

Knowledge Building Principles (2)

Improvable ideas All ideas from students are treated as improvable

Students work continuously to improve the quality, coherence, and utility of ideas. The learning culture must make students feel safe and comfortable to take risks in revealing ignorance, voicing half-baked notions, giving and receiving criticism.

所有的概念與想法皆可改進

學生的**概念和想法皆被視為可改進**的。學生需要持續改進他們的想法和概念，以提升這些想法和概念的質素。在這樣的學習過程中，學生要**經歷一些挑戰**，包括要勇於發表未完善的意見、要面對別人對自己的意見的批判。因此學習的文化必須讓學生感到安全，能自在地表達自己。

Knowledge Building Principles (3)

Idea diversity

The diversity of ideas raised by students is essential to the development of knowledge advancement. To understand an idea is to understand the ideas that surround it, including those that stand in contrast to it. Idea diversity creates a rich environment for ideas to evolve into new and more refined forms.

多元化的意念與想法

學生提出**多元化的意念和想法**，正是知識進深的必要過程。我們要了解一個概念，就必須了解所有與之相關的概念，當中也包括與之相反的概念。一個充滿多元化的意念和想法的學習環境，**能有效促進概念的進化**，達至更新和更高的層次。

Knowledge Building Principles (4)

Rise above

Through working with growingly diverse and complex problems, students sustainably improve their ideas and understanding. They eventually achieve new syntheses, more inclusive principles and higher level concepts.

自覺提昇討論層次，開展更深入的討論方向

通過愈來愈**多元化和複雜的討論**，學生**持續改進**他們的想法及對知識的理解，逐漸能**綜合知識**，**創建出新的理論**，學習到更廣泛的原則和更高層次的概念。

Knowledge Building Principles (5)

Epistemic agency

Students themselves actively find their way to knowledge advancement. They fully consider the various ideas given by the learning community and negotiate a fit between each others' ideas. They set their own learning goals and plans, be self-motivated and engage in evaluation by themselves.

自覺參與主導知識建構的過程

學生**主動尋找提升知識的方法**。他們充分考慮知識建構群體提出的各種意念和觀點，並**互相協商尋求適切的結論**。他們自主地訂立學習目標和計劃，主動參與並作出自我評估。

Knowledge Building Principles (6)

Community knowledge, collective responsibility

Students' contributions to shared goals of the learning community are prized and rewarded as much as individual achievements. Team members produce ideas of value to others and share responsibility for the overall advancement of knowledge in the community.

共有的知識，集體對認知負責

學生對群體的**共同學習目標**作出貢獻。**個人對群體的貢獻**會如個人的學習成就一樣，得到同等的重視和表揚。作為知識建構群體的成員，學生提供對群體的學習有價值的意見，並共同承擔令群體知識進升的責任。

Knowledge Building Principles (7)

Democratizing knowledge

All individuals are invited to contribute to the knowledge advancement in the classroom and take pride in the achievement.

創建新知民主化

所有學生不論成績能力參差都能參與知識提升的過程，並因為參與創建新知而值得驕傲。

Knowledge Building Principles (8)

Symmetric knowledge advancement

Expertise is distributed within and between communities. Symmetry in knowledge advancement results from knowledge exchange and from the fact that to give knowledge is to get knowledge.

知識上的共同增長

一個知識建構群體內的各成員或各個不同的群體都擁有各自的專門知識。當他們將自己的知識分享和交換，就能得著共同的知識增長。

Knowledge Building Principles (9)

Pervasive Knowledge building

Knowledge building is not confined to particular occasions or subjects but pervades mental life— in and out of school.

不受時空限制建構新知

知識建構不受特定的情況或科目所局限。無論在校內或校外，知識的**建構滲透在日常生活中**。

Knowledge Building Principles (10)

Constructive uses of authoritative sources

To support their learning, learners need to respect and understand authoritative sources to get in touch with the present state and growing-edge of knowledge with a critical attitude.

有建設性而不盲目地利用權威文獻

學生需要以批判性的角度，關注和理解具權威性的文獻，從中接觸一些知識的現狀及它們的最新發展

Knowledge Building Principles (11)

Knowledge building discourse

Students are engaged in discourse to share, refine and transform knowledge to reach for the goal of knowledge advancement.

以建構新知為目的的討論

學生參與討論不單為了分享交流，他們還要改善和革新他們的想法，達至建構新知的目的。

Knowledge Building Principles (12)

Embedded and transformative assessment

Assessment is part of the effort to advance knowledge—it is embedded in the day-to-day learning process and used to identify problems as the learning proceeds. The community creates and engages in its own internal assessment, which is more fine-tuned and rigorous than external assessment.

評估嵌進知識建構的過程中，以提升和改進群體為目標的

評估是促進知識增長的重要元素。評估應包含在每天的學習過程中，用以識別出學習進行期間出現的問題。

學習群體自主地設計和參與內部評估。這樣的評估比外界的評估更加適切和準確。

2. Classroom Physical Settings, Environment and Student Grouping for CPS



2. Classroom Physical Settings, Environment and Student Grouping for CPS

討論：

你是如何進行協作解難（CPS）能力的相關教學活動？

1. 活動性質
2. 分組佈置（場地設定）
3. 分組策略（組員安排）

2. Classroom Physical Settings, Environment and Student Grouping for CPS

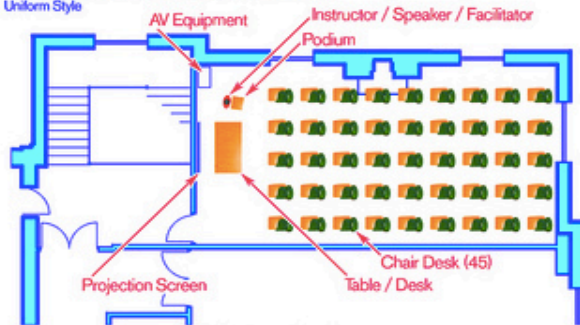
Classroom Seating Styles

Educational Spatial Planning

Seating plans for a 20x40 foot [6x12 meter] classroom with 45 chair desks, podium, table, ceiling-mounted projector and projection screen.

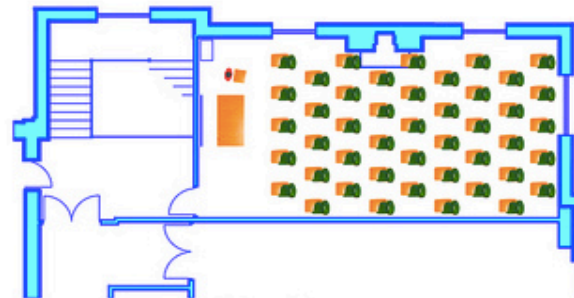
Traditional Classroom

Uniform Style



Advantages: Simplicity, Access & Familiar
Disadvantages: Visibility, Personal Space & Instructor/Student Proximity
Sense of Place: "Assembly Line" "Factory"

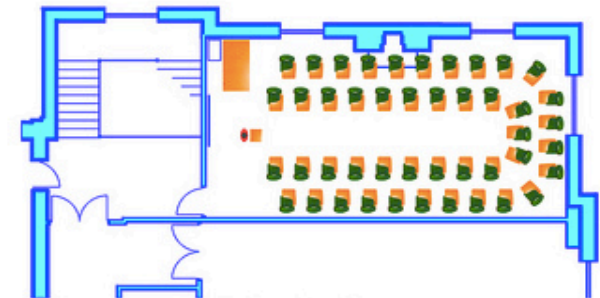
Offset Traditional Classroom



Advantages: Visibility, Personal Space
Disadvantages: Complexity, Access, Unfamiliarity, & Instructor/Student Proximity
Sense of Place: "Network" "Diagonal Grid"

Dialogue Classroom

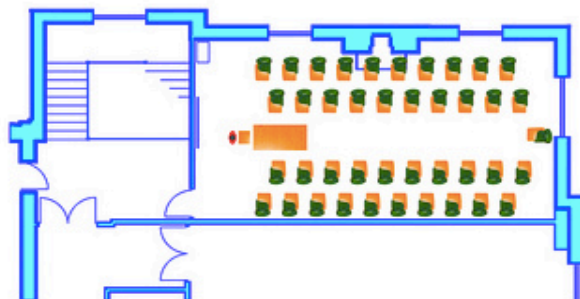
U-shape Style



Advantages: Visibility, Personal Space & Engagement
Disadvantages: Complexity, Access, & Instructor/Student Proximity
Sense of Place: "Conference" "Committee"

Debate Classroom

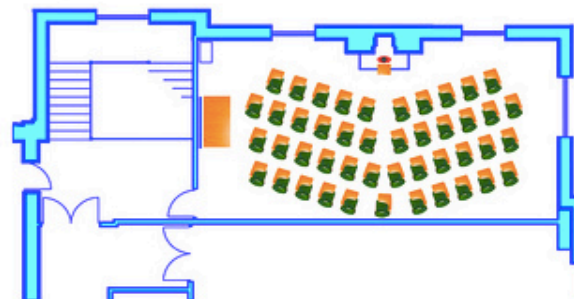
Arbitration Style



Advantages: Visibility, Personal Space & Engagement
Disadvantages: Polarizing, Instructor/Student Proximity
Sense of Place: "Confrontation" "Trial"

Forum Classroom

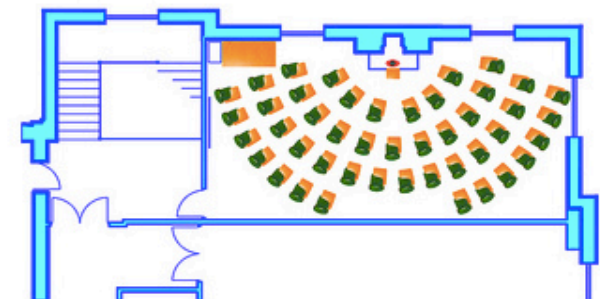
Chevron Style



Advantages: Visibility, Personal Space, Focus & Instructor/Student Proximity
Disadvantages: Complexity, Access & Polarizing
Sense of Place: "Senate" "Congress"

Oratory Classroom

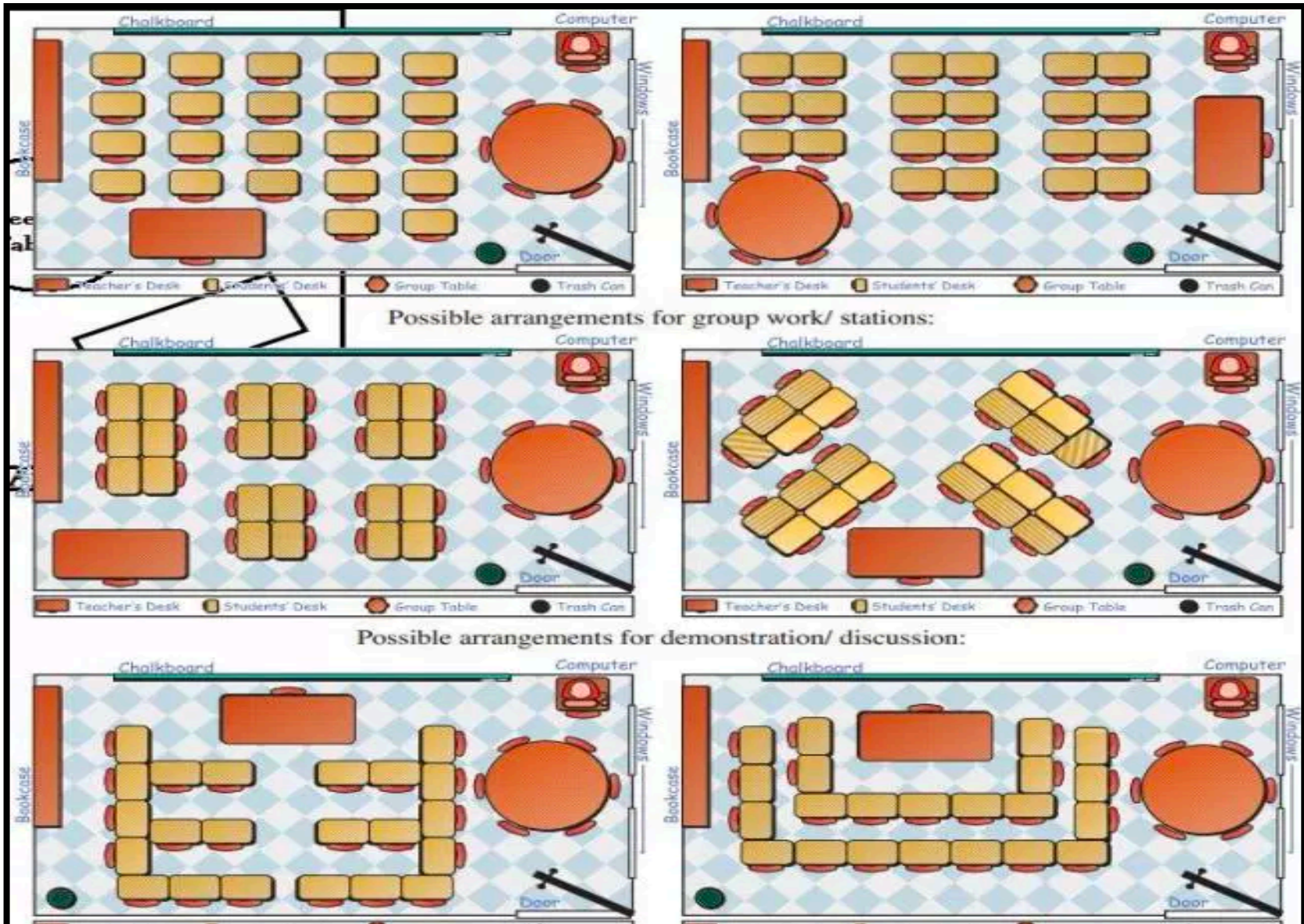
Theater Style



Advantages: Visibility, Personal Space, Focus & Instructor/Student Proximity
Disadvantages: Complexity & Access
Sense of Place: "Theater" "Stage"



2. Classroom Physical Settings, Environment and Student Grouping for CPS



2. Classroom Physical Settings, Environment and Student Grouping for CPS

- The 'collaborative' situation is a kind of **social contract**, either between the peers or between the peers and the teacher (then it is a didactic contract).
- This contract specifies conditions under which some types of interactions may occur, there is **no guarantee they will occur**.



2. Classroom Physical Settings, Environment and Student Grouping for CPS

- For instance, the 'collaboration' contract implicitly implies that both learner **contribute** to the solution, but this is often not the case.
- Conversely, reciprocal tutoring (Palincsar and Brown, 1984) could be called 'a method', because subjects follow a scenario in which they have to perform particular types of interaction at particular times. (Dillenbourg (1999:5))



2. Classroom Physical Settings, Environment and Student Grouping for CPS

異質分組 (heterogeneous grouping)

- 在教學上對於群體學生的分組，很重要的是要以學生學習的獲益為優先考量。
- 不同的分組結構對於整體情境的學習脈絡，提供不同的可能和挑戰，也會造成學生不同的學習機會。
- 因此教師在實施分組時，應注意與教學目標作緊密連結，作彈性適切的分組。而群體成員的組成，以及群體的活動規劃，除了依據教學目標的指引外，若能關注於學生學習的需求，即能把學習效能最大化。

2. Classroom Physical Settings, Environment and Student Grouping for CPS

異質分組 (heterogeneous grouping)

整體而言，進行群體分組時，要思考的面向有三：

1. 要創造**合作性**分組或**競爭性**分組（或結合兩者）？
2. **小組規模**為何
（是否要有個體活動、成對行動，小群體或大群體）？
3. 群體要作**同質分組**或**異質分組**？

在對學生進行分組時，基於許多不同因素考量，**如年齡、興趣、學業能力、社會背景、體力、學習風格**等。

在小組規模方面，由於**同儕互動品質**與其**學習成效**有著正相關的連結，因此為了使小組成員有著良好的互動效果，小組**人數不宜過多**，以免有些成員被邊緣化，至於確切的小組人數則視教學活動設計而定

2. Classroom Physical Settings, Environment and Student Grouping for CPS

異質分組 (heterogeneous grouping)

教學上的分組方法，王岱伊在2002年指出常用的四種：

- (1) 學生自行選擇合適的組員
- (2) 隨機組隊－用抽籤或電腦選員組隊
- (3) 互補組隊－將特質不同的學生編為同一組
- (4) 平衡組隊－設定組員角色，使每組都符合該角色分佈

教師在計畫教學的分組時，如何選擇分組依據、小組人數和分組方法，很重要的是要謹慎思考群體的構成，以及對所有學生的可能效果。

2. Classroom Physical Settings, Environment and Student Grouping for CPS

異質分組 (heterogeneous grouping)

- 異質分組可就學生的**學習成就**，或從學生本身的**特質和屬性**加以編組。
- 異質分組策略之一是「**最大混合**」(max mix) 策略－小組成員在許多層面是以最大差異的方式來組成。
- 許多學者研究指出，進行合作學習分組時，應使小組作異質性的組成；其異質性可包括三方面：**學習能力和成就**、**學習動機和行為表現**，以及**學生特質**。
- 把高能力和低能力學生合併一起作異質分組時，藉由高能力學生的協助和示範，引導低能力學生跨過學習障礙，因此，**高能力學生的學習和參與度會提高**，**低能力學生的學習表現也會比獨立學習更為良好**，結果使兩者同時提升其學習成效；其中同組成員須作最大差異性分組，才是最佳化的異質分組。

3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment (無線網絡環境) and Cloud-based Technology (雲端應用技術) to Enhance Collaborative Learning



3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

XXX XXX XXX 學校 201?



3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

Discussion:

1. Discussion on available choices and measures
學校有那些良好的案例，有關善用無線網絡環境及
移動學習裝置，配合雲端應用技術，推動電腦為本
的協作解難(CPS)能力
2. Discussion on the future trend and how school
and teachers could prepare for it.
將來的科技會怎樣影響學習模式？
老師要如何準備自己？



3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

如何量度學校 eLearning 發展？



A. 設備及網絡基建

B. 電子教材及內容

C. 電子學習管理平台

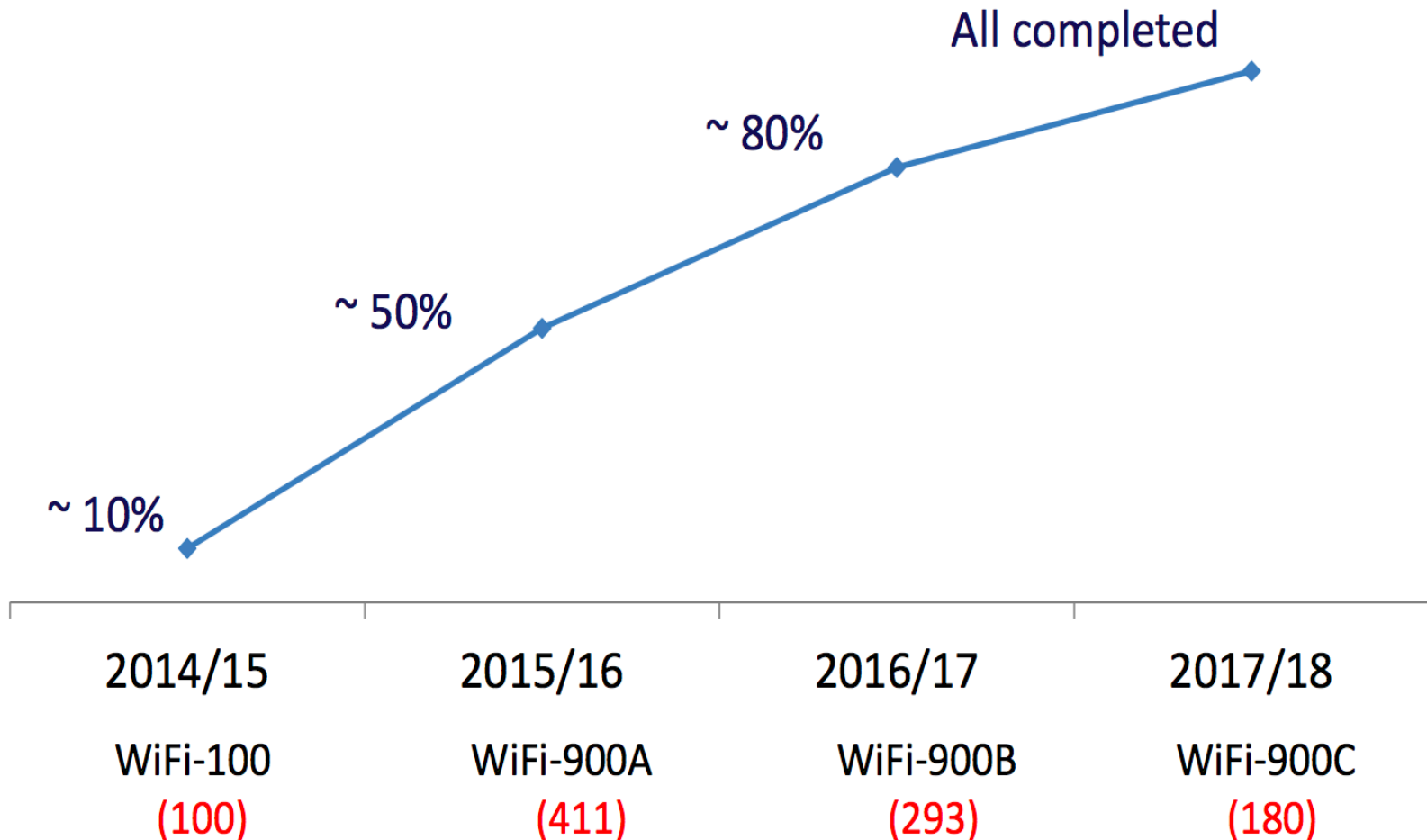
D. 學生自主學習態度

E. 老師教學範式轉變

F. 學校資訊科技領導

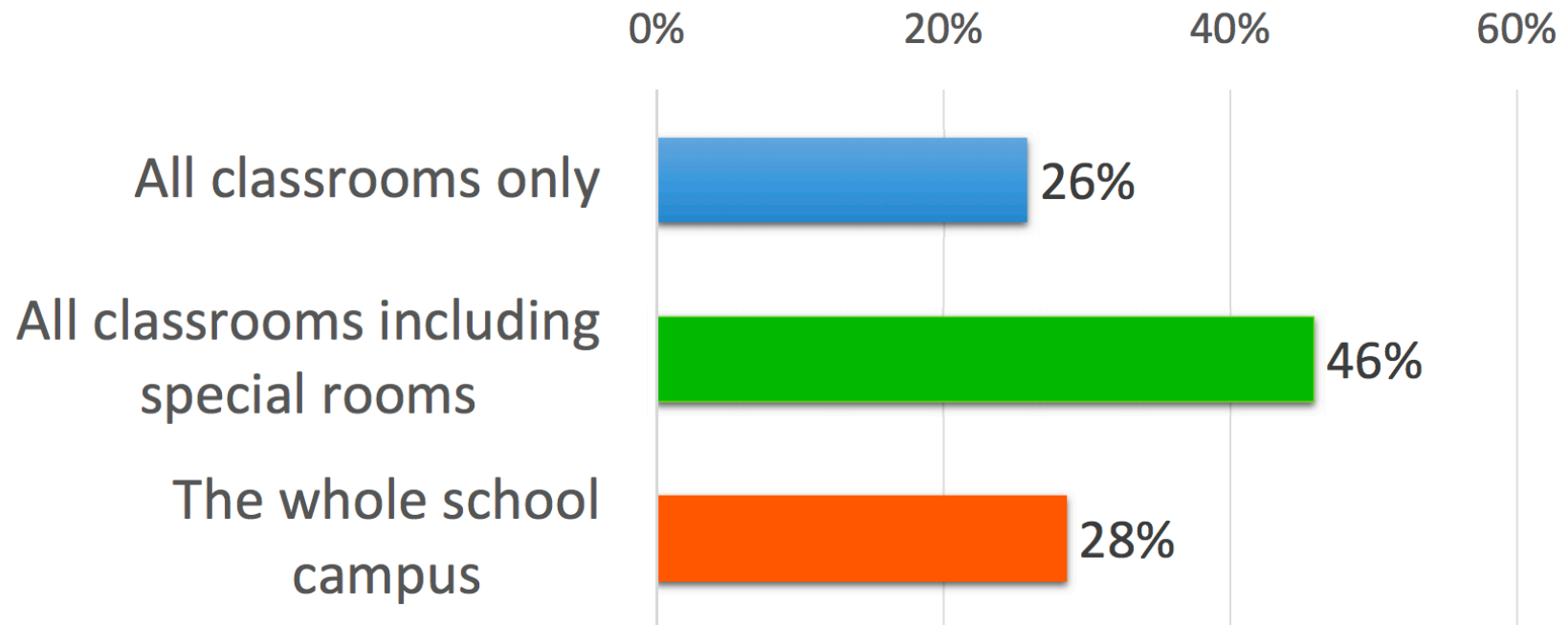
3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

Schools with enhanced WiFi



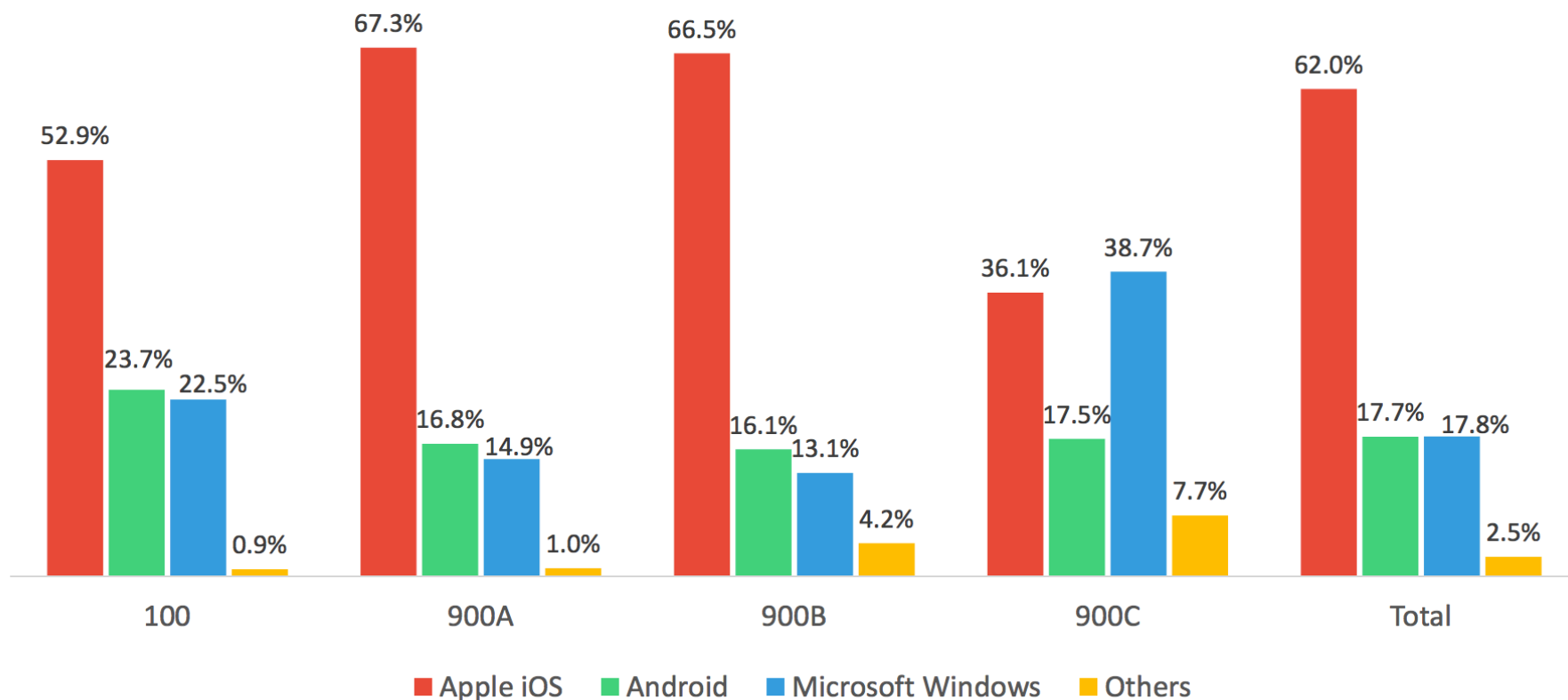
3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

School areas covered with WiFi (WiFi 100 and WiFi 900A)



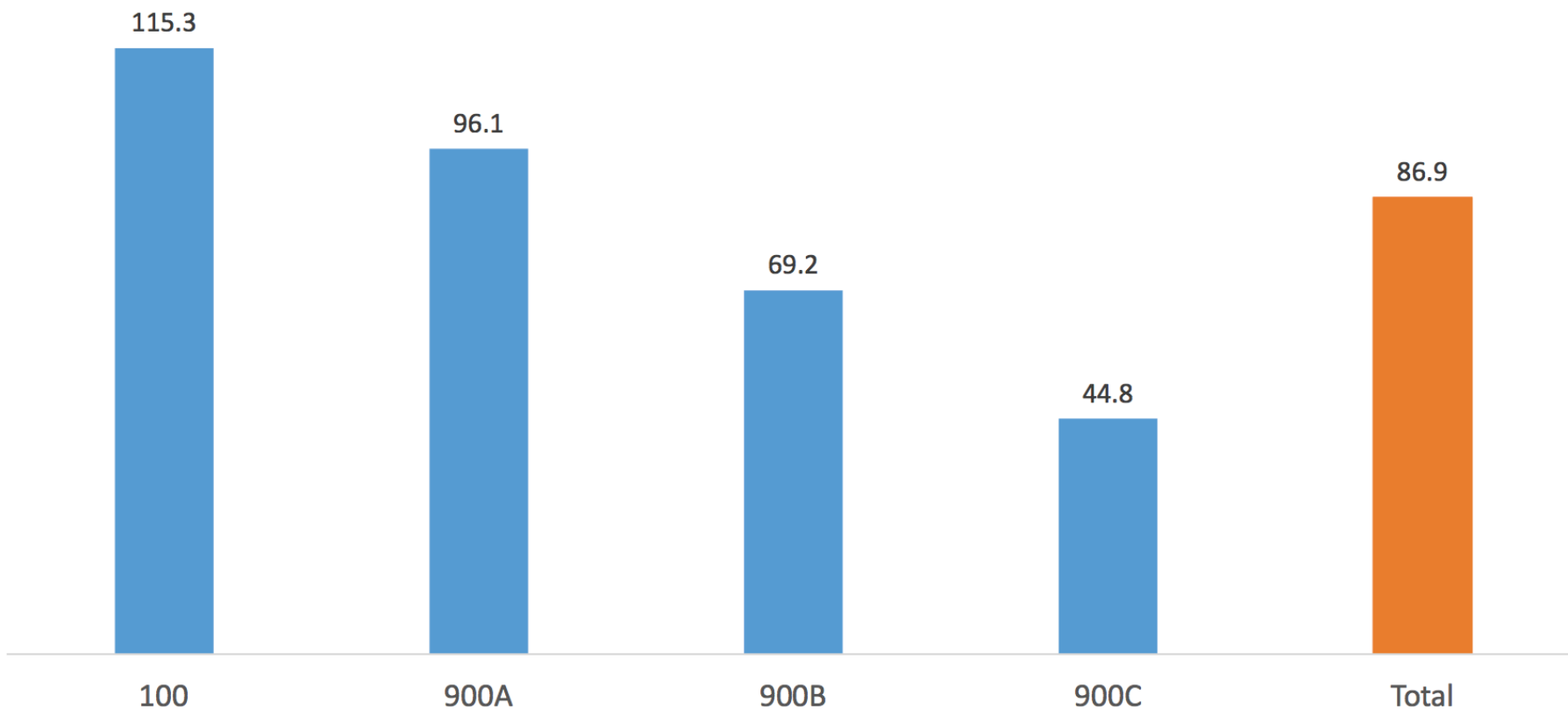
3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

學校流動裝置的操作系統



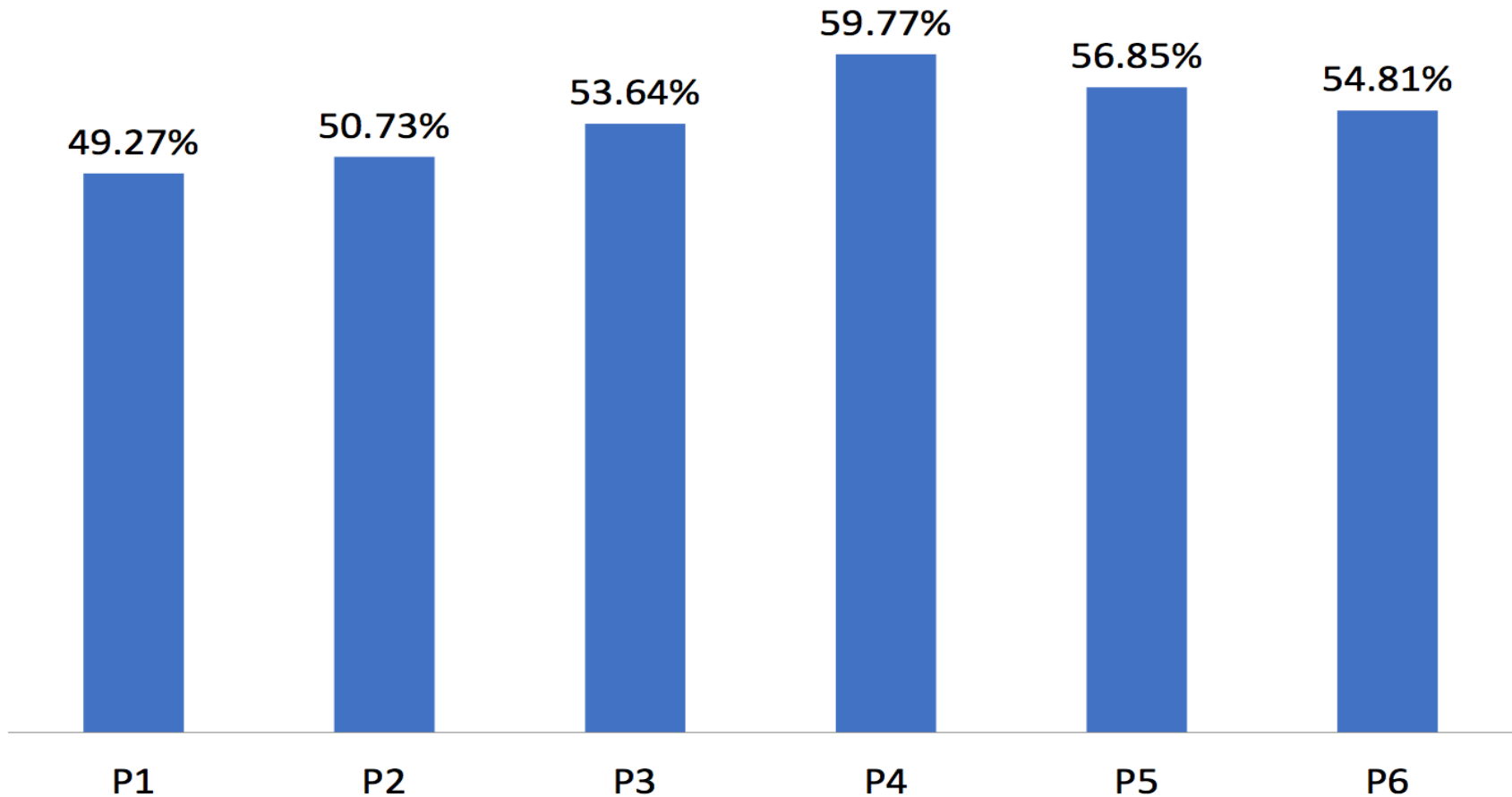
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學校擁有流動裝置的平均數量



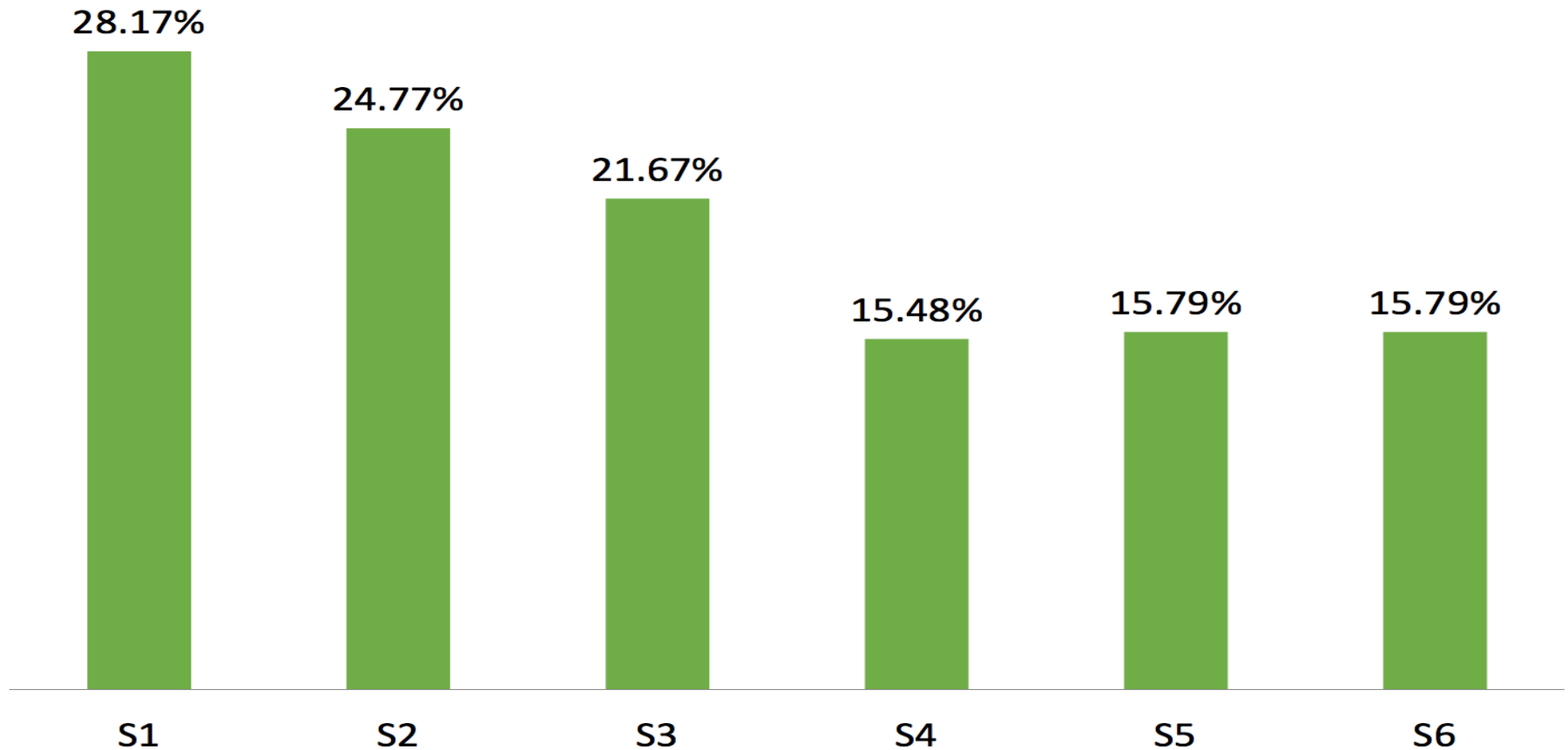
3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

使用電子教科書（小學）



3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

使用電子教科書（中學）



3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

學校的 BYOD 平均班數



WiFi100
11.7 班



WiFi900A
9.0 班



WiFi900B
7.6 班

WiFi900C
0 班



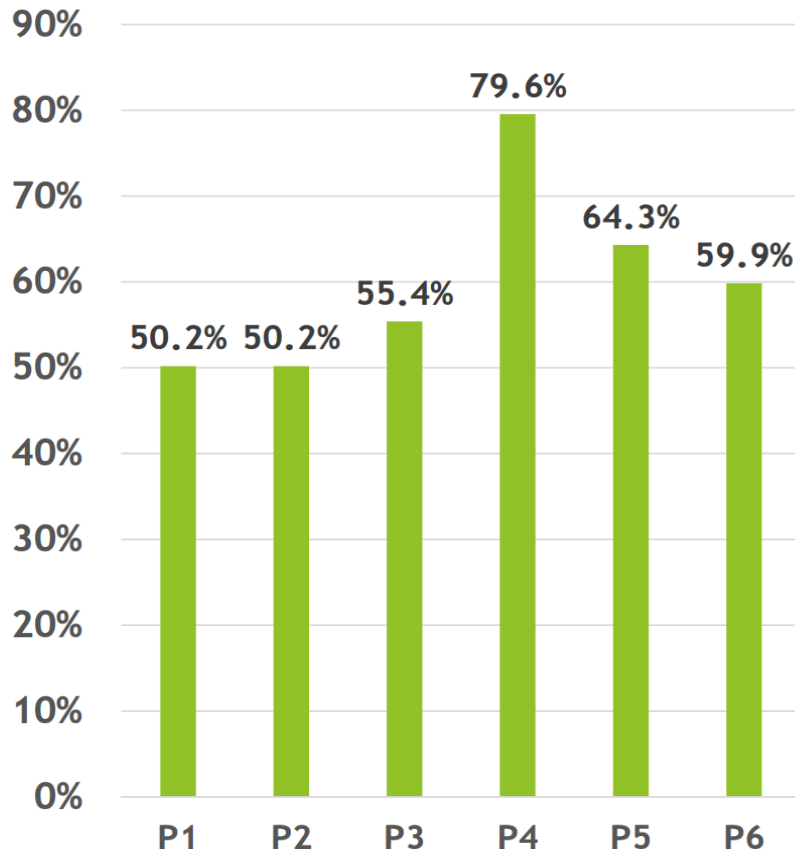
所有學校
10.5 班

3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

Using e-textbooks and e-resources (2015/16)

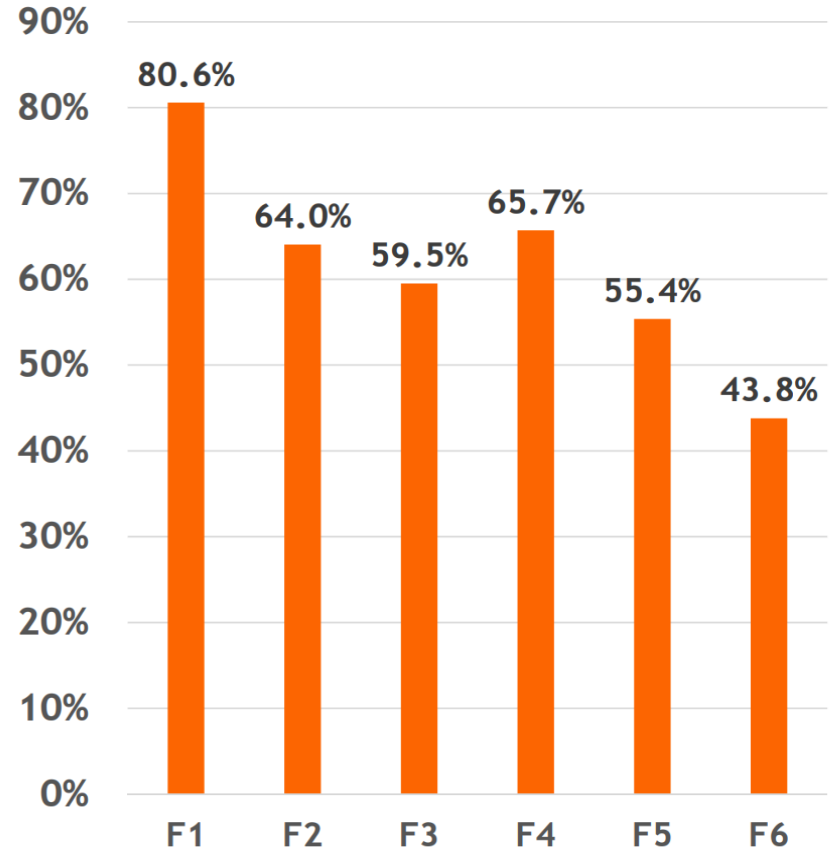
% of school
respondents

Primary Schools



% of school
respondents

Secondary Schools

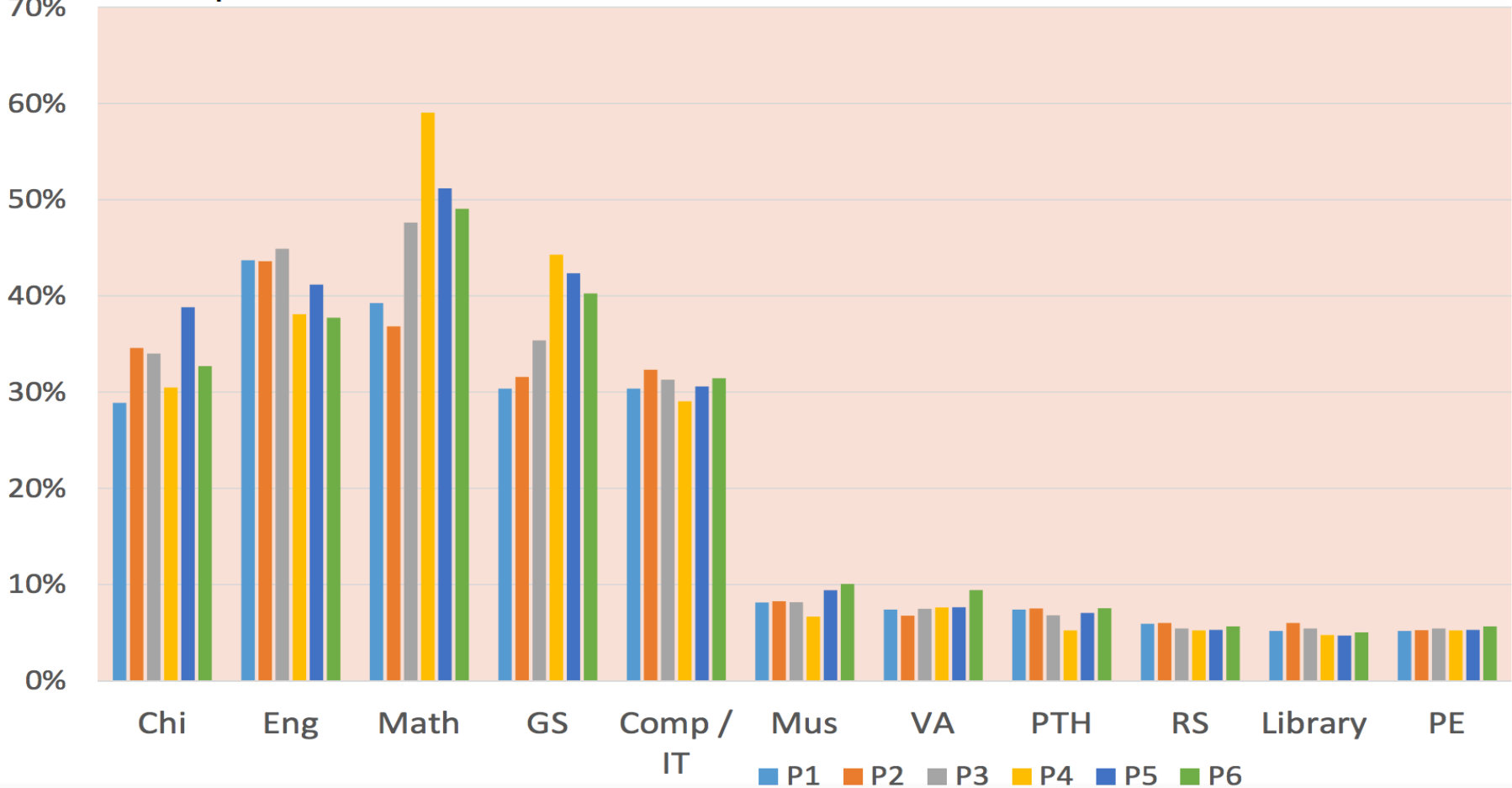


Levels

3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

Using e-textbooks & e-learning resources across
subjects in primary schools

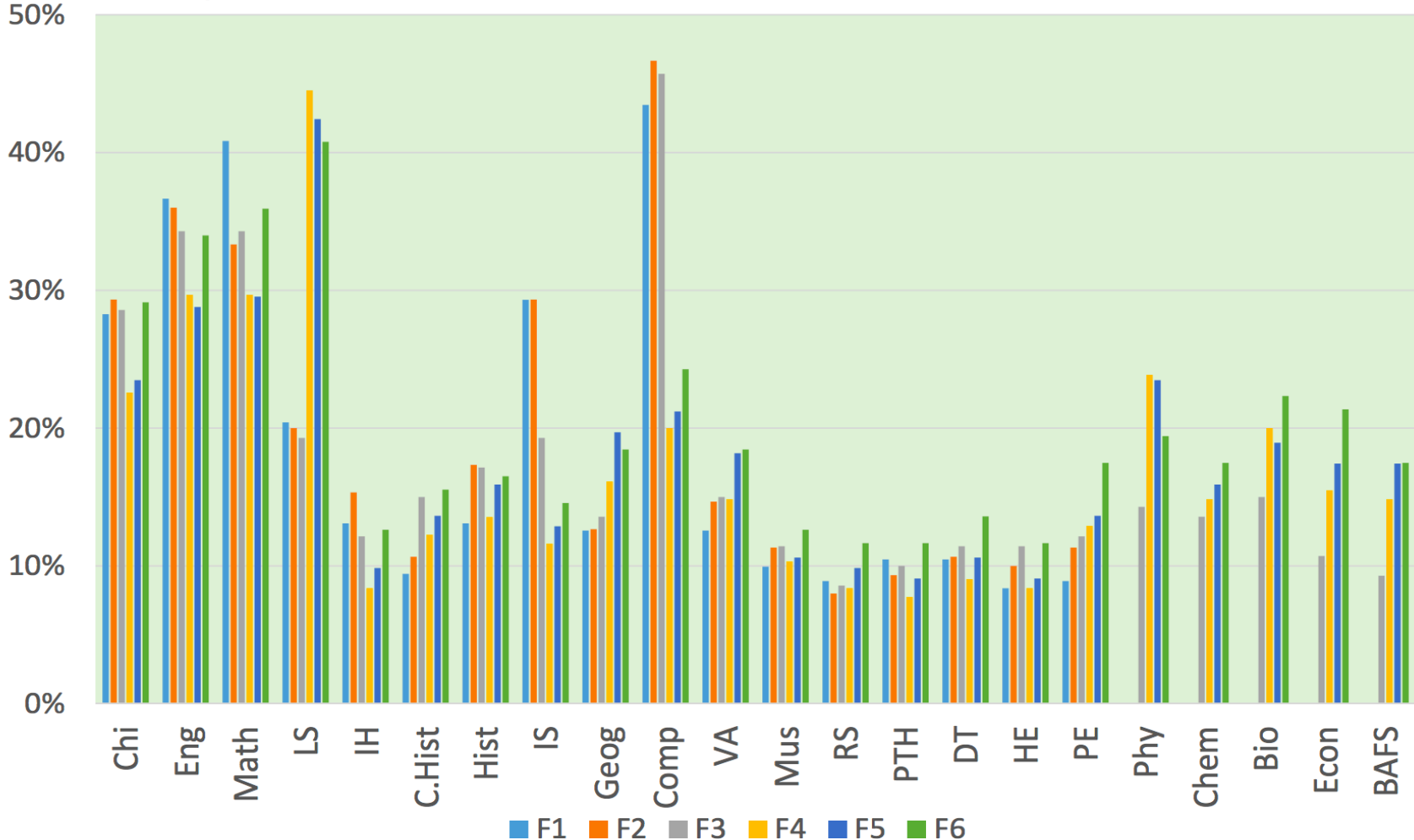
% of school respondents



3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

Using e-textbooks & e-learning resources across subjects in secondary schools

% of school respondents



3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

Discussion:

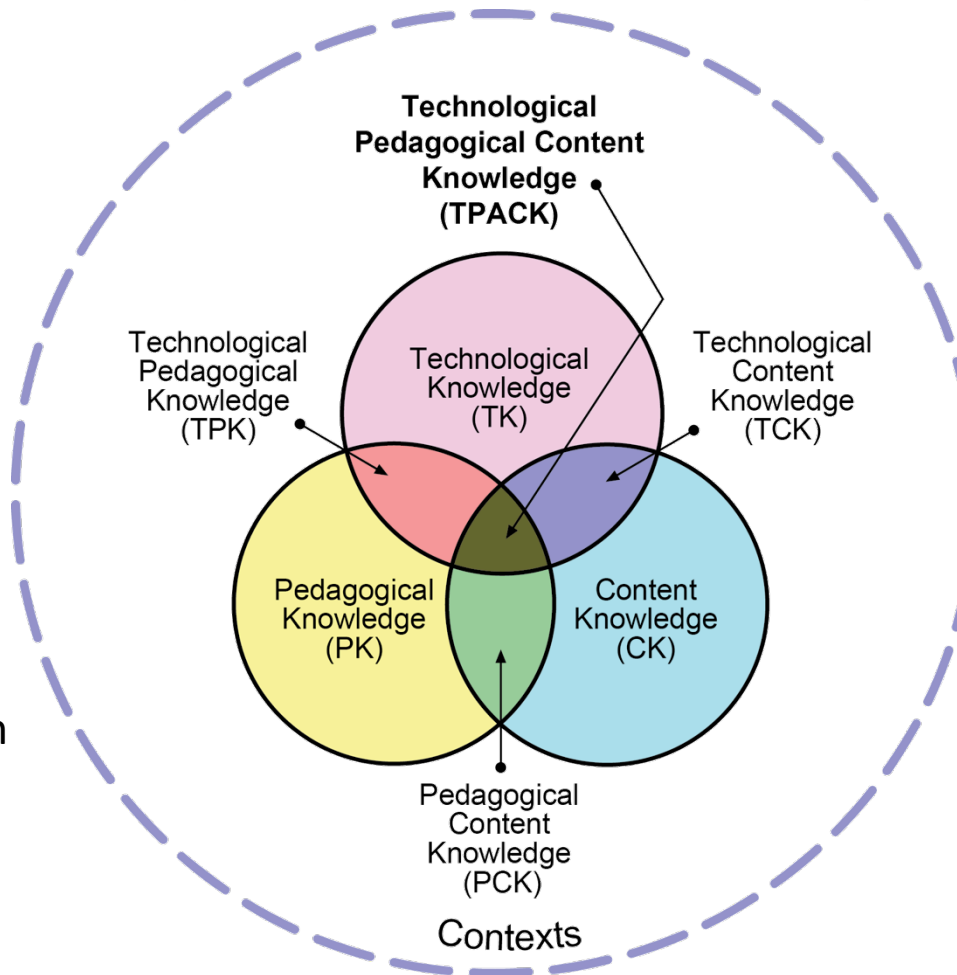
Common hurdles in conducting traditional Collaborative Learning:

- Teachers' perspective (教學設計)
- Students' perspective (資訊素養)

3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

Technological Pedagogical Content Knowledge (TPACK) Framework

Effective technology integration for pedagogy around specific subject matter requires developing sensitivity to the dynamic, transactional relationship between these components of knowledge situated in unique contexts.



There is no “**one best way**” to integrate technology into curriculum.

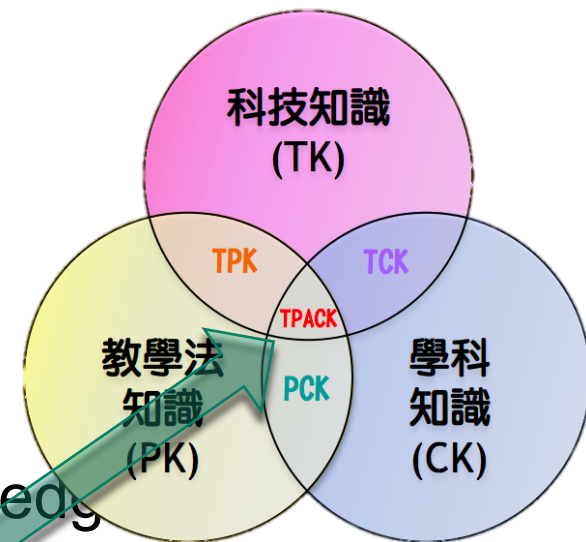
Integration efforts should be creatively designed or structured for particular subject matter ideas in specific classroom contexts.

Mishra & Koehler (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, 108(6), 1017-1054.

3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

(TPACK) Framework

- 學科內容知識 Content Knowledge
- 教學知識 Pedagogical Knowledge
- 科技知識 Technological Knowledge
- 教學內容知識 Pedagogical Content Knowledge
- 科技內容知識 Technological Content Knowledge
- 科技教學知識 Technological Pedagogical Knowledge
- 科技教學內容知識



Technological Pedagogical Content Knowledge

Mishra & Shulma, 2005 Mishra & Koehler, 2006

3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

Teachers' perspective (教學設計): 課程規劃



3. Adapting CPS Mobile Apps/Platforms under Wi-Fi Supported Network Environment and Cloud-based Technology to Enhance Collaborative Learning

Teachers' perspective (教學設計): 課程規劃

PDCA: Plan-Do-Check-Act

PDCA stands for Plan-Do-Check-Act.
It is a cyclical method for continuous improvement of processes.



PLAN

Create a process
improvement plan.



DO

Execute a process
improvement plan.



CHECK

Inspect feedback
and adjust plan
accordingly.



ACT

Integrate a process
improvement plan
into the system.