A Probe into the Mode of "Future School"

Lu Huang

School of Political Science and Public Administration
University of Electronic Science and Technology of China
Chengdu, China 610000

Xi Yang

School of Political Science and Public Administration
University of Electronic Science and Technology of China
Chengdu, China 610000

Abstract—In recent years, with the rising of smart education, education informatization has been a trend for educational reform throughout the world. Acting as a newborn of education information, future school has risen and been launched across the country. However, due to the inadequate understanding of future school, it is still in a nonstandard and imbalanced development in different regions. Therefore, it is necessary to clarify the definition, characteristics and factors of future school and deeply analyze the construction mode of future school so as to promote the scientific and advanced development of future school.

Keywords—"Future school"; education informatization; smart education

I. INTRODUCTION

Going with changes of the world economic situation, China has been pushing its transformation of economic growth to build a modern industrial system, intensify social construction and boom the culture, and the requirements on talented people have changed greatly, so do the requirements of the people in learning and development. In order to meet the changes and cultivate talented people meeting China's development and economic and social need, we have to set up a corresponding educational mode. To build future schools is just to meet the need of cultivating innovative talented people and education informatization.

II. DEFINITION OF FUTURE SCHOOL

A. Connotation and Extension of Future School

According to the description and summary of future schools by scholars, authorities and enterprises around the world as well as actual conditions in China, the connotation and expansion of future school is outlined as follows:

As for the connotation of future school, it aims to complete teaching via information technologies such as interactive whiteboard, tablet computer, Wi-Fi during the teaching, where the timeliness, resource sharing and diversity of Internet in traditional teaching can be fully exerted, which enriches the teaching tools and push the in-depth reform of traditional educational and teaching modes.

As far as the expansion, it means that information technologies are promoted to use in teaching, and the perfect combination of Internet and information technologies are conducted to exert its advantages, which will make it easy

for class teaching, expand knowledge levels, create more chances for students and overcome the disadvantages of traditional teaching[1]; Besides, it values quality education, stresses the cultivation of students' capabilities such as creativity and innovation, communications and cooperation, research and information access, critical thinking, decision making and solution, information accomplishment, technical theories and application, aim to cultivate new type of talented people, and the reform of educational mode is to cultivate new type of talented people[2], drive the social and economic development and place a solid foundation for the great revival of Chinese nation

B. Characteristics of Future School

1) An integrated platform for study: An integrated platform for study is a distinct characteristic to distinguish future schools from traditional education and teaching, for students, it is a teaching platform where man-machine interactive equipment and Internet are combined for interactive teaching, through the platform, teachers may record students' courses, exams, tests and communication, and introduce students' records of attendance, exercise and exam to the platform, form complete students' archives, and provide impersonal and powerful support for teachers to conduct fair evaluation and correct analysis of student quality.

2) Multiple electronic contents: Another factor of future schools is multiple electronic contents, information technologies are combined with network resources, which can break through the narrowness of traditional teaching and textbooks, making students get rich knowledge after class through more channels so as to guarantee the wide contents of class teaching[3]; on the other hand, diverse teaching modes such as photo, video and online evaluation can be used to cultivate students' capabilities in creativity,

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[1] Cao Peijie, Paths for Reform on Future Schools—Orientation and Sustainable of Internet + Education [J]. Educational Research, 2016, (10):46-51.

[2] Lu Yanfei, Zhang Wen, Liu Xinbo, Comparative Studies on Group-based School Running of Higher Vocational Education at Home and Abroad [J]. Journal of National Academy of Education Administration, 2014, (01):14-18.

[3] Xu Junhua, Studies on Influences of Online Information on Students' Startup [J]. Journal of Jiangsu Teachers University of Technology, 2013,(03):122-124.

innovation, communication and cooperation, research and information access.

3) Elastic teaching environment: Elastic teaching environment is another factor for future schools. Differing with traditional classrooms, the elastic teaching environment has no fixed and ordered desks, instead, students are encouraged for interactive discussion between themselves and teachers, and the classrooms are required changeable so as to cultivate students' capabilities of communications and coordination as well as open thinking.

4) Individualized study: In future schools, relying on information technologies, teachers may grasp the studies of every students, discover and solve problems of students through evaluation on specific students, establish special study method and modes different from others, making the students study efficiently[4]. Every student has characteristics of his or her own, owning unique endowment, preference, natural advantages as well disadvantages. Future schools are to adopt individualized methods to meet the study and solve students' difficulties in study.

5) Communications in communities: The elastic teaching environment can guarantee the communication and interaction between students, students and teachers so as to cultivate students' capabilities of communications, cooperation and open thinking.

C. Factors of Future School

1) Man-machine interactive equipment: Man-machine interactive equipment is the first factor of future schools and the base for education and teaching of future schools and classes, it consist of information technologies used by teaches and students such as interactive whiteboard, tablet blog, tablet computer, Wi-Fi and so on, relying on the combination of Internet and information technologies as well as man-machine equipment, the teaching efficiency will be further improved.

2) Public service education cloud: Public service education cloud is one of the important factors and an Internet application platform with resources inside and outside schools integrated, which aims to gather all aspects including teaching process, management, resources and logistic supports through advanced information technologies and provide uniform digital spaces to achieve the efficient integration of school resources, improve teaching and office efficiency, meet the individualized needs which are developing increasingly so as to realize the informationalized education finally.

3) Unique building layout: Three main conditions are required for the building layout and design of future schools: elastic and diverse teaching spaces, connection with individualization, groupment and community styles. In addition, the buildings of future schools must have features

such as humanity, high tech building, ecological environment, automatic building system, compound operation, elastic space and the like[5].

4) Training for future teaching: Training for future teaching is a basic point for the well-going of education and teaching in future schools, through training, teachers can get and grasp new education philosophy, teaching methods and advanced teaching means. Its ultimate goal is to require every teacher and his or her students to make use of information technologies and resources for communications and study, during the study, students can get how to learn, cooperate, summarize and create so as to cultivate students' capabilities of innovative thought, operational-ability, teamwork as well as research[6].

III. MODES OF FUTURE SCHOOLS

Modes of future schools include three aspects as shown in "Fig. 1", namely learning mode in "Fig. 2", learning environment mode in "Fig. 3" and school management mode in "Fig. 4".
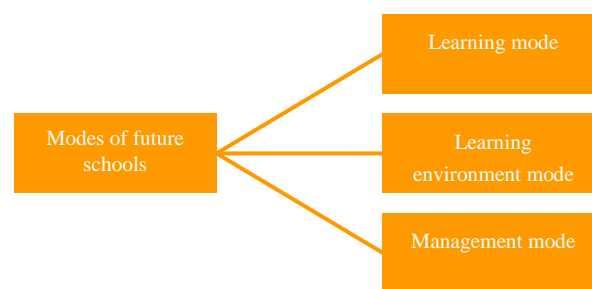

Fig. 1. Modes of future schools.

A. Learning Mode

1) Non-textbook classroom: In future schools, a classroom with be equipped with computers, project and whiteboard as well an interactive smart board which integrates functions of the above three[7]. Whether students' computers or teachers' smart boards both can access and quit freely. Basically teaching activities will depend on all kinds teaching resources online. What the future schools pursue is a non-textbook classroom, however, we cannot leave textbooks aside completely. Yet future schools do not refuse paper textbooks, if paper textbooks are obviously better than digital textbooks, with the paper used as means, the teaching will gradually its dependence on textbook. In future schools, interactive learning will replace libraries and digital media that are renewed quickly replace books. Yet

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[4] Li Xiaofei, Creating the Most Suitable Future Education for Students—Exploring Construction of Future Schools on the basis of core Quality and Learning [J]. Education Science Forum, 2016,(14):27-31.

[5] Cui Yuzhong, Green Design-based High Performance School Buildings—Future Schools in Philadelphia, Pennsylvania, USA [J]. Building Block and Block Building, 2014, (05):12-13.

[6] Andrew Hill, Reflection of Management Trainees Project [J]. Training, 2013, (06): 39—40.

[7] Li Shuqi, American 21st Century School Project: Experience and Enlightenment [J]. Journal of Zhangjiakou Vocational College of Technology, 2013,(02):7-10.

schools still have to purchase some books as reading materials for students who select senior courses.

2) Non-boundary classroom: Future schools can change the people's thinking of students and learning, where children are not students but learners, who learning is more than learning, it also include life, it is a continuous learning of learners in the society but not in a fixed space. Therefore, the classrooms of future schools have no obvious boundaries [8]. Future schools require that students should carry laptops with them, going inside or outside schools. Therefore, students may learn in classrooms or at the interactive learning centers and even at dinning halls. Suppose it is expanded in a large scope, students only need a mobile phone to keep continuous learning in a park, museum and a historic site, which will break through their dependence on the time and place, finally the learning habit is merged to life. However, future schools do not mean an indulging in learning. For example, through the family-school broadband system, parents may have access to the homework that teachers have arranged on interactive smart boards so as to supervise the students. Another example, when leaving classrooms for interactive learning centers in campus, students may get instruction and assistance of multimedia experts of the school.

3) Non-fixed work and rest: One of the important thoughts of future schools is to provide students with a learning and life which keep continuous, related and suitable relations with future jobs [9]. Future schools should fix the work time to a certain period where the rest time of each student is not fixed, after signing-in with cards, students can input their online learning agenda respectively or agreed timetables to meet teachers, which will replace fixed class timetables.

4) Individual progress: In future schools, in order to meet the individual needs of students, every student will have different learning progress. Students' laptops are all installed with learning progress software, suppose a student completes quickly the teaching contents of that day, more courses can be started [10]. Suppose the evaluation software shows the student has not mastered the contents, he or she can ask for assistance from teachers in time. In addition, teachers will check the homework via digital homework system and grasp students' learning progress in time as well as students' input - effect. Teaches shall conduct an overall evaluation on students each month, finding who need to slow the progress or speed up it. In the meantime, with the

fully understanding of students, teachers may give special instruction to students.

5) Research-based learning: Going together with non-textbook classroom, non-boundary classroom, non-fixed rest, individual progress, research-based learning is another feature. In future schools, the research-based learning generally cannot be separated from courses. Teachers can integrate students' research-based learning and history, geography, chemistry and so on through problems involving in complex subjects. The learning mode can not only cultivate students' capability of exploring knowledge but also establish close relations between courses and current social events.
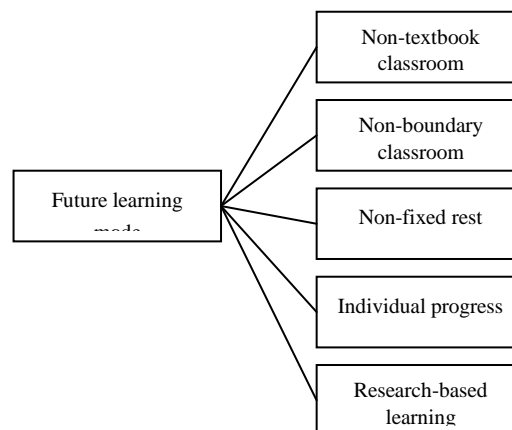

Fig. 2. Future learning mode.

B. *Future Learning Environment Mode*
1) All-round learning environment

Future schools will provide students with an all-round learning environment. It will not only design direct learning environment (such as WiFi for all the campus, through which students may have access to learning resources easily in campus) [11] but also give a considerate consideration to indirect learning environment in campus and bring more learning chances for learners, for example, students may see mathematical formula, physical equation and so on.

2) Multi-dimensional learning environment

Aiming at different learning spaces, future schools shall give more consideration to the multidimensional requirements, and the learning spaces designed shall be kept encouraging, flexible, cooperative, reflective and operable [12]. For example, the space design of science lab shall be making students feel the rules of sciences in shaping modern society and driving future civilization, and form longing to the sciences accordingly. With the goal set, the lab design may give careful consideration to "encouraging, flexible,

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[8] Li Shuqi, American 21st Century School Project: Experience and Enlightenment [J]. Journal of Zhangjiakou Vocational College of Technology, 2013,(02):7-10.

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cooperative and reflective"; with indoor layout and atmosphere preparation, students may feel that they look like professional researchers after entering the labs (encouraging); Facilities and furniture are movable, and the labs are closely related to other teaching places so as to meet the shift and execution (flexible) of diverse teaching activities in the same teaching period; the labs shall have spaces applicable for students' interaction and cooperative learning (cooperative) as well as quiet areas (reflective) for students to deeply think of scientific problems. In order to better achieve multidimensional learning, future schools may set learning spaces such as students' achievement center and information technology and online design labs, which will be used by students to access future job market and conduct independent innovative researches and so on.

3) Economical learning environment

Though future schools are pioneer schools in the 21st century, yet for it is required to lead the reform of school education and also become demonstrative one for other schools, so the investments in infrastructure of future schools are still almost the same as budgets of general state-owned schools. In order to well control the building costs of future schools in budget, it must be kept economical in design. Of course, the "economical" doesn't mean simple or sacrifice the senses of the time of school appearances and internal modernization, instead, it is achieved through the space sharing and vague boundaries of learning environment. For example, in future schools, multifunctional spaces can be designed such as cafeteria, open theatre, after-school activity space, meetings and so on. The space can be designed with multiple movable walls, where furniture can be moved freely to for multiple report halls, discussion rooms or classrooms. As such, the space avoids single building of assembly halls, cafeteria, report halls and so on, besides, the space can be used repeatedly at different times, so through it facilities need to be well designed, yet the total costs are not higher. It is the space sharing, and another form to keep it economical is vague boundary. In dorms of future schools, the boundaries for traditional learning and non-learning spaces are vague, and almost all spaces including corridors and dining halls can be fully utilized for learning. In dorms of future schools, the boundaries of inside and outside school are also vague, for example, future schools can be built close to libraries where students can learn and think.
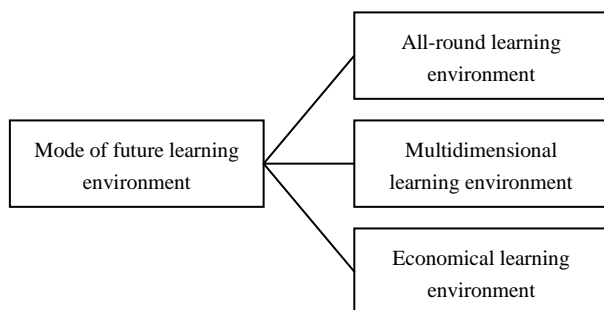

Fig. 3. Modes of future learning environment.

C. Future School Management Mode

Differing from traditional schools, in addition to modes of education and teaching, it is also reflected in management mode, mainly including the two aspects:

1) Multi-party cooperative management

Future schools will get involved in education and teaching, furthermore, it is closely related to information, technology, equipment management, school-parents communication management, therefore, aiming the focuses in different fields, future schools may establish a multi-party cooperative management mode. Multi-party cooperation management mode [13] can promote the application of advantages of all parties concerned and cultivation of diverse management orientation. Engagement system can be adopted for headmasters, and talented people who excel in education and teaching will take charge of education and teaching management in schools, and special enterprises will be in charge of school information, technique and facility management. As such with the application of advantages of different management, future schools will tend to professionalized management.

2) Participation of diverse experts

Within the cooperative management of future school framework, it needs a management team which consists of all kinds of experts, including experts who excel in environment setting, course development, technical integration, information management and leadership. With such an expert team, future schools can not only guarantee the efficient management but also have it part of the schools in the future.
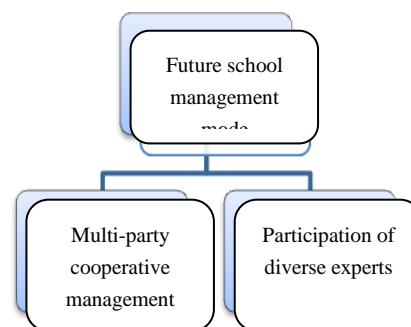

Fig. 4. Future school management mode.

IV. CONCLUSION

On the background of smart education, future schools will be a new educational mode to meet future needs and cultivate talented people in the future. It was initially raised in the US and spread around the world. However, due to the difference in education at home and abroad, it is necessary to build a future school education mode with Chinese characteristics on the basis of national conditions in education so as to guide the scientific and innovative development of future school across the country, with the

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[13] Editorial Dept of Education Science Forum, Top Level Design and Path for Future Schools [J]. Education Science Forum, 2016,(13):65+4.

teaching process and technologies deeply integrated and students-based, it aims to cultivate new type of talented people so as to meet the needs of the 21st century.

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