

## Is it just for fun? A re-evaluation of creative learning in a tertiary TOY course

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### Introduction

- creativity cannot be studied in a vacuum!
- Creativity and Creativity training are both domain-specific. This implies creativity training is only confined to the domain/task in which it is taught (Baer, 2012; Kaufman and Baer, 2005)
- Creativity is considered as a "generic skill" in HK school curriculum

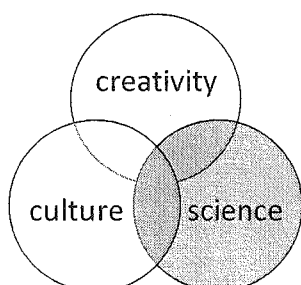
### Introduction

- **Transfer of learning** is the ultimate aim of teaching (Macaulay, 2000).
- Learning transfer is a kind of generalization
- Ranging from direct application, near transfer to far and creative transfer (Haskell, 2011)

### Key question

**What kind of curriculum can facilitate  
self-initiated transfer of creative learning  
to daily-life and professional domains  
for all our students?**

GE course "Understanding science and human creation through toys" --  
- an integrated thematic study on toys



### Science and technology in toys

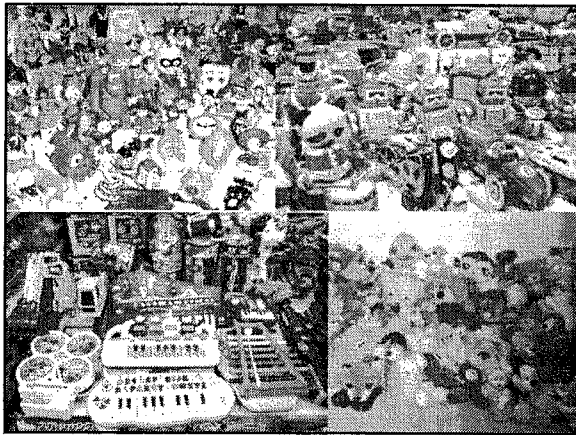
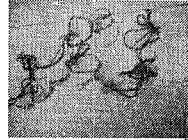
#### Mechanics :

Bamboo dragonfly 竹蜻蜓; Kite 風箏/紙鳶; Spinning top/Gyroscope 陀螺; 旋木玩具;  
Shuttlecock 花毽; Cuju 蹴鞠; Hobbyhorse 竹馬; Walk on stilts 高跷;  
Puppet show 木偶戲; Bamboo dance 跳竹舞; Jackstone 玩抓子;  
Swing 秋千/鞦韆; Pinwheels 風車; Rope skipping 跳白索/跳繩  
Pick-Up Sticks 挑竹籤; Drinking bird 飲水鳥; Woodpecker 醫生  
Chickens eating rice; 雞啄米; Balancing birds/ dragonfly 平衡竹蜻蜓  
Sound: Diabolo 抖空竹; Whistle 哨子; 土電話;  
egg-shaped, holed wind instrument 埙  
Heat: Trotting horse-lamp 走馬燈; Sky Lantern/孔明燈;  
Light: Shadow play 皮影戲; Festival lantern 黃燈/花燈/燈籠  
Chemistry: Firecrackers and fireworks 煙火爆竹製作技藝;  
Clay sculpture 泥塑  
Geometry: Paper-cut 剪紙;  
Biology: Straw plaiting article 草/竹編;



changes in toy culture

my childhood



Category 1: self-controlled hand-made toys →  
high-tech but low skill toys

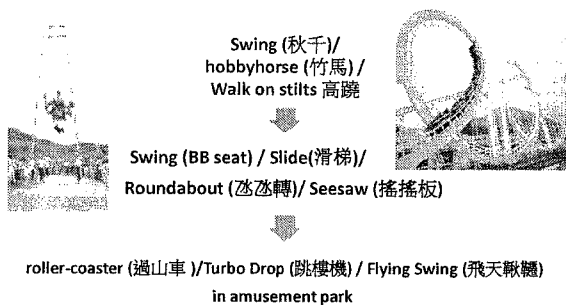
Bamboo dragonfly 竹蜻蜓 → remote control helicopter



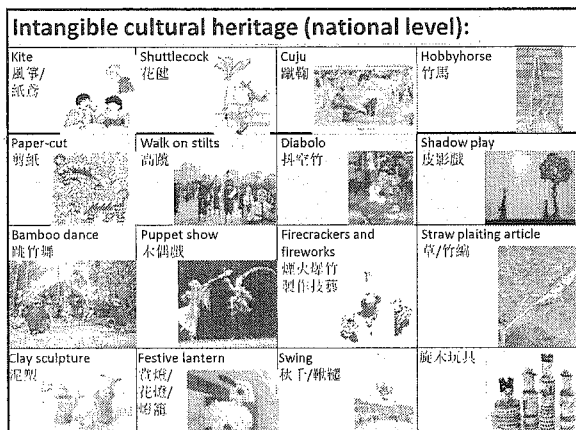
Clay sculpture 泥塑 /  
Straw plaiting article 草編  
Whipping a top (抽陀螺)  
Crotch (丫叉)  
Children trailer (兒童拖車)  
Kite (紙鳶) /  
Paper fold aeroplane / boat (摺飛機/船)  
吹筒樂 / Whistle using bamboo 竹哨子  
Hand-made lantern (自製燈籠)

→ Robot (機械人)  
→ Beyblade(爆旋陀螺) / Magnetic top(磁浮陀螺)  
→ Laser gun (激光槍)  
→ Remote control car (遙控車)  
→ Remote control plane/ boat (遙控飛機/船)  
→ Electrical piano (電子琴)  
→ Plastic and electrical lantern with cartoon  
(膠製及電燈卡通燈籠)

Category 4: players control the toys →  
players controlled by the toys



Toy and Chinese culture



### Toy & Chinese culture

Musical toys have a long history,  
and social functions in olden days

### Music 樂:

先秦時代：維繫社會秩序的功能

- Maintain the society discipline

儒家思想：人性具有教化啟迪的作用

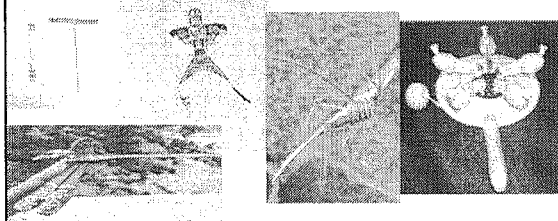
Confucian Thought: Cultivate human mind

### 10 Cultural elements reflected in ancient Chinese toy/play

#### 1. Respect/close to nature/ related with farming life

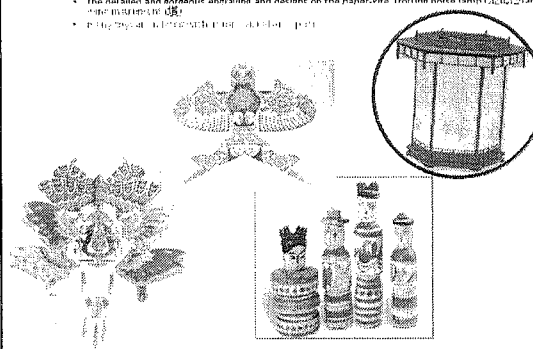
##### - making toys with natural materials; imitating things in nature

Materials used to make swing 鞦韆, shuttlecock 毽子, stilts 高蹺, bamboo dragonfly 竹蜻蜓, diabolo 空竹, and Cuju are materials from nature  
Imitation of Nature: Paper kites imitating flying birds, bamboo-dragonfly copying the shape from insects



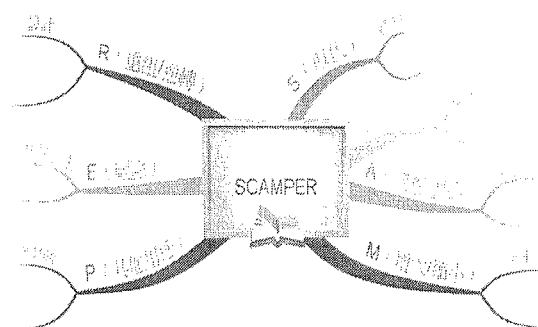
#### 4. Artistic – emphasize on arts for cultivating and ritual purposes.

- Lantern festival: Kites, Stilts are the in the programs of the "rural folk dance"; Trotting Horse lamp; "sky lamp";
- The detailed and exquisite ornaments and designs on the paper kite, Trotting horse forms (走馬/走馬燈) and "rural folk dance";
- Paper dragonfly, diabolo, and Cuju are the art of paper.

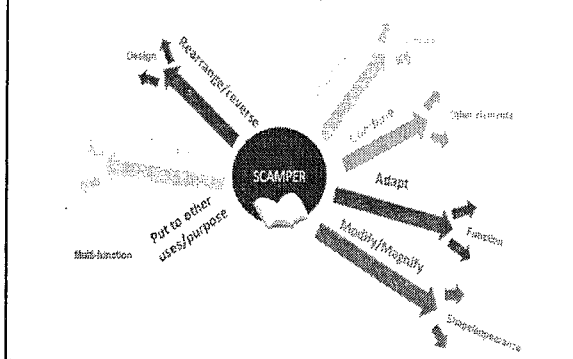


### Toy and creativity development

#### Ex. use SCAMPER to redesign air pressure rocket 氣壓火箭

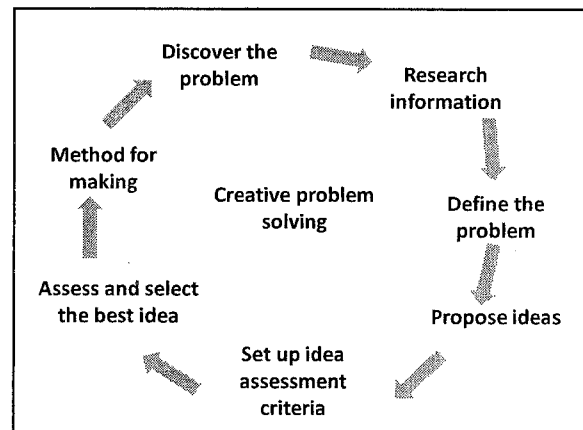
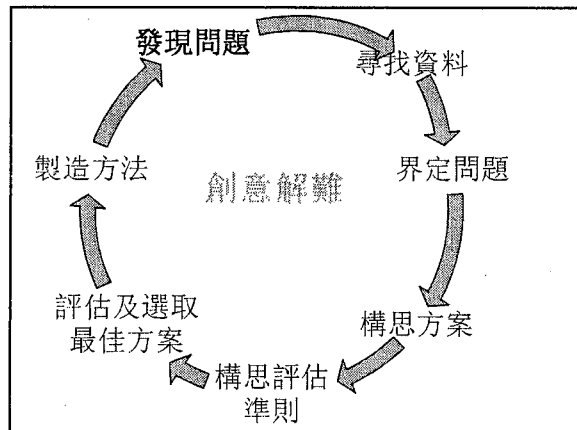


Ex. use SCAMPER to redesign air pressure rocket 氣壓火箭

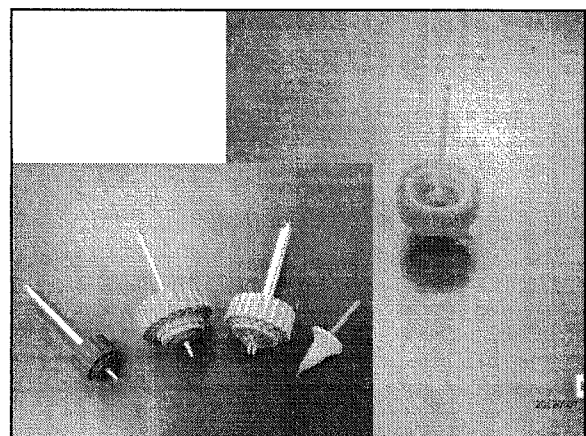
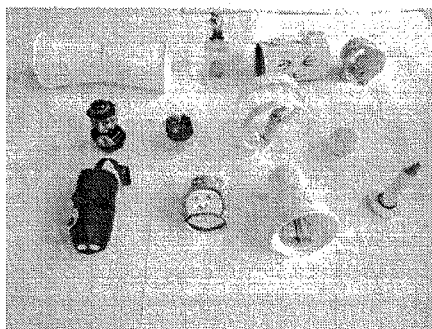


in their history of development, toys had demonstrated rich, creative and useful changes. Let's use a creative strategy (SCAMPER) to analysis them

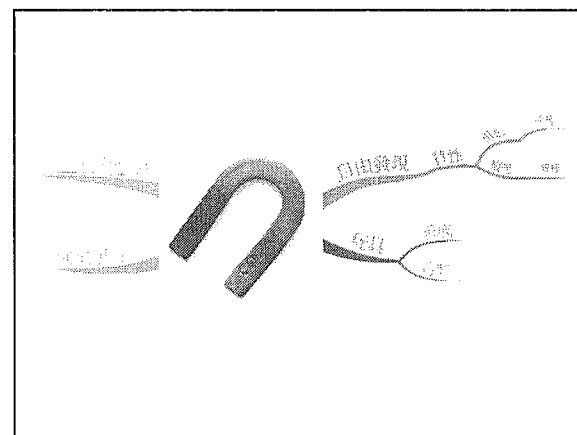
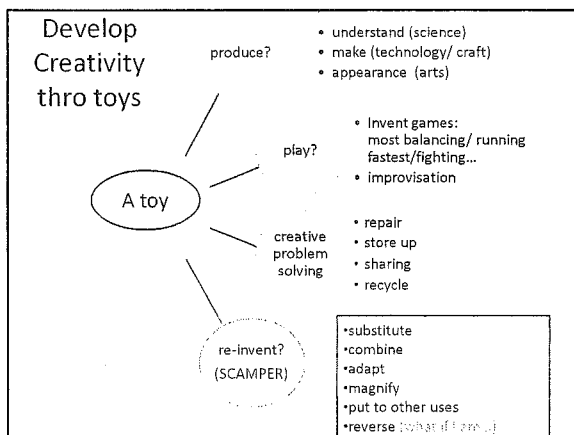
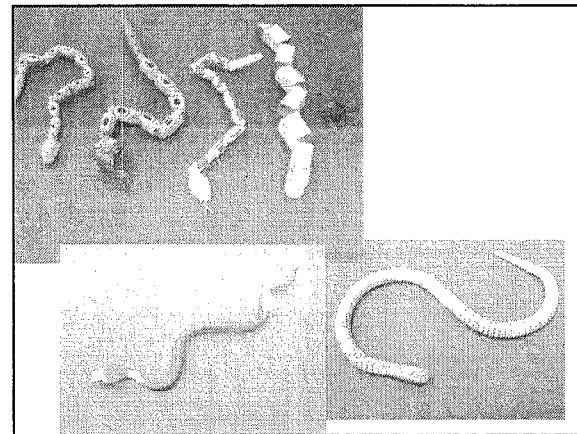
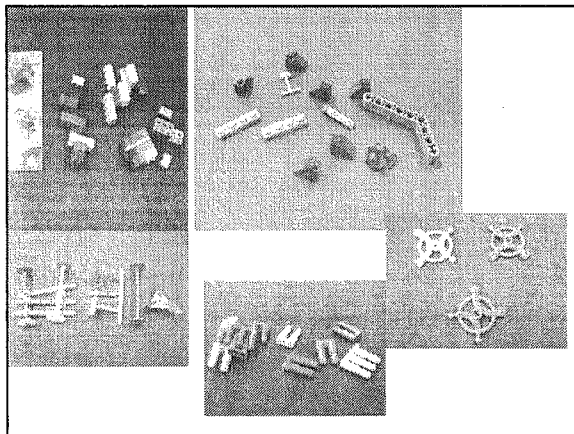
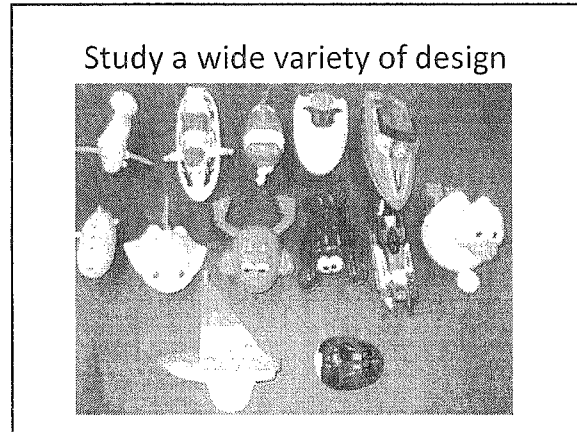
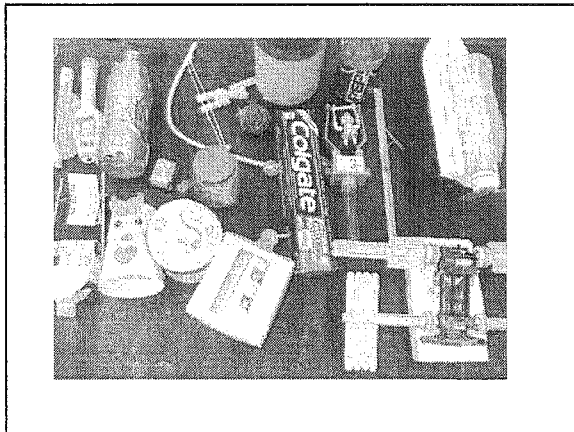
Substitute	木製陀螺→千千(宮女x象牙製的圓盤，中間有一支鐵針)
Combine	紙鳶→風箏kite(加入小竹笛，風吹時發出聲音)
Adapt	木鸞(車轆)→紙鸞(貴族娛樂Royal entertainment) 陀螺:for children → for adults競技比賽
Magnify	Spinning 陀螺→抽陀螺 (big heavy one, 競技比賽)
Put to other uses	陀螺 → Gyroscope (use in ship or air plane) 深秋選從時遇到山澗小溝，就抓住藤條晃蕩過去 → 鞦韆 toy 狩獵或放牧時聯絡或召喚牧群的音響工具 → children 風箏 toy
Eliminate	陀螺 → 冰猴兒 (東北地方，將陀螺至於冰上抽打，reduce its friction，使其旋轉不停) 蹴鞠:實心球→空心皮球 (more elastic)
Reverse	easy to play → difficult to play, e.g. very long and heavy 風箏，invent kite to play in no wind indoor

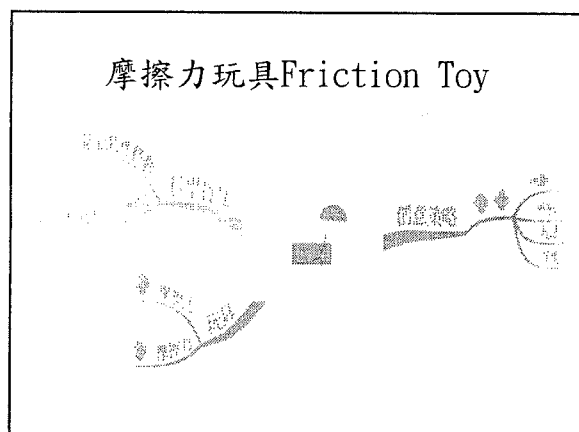


Self-made toys  
自製平衡玩具DIY balance Toy









Topics on toy 玩具主題	Creativity concepts & strategies 創意理論/策略	Cultural aspect 文化討論	Science behind 科學原理	Olden toys in China 古代玩具
Magnetic toys 磁石之運用	Free discovery 自由 發現; attribute listing 特性分析 forced association 強 迫組合		磁性	
Rocket Air-cushion & friction toys 摩擦及氣墊玩具 火箭及氣墊玩具	Add & eliminate; 加與減策略 SCAMPER;		摩擦力 氣壓 作用力與反 作用力	火箭、槍
Spinning tops; Balancing toys 平衡玩具 陀螺	Creative problem solving: - 解難遊戲 - 製造玩具 - 玩具之改良 -- 發明玩具	Toy & Chinese culture; History of 10 olden Chinese toys; cultural sustainability	平衡原理 力學原理、	毽子、竹 馬、陀螺
Musical toys 樂器玩具			聲學原理	樂器、土 電話、空竹

Toy topics	Creativity	Culture	Science	OldChinToy
Chemical toys; heat toys 化學玩具 熱學玩具			化學 熱學	標花、孔明 燈、走馬燈
Optical toys Electrical toy; energy toys 幻覺玩具 觸電、靜電玩具 能量守恒玩具	Basic elements of C Making connection between C in daily- life and C in this course	Environmental sustainability and toys	光學 電學 生物特性 能量守恒 及轉換	
Gun, car, boat, flying toys 槍、車、船、 飛機 生物、模擬玩具	Past-present-future; Modeling	Toy & science / technology development	遙控科技 機械人科技 電腦科技 人工智能	蹴鞠、繩、 風車、風 箏、竹蜻蜓 .....
Multiple uses of balloon, Blowing soap bubbles	Creative/alternative uses of toys. How to develop C through toys	Toy & child development; toy & creativity dev.	Diverse science concepts	

### Activities

- Many hands-on explorations
- Thinking exercises around toys (improvisation)
- Metacognitive discussion
- Visit flower market /toy museum
- Guest talk/workshop – LEGO / history of toys
- Student project – near transfer to selected toy topic
- Reflection & self-initiated transfer report

### Course evaluation - SET results

Q4: The learning activities stimulated my interest in the subject.  
Q5: The learning activities inspired me to think.  
Q11: The course was valuable to my development

2012-12	SET scores
Q4	3.50
Q5	3.61
Q11	3.17
Mean	3.30
2012-13	
Q4	3.67
Q5	3.76
Q11	3.43
Mean	3.48

### Student feedback in SET (2012-13)

#### The most useful aspects of this course:

- 認識創意與玩具的關係
- 對玩具及與玩具為題為主創造思維及知識
- 了解玩具中的科學
- 多種類的玩具激發思考
- 可以認識玩具背後的科學原理
- 從玩具中學習科學
- 認識不少科學原理
- 了解創意的應用及與文化的關係
- 創意解難
- 認識更多創意方法、更多玩具科學原理

## Student feedback in SET

## They were helpful because:

- 課程內容極豐富、充實，本身已有創意性
- Course is rich in content and substantial, itself is full of creativity
- 很多玩具 Many toys
- 課堂豐富的探究 rich explorations in class
- 有很多機會接觸玩具 have many chances to touch/play the toys
- 把原理應用在生活、教學  
apply the theory/strategies on daily life, teaching ...
- 能或用於生活及日後教學工作上  
- CAN apply on daily life and future teaching
- 可應用於日後自己的創意/思考上(如對事的看法、解決方案)  
can apply on personal creativity /thinking (i.e. views, problem solving)

But...

assignments only revealed forced near transfer,

whereas SET revealed the immediate &amp; localized learning outcomes.

How about the delayed, self-initiated &amp; transferred outcomes?

## Follow-up evaluation

## 1. Interview students

Immediate interviews: 1-2 months after

Delayed interviews: 1-3 years after the course

Sample: 18 students (randomly selected from good result group i.e. B or above in final grade; voluntary participation)

Data Analyses: wrote the transcripts; analyzed by coding and categorization

## 2. Analyze student reflection &amp; transfer reports

(15 reports collected during the course in 2012-2013)

## Levels of transfer

Near transfer : transfer to toys in daily-life

e.g. (Daily shopping, water gun, idea sparkle in mind)

之前學完SCAMPER，腦海中知道一些如‘取代’、‘放大’、‘縮小’等等的技巧，在平時逛街時，看到一些東西，就會想如果這個東西換成別的形狀等，會怎麼樣。(making connections; self-questioning) 有時看到水槍，我會想，若果水槍的頭轉換了，那射出的水會有花紋？Ha! 會否噴散水炮？假若沒有讀該科，我會想的問題是買下買這個水槍，它的外形是否美觀等，不會想它的變化。例如我見到一輛四驅車，我會想換它的輪胎、外觀等，“好上腳”，覺得很自然，...有不斷閃出的念頭(BB)

## • Far and direct transfer ( quite common)

## Transfer to fashion design / cooking

在服裝設計上會聯想到 SCAMPER 如平時有品過呢CROSSOVER，不同風格的設計師，在「把」一件衣服，設計，當「這件衣服」變成「這件衣服」等

## To teaching English word spelling

教一些數學班及學生的英文能力較弱的中學生，因為他們的基本功是比較差的，上完這個課堂之後，我在教他們串字時都有所改變。譬如我會以SCAMPER的技巧去教他們串字。因為本身一個好長的字，如restaurant，是由10個字母組成的，因為學生本身是懂得rest這個字的，可能是教他們怎樣拼開去想...我當時是先教他們rest的，因為他們聽到有一個break就會很開心，而ant始終都是短，短的他們就可以牢記了，我當時就在互聯網上找了一些很醜的鱈魚相片，Aur其實我沒有特別去教的，只是純粹教他們好像「咬」的發音，只是把其中一個子substitute取代了，把所以加起來其實就是一個餐廳，因為現在有間店叫「品鱈魚」，可能又可以帶他們去看看。FYI

## Far and creative transfer (less but impressive!)

--- transfer non-scripted ideas/skills to non-toy domains

- (concern about underlying reasons/thoughts → acquaintance with friends and other science learning) 在解決問題，我會運用CPS來認識問題，SCAMPER作輔助構思解決方法，在科學上，我在接觸新事物時，我都會思考其神秘之處是魔術，還是另有原因。在社交上，我會了解多些人的背後想法，因不同人都有不同的想法，亦有可取之處，並懂得如何採取「中庸之道」來結交朋友。LWC
- (sensitivity in observation → classroom management in teaching) 在課堂中經常要細心地觀察，找尋玩具的原理，了解他背後的創意，這種細心觀察的態度運用到教學上亦可行，觀察學生的行為，從小事情中了解學生的性格特點，可以幫助教學和課堂管理。
- (difficulties can affect motivation → student differences in teaching) 想到玩具困難程度會影響買家購買意欲。在教學上考慮到學生的個別差異，亦會設計多款課堂練習、問題、工作紙，以協助學生獲得學習成功感

## Far and creative transfer --- more examples

(can invent in opposite direction -> target at shortest novel & longest prose poem in chinese composition) 例如有些玩具有有摩擦力才可以玩，有些則完全沒有摩擦力才可以玩，即是當中相反的概念reverse concept，在玩玩具的過程能體驗得到，從而影響到我學習等其他事情上都用得到。就好像上文學創作課的時候要求寫小說，字數限制三千字，其他同學都會構想好長且內容很豐富的小說，而我則調轉，我會想可否寫一篇最短的小說，結果寫了八百字左右，而我的散文竟然寫了二千多字。即是我認為小說不一定要長，可以短 AYWY

- (change in learning style --- day-dreaming, self-brainstorming, idea log book) -> learning in other courses, especially in method courses) 上堂發白日夢，不跟老師進度(太慢)，自己想，想到很多野記在點子簿

## Far and creative transfer --- more examples

- (need a proper pivot to keep balance in spinning tops -> balancing points in art works; balancing in life!) 曾學平衡力的玩具是需要一個支點的。曾在公共藝術這一科目，我都會留意大型藝術品的支點...我認為為人的生活與支點玩具一樣，都需要一個支點去平衡，才能活得精彩！
- (don't go to extreme -> why people accept Leung Kok Hung( a HK legislation officer?))...有同學提及「太難或太易都不吸引，吸引人玩下去的是有挑戰性的」，令我思考一下日常生活，這或許是中庸之道，每個極端都不討好，只有達致平衡點才討好大部分人。可是，當我想到長毛我在想是否有其他因素比中庸更重要(目標一致?)，還是他不討好，他只是選民放入立法會的棋子，幫助他們。

## Categorization

- **Strong transfer** -
  - students have reported far and creative transfers;
  - Have significant transfers/generalizations in many areas/perspectives;
  - Demonstrate fundamental changes -> a person of creative style
- **Significant transfer** -
  - students have reported some far transfers;
  - Have some important transfers/generalizations
- **Limited transfer** - can quote one or two far transfers with difficulties, or only some not so important transfers
- **No transfer** - no obvious transfer nor generalization

## Sample &amp; results

Time of interview	No. of students interviewed	No. of students have		
		Strong transfer	Significant transfer	Limited transfer
Immediate after the course	5+4 #	2	5	1
1 year after the course	2 + 4 # (see note)	1	5	0
2 year after the course	2	0	0	2
3 year after the course	5	0	4	1
Total:	18	4	14	4

Note. This 4 # students have both immediate and one year delay interview after the course.

## A strong transfer case (AYWY)

Immediate interview (1.5 months after the course)

**Background:** major Chinese(Yr 4), like new things and challenges, used to think what are the uses of things studied; used to relate what's learnt with teaching; had learnt some CT strategies in secondary, but not impressive at that time. She said, before "好像一般人這樣，在日常生活及學習上都沒有甚麼創意的"

## Changes:

- greater confidence in C; pick up the CT strategies
- eager to apply C to daily life & teaching;
- Adopted a new creative style (think in reverse way and try to do unusual things);
- Can quote transfer examples in her writing creation, her job hunting, her teaching and other aspects
- In her words "做一些其他人不會做的"

## A significant transfer case (LTY)

Immediate and one-year delayed interview; major Maths, no creative bkg.

都會說第時如果教小朋友，都會說下用D玩既方法，....  
起碼我做SCAMPER可以望番，有D乜野係可以改....，功課喇，因為我讀數學有個叫趣味數學既Course既，....，搵...d數學既遊戲...加加減減，....

因為我搞PROGRAM，...好像我要搞CAMP...唔會每一年都一樣，又要改下D野呀....

係，個思維模式，即係問問題可個方向會多左，會認得深入D，因為不歸我都會有聯聖經可D都有既，...我教會D導師，都成日叫我去認多D...

## Change:

Playing is a good teaching method;  
Conception: big C -> C in daily life and teaching,  
Think more and try to seek alternatives; stronger questioning skills



## A significant transfer case (CWS)

Immediate interview; major Music, no creative background

見到一d傳統既玩意呢，我就會覺得好啱呀，有啲興趣。依家反而覺得儲舊野(原來)係咁有用個囉。...我之好多次時候舊既野都唔會KEEP住既。而且我以前係鍾意行博物館個D就，...研究返一D古代既野去發掘一D新既野，...原來都會發現到(當中包含既)創意出黎囉。...同埋諗到D人既創意思維，即係你睇到佢點由舊既野轉變去新既野。(即係你鍾意咁埋創意思維，而唔單止係個產品)....係呀。

## Summary:

Attitude toward old things changed → appreciate C in old things/history

Do not keep/visit old things → now opposite

Focus on creative product → focus on creative development process

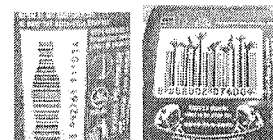
## A significant transfer case (AYYY)

3-yr delayed interview; major Chinese, no creative bkg.

## Change:

- More observant and more critical on C things and her mother;
- Can still recall something!
- Try to find alternatives in teaching; do something exaggerating

可以可樂個BARCODE佢係一個樽裝可樂既樣架喇，咁D位，好細微既位，你會平時，你會留意多左囉，你會發覺原來可D，即係其實佢係運用左1D類似SCAMPER既.....(佢係...改少少呀...加加減減呀).....



## A significant transfer case (AYYY)

3-yr delayed interview; major Chinese, no creative bkg.

## Change:

- has reconstruction thro interacting with new experiences (not all changes are good; common things may also be valuable)

我發覺原來我亞媽好得意囉，...我無教過佢SCAMPER，但係佢(丫媽)身上見到SCAMPER....(哦，即係佢好耐之前已經係咁既)....我會有陣時JUDGE下佢D創意係咁係好正常囉.....

有陣時我覺得，見得多創意之後，有陣時覺得，唔係改得多就好，我會有陣時會欣賞番最原始既創作囉(咁個我地上堂無討論架喇)係喇，因為有陣時我見到我亞媽，你唔係改就得囉，有陣時我覺得佢改完之後唔好，例如我家姐買對CROCS既鞋，...我亞媽真係好個常將D日常用品呢改WO，但係佢一買番架，或者未買既時候已經諗出改

....我依家覺得D簡單既野先容易睇到創意.....簡單既野先，我覺得最COME囉，佢COME既話係有原因囉...鍾意簡單既野...得意呀..

## A limited transfer case-- LKK

3-yr delayed interview; major Chinese, no specific creative bkg

## Change:

- Believe C can be learnt, got sensitivity in C,
- has reconstruction thro interacting with new negative experiences (realizing creativity in reality has constraints)

就係話...原來創意係可以培養...或者通過1D特別既方法去嘗試...其實係...點樣講呀...係生活上會睇到或者真係會有機會用可個其實係好多，但係會有呢個意識囉.....，比如話，呢排會有IPHONE呀IPAD呀咁樣，其實個腦其實會知道佢係將1D野合併，比如話，將電腦，同埋相機同埋電話合併如果淨係中文既，可能會少D，但係你會睇到，因為其實都比較難架，...係話係實習到，有教左1D詞語咁，咁如果係夾硬將兩個詞語夾埋一齊呢，其實小朋友黎講係比較難去，做到一句句，咁陣時就試過，但係原任老師就咁樣講.....

我可能係第二次實習.....但係我嗰陣時唔係真係老師黎加嘛，可能人地有好多野做呀，或者點樣，如果我提出呢個觀念既時候...可能...可能要有一個時，空間或者俾個機會先可以表演，即係打正名號係講創意既，咁就會運用到相關既技巧囉

## Transfers of CT strategies -- quite commonly reported

Scamper &amp; add/sub &amp; finding alternatives

Fashion design/ cooking/ in teaching (2)/ many other domains...

## CPS:

- 可以把創意放到解離能力中，就如上次所說的金魚缸內某些配件，我覺得都有運用得到 (WCK-1)
- 我想就是遇到問題的時候，先別這麼快就放棄，可以想不同的解決方法，下一一定要循用以往慣用的方法，無論是做功課，和同學合做的時候，經常都要發揮創意，例如我們怎樣去做報告，怎樣把我們的想法表達出來，我覺得這門課有它最核心的地方，教會了我們怎樣一步一步的從發現問題到嘗試不同的解決方法，再到解決問題，清晰的交代解離的步驟，除了我自己覺得很有用，也希望將來也可以用這種的方法教學生，..... (ZYT-1)

## Transfer/generalization of conceptions – quite commonly reported

Intuitive/spark → has steps or methods

以前的話，就會覺得創意是一樣很厲害的方法或意念，是沒有人能想到的；但現在會覺得是有技巧的、有系統的

.....

Great C; only elites → everyday C; common people

....，即係原來唔需要做到好大壇野...係呀，以前認為可亂係發明家個d，有舊新野彈出黎先叫創意...係呀，即係個個都有創意，好多好小事既野都得，你只須加少少自己既新意思落去...所以我覺得唔洗諗到咁複雜 (CYS)

Other self-dev. concepts: e.g. not too C and not too lag behind (doctrine of the mean)

即是創意有時標奇立異一點會有人受用，但你走得太多，人們會覺得你OUT，所以你要中間掌握得很好，這個很有印象，在中庸之道這裏(LWC)

## Transfer/generalization in attitudes

## Confidence, interest and values in creativity – quite commonly reported

- 同時亦增加了我運用創意的信心，尤其是最大的影響是在我的教學上，因為令我明白到創意能令整個課堂氣氛很活躍好開心。(AYWY)
- 主要都是其他人不懂得什麼是創意的時候，你可以用不同的創意的方法去讓別人得到創意的靈感，我覺得這樣都算是一個自信來。(LSY)
- 但是在創意方面，就是因為有這個課程，我覺得是肯定了你正在做的東西，即是說你做的東西是有價值的，不只是自己生活裡無聊的一部分，而是可能是代表一個很偉大的想法，即好像是人類創造。(LWS)

- **Valuing cultural heritage** --- cultural heritage is a product of human creativity (CYS)

而我認為，一件自製玩具雖然無分好壞、簡單或複雜，但如果較傳統的製作方法及科學原理，人們較易接受，傳承的機會亦較高。而得到傳承後，不斷的創新、開發，就可增加玩樂的興趣，令人繼續「玩」，亦做到傳承之用。因此傳統與創新的玩具反映出我們過往、今日怎樣將智慧、創造力與科學結合。

## Transfer/generalization of behaviors

## More observant in daily life – quite commonly reported

日常生活中會多了觀察及探索。譬如我記得很清楚的一件事，是去了「所」電器店，...當中會有一些很有趣的產品，例如黑頭機，...以前我會覺得都是騙人的啦，然後就走了。但現在的會多了去嘗試一下使用產品，了解一下產品。即我覺得已經成為了生活的一部分，即不一定可以應用有關的理論，但在日常生活中多了停下來的時間，對於有趣的事停下來，觀察一下，接觸一下，看一下，不論我是否會買那些產品，但是都會多了去試。(YCL)

## Multi-perspectives/ think wider -- quite commonly reported

是，精進力.....變通力都有的。因為這個課程是要分開很多角度去看同一件事的，令我有些思考的時候都會嘗試用不同的方面去思考，不論做功課或有時去思考自己的問題，如家庭的問題都會去想一想。LYY  
依家就覺得再闊d，即係可以亂諗，即係可以天馬行空，唔需要去限制自己。...因為譬如你之前教過...d強迫聯想，兩樣野好冇關係既都可以拉埋一齊。.....(CWS)

## Only a few students reported.... these transfer of behaviors

## Unusual perspective/reverse thinking e.g. AYWY

## Higher tolerance to ambiguity

思維上的改變，我記得教授曾經說過，當我們的創意產品面世的時候，首先不要有所質疑，而是先要想想它成品的過程，所以我的改變首先是心態上的改變，以前只會先質疑別人這樣做是不好的....(LWW)

## More critique &amp; analysis on creative things; higher expectation

(做左三個月toy shop，無諗起創意design?)會諗點解出嚟出去都係咁。(係因為個學科影響?)會，因為我地學點改玩具，有時會覺得點解佢地唔改玩具?.....LTY-2

.....咁其實都係加減咁嘛。.....唔...產品啦好似相機可以不斷推陳出新，因為其實相機好簡單咁嘛，都係不斷係咁影，.....(同我哋得冇關係?)其實係有關係嘅，但就係都係同玩具一樣姐，點解年年都可以有新，除左形象既轉變之外啦，功能都係不斷要點樣加落去好呀(WCK-2)

## Transfer of abilities – rarely reported

Few students reported that they have significantly greater creativity, or creative thinking abilities.

But many of them perform better in the creative thinking tests. Why? Here is one student's explanation:

比如老師教...無論你寫得多壞，你都把它全都列出來，越多越好，.....第一節課老師發了一張紙(CT test)，讓你把一個玩具改良，我寫出了三個，因為我總是想把它做得好一點。無論你花多少錢，把它改造的好一點，我寫了一個可以換衣服，可以噴水，結構圖也畫出來了，我只寫出三個，.....但是最後這節課我寫了十五個把這大象玩具改良，我寫了很多。LC

## Factors facilitating transfer

## Toy characteristics

1. fun, interesting, playful, relax
  2. Simple, concrete, daily life
  3. Cultural-rich, science-rich, creativity-rich
  4. support hands-on exploration, inquiry experiential learning, self-made practical works
  5. Require no difficult pre-requisite knowledge
  6. everybody has experienced (loved) them before!
- 個角度去看我們平時常玩的玩具，會讓人覺得實在了，不會覺得很理論性和虛無縹緲，所以我覺得讓學生能夠有操作的機會，放在手上觀察...會.....(那如果針對於遷移，是否只要有興趣的東西就可以...?)因為印象深刻，...未必好多同學對文字唔識識，啲個興趣咁高(即係玩具就係人眾興趣咁高)大家都曾經玩過(LKK)
  - (同我哋教學法又或者課程結構係好大關係)唔係，你選材料係得岩(玩具?)玩具，因為本身呢個媒介真係幾好囉(好係邊呢?)會覺得輕鬆D囉...玩具好多人係唔識識，即係每個人都識識過囉...即，其實你D其他媒介架(好得意呼講，每個人都有識識過)AYYY

## Factors facilitating transfer

## For deep learning &amp; memory:

- Clear structure and contents/points – compare with other creative learning, this one more explicit and structural
- Other teaching elements – questioning, simple language, worksheet, notes, examples, praising, repeating key points,
- Peer interaction
- Impressive, surprise & memory  
(surprise → impressive → memory & positive view → transfer)
- Experiential learning → hands on/concrete toy (play and make) or has experienced before

### Factors facilitating transfer

*For developing the needs, motives, skills and habits of self-initiated transfer:*

- Provide creative space for thinking & trying; teacher openness; encourage improvisation
- Constructive learning habit – building on prior knowledge → transfer
- Doing independent near transfer in assignments
- Highlight the goal of this course is in self-initiated transfer
- Directly encourage transfer and its reporting in reflection sheet (mark not counted)

### conclusion

evidence revealed that

- *self-initiated, delayed transfers of creative learning are possible (common?) in an integrated toy curriculum of this kind (a convergence of multiple elements)*

We further believe that the transfer is also possible in other *thematic learning on everyday topics*

- *Common transfers ---  
CT strategies, C attitudes; C conceptions, C behaviors (not all)  
Limited transfer --- CT abilities*

- *Among all domains, most common to teaching and learning*

### Limitation of this course

#### Dilemma of using toys for creative learning

- little c/mini-c vs pro-c/big-c
- free imagination vs contextual thoughtful creativity
- playful vs serious thoughts

#### Dilemma in changing learning habit

- Open experiential learning vs clear guidance
- Group work vs individual work
- Graphic vs verbal presentation

#### Dilemma in choosing content

- fixed CT strategies vs free brainstorming
- Old toys vs new IT toys
- wide vs depth

### Dilemma in thematic/ GE course structure

#### → Good points:

- focus --one theme, but explore in multi-dimensions & multi-perspectives
- can cater ALL students, of diversified backgrounds
- free to design, flexible, personal interest of lecturer

#### → Limitation to transfer

- Too focus on toys--  
use of other daily-life items (e.g. food, furniture) may better facilitate transfer
- have not taught directly how to transfer (the method)
- Lack of formal chance to practice and no demand on self-initiated transfer
- no continuous studies on creativity – forget and fade out
- GE --- lack of significance/like an interest group

### Dilemma in context

(Creative learning is valuable in conservative context,  
but this context restricted their creative transfer)  
e.g. Daily life living is too plan/restrictions in teaching practice

### Suggestion --- Beyond OBL

- Randomly choose 10% students at the beginning of the course;
- They would be requested to keep a learning journal on their self-initiated transfers.
- They need to submit the journal at the mid-, immediately after, 6 months and one year after the course study.
- Certificate of participation would be awarded (or/and iwork would be paid) after students submit their final journal. Their performance in learning transfer would not affect their course result.