

# Research on Connotation of Smart Education

Yangchunxiao Wang  
Faculty of Education  
Beijing Normal University  
Beijing, China  
wycx2019@mail.bnu.edu.cn

Shiyu Liu  
Faculty of Education  
Beijing Normal University  
Beijing, China  
liushiyu@mail.bnu.edu.cn

Yonghe Zheng\*  
Faculty of Education  
Beijing Normal University  
Beijing, China  
zhengyonghe@bnu.edu.cn

**Abstract**—Nowadays, with the rapid development of Information and Communication Technology (ICT), many countries have been developing *Smart Plus* vigorously for the sake of enhancing national strength. On account of the development of ICT in education has the trend towards intelligentization, smart education come into being. However, the quality of smart education varies greatly without common definition and connotation analysis of smart education. In the study, the connotation of smart is discussed from perspective of philosophy, Chinese culture, semantics and so forth. Then, expanding the meaning from smart/wisdom to smart education. Furthermore, comparing with the different connotations of smart education which mentioned by researchers both at home and abroad, so as to clean up the border of smart education from technology supporting, data applying and participants to make a contribution to the related research areas.

**Keywords**—smart, smart education, connotation

## I. INTRODUCTION

As a high-end form of ICT in education, smart education has attracted more and more attention around the world. However, there is no uniform definition and scope of smart education so far. Education contents and products are named *smart* thoughtlessly, and the misuse of information technology is being widely debated. Meanwhile, many scholars have been devoting to sort out the connotation, scope, characteristics and contents of smart education to realize the real smart learning and teaching. And they adapt to put the *smart* into a modern technology context to analyze the connotation. Chinese scholar Ronghuai Huang thinks that smart education is system whose great learning experience, nice content adaptability and good teaching efficiency are offered by schools, districts and countries [1]. IBM summarizes the characteristics of smart education from five technology-related aspects. Almost no papers unify the philosophical view of wisdom or smart and think from the perspective of ancient China to define the smart education. Maybe we should combine the outside meanings of today's technological environment with inner technology context to think about what smart is in order to avoid the limitation of modern and technology.

## II. CONNOCATION OF SMART

In order to find out what smart education is, the primary task is to understand the term smart and give a definition to it. Wisdom appears below also stands for the term smart.

### A. Philosophical Views

Heraclitus was the first one who posed the word smart in the west. Smart, he thought, was based on telling the truth, acting naturally, and complying with nature. Heraclitus have the belief that erudition does not make people smart or wise.

That is, true wisdom does not consist in the amount of knowledge acquired, but in the relationship between human beings and nature. A smart man can analyze the essence of things based on truth, and the man has the ability to understand the world and create the world correctly. Socrates said, I know nothing except the fact of my ignorance, and the people who have this thought is the smartest. That is to say, human has no wisdom, and people who admit their ignorance are always on the path to wisdom, but never get the real one. This is reminiscent of the words of the famous scientist Albert Einstein: the more you know, the less you know. Aristotle, for the first time in the metaphysics gave a clear definition to wisdom: wisdom is the knowledge of certain principles and causes. Wisdom is far more valuable than knowledge. The knowledge here refers to all the sources and causes of everything, including the new causes which are resulted from intricate collisions.

### B. Chinese Ancient Views

In the east, the most iconic philosophers of ancient China used words like Zhi Hui or Zhi in large numbers to express wisdom, but there were no direct explanations to the term until Jiayi made a clear definition for the first time in the early Han dynasty: knowing well about weal and woe is wisdom, conversely is fatuity. In others word, wisdom is a foresight of what will happen in the future and the ability to think about things. The great Chinese thinker and educator, Confucius, once remarked, knowing you know nothing is the beginning of wisdom. Such as, wisdom is not just wisdom itself, but the passion and attitude to pursue it.

### C. Semantic Views

From the semantic point of view, wisdom and intelligence are both refers to Zhi Hui. In the explanation of Oxford dictionary, wisdom refers to the ability to make sensible decisions and give good advice because of the experience and knowledge that you have and intelligence refers to the ability to learn, understand and think in a logical way about things[2]. In Chinese, Zhi means resourcefulness, intelligence and considerate, thoughtful and insightful thinking. Hui means smart, intelligent, and capable of gaining an insight of everything. Zhi Hui refers to the ability to discriminate judgment and invention.

Therefore, the meaning of wisdom in philosophy, Chinese cultures and semantic views not only stay at the knowledge level, but refer to a kind of more comprehensive, systematic talent. Wisdom (Zhi) and smart (Hui) have a certain relationship of continuation: people can finally see through everything and find out the origin and cause of things when they have enough resourcefulness. When people see an apple, the knowledgeable one would know the name, composition, planting techniques, and nutritional value of this fruit, but the wise one might find out the law of

gravitation, search a small part of the origin of things. Knowledgeable people have a vast amount of knowledge and would build a system based on this knowledge by using them. Through this process, they do finally reach a state of complete enlightenment and foresight and become intelligent people.

Life is the collection of choices. Intelligent people don't go with the tide. They are able to make their own judgment on the basis of all aspects, and finally form a valuable choice. However, the value is relative. Differences exist all the time when different people measure values, but wisdom can eventually help people to find out the meaning of life, the sense of presence and well-being. Newton was wise, and he must have an intense sense of presence.

### III. CONNOTATION OF SMART EDUCATION

From the above analysis of the wisdom/smart, we come to the conclusion that the cultivation of wisdom is the closest analogy to the mansion building. Wisdom is a kind of spiritual state owns high level of understanding, full awareness, bright and clear heart, which is like the edifice for work, living and entertainment. Wisdom uses knowledge as raw materials, which is bricks and cement of the building. and the high quality of thinking, understanding, positive abilities are all the construction technology of wisdom, which are equal to the tools and tech-savvy building skills for that mansion. Cultivating a smart or wise person is the goal of smart education, which needs knowledge teaching, abilities training for students, as well as the healthy and positive spiritual state infusing. The processing of cultivation is as difficult and complicated as mansions building. See Fig. 1. They are both the significant parts to the social operation system.

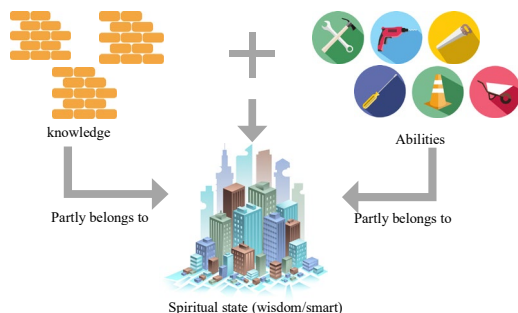


Fig. 1. Visualization of Smart / Wisdom

The term *smart education* should have different meanings at different ages. Due to the different appearances of the term Smart and Education, therefore, when understanding the meaning of smart education, we should try to find the features of wisdom in education and follow the education in the smart context. The present popular viewpoints consider that smart education is an education mode that can directly help people establish complete smart education system. It aims to guide, cultivate, and assist people to discover and apply their own wisdom[3]. This process doesn't emphasize the application of IT, however, it focuses on the results of smart education from the individual perspective. If we don't consider smart education from the context of information age, it refers to an education mode that uses a scientific teaching method to cultivate learners to build knowledge system, basic ability and comprehensive ability, and finally reaches to be an intelligent person. This viewpoint is suitable for the summarization of smart

education in ancient time. At that time, there had no computers, digital resources, and new learning analyses technology. However, you still could cultivate an intelligent people. As for modern advanced technology, smart education has an additional meaning.

Scholars discussed the definitions of smart education. Zhiting Zhu believes that smart education should be based on the smart learning environment as a technical support to help teachers and students use learning and teaching methods freely, changing the impossible thing into possible thing and little possible thing into powerful thing, cultivating them with the ability of good value orientation, high thinking quality and high action ability. The smart learning environment can perceive the information of learning comprehensively[4]. Ronghuai Huang thinks that the wisdom learning (system) is a kind of educational action which includes high learning experience, high content suitability and high teaching efficiency, supported by school, area or country. It can use modern science and technology to provide a range of differentiated support and on-demand services for students, teachers and parents, and can collect and utilize the condition data and education and teaching process data of participant groups to promote fairness, enhance performance[1]. Liu Xiaolin believes that smart education aims to provide learners with open and on-demand education, through the support of creating smart learning environment by networks and intelligent technology, and achieve the deep integration of information and technology and education and teaching, and ultimately promote the learners' development and improve learners' wisdom[5]. Jiangjun Jin believes that smart education is the advanced stage in the development of ICT in education. It can promote quality education resources sharing, improve the quality of education and education level through New generation of IT[6]. IBM thinks that the five features of wisdom education are: Adaptive learning programs and learning portfolios for students; Collaborative technologies and digital learning resources for teachers and students; Computerized administration, monitoring and reporting to keep teachers in the classroom; Better information on our learners; Online learning resources for students everywhere[7]. The development direction of smart education in the future is technology immersion, personalized learning path, knowledge skills, global integration and economic adjustment[8].

In conclusion, smart education is a kind of education supported by IT. it must use intelligent ways to train intelligent talents. And the two intelligences are not dispensable. The connotation of wisdom education will be analyzed from three perspectives as follows.

#### A. Technology Supporting

Smart education uses a new generation of IT as a basic support. It can be seen that the general IT cannot cater for smart education. For example, does teaching in the classroom with only multimedia equipment and digital resources belong to smart education? High learning experience, high content adaptation, comprehensive perception the information of learning environment, emerging IT, technology immersion, personalized learning path and other statements all illustrate that technology used by smart education must be able to perceive a variety of state (physical, psychological, learning process, et al.) of participants and can be adjustment intelligently. For example,

the physical environment can be adjusted to the optimal temperature according to the learner's body temperature, the atmosphere will be adjusted when the learners feel nervous, and when learners have doubts about the knowledge points, smart learning environment can automatically explain contents again. All of these are done by IT.

### B. Data applying

Data is becoming the most important asset of society development in the information age. Microsoft, Google, Tencent, and IBM can share their core technology, but the key that they still cannot be surpassed is that they are the owners of a large number of data. Ma Yun, the Chinese well-known IT entrepreneur, once said that the world is moving from the IT era to the DT (Data Technology) era. Smart education is not just as simple as the use of IT, data mining and learning analysis based on the big data are two cornerstones to achieve smart education[9]. Therefore, the education cannot be considered as smart education if there is no data generation and data analyzing process. So the core of smart education is what data to use, and how to use the data.

### C. Participants

Teachers are also essential parts of smart education. They are the constitutor of wisdom. The smart education is expected to enrich the whole teaching environment, monitor the state, offer advice and guidance by technology. But there must be no shortage of teachers. science and technology can have function such as guide, enlightenment and control like traditional education, however, the teacher's love, the light of eyes or even a nod cannot be replaced by the technology in the growth of the students. If they can be substitute, the human will be very dangerous.

## IV. CONCLUSION

This study takes the view that the smart education itself doesn't have characteristic of technology, and there also was smart education in ancient times. Although there was no IT at that time, it's not enough to influence the development of wisdom, and the number of intelligent people is not less than modern times. But in the context of science and technology, education anyway need IT as support. It will not necessarily bring wisdom, but the roads that reach the wisdom must be risky and endless without IT. It can effectively promote wisdom education process. But in the implementation of

wisdom education, the following principles should be followed:

The moderate use of technology. Technology is not always wise; it is foolish when use them inappropriately. If the learner overuses the guidance and recommendation functions, and all the decisions are made by IT for the participants, so do they still have wisdom? They can't rely on their own thinking ability to choose the suitable learning contents and explore questions by themselves without smart learning environment. If that happened, we would lose out the fundamental goal of smart education— cultivating the wise people. Of course, this moderate level still needs to be researched by scholars.

The research scope of smart education needs to be further defined. In terms of the technology division and the effect of technology, we still need to study how to combine technology, or what education effects belong to the content of smart education. Smart education is huge and the developing road is long, but we still have to work hard to clean a bright border for it, and make a series of common standards for smart education.

## REFERENCES

- [1] Huang Ronghuai. (2014). Three Realms of Smart Education: Smart Learning Environment, ICT Teaching Model and Modern Educational System. *Modern Distance Education Research*, 2014(06), pp.3-11.
- [2] University of Cambridge. (2012). Cambridge Dictionary online. from: <http://dictionary.cambridge.org/dictionary>.
- [3] Yuheng, W. (2002). Smart Education. from [http://www.edu.cn/include/new\\_zhong\\_guo\\_jiao\\_yu/zhihui.htm](http://www.edu.cn/include/new_zhong_guo_jiao_yu/zhihui.htm).
- [4] Zhu Zhiting, He Bin. (2012). Smart Education: New State of ICT in Education. *E-education Research*, 12, pp.7-15.
- [5] Liu Xiaolin, H. R. (2016). From Knowledge to Wisdom: Smart Education in Authentic Scenarios. *China Educational Technology*, pp.14-20.
- [6] Jiangjun, J. (2012). Research on Development Strategies of Smart Education. *China Edu Info*, 22, pp.18-19.
- [7] IBM. (2017). Smart Education, from: [http://www-03.ibm.com/press/au/en/attachment/27567.wss?fileId=ATTACH\\_FILE5&fileName=Smarter%20Planet%20POV%20-%20Education.pdf](http://www-03.ibm.com/press/au/en/attachment/27567.wss?fileId=ATTACH_FILE5&fileName=Smarter%20Planet%20POV%20-%20Education.pdf).
- [8] Rudd, J. (2017). Education for a Smarter Planet: The Future of Learning. from: <http://www.redbooks.ibm.com/redpapers/pdfs/redp4564.pdf>.
- [9] Qingchao, K. (2013). Big Data and Smart Education. *China Edu Info*, 24, pp.8-11.