



What is Research?

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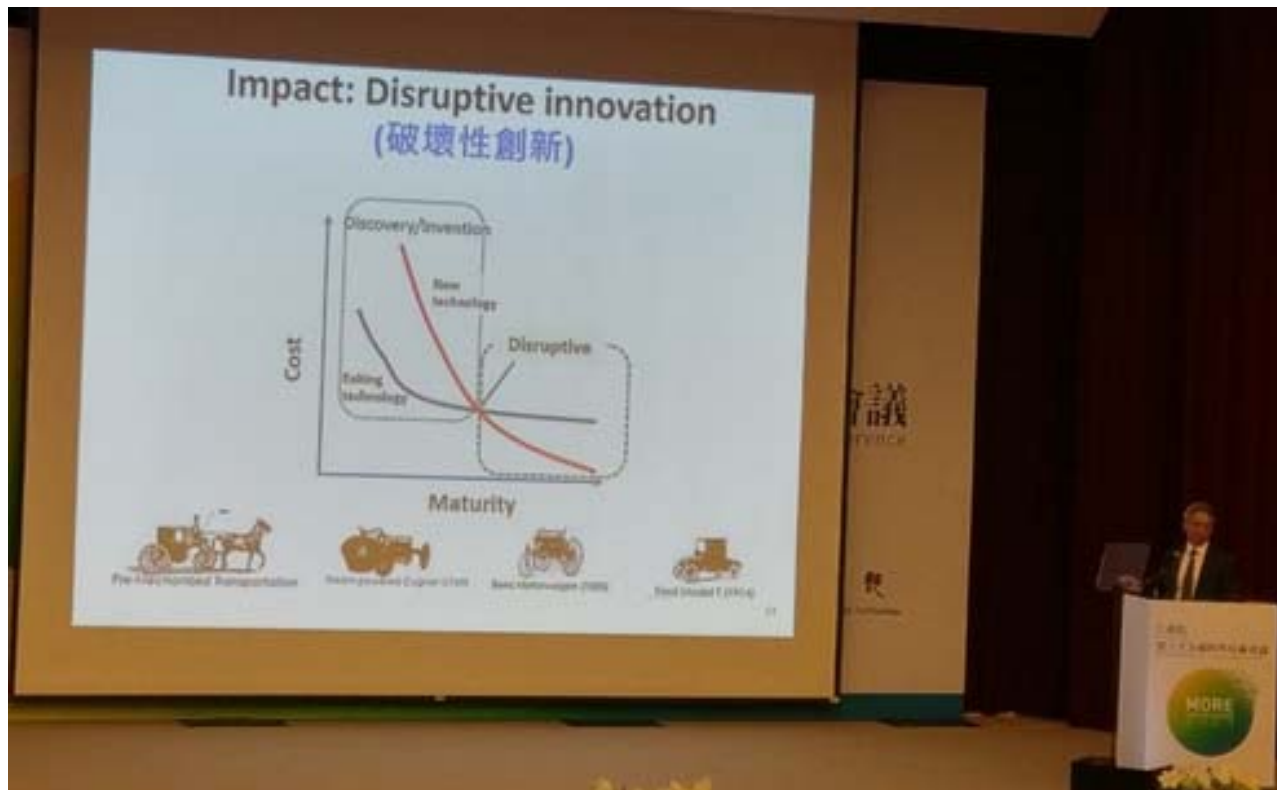
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Declaration

- 以下言論均來至世界知名學者，不代表本人立場。
- 以下言論的轉述，可能因本人的理解力而有所失真。

Why Research?

- 普 (くまろ) 世 (にた) 價 (うめち) 値 (にやゝ)
 - To improve human civilization



- Why papers? Share findings with the community

Research Types

- Research is a **repeat search** process to know unknown.
– Lui Sha

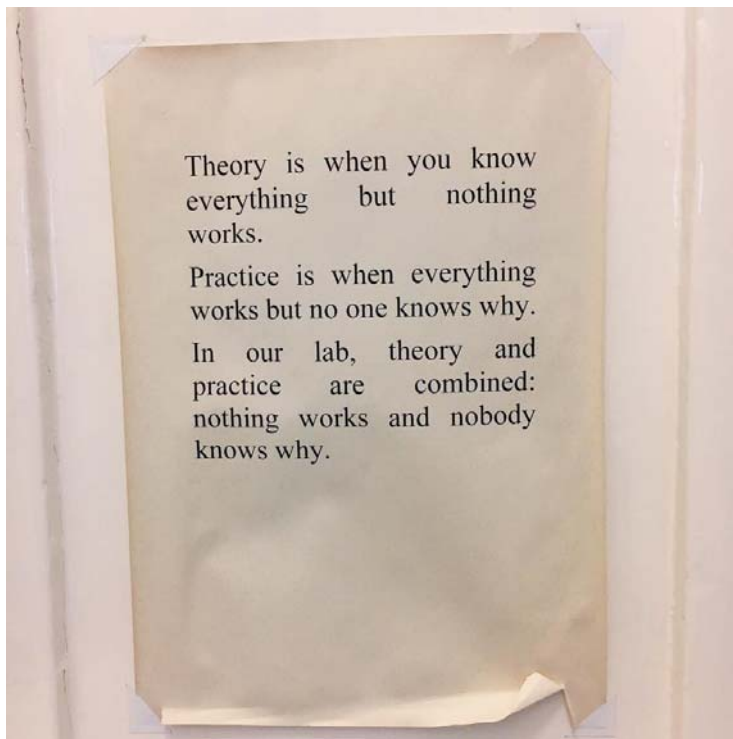


<i>Quest for fundamental understanding?</i>	<i>Considerations of use?</i>	
	No	Yes
	Yes	Pure basic research (Bohr)
No		Pure applied research (Edison)

Practice vs. Theory

- The best theory is inspired by practice, and the best practice is inspired by theory.

- Donald E. Knuth



The Tough Part in Research

- Finding a problem is 90% of the problem.

- P. R. Kumar



- Open problems (e.g., $P = NP?$)

- ◆ What is solvable?

- Mature areas

- ◆ What is unknown?

- Emerging areas

- ◆ What is promising?

題目決定 Impact !

您如何找題目？

-- 用熟練的數學找題目

or -- 用腦袋找題目

題目決定研究的高度

- Mark Liao



國家實驗室 vs. 另一所大學



- YN Huang

- 什麼研究是中研院做得到, 但大學做不到的?
 - Philosophy: 論文很重要, 但篇數不重要!

(1) High Risk, High Impact 的題目 (e.g., 黑洞計畫)

- 一個團隊共同完成, 產生一篇論文, 因為沒有學位問題

(2) 團隊成員的組成 (e.g., 後量子密碼NIST標準)

- 人數不用多, 但具研究經驗, 吸引外籍專家

(3) 經費來源支持前瞻基礎研究 (e.g., 固碳技術)

- 關鍵突破/主題/深耕/前瞻計畫, 不要求短期商用化



Concrete vs. Abstract



- M.-S. Chen

- 具體的問題抽象回答
 - 助升副的標準?
 - 副升正的標準?
 - 你有問過你老闆什麼時候可以畢業嗎?
- 抽象的問題具體回答
 - 如何評價研究做得好不好?
 - GREAT: Goal, Receiver, Elite, Article, Teaming
- 教授獨特的能力?

Different Criteria at Different Stages

- T.-W. Kuo



- PhD Student/Postdoc
 - Assistant Professor
 - Associate Professor
 - Professor
 - IEEE/ACM Fellow
 - Academician
 - Nobel Prize/Turing Award
- 
- Potential
- Independence
- Leadership
- Visibility (Peer Recognition)
- Impact
- 命 (Impact sufficient to change the world)

Idealism vs. Pragmatism

- It is difficult to say what is impossible, for the dream of yesterday is the hope of today and the reality of tomorrow.

➤ 想深遠一點，把夢做大一點。

– Robert H. Goddard



- Don't try to "solve the world" or "boil the ocean".
 - 做一個務實的理想主義者。

Are You Looking for an Interesting Research Area?

Welcome to Join **EMCLAB@SINICA!**

