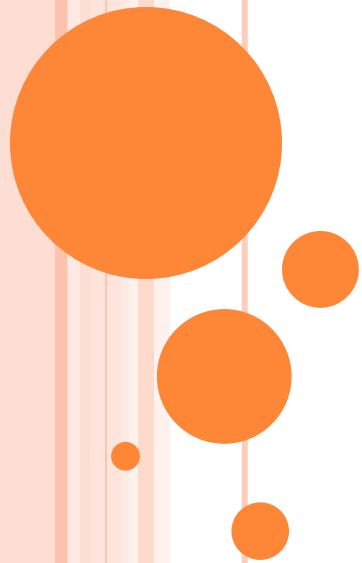


# 第五章 個別差異



# 個別差異（individual differences）

- 個別差異通嘗是遺傳及環境共同作用下所創造出來的結果。
- 遺傳提供了一個基本的藍圖，也使兒童先天傾向於展現出不太一樣的能力與行為。但環境的因素（包括在教室裡的情況），也對兒童的能力與行為有重大影響。
- 主要議題
  - 智力
  - 學習成就
  - 認知風格



# 智力 (Intelligence)

## ○ Defining intelligence

- One ability or many?
  - Plato
    - 1) the capacity to learn
    - 2) the total knowledge a person has acquired.
    - 3) the ability to adapt successfully to new situations and to the environment in general.
  - Spearman (1927):
    - general ability, or **g**. & specific factors
  - Cattell, 1963, Horn, 1998:
    - **Fluid intelligence** (流動智力 / 應變智力): cultural free and non verbal. It increases until adolescence because it is grounded in brain development, and then decline with age.
    - **crystallized intelligence** (結晶智力 / 累增智力): the ability to apply culturally approved problem-solving methods. It can increase throughout the life span.



- Intelligence as process
  - Robert Sternberg
  - 三種智力（智力三元論）
    - 分析的智力（analytical intelligence）：與理解、分析、對照、評估等常出現在學術環境及智力測驗中的資訊。
    - 創造的智力（creative intelligence）：在新情境下，想像、發明、及將想法綜合起來的智力。
    - 實踐的智力（practical intelligence）：有效地應用知識與技能，去處理及應付日常問題與人際間處境的智力。



- 多元智能 (Multiple intelligences)
  - Howard Gardner
    - How did he find out?
      - 智力的種類：邏輯/數學、語文、音樂、自然、空間、肢體/動覺、人際、內省
  - 在心理學領域受爭議，但在教育領域受歡迎
  - 鼓勵教師運用許多不同的教學方法，讓學生不同的能力得以發揮



# Measuring intelligence

- Alfred Binet (1904)
- Question from Minister of Public Instruction in Paris:
  - How can students who will need special instruction and extra help be identified early in their school careers, before they fail in regular classes?
- Testing children for general knowledge, vocabulary, comprehension, memory, and abstract thinking (一般知識、字彙、理解、記憶及抽象思考)。
- Later the Binet's test was brought to the United States and revised at Stanford University.
- Stanford-Binet test has been revised many times, the latest version was revised in 2003 (fifth edition).
- Stanford-Binet test is an individual test.

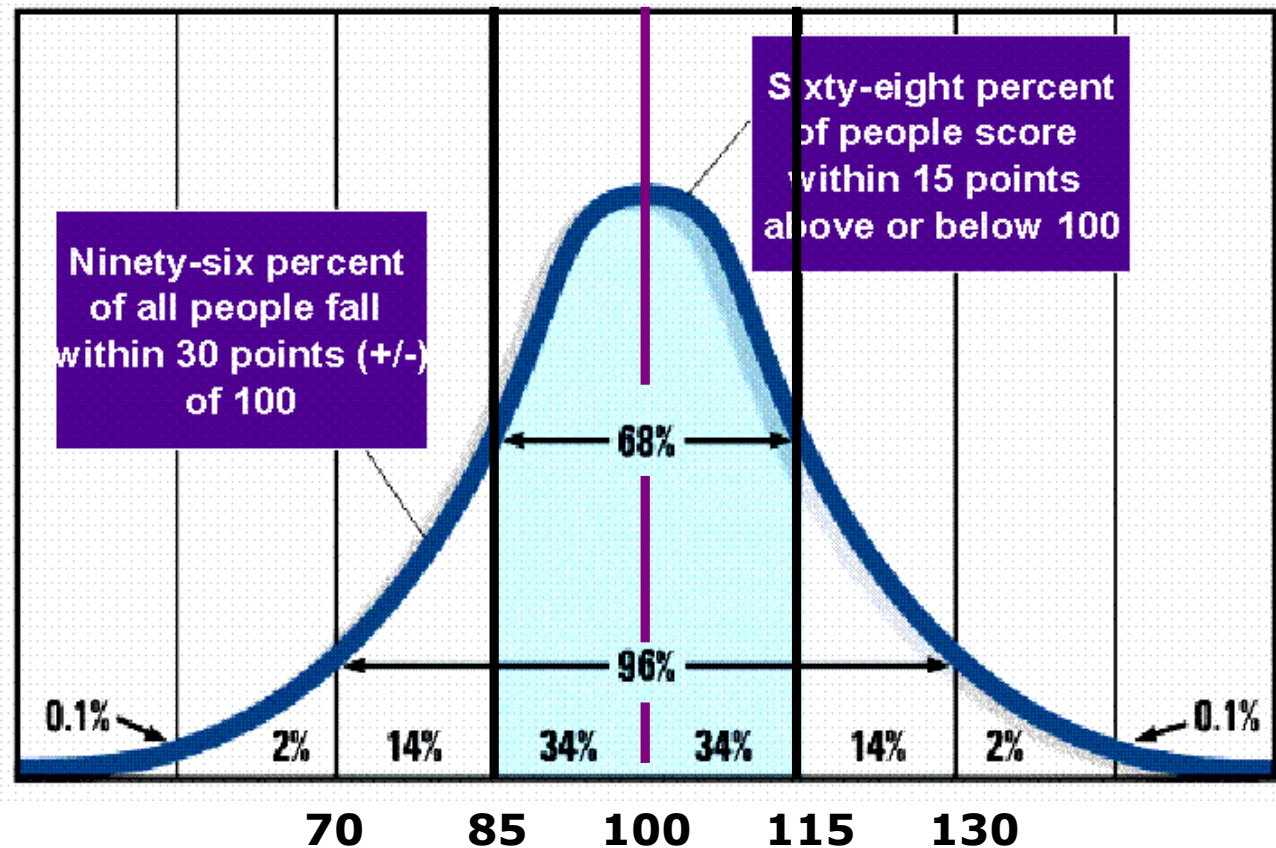


# IQ

## ○ 智商計算公式：

- IQ (intelligence quotient) = 智商；
- MA (mental age) = 心智年齡；
- CA (chronicle age)= 生理年齡

$$IQ = 100 \times \frac{MA}{CA}$$



## 魏氏智力測驗

- 目前常用的智商測驗
- 魏氏智力測驗中文第四版（ WISC-IV ）由陳榮華與陳心怡於2007年完成修訂。
- The **Wechsler Intelligence Scale for Children (WISC)**, developed by David Wechsler, is an individually administered intelligence test for children between the ages of 6 and 16. The Fifth Edition (WISC-V) is the most current version that generates a Full Scale IQ (formerly known as an intelligence quotient or IQ score) which represents a child's general intellectual ability.

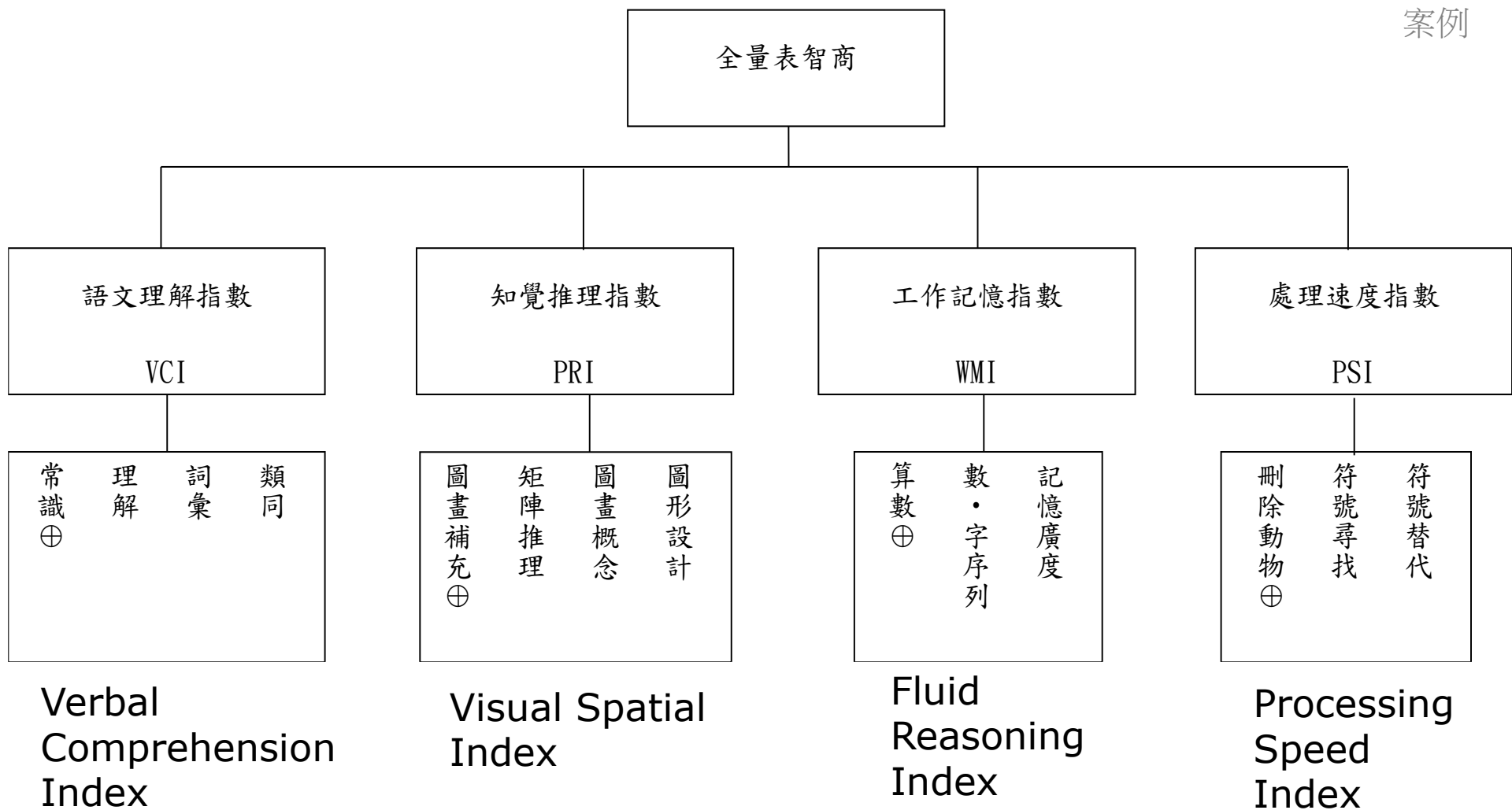




# 魏氏智力測驗之指數與分測驗分析

## ○ WSIC-IV(中文版)的測驗架構

案例



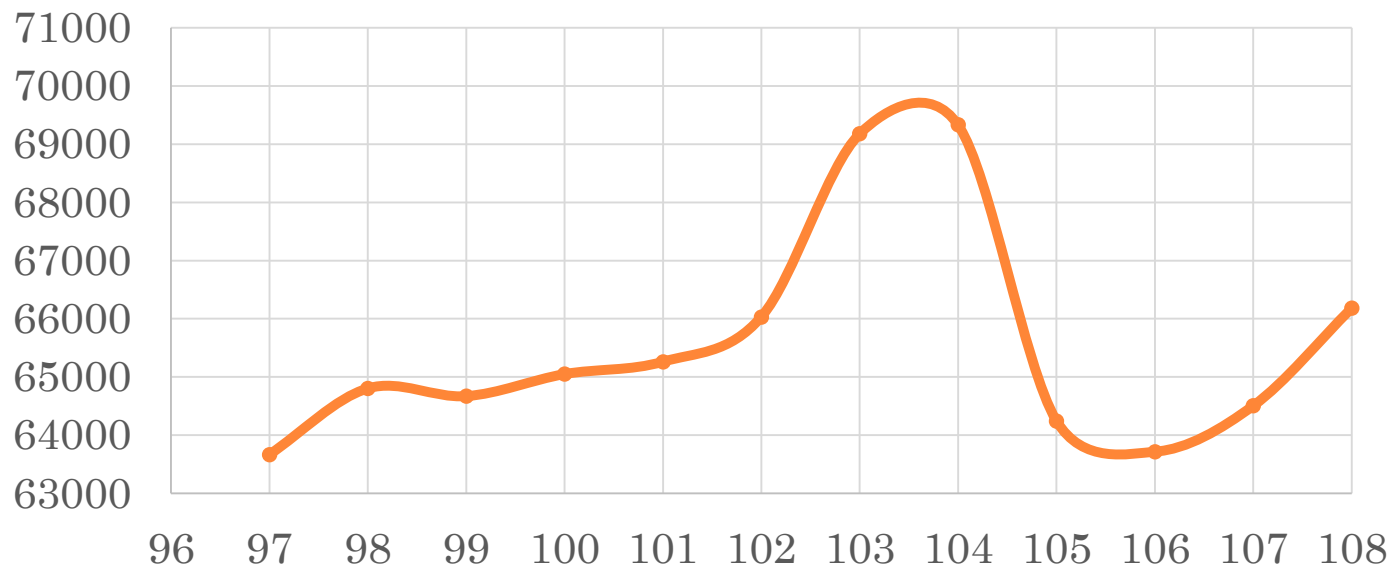
智 商	量表分數	百分等級	表現水準描述
145	19	99.76	極端優秀
140	18	99.62	極端優秀
135	17	99	非常優秀
130	16	98	非常優秀
125	15	95	優秀
120	14	91	優秀
115	13	84	中上
110	12	74	中上
105	11	62	中等普通
100	10	50	中等普通
95	9	38	中等普通
90	8	26	中下
85	7	16	中下
80	6	9	低下
75	5	5	低下
70	4	2	能力不足
65	3	1	能力不足
60	2	.38	能力極端不足
55	1	.14	能力極端不足

魏氏智力測驗的智商（IQ）、  
量表分數(Scaled Score)與  
百分等級（Percentile Rank）  
對照表

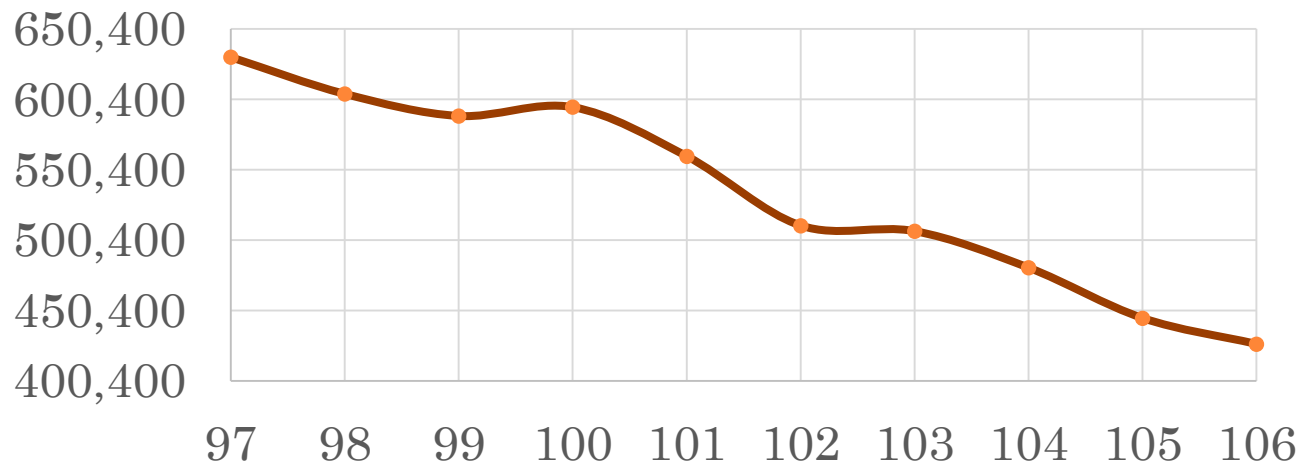
- I.Q. 130以上 資賦優異
- I.Q. 50~70 可教育性智能不足
- I.Q. 30~49 可訓練性智能不足
- I.Q. 30以下 養護性智能不足



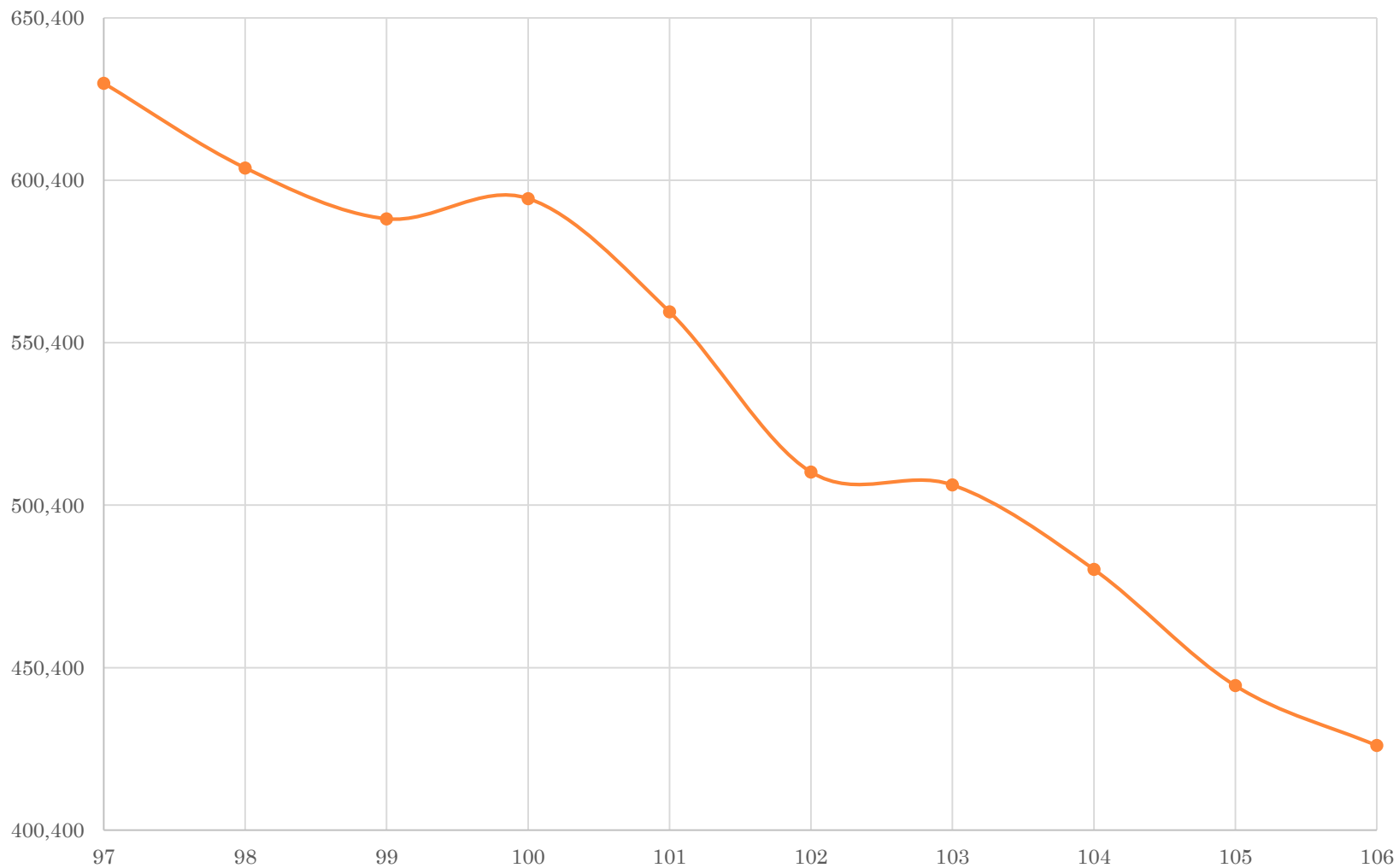
# 國中小身心障礙學生人數總計



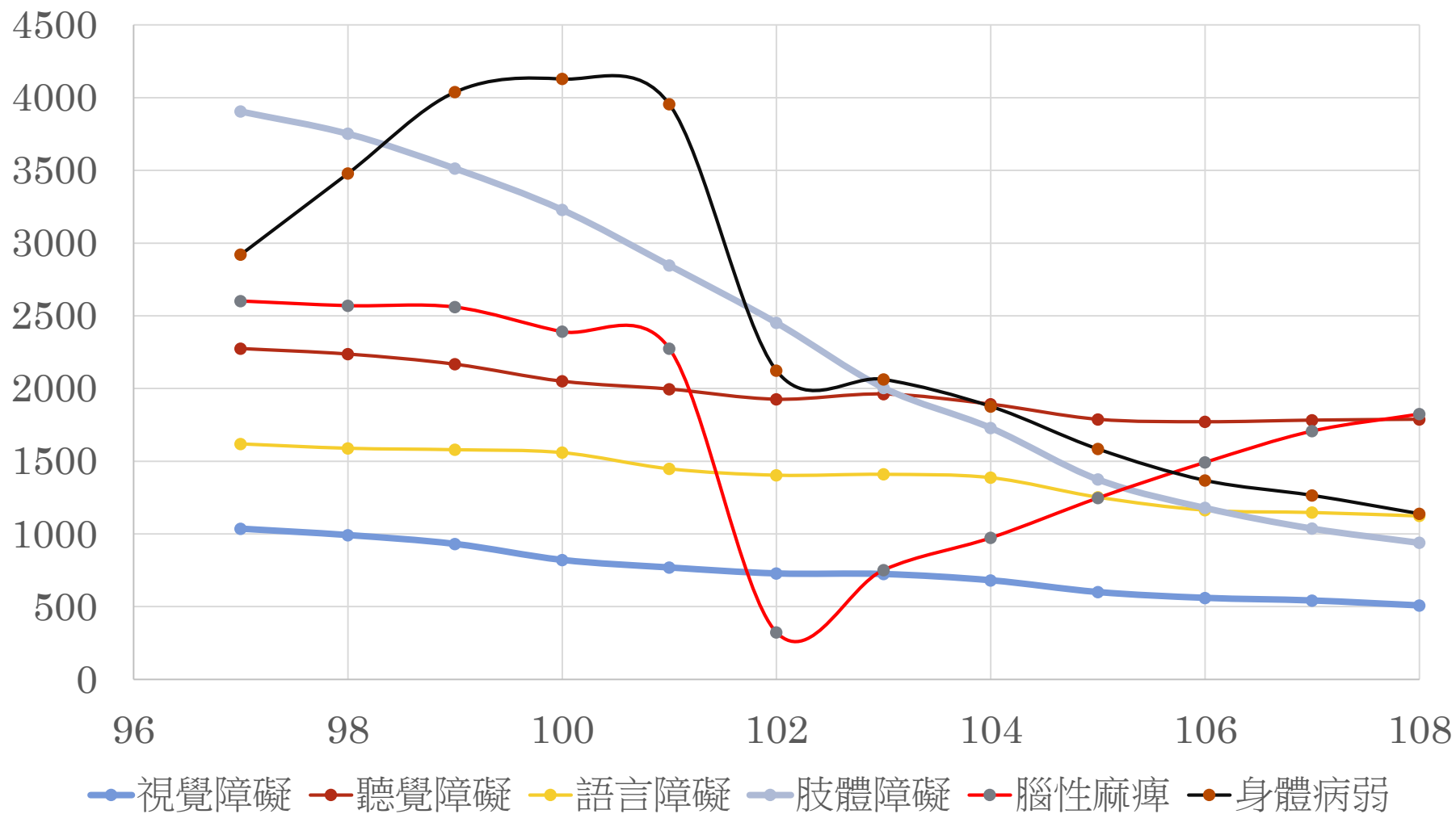
# 國中小畢業生總人數



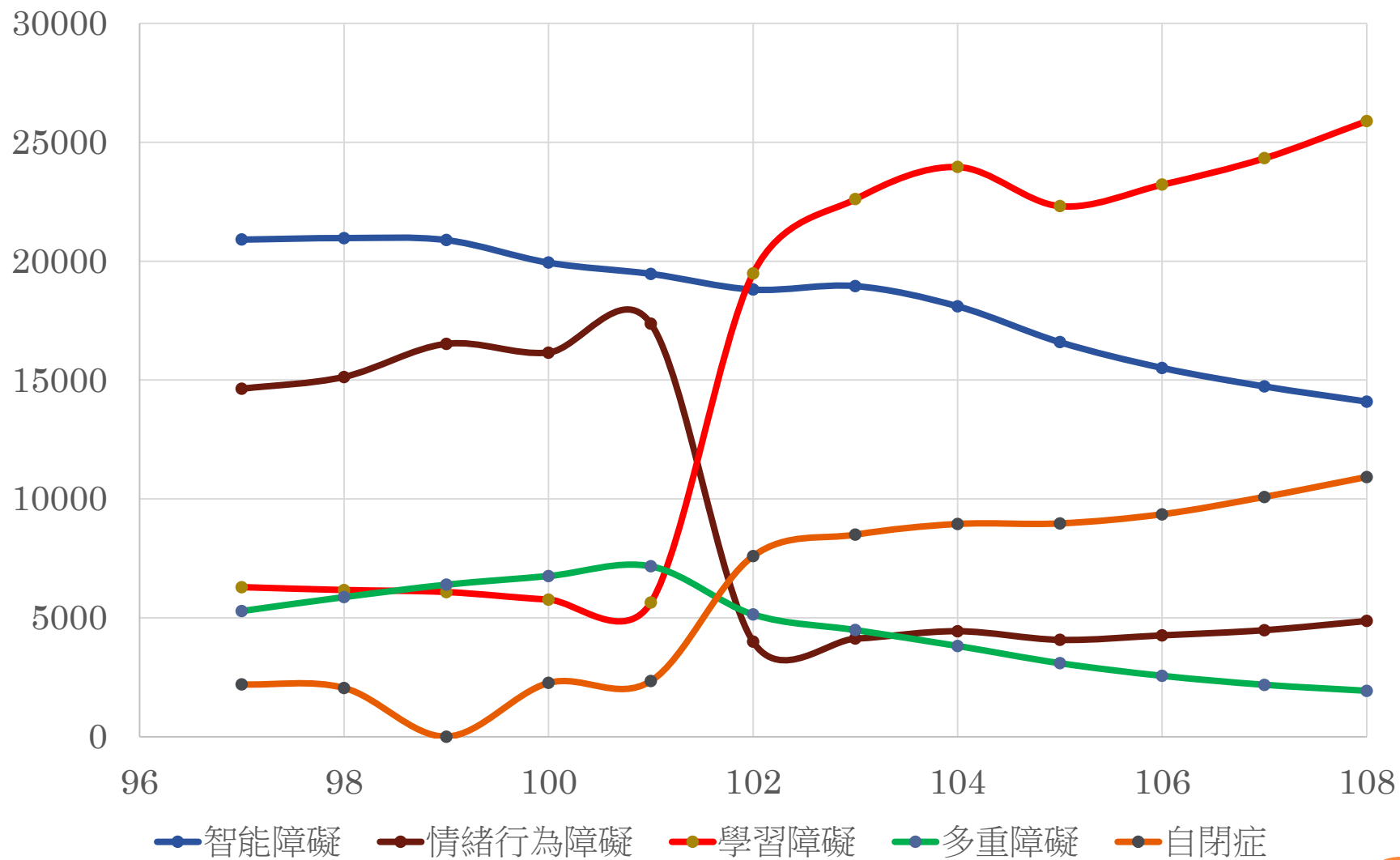
國中小畢業生總人數



國中小身心障礙學生人數



國中小身心障礙學生人數



# IQ與學業成就

- 智力不必然導致成就，它僅僅與之相關。
- IQ得分與成就之間的關係並非絕對，且有許多例外。
- IQ分數的「有效期」不長。



# 善用智力與IQ

- 提供環境上的協助，以促進智能成長
- 視智力測驗為有用但不盡完美的測量方式
- 如要測知特定的能力，須利用較精確的測量工具
- 注意學生的行為表現，從中找出符合其與文化脈絡相符的優異才能
- 還有許多因素會影響學生的學業成就

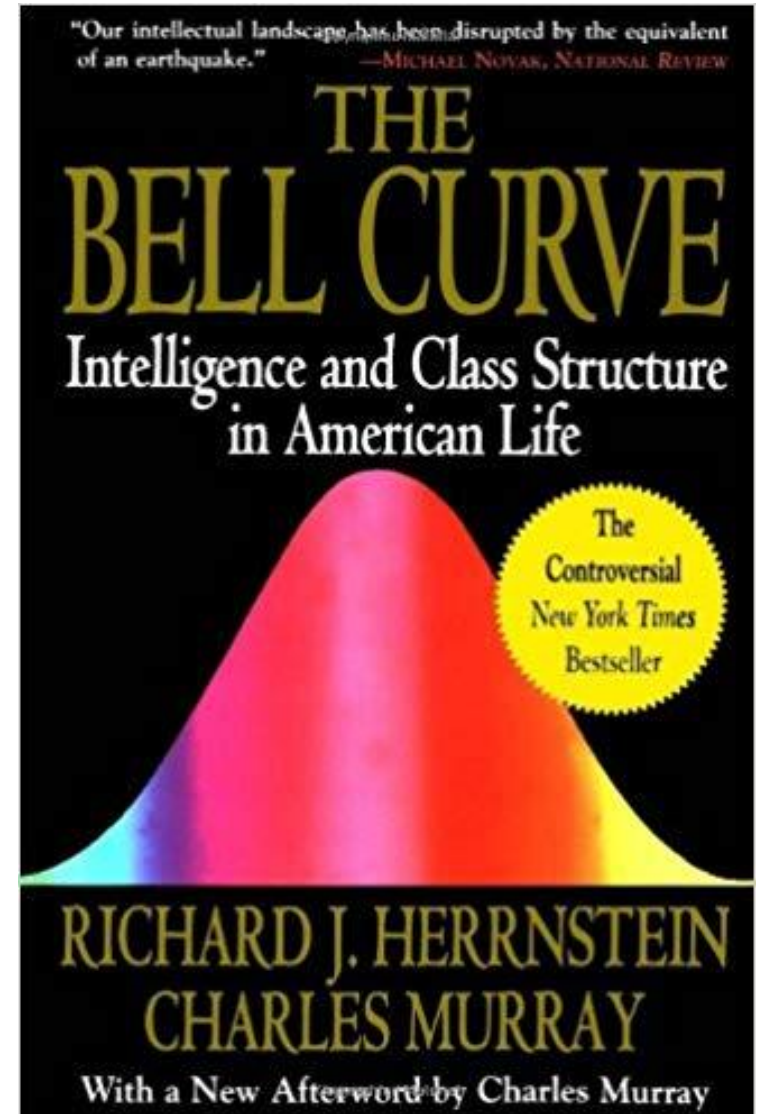




# cautions

## 鐘形曲線：美國社會中的智力與階層結構

- (*The Bell Curve*) 是一本1994年出版，暢銷但充滿爭議的著作。
- 其核心觀點是，智力對於個人的經濟收入、工作表現、未婚懷孕、和犯罪問題，比起父母的社會經濟地位或教育程度，是一個較好的預測因素。
- 這本書引發最大爭議之處，在於提出「種族與智力有關」的結論，並且認為黑人的智力低於白人，和其種族有關，而和社會經濟背景沒有關係。



# Ability Grouping or tracking

- Between-class ability grouping
  - Low-ability classes
    - receives low quality instruction?
    - Disproportionate number of minority group
  - Lead to low achievement with two exceptions:
    - Gifted classes
    - Nongraded elementary school/The Joplin plan
- Within-class ability grouping
  - General
  - Subject-specific



# Ability Differences and Teaching

- What's the purpose of ability grouping?
  - Better teaching? Better learning?
- Individual differences vs. Human potential

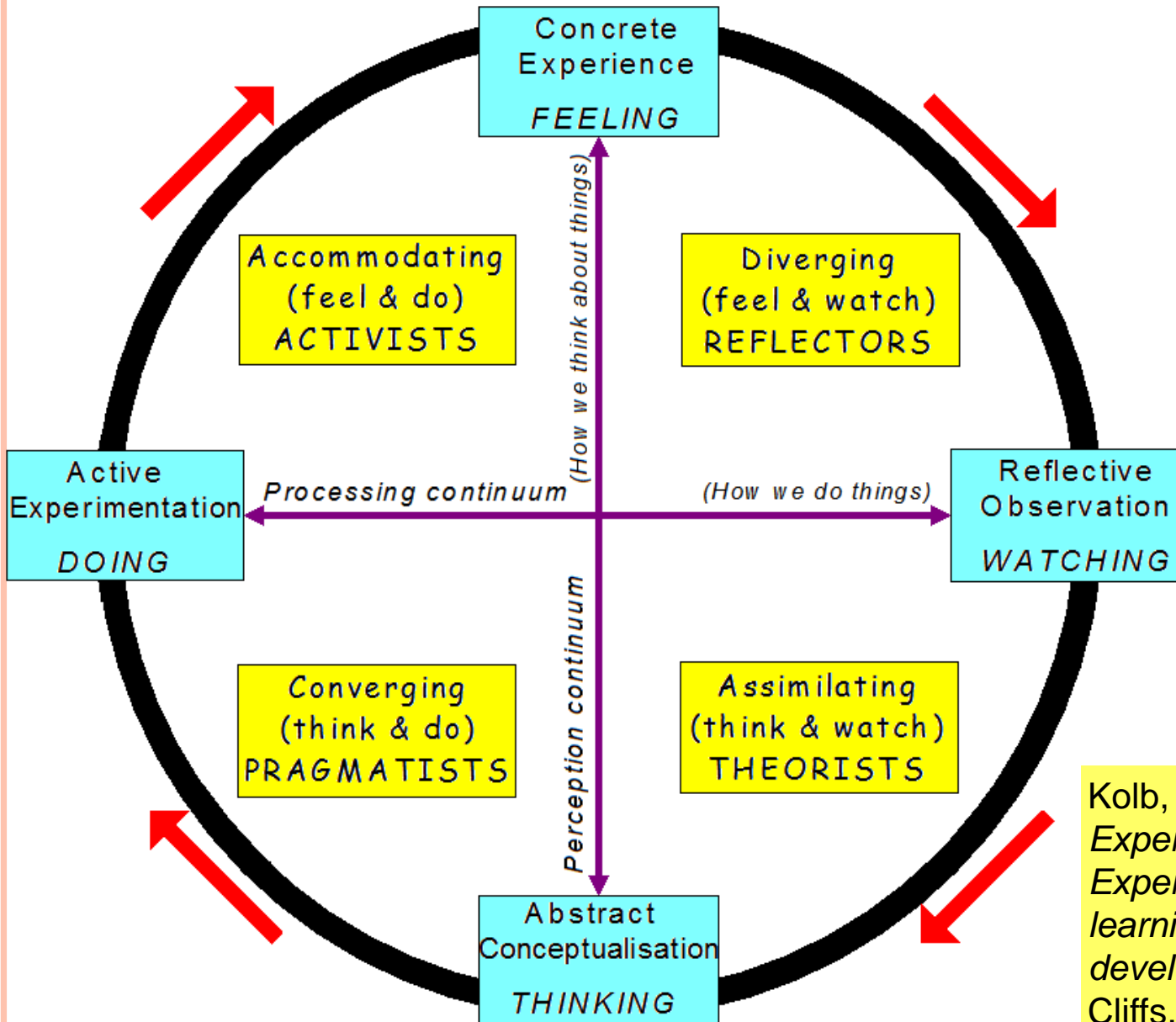


# 認知風格傾向

- 認知風格（Cognitive style）
  - 分析式或整體式
  - 語文型或視覺型
  - 場地獨立（field independence）或 場地依賴（field dependence）
  - O'Brien (1985) learning styles (小測試)
- 對課堂有助益的傾向（dispositions）
  - 尋求刺激
  - 求知慾
  - 慎思明辨
  - 能接受新想法



# Kolb's experiential learning and learning styles



Kolb, D.A. (1984, 2006)  
*Experiential Learning:  
Experience as the source of  
learning and  
development.* Englewood  
Cliffs, N.J.: Prentice Hall.

# Experience as the base of learning

The learning cycle is composed of four stages: experience, process, generalize, and apply. Each stage drives the next in a continuous loop.

- First, students experience what they are going to learn about through a **concrete** activity.
- Then they process the experience by looking back and evaluating it through **reflections** and observations.
- Next, they generalize what was important about the project by developing **theories** and concepts.
- Finally, they apply the information they've learned by **testing** it in another activity.



# Kolb's learning styles of individuals

## 1. Diverging (feeling and watching -CE/RO) -

- These people are able to look at things from different perspectives. **They are sensitive.** They prefer to watch rather than do, tending to gather information and use imagination to solve problems. **They are best at viewing concrete situations several different viewpoints.** Kolb called this style 'Diverging' because these people perform better in situations that require ideas-generation, for example, brainstorming.
- People with a Diverging learning style have broad cultural interests and like to gather information. **They are interested in people, tend to be imaginative and emotional, and tend to be strong in the arts.** People with the Diverging style prefer to work in groups, to listen with an open mind and to receive personal feedback.



## 2. Assimilating (watching and thinking - AC/RO) -

- The Assimilating learning preference is for a concise, logical approach. **Ideas and concepts are more important than people.** These people require good clear explanation rather than practical opportunity. They excel at understanding wide-ranging information and organizing it a clear logical format.
- People with this style are more attracted to logically sound theories than approaches based on practical value. **These learning style people is important for effectiveness in information and science careers.** In formal learning situations, people with this style prefer readings, lectures, exploring analytical models, and having time to think things through.





### 3. Converging (doing and thinking - AC/AE) -

- People with a Converging learning style can solve problems and will use their learning to find solutions to practical issues. They prefer technical tasks, and are less concerned with people and interpersonal aspects. People with a Converging learning style are best at finding practical uses for ideas and theories. They can solve problems and make decisions by finding solutions to questions and problems.
- People with a Converging learning style are more attracted to technical tasks and problems than social or interpersonal issues. A Converging learning style enables specialist and technology abilities. People with a Converging style like to experiment with new ideas, to simulate, and to work with practical applications.



## 4. Accommodating (doing and feeling - CE/AE) -

- The Accommodating learning style is 'hands-on', and relies on intuition rather than logic. These people use other people's analysis, and prefer to take a practical, experiential approach. They are attracted to new challenges and experiences, and to carrying out plans. They commonly act on 'gut' instinct rather than logical analysis.
- People with an Accommodating learning style will tend to rely on others for information than carry out their own analysis. This learning style is prevalent and useful in roles requiring action and initiative. People with an Accommodating learning style prefer to work in teams to complete tasks. They set targets and actively work in the field trying different ways to achieve an objective.



Table 1  
Relationship Between Learning Styles and Five Levels of Behavior.

Behavior level	Diverging	Assimilating	Converging	Accommodating
Personality types	Introverted Feeling	Introverted Intuition	Extraverted Thinking	Extraverted Sensation
Educational specialization	Arts, English History Psychology	Mathematics Physical Science	Engineering Medicine	Education Communication Nursing
Professional career	Social service Arts	Sciences Research Information	Engineering Medicine Technology	Sales Social service Education
Current jobs	Personal jobs	Information jobs	Technical jobs	Executive jobs
Adaptive competencies	Valuing skills	Thinking skills	Decision skills	Action skills

# 新竹市光武國中的戶外體驗課程

- DaAiTV大愛電視\_大愛全紀錄\_法拉第少年\_20110123.wmv
- 大自然教室-光武國中(新竹)
- 2014合歡山探索課程

