

A Comparison of the Evaluation in East and West

The Humanism and Scientific in the Engineering Education

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Abstract: There is a great evaluation for the high education in China from the government. And there're more and more reform and exploring taking place in China, too. For a traditional rule, Chinese usually take a view of humanism while the west takes more scientific. In this paper, a comparison was put forward to understand the difference.

Professor Jack·M·Wilson once said in his works as follow:

“Faculties often fear the new technologies and ask, “Will the Web or a CD-ROM Replace your Instructor?” How foolish. Faculty cannot be replaced by a web site! I often tell them that any can be replaced by a web site should be replaced as soon as possible. There is little likelihood that faculty can be replaced by any technology.

Nevertheless, faculty fear and some legislators hope that there may be some truth to this. Prism Magazine even asked: “If a student can zoom the best professors into his or her living room, then what is to happen to the rest of the countries professors?” (The mainframe model!)

In a word: hogwash. Presenting is not teaching!”ⁱ

I can't agree any more! But, Dr. Wilson hasn't explained it. I try to do and of course, Mr. Wilson could correct me.

It is true that On-line education could not completely replace classroom teaching. Because classroom teaching is not only the excellent work of a teacher who brings his skill in full play but also the interactive corresponding work among the teacher and students. So it is far beyond a process of knowledge transmitting. Even what the teacher wears, shows or acts that reveals his/her character and humanities would exert a subtle influence on the students. However, it would be ridiculous to take for granted that on-line teaching would turn college education in the extreme of emphasizing knowledge teaching by only few professors lecturing on net, but overlooking the cultivation of the taste and attitude. Such also touch the sensitive topic about the amalgamation of scientific spirit and humanistic compassion, and the bifurcation and amalgamation of the education and culture in the East and West.

Although the differences between scientific and humanistic spirit have long been there, the interflaves has only been revealed since modern days. In the old times, the two had once been hanged together someway implicit but simple. The typical representative is the ancient Chinese idea, based on natural economy and agriculture, of the unity of heaven and mankind (Heaven and the individual are one and the same.). In that case both the

traditional idea of “charity” in Confucianism and the high regard for individual life and spirit by Taoism are bound to last long. While in ancient Greek, though the trend of a schism between science and humanity existed at the beginning, either the idea of “Knowledge is virtue.” in Socrates or “the idea of kindness” in Plato reveals both scientific and humanistic spirit.

The “giants” in the Renaissance like Da Vinci, Albrecht Durer, and Machiavelli too, haven’t been the slave of the social division of labor but combine scientific spirit with humanistic spirit with no effect from the limitation or unilateralist. They are not like scholars confined in the study but all versatile and knowledgeable. They live with time and therefore have a spirit for adventures and are integrate and strong in character. Owing to such great people we have the flourishing achievements in science and humanity during renaissance.

After 15th century, the rapid development of scientific technology and the great material wealth have made people convinced of the value of science, and thus the scientific logic thinking has been highlighted and separated from humanistic spirits. Since then scientific spirit being objective and rational, and humanistic spirit that upholds sense, intelligence, beauty and kindness, each goes its own way. That is seen in different perspectives people have.

Since 19th century, we seem to enter an era of confrontation. One side

upholding the flag of scientism highly praises the objectiveness of natural science and its unique scientific methods while denying the scientific character of humanities and claiming it meaningless in acquisition. And the other side stands humanists, who condemning the negative effect brought by the application of scientific technology: the increase of natural disasters; our life in a desert of humanity when losing the dominant status; pressed by machines, people becoming single -faced.

Science is rooted in peoples' infinite exploration of the nature, which aims to attain the truth. Regarding the objectivity and orderliness of the entities, scientific understanding is determined to employ the rational method of demonstration to be concise and logically strict, and thus correctly bring to light the inner construction and the general rule and regulation of the object. The characteristics of such scientific activities then decide the content of science, that is take the object as the yardstick to seek for the truth and search for the rule; advocate rational thinking; focus on obtaining the truth and demonstrative evidence in order to achieve the greatest efficacy. In other words, they are impersonality, rationality, logical thinking, demonstrationist and pragmatism, etc. And humanism is the understanding and feeling of human itself or other things (especially human minds). In contrast with science, it is human-centred (explores the inner feeling of the main body), advocates the ideal of values such as sense, intelligence, beauty and kindness.

Similar to the points of science and humanity, Weber thought that the rationality of the tools is just the best way to achieve the goal but not the aim rational or not. But the rationality of value only looks the aim instead of the method or cost to achieve. Pascal's idea of geometry lies in accurate analysis, and to deduce the truth by the axiom, which is characterized as perspicuity and inevitability. And being sensitive is like those artists who observe with delicate receptivity and keen discernment, and is used to judge by sense. Another Wilson called it "ice-cold and clear Apollo method" and "satiating and artistic way of spiritual life".

No matter how they put it, people believe that objective rational science emphasizes on discovering the rules of the nature but cares nothing about the human status in science and nature. So science is undoubtedly considered as non-ethical, unemotional and inartistic that described to be humane. In comparison, what science lack is all humanism aiming for. It cares more about human nature, value and destination. It also expresses its concern on the future, fate, freedom and development of humans. Resulting from such differences on concerns, ways to achieve and representation of contents, the two are parted as two human spirits.

Hence, the immense progress in science technologies blinds us for its limitations, and the lack of humanism also make us consider only the large material force of the science technology as well as the best way to realize its effects but take no control over such impersonal power, and thus result

in the crisis in people's outer environment and inner world. The over-exercise of science rationalization edges out human's principal part. In the eyes of the rational world, the whole world is a never-stopping working machine with good order, and humans are only part of it. The engineering education in some of the western countries has even showed the abuse of being rigid. They demote humans to things and make education rationalized as one level by emphasizing quantity while ignoring quality. They make so-called "talents" mass production according to united standard and requirements: same structure, same division of majors, same design for the subjects, same standard for the "products", and even the examination contents become globalize. Thus the higher institutions generate graduates like "standard components" in factories by same equipments, which could be used or to be use in the large machine of capitalism. In a world of "money-decides-all" a man is just like a piece of goods, and the whole society is only the stage of trade. When it is considered the common truth to pursuing material interests, that entire spiritual, material, theoretical, practical, natural, artificial, article or applicable goods, human and all things on earth demote to goods. The aim of education also demotes from cultivating human soul to excising the "instruments". Such materialization of humans is the cause of all stagnancies and is blasphemy of human world and culture. When humans have been materialized to goods, education becomes an industry and the

students become one-sided—by knowing themselves the screws of the whole society, and they are deeply influenced by such a society. People's potential interests have been oppressed instead of been cultivated and developed. And the students, particularly, have no time and energy to dream about their future life when their dreams, wishes and ideals have been oppressed. Emotional education has therefore been ignored, which leads to a lot of serious social disease: some people become anxious, aimless and lead sorrow lives. Heidegger gave a sign: modern developed technical world licks up all men, utilitarian thoughts edge out consideration and distinction; people become history-less and homeless vagrants; the nature becomes material for practicing intension, and people themselves become materials for greater aims.

China has taken example of the West. At the end of twenty century, we also emphasized on education industrialized which lead to the plight of engineering education. As Max has predicted, in our time, everything seems to have its negative side...the victory of technology seems to be an exchange with the corruption of moral. With mankind's control over nature, individual becomes more of a slave of others or self-doggeries. Even the pure lights of science have to sparkle on the black background of ignorance. Every discovery and progress seems to be the force that makes materials rationalized but makes the human life doltish.

However, people's labour is not for some kind of materials, as Max

puts it, but for the compass of thoughts, the physical body and every side of life developing in freedom according to its will and interest. The productive consumption is by the meaning of lending consumption, while real consumption should be “all for the mankind, for each of the society”. So the aim of education should be a preparation for those being educated to live for a happy life: cultivates the skills for all kinds of living, as to broaden one’s eyesight, to understand oneself, the society, the nature and their relations. Students, via school education, should see the colourful life and all kinds of roads to a living. Through education, we tend to pass the accumulated intellectual spirits, crystal mind ness and experiences to the next generation. And that will help people be able to see through the life, improve the mind, purify the soul, understand the meaning and aim of life as to find the correct way of living.

The dissimilation of nature and human make people take a second thought of scientific technology and its applications. Meanwhile, the development of modern science throws some new humanism problems to people, such as tube baby, crone man, etc. People become to recognize that historically speaking, even there has been opposite views and separation between science and humanism, their spirits are different concepts and just differ in a sense of illusion by modern people to great extend. The two spirits in essence are inseparatable, and are theoretically and practically in harmony. They both are the precious parts of human

spirits. With the growing of science and technology, the development of human society should need the guiding of both science and humanism, which makes their harmonization more and more necessary.

The syncretism of scientific and humanistic spirit doesn't mean that one should clear up, or control over the other but that they should guide the mankind through the activities of scientific technological cognition, correspondence and transformation towards nature. Only by this could we make scientific technology develop in harmony with humanistic society.

The objectivity and orderliness in the movement of natural things require scientific acquisition should eliminate all impersonal subjectivity and evaluation, and come to all kinds of theories that have rigorous logic and resist to practical verification via demonstration. However, such doing is impartial which in fact excluding the restriction of humanism and therefore becomes merely knowing not for the need of mankind where the latter has been the real destination of scientific acquisition. Even though reflecting the true nature of the objective reality should be the essence of scientific research, there would not be any conflicts when we make our own judgment and evaluation towards the achievements during the process. Because those scientific products are not just something at conception level but would transform into technical force and lead to some result. So that scientists should maintain the appropriate way in understanding the nature when doing evaluation work at the same time

before, in and after the process in order to decide the direction of later research to ensure that the product brings goodness rather than badness. In such a way the combination of the two kinds of methods would guarantee the co-development of technology along side with the existence and whole-sided free progress of mankind.

The society of science is a subsystem of human society, which represents the humanism of good virtue and moral of the whole mankind in the scientific spirits. Like, the general rule requires when doing evaluation for the products it is not necessary to consider the scientist's personal or social property, that is in fact another kind of statement of free and equal spirit. Public-own regulations represent the human spirit of co-assisted and cooperation while selfless principle exercises the rigorous self-discipline. And rational scepticism meets the requirement of pursuing progress because only with the courage to doubt what we have could us create a better future. In such we can say that at the social relation level the scientific spirit has been in harmony with humanistic spirit. When people focus on the enlargement of knowledge with increase of efficiency, the humanistic problems result from some research would probably be ignored. Therefore, at the social relation level scientists are required not only to judge the research products by general public-own and selfless rational scepticism, but also with open-minded perspective and profound humanism. They should remember their social responsibilities every time

when keep a close eye on the present research situations where to affect the human society, and to question closely the design of technology has extended the bright side of humanism or not. At the same time, the evaluation of the technological cost for the research products should also follow the general public-own and selfless rational scepticism.

In all, scientific spirit represents itself as the infinite pursuing of truth when humanistic spirit concerns the most the freedom and whole-side development of mankind, the blessedness of the whole, as seen in the great desire for goodness. And the pursuing of truth and goodness could not be divided. With the pursuing of truth and the discovery of nature mysteries, people become to understand themselves and their relation with the nature, and thus stand on the base of a real world to build up the human civilization that fit for their own ideal. On the other hand, only with the guide of goodness the exploration of the nature would not go distant ways. The dream of a better life could mobilize the enthusiasm of all to get knowing and exploring the nature, and to access the truth more efficiently. The combination of truth, goodness, and beauty would help us to establish a real beautiful world and our pursuing would in reaction promote the development of the three. In such a way the unity of the three becomes the highest standard of the value of engineering education.

The Chinese education circle attaches more and more importance to such issues when the Chinese government takes great efforts on such

fields. In October 15, 2004, the Central Committee and the State Council has put forth a document under the title of “Suggestions On Further Enhancement and Betterment of College Students’ Moral and Political Education”, emphasizing the education on moral education, physical training, esthetical cultivation and psychological education. And it also states such values should be included into the party construction and evaluation system of education and teaching as an important standard for the educational quality and level of the higher educational institutions.

Since 1970s, some American schools began to set up courses like science, technology and society (STS) as to adjust and cope with the relationship between science and society. There after, the STS education has been founded and welcomed in countries like the U.K., American, Australia and Canada. The summit of technological education forum opened on December, 1984 has published the dissertation collection “ Education Formed by the Cooperation of Science, Technology and Society”, which seen as the international pronouncement. At the meantime, in American the so-called cooperative learning teaching strategy has come into being in order to promote the interactive communication and study among students from different races, gender and level that have the same goal.

And we are glad to see the US and other western countries are doing more to lift the situation and improve our education. Anyway, the

problems in engineering education are common and serious, even far beyond people's imagination, so we must be highly aware of that science and technology is a sword with two sides: it could benefit the people or destroy people. Whether science and technology brings us fortune or disaster depends on ourselves, and the key is to decide how to control and utilize it. This also relies on the guiding of humanism, which could lead the development of science and technology to the direction that benefits mankind in a bright side.

Einstein made his speech to the students of California Institute of Technology in American in 1931, putting out that if they want their work be beneficial to mankind they should know not only the application of science but should also care human itself which should always be the main target of all technical progress. And mind the issues of how to organize and distribute labour and products as to ensure the technological products would benefit mankind but not become disasters. Never forget this when anyone working on the diagrams and equations.

Such people could really promote the development of humanistic science and benefit the whole mankind.

All in all, the world should be beautified with the highlighting of both scientific spirit and humanistic spirit. A whole new world would be a world of the unity of science and humanity.

ⁱ Jack·M·Wilson: E-Learning in Engineering: The Interplay of Technology and Pedagogy, Engineering Education for a Global Economy, Tsinghua University Publish, 2004, Peaking, P286-287?