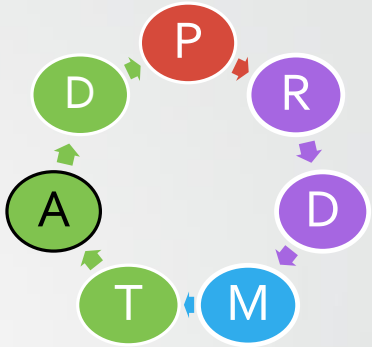
Reviewing, Evaluating and Reflecting

Features provided by E-platform

- Allow students to present charts other than tables or hand-written results
- If videos on how the prototype works are uploaded by students, teachers could cross the validity of their results



Analyse and Redesign



Reviewing, Evaluating and Reflecting

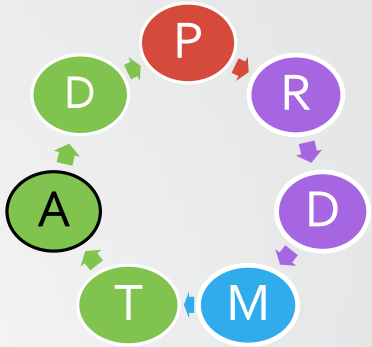
Instructions

- What do the results tell you about the effectiveness of your solution to the problem?
- Do you think the results are accurate and reliable?
- How to improve your prototype?
- Do you need to change part of the design (e.g. the materials used) or the whole design concept?
- Do you need to do further research before redesigning?

Student works

- Drawing of revised/ new design
- Prototype of revised/ new design
- Results of the tests

Analyse and Redesign

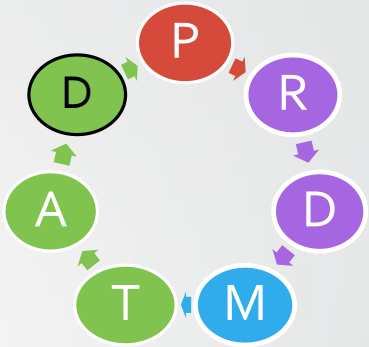


Reviewing, Evaluating and Reflecting

Features provided by E-platform

- Allow students to present charts other than tables or hand-written results
- If videos on how the prototype works are uploaded by students, teachers could cross the validity of their results

Disseminate



Reviewing, Evaluating and Reflecting

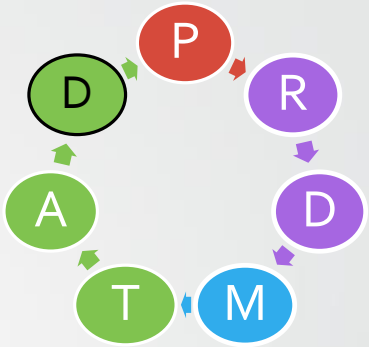
Instructions

- What is your purpose of dissemination of your work?
- How do you disseminate your result?

Student works

- Group presentation
- Self-evaluation questionnaire
- Reflective journal

Disseminate

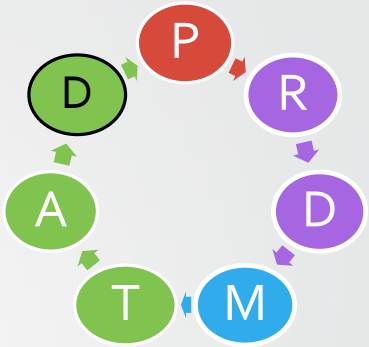


Reviewing, Evaluating and Reflecting

Features provided by E-platform

- Allow students to generate personalized e-portfolios for presentation to other classmates
- The e-portfolio can serve as a record of students process of learning
- Provide an alternative channel for student to share their work with other classmates

Disseminate



Reviewing, Evaluating and Reflecting

E-Portfolio

- Sample 1
- Sample 2
- Monitoring Platform


王麗美 STEM E-Portfolio

我是王麗美，今年就讀光明小學四年級。這個博客是一個電子學習歷程檔，記載了這幾年我的學習成果及經歷 ^_^

2017年5月26日 星期二

STEM活動一智能家居5

成品及反思

根據上次的測試，以及組員的意見，大家最終都成功製作了一台能順利轉動的瞄哺器。真的要鳴謝每位組員的支持，包括英明神武的李文昇組長，同我同名同齡的陳麗美，更加要多謝雷老師的鼎力相助及指導。我很喜歡這類型的課程，因為老師給予很大的空間給我們，各位同學亦可以按自己的時間來完成不同的任務。一個字，非常好！

製成品的影片

最後，雷老師叫我們想一想在這個活動中學習甚麼，我便用了雷老師教過的PMI模型，以及運用網上的Mind Map 工具來組織我的學習內容：

WHAT WE LEARNED!

關於我自己

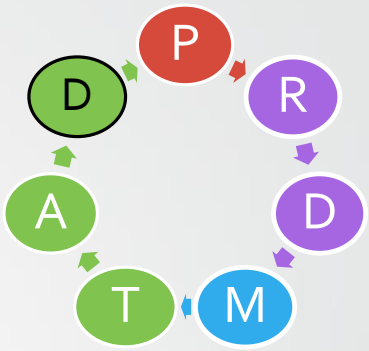
Wong Mary

檢視我的完整簡介

檢舉濫用情形

- 首頁

Disseminate

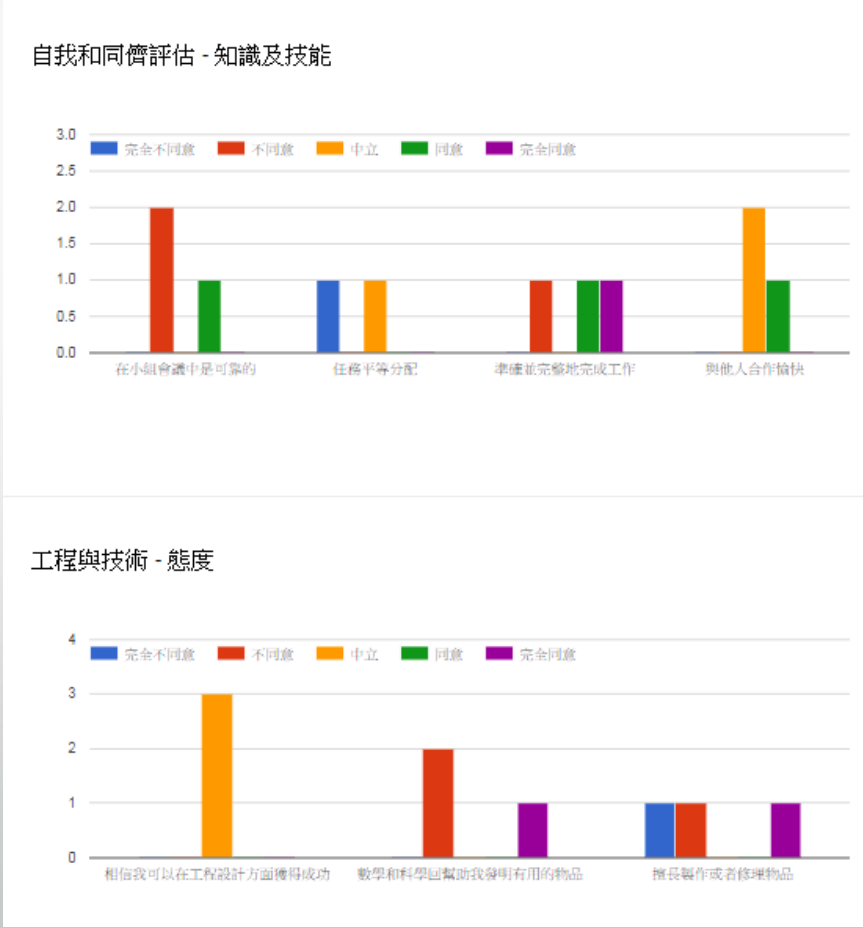


Reviewing, Evaluating and Reflecting

Features provided by E-platform

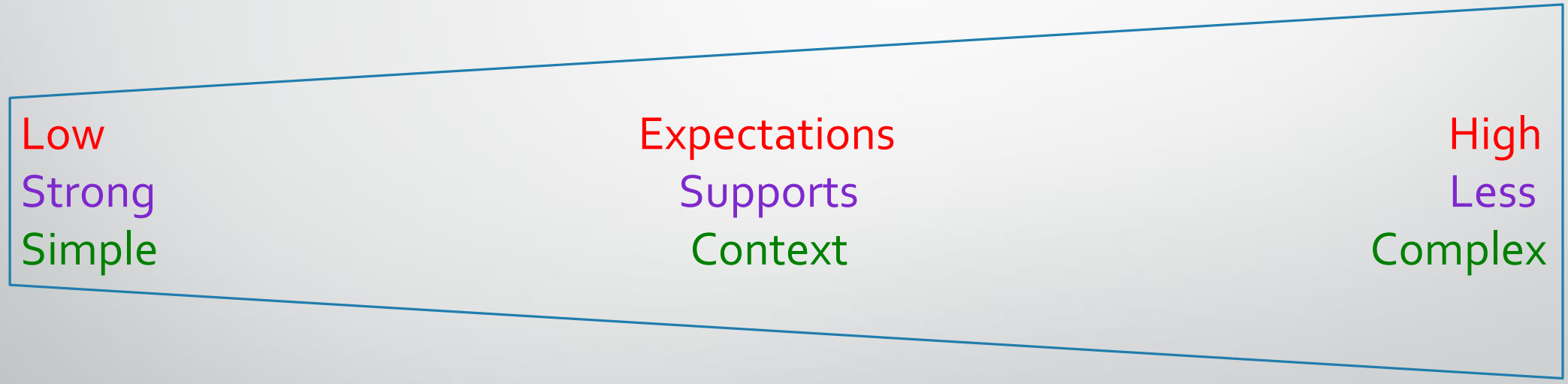
- Allow for statistical analysis

of the outcomes of students' self-evaluation for the whole class



Self-direction Learning across School levels

- Self-direction learning should be developed on a continuum:



Example

Take STEM project "Smart Home" as an example, the progression of self-directed learning is suggested as follow:

Level	Elementary	Intermediate	Advanced
Complexity	Specific topic e.g. DIY security	Broad topic e.g. Smart Home Design	Interdisciplinary Project studies e.g . Research on age-firendly city and innovative home design
Duration	1-2 week activity	1 month mini-project	6 months project
Voice & Choice	A assigned task with different choices of solutions	List of Choices e.g. Leak detectors, thrmostats, lighting system	Student frames project with teahcer as advisors
Management	Student manage teacher-framed tasks	Students manages project with daily/weekly checking	Student management project with several advisior consultations

Other advantages of using E-platform to assist in self-directed learning in STEM contexts

For Teacher

- Track and monitor students' progress over the project period
- Facilitate interaction between Teacher and Students in the form or Q&A and provision of feedback or information
- Allow for statistical analysis of data
- Showcase e-learning in the school

For Students

- Monitor own progress over the project period
- Enjoy collaboration among group-mates
- Personalize own work in the form of e-portfolios
- Develop ICT competencies and capability of e-learning

Concerns of using e-platform

- Motivation Issues
  - Embedding reward systems, such as ranking, Badges, etc
- System Problems
  - School can choose their platform, and get support from EdUhk
- Technical Issues
  - E-platform set up Guide and support will be provided
- Time Limitation
  - Need time in practice, but save time in using
- Teaching and Learning Culture/School Culture
  - Form a team in school to lead the change

Setting up E-platforms and exemplars