



# DAKES INSTITUTE

(Data, Knowledge & Education Service Institute)

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## **A Concise Research Report 2022-2023**

We pay attention to key thinkers whose thoughts changed the world, key books that shaped human mind, key universities that guided knowledge progress. How these thinkers, books, and universities are selected or evaluated is a matter of debate. We try to give a concise research report based on a few brief principles.

### **1. Top 10 great thinkers since the Renaissance**

The selected principles focus on two points: one is that thinker's thoughts have a worldwide influence across the ages, and the other is that thinker's thoughts have interdisciplinary influences (not limited in his professional field). The preliminary results are as follows:

(1) Leonardo Da Vinci (1452 - 1519). He was active as a painter, as well as engineer, scientist and architect. While he contributes his drawings to the world, his contributions also covered engineering, astronomy and biology.

(2) Francis Bacon (1561 - 1626). He led the advancement of both natural philosophy and the scientific method. His contributions also affect ethics and law.

(3) René Descartes (1596 - 1650). As a philosopher, scientist and mathematician, He formulated analytic geometry and had a widely influence on

modern philosophy and science.

(4) Immanuel Kant (1724 – 1804). His comprehensive and systematic works concern epistemology, metaphysics, ethics and aesthetics, and his thoughts had great influences in modern philosophy and science.

(5) Adam Smith (1723 – 1790). As an economist and philosopher, he was called father of modern economics and a pioneer of political economy and social philosophy.

(6) John Maynard Keynes (1883 – 1946). As an economist, his thoughts fundamentally changed the theory and practice of macroeconomics and the economic policies of governments.

(7) Isaac Newton (1642 – 1726). As a scientist, his contributions covered mathematics, physics, astronomy, philosophy and theology.

(8) James Clerk Maxwell (1831 – 1879). His theory unified electricity, magnetism and light, and then guided the electrical revolution.

(9) Albert Einstein (1879 – 1955). He made important contributions to both theory of relativity and theory of quantum. His impact also concerned scientific philosophy and social philosophy.

(10) Charles Robert Darwin (1809 – 1882). As a biologist and naturalist, he also contributed new knowledge to scientific philosophy and social philosophy.

Of course, there are many other great thinkers worthy of inclusion, and these are just examples.

#### References

[1] Encyclopedia Americana. 30 vols. 2006

[2] Encyclopædia Britannica. 32 vols. 2010

## **2. Top 10 great books in human history**

Taking the Great Books of the Western World (1st ed. 1952, 2nd ed. 1990)

and the Commercial Press' World Academic Classics Series (120th Commemorative Edition) as references, and taking into account the representatives of Eastern and Western cultures, the following 10 types are recommended:

(1) Bible (c.1000BC). The Bible is a collection of religious texts. It plays an important role in the Western civilization.

(2) Tao Te Ching (c.500BC). It is the most translated ancient classic in the world except for the Bible, representing the Eastern spirit.

(3) Euclid's Elements (c.300BC). The *Elements* cover plane and solid Euclidean geometry and elementary number theory, which play the fundamental role in logic and science.

(4) The Mathematical principles of natural philosophy (1687). The *Principia* set up classical mechanics, which shaped the foundation of modern science.

(5) An Inquiry into the Nature and Causes of the Wealth of Nations (1776). The *Wealth of Nations* set up the foundation of classical economics, leading to modern economics.

(6) The General Theory of Employment, Interest and Money (1936). In the *General Theory*, Keynes contributed his ideas of macroeconomics. With combining microeconomics, contemporary mainstream economics shaped.

(7) The Spirit of Law (1748). In this treatise, Montesquieu contributed his ideas of politics and law with concentration on the separation of powers.

(8) Charter of the United Nations (1945). The Charter of the United Nations is the founding document of the United Nations, which represents the common will of all UN Member States in the world.

(9) Faust (1808). This is a great literature work combining epic style with dramatic novel by Goethe, which represents a peak of modern literature.

(10) War and peace (1869). This is a unique novel by Leo Tolstoy, which

combined literature with history.

This is only a selection, and it is bound to be controversial. For example, Homer's epic "Iliad" as a literary classic, Aristotle's "Metaphysics" as a philosophical classic, and even Penrose's "The Road to Reality" as a scientific classic could be considered, but the above 10 books are the top priorities.

References

[1] Great Books of the Western World. 1st ed. 1952; 2nd ed. 1990

[2] World Academic Classics Series (120th commemorative ed.). The Commercial Press, 2017

### **3. Top 10 great universities promoting human knowledge**

Universities are engines of knowledge. The greatness of a university lies in its contribution to knowledge and social progress. Here are top 10 universities whose contributions have been unparalleled since the founding of the University of Bologna in Italy in 1088.

(1) University of Cambridge: The University of Cambridge has contributed many ideas, discoveries and inventions that have changed the world since the Industrial Revolution, affecting economics, science, technology and other fields and promoting continuous progress in these fields.

(2) Harvard University: Harvard University has contributed a lot of scientific and humanistic ideas to the world today, and its teachers, students and alumni have won many recognized internationally Nobel Prizes.

(3) Stanford University: Stanford University leads innovation in Silicon Valley and is an important engine for technological progress and economic development in the information age.

(4) University of Oxford: Oxford University leads the progress of humanities and contributes wisdom and strength to the humanistic spirit and sustainable development of modern society.

(5) Yale University: Yale University integrates humanities and technology, and has trained many outstanding talents and leaders in the world for the international community.

(6) University of Göttingen: The University of Göttingen once led the development of science in the 20th century, and the Göttingen School has made important contributions to world academics.

(7) Humboldt University: Humboldt University (University of Berlin) opened up the concept of modern higher education and became the “mother of modern universities”.

(8) University of Paris: The University of Paris (Sorbonne University) has contributed unique technological and cultural achievements to human society and promoted the progress of civilization.

(9) University of Bologna: As the world's first modern university with a history of more than 900 years, the University of Bologna keeps to maintain its contemporary academic vitality.

(10) Kyoto University: Kyoto University's profound humanistic heritage and outstanding scientific and technological research make it to win the most Nobel Prizes in Asia, and it can be called the number one university in Asia.

There are many excellent universities, and this is only a qualitative evaluation selection different from quantitative university rankings. The methodological basis still needs to be further improved.

#### References

[1] Methodological clue: Using the cross-set of most top 100 university rankings as a pool, select top 10 based on their high-qualified achievements.

[2] Wei, S. X., Wang, H. Y., Cao, C.\* & Ye, F. Y.\* (2021). One big science project or 1000 smaller ones? *Current Science*, 121(4), 479-484.

#### **4. Top 3 knowledge progresses 2022**

The three compelling knowledge advances in 2022 are

(1) AlphaFold: It changed the scientific and technological procedures of protein structure determination, and greatly improved scientific and technological cognition with AI.

(2) ChatGPT: It has advanced the process of natural language understanding and is changing the information technology landscape.

(3) NIF (The National Ignition Facility): It achieved the first scientific breakeven controlled fusion experiment on December 5, 2022, with an energy gain factor of 1.5.

References

[1] 2022 Breakthrough of the Year. Science. 2022

[2] 2022 Research Highlights. Nature, 2022

[3] 10 breakthrough technologies. MIT Technology Review. 2023

#### **5. Top 3 sci. & tech. progresses in China since 2000**

China's three major technological advances since the new century are:

(1) Moon landing and manned spaceflight: launch the "Chang'e" moon landing and "Shenzhou" manned spacecraft series to start spaceflight.

(2) Quantum experimental satellite: Launch the "Mozi" quantum experimental satellite to lead quantum technological experiments.

(3) High-speed rail network: Build the most advanced and practical high-speed rail network with the longest operating mileage in the world.

References

[1] 两院院士评选中国世界十大科技进展. 2000-2022