Adapting the PBL Approach from Medical Education to Teacher Education

Presented by
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Definitions of Problem-based Learning

- Students were \textit{passive} \& \textit{traditional} medical education emphasized on memorization.

- Clinical \textit{reasoning ability} \& \textit{problem solving skills} were inhibited.

- Led to the development of \textbf{PBL in medical field}.

- PBL confronts students with an \textit{ill-structured situation}. They identify the real problem and learn whatever is necessary to arrive at a viable solution through investigation.

- Teachers coach learning through \textit{probing}, \textit{questioning}, and challenging student thinking. (Barrows, 1996; Torp \& Sage, 2002)
Medical Education VS Teacher Education

- Learning Objectives
- Problem Scenarios
- Using Resources
- Teachers’ Support
- Learning Outcomes
Learning Objectives

- Science
- Medical
- Maths
- IT
- Social Sci.
- Generic Skill

Subject-specific

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Learning Objectives

- **Social Sciences**
  - critically analyze current issues

- **Medical**
  - diagnose the patient in a logical way

- **IT – programming educational software**
  - design of interactive tools using programming skills and subject knowledge

- **Science**
  - acquire subject knowledge (within a specific domain)

- **Maths**
  - acquire subject knowledge (a particular theorem)
Problem scenarios

Concrete

Maths

Science, Medical

Social Sci.

IT

General description
Sammy Chu is a 45 year old banking executive, 1.78m tall and weighing 97.5kg. Though he takes no regular exercise, he perceives his health to be pretty good. His colleague asks Sammy to join him for the charity Maclehose Trail Trailwalker which will take place in 5 month’s time.

(Source: Faculty of Medicine, The University of Hong Kong)
情境一

母親節快到，小詠很想送一張心形咭給媽媽表示謝意。她到文具舖找來一款別緻圖案的紙並詢問店主價目。店主：「這款紙每平方厘米售價為1元。但得知你孝心，可以1元的手續費替你剪裁成任何形狀並按該形狀的面積計算售價。」小詠：「很好啊！謝謝你！」

請替小詠列出一些找面積的方案並討論其可行性。
情境二

店主有輕度弱視，他希望小詠自行計算所需付的數目並給他解釋如何得知。下圖顯示小詠已設計的圖案，請替小詠選取適合的方案並作出計算。
PBL learning on **nutrition and health**

Browse the following **video clips** and identify the **learning issues** in them. As a group, **search for information** to answer the issues identified.

- 健康大道[2007]
  

- [兒童肥胖與瘦身] 0-7 min

- [減肥謬誤] 0-7 min
情境一

阿明是香港教育学院一年级生，他自从搬进大学宿舍生活，没有了家人的「爱心餐」，基本饮食便出现问题。他不喜欢吃即食麵及『叮叮』(微波爐)食品，只好每天以面包度日。「每星期我都會到超級市場買麵包食，作為未來一個星期的主要食糧。」阿明的生活離不開麵包。「我每星期有三天的上課時間為早上八時半，之前一晚由於做功課做得太夜，起床已經是八時，只好咬著麵包上課。」此外，他是排球校隊的成員，每星期有兩日練習至晚上十時多，學校飯堂已經關門，附近沒有食肆，而宿舍的小食部只有他不愛吃的即食麵發售。「沒有其他選擇時，我只好吃麵包當晚餐。」有時麵包吃光了，他便會空著肚子睡覺。「肚餓便早點睡，睡醒就不會感到肚餓。」
IT – Programming educational software

- 設計教學軟件

- 要求
  - 促進學生學習
  - 以學生為中心

- 內容
  - 任何學科的單元內容
  - 建議設計圍繞主修科的內容
問題陳述 (Problem, Statement)

鄭宇碩：梁家傑的政制政論

【明報專訊】梁家傑在政制政論後，隨即受到親政府陣營「圍剿」，批評
他提出數項涉及修改《基本法》的建議，根本是在挑戰中央。政協常委陳永
祺更質疑他「連當特首候選人的資格也沒有」。

中央領導層推動建設「和諧社會」，避免兩極分化，香港出現政治分化，甚至兩極化，
正是親政府陣營有人動輒採取「扣帽子」、「打棍子」的手段。這種罔顧中央精神的紅
衛兵式的行徑，在文革期間被批為「打紅旗反紅旗」。

《基本法》第 159 條清楚規定，《基本法》的修改屬於全國人民大會，在這個大前提下，
建議修改《基本法》，旨在推動討論而已。任何建議要經過民意考驗，怎能提出建
議就扣上香港「視為獨立國家」、「香港走向危險地帶」呢！

《基本法》要與時俱進，建議修改《基本法》是自然不過的事。即使是中華人民共和
國的憲法，自 1982 年頒布以來，亦經數度修訂。今天國內接近領導層的知識分子也同樣
在討論「民主是個好東西」。

特首候選人的資格，由行政長官選舉條例規定，不是一位政協常委可以隨意決定。老實
說，港區人大代表經由小圈子選舉產生，港區政協委員由中央委任，他們有多少民意基
礎，有沒有資格代表香港市民發言，市民是眼睛雪亮、心中有數的。

仔細審視梁家傑修改《基本法》的建議，特首可在民選立法會議員中，挑選內閣成員，
這其實是理順行政、立法關係，確保特首在立法會內有穩定多數支持的可行方案。即使
細詩在梁家傑的政制政論中，也經常提及的內部討論，也應有一個民間的參與。

至於取消中央任命主要官員的安排，由特首委任，這其實是走向普選行政長官合理的附
帶安排。行政長官既然由普選產生，中央的委任自然不會再是實質的。主要官員的委任，
應該可以遵循中國各省根據《地方各級人民政府組織法》的規定，由特首提名，經立法
機關通過。

熟悉國情的朋友都知道，1991-92 年間，浙江貴州兩省的人大拒絕通過黨組織提名的省
長人選，另行選出較能代表地方利益的人選。中央領導人終考慮後亦只能接受。請注意，
這兩省的人大代表不是提建議，而是採取實際政治行動。

關於取消特首選舉中提名委員會的安排，這應該被視為普選特首的一種模式，各種真正
民主的模式自然應該考慮。有關提名委員會的建議，部分來自這些參與「圍剿」的人士，
倒實在令人吃驚。他們的建議，基本上是要求港區人大代表或某一類既得利益者擁有否
決權，從而否定普選的民主實質。

這些參與「圍剿」的人士應該好好反省，您們的無理批評破壞了社會的和諧，阻礙了理性
的討論。您們的建議，否定了民主普選的承諾。

「問題為本」學習活動：小組討論

<table>
<thead>
<tr>
<th>已知資料</th>
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<tbody>
<tr>
<td>1. 事實性</td>
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<td>2. 觀點性</td>
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| 未知資料 |

| 值得探究的項目 |

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Using resources

Social Sci.

Less

Medical

Maths

More

Science

IT
Using resources

- **Medical**
  - None

- **Social Sciences**
  - Table of “Need to know”

- **Science**
  - Related links

- **Maths**
  - Geoboard, transparency films, stationary

- **IT – programming educational software**
  - Related links
  - Notes on Visual BASIC Programming
Teacher’s Support

Time of guidance

Less

Maths
Science
Social Sci.

IT

Medical

More

Orientation of guidance

Content-related

Maths
Science
IT

Medical

Social Sci.

Generic Skill-related
Teacher’s support
Time of guidance

- Medical
  - Each group is facilitated by a tutor in tutorial session

- IT – programming educational software
  - Groups are facilitated by teacher other than lesson time

- Social Sciences, Science, Maths
  - Groups are facilitated by teacher during lesson time
Teacher’s support
Orientation of guidance

- **Social Sciences**
  - Students investigate their interested areas and discuss with teacher
  - Teacher uses prompting and questioning to enhance students’ general thinking skills

- **IT – programming educational software**
  - Teacher helps students to integrate subject knowledge with programming skills
  - Advice of feasibilities are given according to the draft of students

- **Medical**
  - Teacher uses prompting and questioning to enhance the discussion of learning issues
  - After presentation, tutor will not provide any missing information. Students are required to find it by themselves
Teacher’s support

Orientation of guidance

Learning issues from tutor’s guide (Sample from medical):

- What is the key information here?

- Is there any relationship between lifestyle and body weight? Do you think Sammy is overweight? How is obesity or overweight defined?

- Can you predict how much energy he will expend if he decides to go walking on the Trailwalker?
Teacher’s support
Orientation of guidance

- **Science**
  - Teacher uses **prompting and questioning** to enhance the discussion of learning issues
  - After presentation, **missing information is provided**

- **Maths**
  - Teacher sticks to the **problem scenarios** to provide guidance to help students achieve the learning objectives
  - After presentation, **missing information is provided**
Learning Outcomes

Unique

Maths

Science

IT

Medical

Social Sci.

Open
Learning Outcomes

- **Maths**
  - Find 畢加公式 (Or weaker theorem) & apply the theorem

- **Science**
  - Identify the learning issues and find the solutions (related to learning objectives)

- **Medical**
  - To diagnose the patient
Learning Outcomes

- **IT – programming educational software**
  - Consider their knowledge of major and use programming skills to design a software for teaching and learning

- **Social Sciences**
  - Investigate their interested areas within a specific topic
  - e.g. Topic: Using PBL in learning the controversial issue of Chief Executive Election. Interested areas: “the criteria of being the Chief Executive” and “aims of the election debate”
How to adapt the PBL approach to other disciplines?

- Learning Objectives
- Problem Scenarios
- Using Resources
- Teachers’ Support
- Learning Outcomes
References


Nicholls, J.M., & Sham, M.H. (no date). Interactive Learning Programme on Health & Disease. PBL case name: Sammy Chu. Tutor’s Handbook. Hong Kong: The University of Hong Kong

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Thank you!

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