

Innovative Thinking in Collegiate Pedagogy in the Big Data Era

—Analysis of the Teaching Platform Required in China

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Abstract

From the perspectives of the innovation of teaching methods and the kind of thinking ability that the society in the future may require, this article explores the prospect of reform of pedagogy in colleges and universities in the new big-data era. After discussing the demand of the information-based teaching platform, the article designs an innovative teaching platform to help teachers to change old and backward teaching methods.

Keywords

Big Data, Way of Thinking, Thinking Habits, Teaching Platform

1. Definitions of the Big Data

The topic of the big data has attracted people from all walks of life. Various research organizations and companies have attempted to define the big data (BD henceforward). Wikipedia defined BD as “an all-encompassing term for any collection of data sets so large and complex that it becomes difficult to process using traditional data processing applications.”¹ And Gartner defined BD as the diversification of information assets with the need to deal with the new model and high rate of growth (Douglas, 2012). Both definitions differentiated BD, the VLDB (very large database), and XLDB (extremely large database). The current mainstream software has been unable to deal with BD effectively. The use of new technology is desperately desired.

In June 2011, McKinsey released a detailed report on BD: “Big Data: the next frontier for innovation, compe-

¹Nucleus Research Business Intelligence ROI Tool (2008). Retrieved September 1, 2014, from <http://nucleusresearch.com/>.

tion, and productivity” (Manyika et al., 2011). In the report, the influence of BD, relevant key technology, and application range and so on are described in detail. In January 2012, BD became one of the themes of Davos World Economic Forum, which released a report: “Big data, Big impact: New Possibilities for international development.”² The report discussed how to utilize the existing huge amount of data services to improve our contemporary society. Since then, BD has attracted the attention of global governments. In March 2012, the Obama administration declared to invest more than \$200 million on the official launch of “big data development plan”, with the aim to study how to make best use of BD technology in areas such as scientific research, environment production, and biomedical breakthroughs. This plan has been identified as “the information highway plan” of US government after another major step in the field of information science. The era of BD management has quietly come to our daily life.

With the effect of globalization, more and more Chinese scholars have paid much attention to the application of BD. They consider BD as collecting data with the size beyond the capacities of commonly used software tools to capture, manage, and process within a tolerable amount of time. Besides, BD has been used in a wide range of different fields in China. The application in higher education will be examined below.

2. BD Applied in Higher Education

A world conference on higher education in 2009 clearly stated that the responsibility of future higher education is to “...help us to improve the ability of understanding complex problem on its social, economic, scientific and cultural aspects”, and “promote the ability of students’ critical thinking and citizen initiative”. “Higher education is not only in response to the needs of the reality and the future transfer of pure skills, but also to guide people to build peace and defend human rights and democracy”. Therefore, the quality standards for college education must reflect the overall goal of higher education, especially to cultivate the students’ critical thinking, independent thinking and life-long learning ability (Druekey, 1998).

It should be noted that the arrival of the BD era will change humans’ basic ability. Ten years ago, for example, in the field of economic management, the compliance was the enterprise management of ERP (Enterprise Resource Planning) process management. However, now more and more companies are focusing on big data via the Internet and business process to find business opportunities at any time (McAfee & Brynjolfsson, 2008). McKinsey said in a research report “Data, has penetrated into every industry and business functional area, becoming an important production factor and causing a new wave of productivity growth”. As the leading force of the future society, contemporary college students have grown up with the concept of BD, and they are going to accept that most of the things around them will be digitized. Today it might look like an interesting novel, but in the near future, it will be as common as eating and sleeping.

Once we have difficulty extricating ourselves, we will be unable to get rid of the crisis. The best way is not to try to overcome difficulties, but to cope with them and prevent them as early as possible. So today’s winners do the correct things which have been designed in advance, and they are ready for new opportunities, and strategies of rational action. Through their “insight” and flexible strategy, a nearly perfect plan can be made. This logic of thinking helps people effectively control risk action, and promote the progress of careers more effectively. And the basis of this process of thinking is all of what is happening in related but seemingly unrelated data. It is data that can tell us what is happening and what is going to happen.

3. A New Teaching Method in China

In terms of thinking method, future society may need such basic characteristics as vision, insight, and strategic action plan, which is ahead of the basic way of the goal cycle. Therefore, in higher education, we should reconsider how to train students and develop their ability of this new thinking method.

The so-called thinking ability is in fact a kind of thinking habit or thinking mode. Kenichi Ohmae said, “The real entrepreneurs often have inner doubt when facing every matter. And they know that the turning point will come around when they get the answer” (Wingfield, 2011). It is a good habit of thinking. Then, how to change habits? Jack Hodge described: “habit is easy to manage as long as you’re being strict with yourself. A great man is great, thanks to the strong support of the habit.”³

²The Davos World Economic Forum (2012). Big Data, Big Impact: New possibilities for International Development. Retrieved September 1, 2014, from <http://www.weforum.org/reports/big-data-big-impact-new-possibilities-international-development>

³Sonderegger (2012). BI 2012: The Future That Has Already Happened. Retrieved September 1, 2014, from <http://tdwi.org>

Acquisition of this habit of thinking, therefore, needs a long-term development through self learning. Basic teaching activities should be focused on an effort to place students in all kinds of known or unknown—e.g. simulated—social, economic, academic, and cultural conditions and environments.

4. Ways to Change Teaching Methods in China

At present, the mainstream in Chinese college teaching has two fatal flaws: First, teaching is offered mainly to reassure known issues and knowledge. Students taught this way are not well qualified in their way of thinking when it comes to dealing with unknown complex issues. Second, students' performance is evaluated on the basis of examination results, which restricts students' thinking to their exam sheets (Bob, 2006).

Teachers who want to improve their teaching methods can make adjustments at any time by letting students think independently. The evaluation system and evaluation standard must have the right tools to undertake the whole process of implementation⁴. Regarding the new BD logic, a new generation of college teaching platform should have the following features:

First, the digital-teaching process is in the regular course of task orders, process guidance, random test, group discussion, data reading, learning time, behavioral characteristics, etc., which should be collected in the BD platform.

Second, teaching methods should be integrated into listening, reading, writing, doing, perspectives, resource sharing, discussion, interaction between teachers and students, and so on. The new platform should be similar to the micro letter, QQ, which features a two-way multimodal interaction. As the course progresses, interactive data can collect the related information to the platform and timely analysis of the behavior will follow.

Third, the evaluation of digital teaching can affect students' behavior. Digital learning and evaluating can be used between teachers and students. The teaching effect can produce relevant information. Through the analysis of this information, the students' behavior can be studied to gain insight into their thoughts.

At last, the teaching platform of mobile phones and other mobile terminals have become indispensable to people's daily communication, which can also become a daily learning tool.

To sum up, the basic function of the BD teaching platform is to effectively increase the interaction between teachers and students. On this platform, Chinese teachers can design effective teaching processes, to find potential problems, and correct them in time. This new teaching method can help to change students' thinking habits in China, and will be embraced by all Chinese schools. Besides, teachers themselves should form the reasonable and up-to-date thinking habits, or it would be a disaster for students to have a teacher with outdated way of thinking to "guide" their thinking.

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⁴Few (2006). *Information Dashboard Design: The Effective Visual Communication of Data*, O'Reilly Media, Inc. Retrieved September 1, 2014, from http://www.gartner.com/it/content/660400/660408/key_issues_bi_research.pdf

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