

# **E-Academy: The Next Scientific Revolution**

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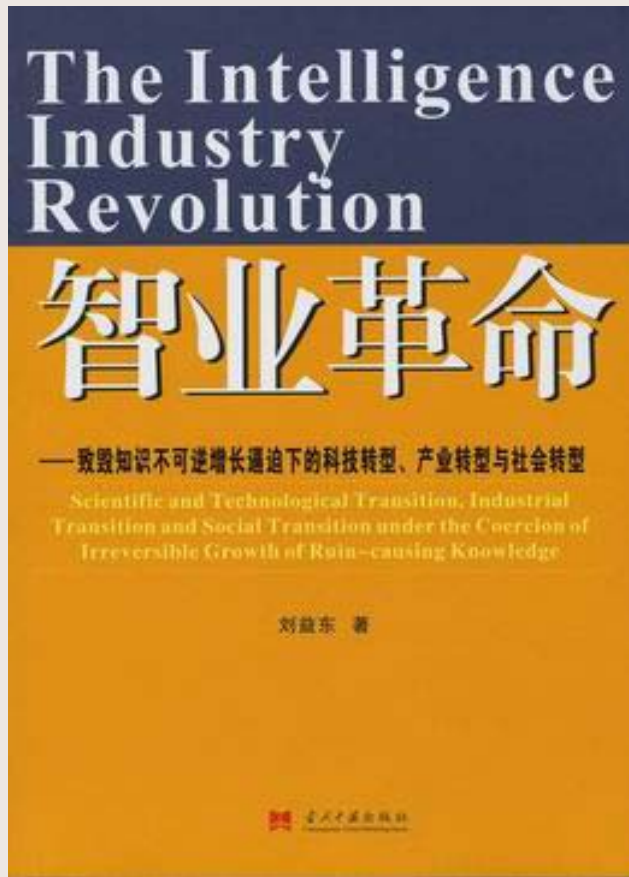
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**&**

**LSE**

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This talk is based on my new book



- **Chapter 17.**

**E-Academy:  
Scientific Revolution  
Led by Objective  
Academic  
Evaluation**

**ICT development has made significant progress while ICT adoption in academia is at a shallow level (1)**

- The development and application of information technology has transformed the image of our society, and informatization in various areas of the society has made significant progress.
- However, the majority of ICT application in academic activities are at a very shallow level; for example, the application has been limited to the digital publication of journals and books.

**ICT development has made significant progress while ICT adoption in academia is at a shallow level (2)**


- There have been very few examples of ICT application at a more profound level, namely reforms and innovations in the aspects of academic standards, evaluation system, promotion and funding mechanism, organization and institution of scientific research.
- As a result, the current academic evaluation, standardization and funding mechanism are still maintained in a state of lower efficiency and quality, which is a serious setback for the development of academic research.

## The primary task is to apply information technology to launch e-Academy

- What is e-Academy?
  - a new institution of academic priority
  - new academic standards
  - A new promotion mechanism
  - new evaluation and funding mechanisms
  - a scholar supporting platform centered on “research institute --- academic market”
  - liberalization of academic talent
  - greater development of science

## **Academic evaluation, standardization and funding system is of lower efficiency and mediocre quality**

- Academic evaluation, standardization and funding system are the key factors for the development of academic research.
- The growth of academic researchers depends on peer recognition and granting of research funds.
- However, these factors had been formed at a time when ICT was underdeveloped and the understanding of academic causes remained superficial. Therefore, these factors are seriously defective.

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- The development of ICT makes it possible to overcome these deficiencies. I will first analyze the deficiencies, before moving on to suggest the solution.

## **▲ Academic evaluation method is lagging far behind**

**(1)**

- The development of science and technology progresses with each passing day, yet the method for evaluating science has remained unchanged for almost three hundred years: “reading papers and writing comments” (Peer Review).
- Peer Review relies more on subjective judgment and experience. For instance, the judgment of whether an academic perspective is of novelty, the reviewer works with his/her memory and impression.
- The quality of research is also assessed with subjective judgment.

# Academic evaluation method is lagging far behind

(2)

- It is incredible that the peer review system is of so much subjective nature, relying so much on individual preference, perspective and integrity, and of such poor efficiency.
- **In my opinion, in the long run, peer recognition is indeed the “hard currency”, yet from a short-term perspective, it is of great uncertainty, arbitrariness, and subjectivity. This is a key difference.**
- Peer review is directed at the evaluation of recent scientific achievement, so opinions naturally differ greatly from person to person with insoluble arbitrariness.

# Academic evaluation method is lagging far behind

(3)

• From a short-term perspective, colleagues tend to have intertwined interests.

• This arbitrariness can be found just from the frequency of mutual criticism and attacks among scholars.

• “A new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it”

----- Planck Law

# Academic evaluation method is lagging far behind - Examples (4)

- Example 1
  - Douglas North, winner of Nobel Prize for Economics(1993), offered the following comment for another winner of Nobel Prize for Economics(1974), F.A. von Hayek, about his core theory--- theory of spontaneous order: “Trash”.

# Academic evaluation method is lagging far behind (5)

- Example 2

- The founder of the “mutation” theory, René Thom, criticized the contemporary intersection sciences, such as system theory and control theory, as “ghostly sciences”, and acutely pointed out that “the wise scientific opinion believes, ... the general system theory ... offers nothing except a pile of vacuum concepts about system; as of the control theory, as is known to all, there is not a single principle in this theory.”

# Academic evaluation method is lagging far behind

## (6)

- Example 3

- winner of Nobel Prize in Economic Sciences, 1991
- Ronald H. Coase (1910-) was a member of LSE Staff from 1935-51. (From 1940-46 he worked for the government, performing statistical work during the war.)
- Coase's masterpiece: "The Nature of the Firm", published in 1937
- Cited by the [Royal Swedish Academy of Sciences](#) in awarding Coase the 1991 Alfred Nobel Memorial Prize in Economic Sciences.

1935~1938	Assistant Lecturer,	LSE
• 1938~1947	Lecturer,	LSE
1947~1951	Senior Lecturer,	LSE

## Academic evaluation method is lagging far behind (7)

- The quantitative evaluation method for academic achievement is not reliable either. The “rate of citation” is essentially improper to be used to evaluate academic achievements, especially outstanding achievements.
- In 2002, Donald Kennedy, editor-in-chief of the U.S. journal *Science*, expressed in its editorial entitled “Tournament, Trophy and ‘*Science*’ Magazine” that “some excellent papers published in *Science* are rarely cited, yet some secondary papers are widely quoted.”

## Academic evaluation method is lagging far behind (8)

- “it is meaningless to count the number of publications, rank the journals that carry these papers, or calculate the frequency of international citation. This evaluation method is inaccurate. As far as I know, for the top economics departments in the world, none of them adopts these criteria.”

--- Steven. N. Cheung (famous economist)

## **Academic standard is in dire need for reform**

**(1)**

- The current academic standard had been formed at a time when academic literature was rare and the information technology was primordial.
- Thus it is full of loopholes. In particular, it is of low efficiency and quality in fulfilling two most fundamental needs of researchers: recognition and research funds.
- Probably, people have overlooked the necessity to seek for better alternatives, and become accustomed or even tolerant to the defective system.

## **Academic standard is in dire need for reform**

**(2)**

- For instance, it is crucial for scholars to get peer recognition, yet the existing method for acquiring this recognition is personalized, spontaneous and inefficient. The process is long and uncontrollable. Real excellent achievements cannot get timely recognition and be used as the foundation for new research.

## Academic standard is in dire need for reform

(3)

- At present, there are two stages for acquiring recognition:
  - first, the achievement is officially published after the review of editors or reviewers to get the initial recognition about the value of the paper or book for publication and communication;
  - second, after a long period of test and competition among similar achievements, it can get universal acknowledgement from the academic community.
- The majority of the papers cannot get this kind of universal acknowledgement.

## **Academic standard is in dire need for reform**

**(4)**

- The former can be controlled, because the scholar can manage to get his/her paper published (after revisions, refusals, and contribution to friendlier journals).
- Yet the latter is beyond the means of the scholar. That is to say, once the paper is published, the author can do nothing about whether the paper will be read, cited, appreciated or opposed (except by giving talks and seminars, which is still to a limited audience).
- Therefore obtaining recognition in the academic community is more or less a passive process.

## **Academic standard is in dire need for reform**

**(5)**

- Obviously, it is inefficient compared to how technological achievements acquire recognition.
- Technological achievements can be actively recognized by means of patent application, which is done without citation or recommendation by technical gurus.

## **Academic standard is in dire need for reform**

**(6)**

- The approval of patent application is objective and repeatable, so the application can be approved if the applicant follows relevant rules.
- Therefore, technological achievements are not subject to peer degrading and suppression from academic authorities. This is advantageous for gifted inventors to be identified and rewarded.

## **Academic standard is in dire need for reform**

**(7)**

- The system of bibliography and citation, which occupies an important position in academic standard, is also seriously defective.
- Actually, what is practiced is the “self-selected references” and “self-selected citation”. Some literature that deserves citation has been purposely or unconsciously neglected, so the excellent achievements cannot become the foundation for new research in time.
- Among officially published papers, 70%-80% (or even greater percentage) carry no new ideas.
- There have been a large amount of repetitive research and research that is equivalent to repetition, which causes tremendous waste of academic resources.

## The funding system is inefficient

(1)

- For scholars, one of the most important things in their career is to acquire research funds. The trade between research outcome and research funds forms a major relationship between the academia and the society.
- However, the currently practiced method of “upfront investment” (funds awarded before the research) is of lower efficiency and quality.
- A large amount of the scholar’s energy and time is wasted in striving for research funds. For instance, in the United States, “university researchers spend 30% to 40% of their time in applying for research funds.” (Paul Labiner, 1998)

## The funding system is inefficient

(2)

- In the countries and areas where academic corruption is rampant, time and energy is further wasted on maintaining “public relations”. “30% academic ability plus 70% PR” is the secret to triumph in the race for funds.
- The currently practiced “upfront investment” method has been inherited from the time when information technology, evaluation method and academic market were still underdeveloped.

## **It takes a series of innovations to overcome the defects**

- Along with the development of information technology and the improvement of academic evaluation system, this inefficient and low-quality funding method, which nurtures academic corruption, will surely be reformed and restructured.
- It takes a series of innovations to overcome the defects with the current system of academic evaluation, academic regulations and research funds management.
- The innovations mainly consist of the adoption of objective academic evaluation method, the establishment of academic priority system, and the reform of academic regulation and funding system.

# Objectification of Academic Evaluation

- Objective academic evaluation applies a set of academic evaluation methods and procedures to allow different evaluators to work out parallel results, thus the evaluation results can be repeated with almost the same accuracy.
- I propose “Programmable Academic Evaluation Method”
  - formal evaluation (pre-treatment, novelty-query analysis, rating and grading)
  - substantial evaluation (fault-finding and refutation)
  - comprehensive evaluation
- This new evaluation method aims at the core content of research achievements --- the three key elements of innovation (novelty, importance, normality)--- to guarantee better objectivity in evaluation.

# Objectivity of this evaluation method - formality evaluation

## 1. Objectivity of formality evaluation

- Demonstration that can be easily evaluated
- Novelty query analysis
- Rating and grading (importance)

- “Novelty” can be identified by means of novelty-query procedures;

- “Importance” can be outlined by reading the researcher’s own interpretation of the significance of his/her research and the literature review available in the papers. Literature review shows the researcher’s allies, competitors, ambitions and priority level of the research.

- The aspects of “normality” to be checked at this stage mainly consist of the research standard, argumentation methodology and logical thinking.

## Objectivity of this evaluation method - formality evaluation

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- Obviously, formality evaluation can be done with standard literature processing and treatment methods, governed with unified codes and requirements, resembling the procedure for handling patent application and examination.
- Qualified academic evaluation experts can work out evaluation results that can also be repeated.
- Since the objects of evaluation are reviewed and openly published papers and monographs, formality evaluation is basically capable of initial identification the quality of research outcome.

## Objectivity of this evaluation method — substantial evaluation

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- There is only one core content of substantial evaluation: scrutinizing the objects of evaluation for subversive errors, which is also the core content of the examination of “normality”.
- Peer reviewers can only provide statements of “YES” or “NO” for these errors, which is more objective than the current practice of providing subjective and ambiguous opinions.

## Objectivity of this evaluation method — substantial evaluation

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- It is worth noticing that it is exactly because of formality evaluation that substantial evaluation can be focused on the scrutiny for subversive errors.
- When it is confirmed that no subversive errors are present, formality evaluation can play a major role to ensure objectivity and repeatability.

# Establishment of Academic Priority System

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- Priority is crucial to academics, yet ironically there has been no formal academic priority system (e.g. similar to the patent system) .
- The above-mentioned evaluation methods provide the conditions for an academic priority system.
- The patent system has led to significant technological progress; in the same manner, the establishment of an academic priority mechanism can surely promote the development of academic research.

# Reform of Academic Standards (1)

- The priority system has provided an intermediate step of acknowledgement to authors in the form of priority recognition, which turns passivity into pro-activity.
- In this case, after the publication of the research outcome, scholars can actively apply for academic priority. Once the application is approved, the paper or monograph can be admitted into the basic bibliography database, and immediately become the basis for further research shared by all researchers.
- In other words, from the priority system we can establish a basic bibliography system which includes all the original contribution in a specific field.

# Transformation of Funding Mechanism (1)

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- Furthermore, the currently practiced method of “upfront investment” can be replaced with “in-progress grants” or “aftermath rewards”.
- Both of the two new methods are used to acquire funds by “selling” the openly published achievements, which in turn have been confirmed with “Programmable Academic Evaluation Method” .

# Transformation of Funding Mechanism (2)

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- As a result, the quality of the research product is the only factor that determines whether the funds shall be granted.
- Compared with the various factors involved in the current funding policy, the new method is a huge step forward in effectively reducing academic corruption.

# Demonstrated contribution that can be easily evaluated (1)

- Due to the academic priority system, a researcher can demonstrate his/her contribution by a list of academic priorities, that is, a list of original ideas.
- Inspired by the “Who’s Who” entries in encyclopedias and professional dictionaries and the format of concise biographies of scientists, I have proposed the method of “evaluation-friendly display”, which includes interpretations of innovation points and significance of the research and the comparison in the same field.
- This is much more efficient and effective than listing all the publications.

# Demonstrated contribution that can be easily evaluated (2)

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- Three aspects should be taken into consideration when a scholar is being evaluated:
  - (1) Innovation and significance of the research should be demonstrated;
  - (2) the limit on the number of major achievements. Even for renowned scientists, the number of their representative works is limited, so the “Who’s Who” entries or concise biographies can be written with 1,000 words or so;
  - (3) Originality shall prevail over correctness, so the priority should be given to inspirations.

# Kick-starting e-Academy

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- Three types of people will welcome e-Academy:
  - People who can provide a list of priorities (original ideas);
  - Investors (providers of research funds);
  - The public (understanding and monitoring science)

# Public Understanding of Science and Public Supervision of Science

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- [Public Understanding of Science - Google Search.htm](#)
- Results 1 - 10 of about 2,400,000 for "[Public Understanding of Science](#)". (0.19 seconds)
- [Public Supervision of Science - Google Search.htm](#)
- Your search - "**Public Supervision of Science**" - did not match any documents.

A spiral-bound notebook with a textured, light-colored cover. The spiral binding is visible on the left side. The text "Thank you!" is centered on the cover in a black, serif font. A small black dot is located below the text.

Thank you!

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