How innovation and creativity develop from science subjects: Fun, tools or burdens?

Ir. Liew Shaw Shong

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Nature of our CPU (Control Unit)

Analytic & Logic
Organised
Communication
Factual
Practical
Conservative

Sensation
Imagination
Excitement
Adventurous
Futuristic
Foresight
Amplification & Suppression of our CPU
Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid.

- Albert Einstein

Nicolaus Copernicus
Law & Business
Arts & Music
The 10 Most Famous Malaysian Athletes

- Lee Chong Wei
- Nicol David
- Pandelela Rinong Pamg
- Julian Yee Zhi-Jie
- Azizulhasni Awang
- Welson Sim
- Shalin Zulkifli
- Farah Ann Abdul Hadi
- Abdul Latif Romly
- Aaliyah Yoong Hanifah

https://theculturetrip.com/asia/malaysia/articles/the-10-most-famous-malaysian-athletes/
Jack of All Trades

Leonardo da Vinci

Artist
Musician
Architect
Scientist
Engineer
Mathematician
Balanced Brain

Utilitarianism

Average starting salaries of teachers in comparison to other professions in Malaysia

<table>
<thead>
<tr>
<th>Profession</th>
<th>Average Salary (RM per month 2010)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Civil service doctors</td>
<td>4,300</td>
</tr>
<tr>
<td>Civil engineers</td>
<td>3,000</td>
</tr>
<tr>
<td>Lawyers</td>
<td>2,800</td>
</tr>
<tr>
<td>Civil service teachers</td>
<td>2,750</td>
</tr>
<tr>
<td>IT executives</td>
<td>2,500</td>
</tr>
<tr>
<td>Accountants</td>
<td>2,500</td>
</tr>
<tr>
<td>HR executives</td>
<td>2,500</td>
</tr>
</tbody>
</table>

¹ Private sector includes only base salary as allowances are usually provided to reimburse out-of-pocket expenses and do not form a significant portion of compensation.
Why boring comes about?

**Reasons**
- Haven’t appreciated the powerfulness of the tools at the time of learning
- No developing story line & force feeding (resisting)
- Too much knowledge to digest within short period of learning
- Subjects are not taught with aspect of imminent applications & idling most of time
- We all take things for granted (outcome of consumerism)
Why “fun” is important in learning?

Surprise & Unexpected/Mystery (WOW!)

Allow imagination (Go wild)

First time experience (Adventurous)

Have drive to continue (Challenging)

Curiosity to pursue (Satisfying)

Creativity to flourish (Harvesting)
Curiosity

Curiosity is like a mental itch and the only way to scratch it is to seek out new knowledge. Albert Einstein once said: “I have no special talents. I am only passionately curious.”
Satisfaction
Creativity

Problem solving capability for better efficiency, convenience and affordability
How Innovation solves Problems

Challenges
- Limited resources (Two wooden planks + 6 strong stunt persons)
- Tasks to attain (To bridge the open gap for passage)

Problem solving
- Conceptual development & innovation
- Configure available materials & resources
- Calculate & analysis for safety adequacy
- Construct to materialise

Go far, Go high & Flying in Civilisation
Creativity Process

Ingredients

- Curiosity
- Observation/Connectivity
- Discovery/Mystery
- Imagination
- Creativity
- Passionate
- Revolutionary

Preparatory Stage

Gestation Stage

Blossom Stage

Verification Stage

Fun to learn

Improvements

Validation of realisation

Tools to develop

Freedom to imagine/create

Fun to learn

Improvements

Validation of realisation

Tools to develop

Freedom to imagine/create
Creative Response

一、按要求做题我最棒。

1. 把数倒着数写在□里。
   1 2 3 4 5 6 7 8 9 10
   8 7 6 5 4 3 2 1 0

2. 把下面的数从小到大排一排。

四、请按照要求写出1-9的数字

从小到大：
2 3 4 5 6 7 8 9

从大到小：
9 8 7 6 5 4 3 2 1
Are tools useful along journey of learning?

What benefits tools can give us?

- Fast *(can complete more tasks)*
- Accurate *(incoming parameters for next move)*
- Knowledge platform to advance *(stepping platform)*
- Complementary between rationale & sensational mind *(balance)*
Learning Pyramid

By the factual findings of Learning Pyramid, you can decide which level you want to engage yourself at.

Learning is a very personal matter. No one to be blamed or to be accountable to your success except yourself.
Summary

- Balanced development of your brain: Never over suppress your dominant strengths
- Do what you enjoy most, not expectation from others
- Work through the knowledge acquisition stage at your comfortable pace, no rushing
- Find out interesting story line of achievements by others
- Nurture your curiosity
- Collect ideas for creativity & innovation
- Put your hands together to build things/prototypes: Practices perfect your skill with time
- Participate competitions & engage in forum discussions
- Passive learning + Active participation
THANK YOU!

Ir. Liew Shaw Shong
References

**Issue**
- [http://blog.xuite.net/kc6191/study/25178768-創造力%28Creativity%29的本質](http://blog.xuite.net/kc6191/study/25178768-創造力%28Creativity%29的本質)
- [http://epaper.heeact.edu.tw/archive/2016/07/01/6577.aspx](http://epaper.heeact.edu.tw/archive/2016/07/01/6577.aspx)
- [https://www.scienceofpeople.com/curiosity/](https://www.scienceofpeople.com/curiosity/)