



FCST Synergy Education Model Based on Mobile Internet Technology in Chinese Higher Vocational Colleges

Fen Tan^(✉)

Institute of Media Art, Hubei Science and Technology College, Wuhan 430074, China

Abstract. FCST collaborative education model is a creative idea for vocational college students cultivating, especially under the background of COVID-19 pandemic. Family, society, school and teacher work together to provide comprehensive education to students. Based on the background of mobile Internet technology, this paper proposes an interactive mode of “FCST” to train higher vocational education students from families, schools, teachers and society. Research methods: literature retrieval method; questionnaire survey; sample interview; logical induction. Research conclusions: Mobile Internet technology is a mature technology and can be widely used in higher vocational education in China. In the process of ideological education for college students, families, schools, teachers and society jointly construct the “1+2+3+N” “FCST” collaborative education model.

Keywords: Mobile Internet Technology · Chinese Higher Vocational Education Institutions · “1+2+3+N” Route · FCST Synergy Education Model

1 Background

Higher vocational education institutions are important positions for cultivating artisans in great powers and are important platforms for carrying forward the spirit of artisans. The Optimization and Innovation of Educational Model in Higher Vocational Education Institutions Is the Necessity of the Intensive Development of Universities and Colleges and an Important Measure to Strengthen the Ideological and Political Work in Colleges and Universities in the New Age. The advent of new media forces ideological and political education workers to change their way of thinking and working methods [1–3]. When the traditional working methods cannot meet the needs of education, they should actively accept the new mode of education. The concrete meaning of “FCST” mode is as follows: F refers to family; C refers to school; S refers to social society; T refers to teacher, that is, society, family and school co-educate people. The way of implementation can be summed up as “1+2+3+N”, specifically as follows: For a college student in higher vocational colleges, relying mainly on two main bodies of education relations (schools and families) The school daily management + social life education + family groups and collective sports), through the establishment of N micro-Internet education

information platform in student ideological education and behavior management to form synergy, co-governance, mutual supervision, and jointly promote higher Adult students become successful, so as to achieve the purpose of Chinese higher vocational education institutions and families to coordinate education [4, 5].

Under the background of the global pandemic of the COVID-19, the safety management of college students has aroused great concern of the government. As the main body of student management, university plays an important role, but students' families and communities should also undertake certain management obligations. In this paper, we establish a college student management model and epidemic prevention and control system with the interaction of families, schools, students and teachers. In order to maintain the normal teaching and scientific research of college students, universities should strengthen the epidemic prevention and control to ensure the health of university teachers and students.

1.1 The Research Methods of This Thesis

Data retrieval method. With the help of internet data, full-text periodical network data and text books, search the relevant information of this paper by data retrieval method to provide research theoretical data support.

Questionnaire method. This thesis draws on the undergraduates of ten vocational schools in central China as the research object, altogether 1000 questionnaires were distributed and 928 were recovered. After invalid questionnaires were removed, 900 valid questionnaires were sent out. The author conducted a statistical analysis of valid questionnaires, and the data obtained will be used as the status quo data in the dissertation.

Interview. In order to understand the use of mobile Internet, such as WeChat, QQ and other parents, the author conducted interviews with 50 parents, mainly about the contact frequency, content and methods of parents and college students.

Logic Induction. According to his own in-depth observation and field visits, this paper summarizes the various materials studied, so that the research results more rigorous, more practical, more application value.

2 The Status Quo of Cooperative Education in Higher Vocational Institutes

Synergy Effects, in short, is the effect of “ $1 + 1 > 2$ ”. In 1971, the German physicist Hermann· Haken proposed the concept of synergy. In 1976, he systematically discussed the theory of synergy and published such works as Introduction to “Symposium Introduction”. Synergies hold the view that there is an interaction and mutual cooperation among the various systems in the whole environment. Collaborative effects can be divided into external and internal situations, external collaboration refers to a cluster of enterprises due to mutual cooperation to share business activities and specific resources, and therefore will be more than as a single operation of the business to obtain higher profitability; internal collaboration refers to the overall effect of different parts of the enterprise production, marketing and management, and different phases and different aspects of using the same resource together [6–9].

At present, the factors that affect the construction of institutions of higher vocational education and family co-ordination mainly include the following aspects: First, the responsibility orientation of the co-education between families and colleges and universities in the country is not clearly defined at the national level so that schools and families play synergies Education for a variety of reasons led to “education vacuum.” Second, due to economic pressure, work pressure and family burden, parents push the education responsibility to schools and participate in the education of common sense. Thirdly, in the process of giving play to the effectiveness of the leader of collaborative education between families and colleges, the higher vocational education institutes have not taken the initiative and made the coordinated education between families and colleges and universities appear on the surface, making it difficult to make breakthroughs [10]. To sum up, the problems that arise in the co-education between families and colleges are related to the “absence” of the cooperation mechanism of co-education between families and universities. Only when the benign cooperation mechanism is really built can all parties play their initiative, participation and initiative, So as to achieve the optimization of education effect.

The main objective of the interactive model between the family and the college is to make full use of information technology and information equipment so as to solve the problem of lack of effective and smooth communication between parents, students and schools on education issues and to narrow the distance between families and schools. The effect of communication enables parents to recognize the importance of family and school co-education and promote the healthy development and overall growth of students.

2.1 The Main Body Composition of Collaborative Education Model

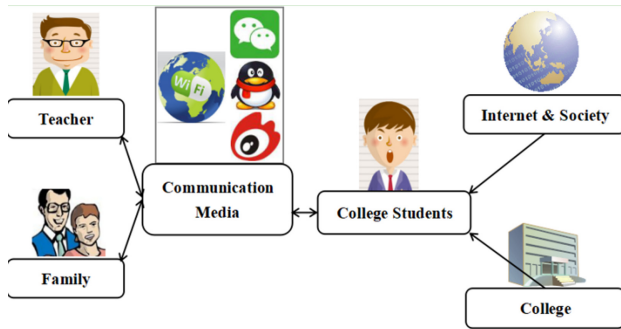


Fig. 1. College, family, society, teacher’s collaborative education model.

The 21st century is a century with rapid development of science and technology. The construction of our country needs more talents. These talents not only need professional knowledge but also have sound personality [11–13]. Therefore, the ideological and political education of college students in higher vocational education should be combined with social development, keep pace with the times, follow the pace of the times, take the

social road. Higher vocational college students' ideological education, relying on the school's own power is difficult to do, we must from the school, family, society share, to play their respective advantages, to make up their own limitations of perspective, from different angles to promote college student's Moral education to develop and grow, as Fig. 1.

College Students' Parents. Parents play an important role in the interactive system of home and college. The parents' expectations of co-educational model are the main functional requirements of the interactive system of home and college. In China's urban-rural one-child-based society, parents pay more and more attention to their children's education in schools. Parents hope to keep abreast of their children's school conditions, including learning, living and hobbies, through the contact of families and colleges and universities [14, 15]. At the same time, parents also hope that through the mobile communication platform feedback school specific circumstances, including positive and positive, but also negative and negative. Good ideas can be feedback to the school through the mobile Internet technology, hoping the school can further improve and jointly improve the quality of children's education, encourage students to better growth.

Vocational College Students. College students are the objects of common education both at home and at colleges and universities, and also the main body of attention of both parties. Through the interactive platform of home and college, students can see the teachers' evaluation of themselves, including positive praise and negative criticism, and formulate new learning plans based on the assessment so as to find out the gaps and make learning more directional and motivated [16–18]. Students at different stages of growth have different worldviews and values, student assessment is also a way to promote better student growth, mutual evaluation can understand what their classmates in a position, what behavior is more recognized by the students, which it is unwelcome, in order to better understand themselves. Finally, students often experience confusion and loss, and through the joint help of families and schools, students can feel warm during their education.

The College. College is the main body of students in school education, is an important place for students to learn and live. Schools can publish various school news and information on home and college interactive systems, evaluate and guide students' thoughts and behaviors, and give feedback on the students' learning performance in recent time. They can also make new education policies issued by higher education authorities In the same way, various social and school supervision programs are conducted through interactive platforms of families and colleges so as to perfect various systems and policies in schools so that schools can develop in an all-round way in education, teaching and personnel training.

The Society. At present, China is in a crucial period of reform and opening up. Various kinds of ideology and culture are intertwined and stirred up with each other, leading to the formation of diverse social values. As a special group in society, the main living environment of college students in higher vocational education is school, but their influence by social environment can not be avoided. Poor social environment will lead to the spirit of college students poverty, moral loss, psychological imbalance, therefore,

it is necessary to strengthen the social environment. The concept of socialization of ideological and political education among college students in higher vocational education should be analyzed and researched from many angles and many factors.

3 China Mobile Internet Development and College Students' Life

China mobile Internet development status quo. August 4, 2017 China Internet Network Information Center (CNNIC) released the 40th Statistical Report on Internet Development in China (hereinafter referred to as the "Report") in Beijing. The Report shows that as of June 2017, the number of netizen in China reached 751 million, accounting for one fifth of the total number of Internet users in the world. At the same time, China's Internet penetration rate was 54.3%, surpassing the global average of 4.6 percentage points. Mobile Internet users accounted for 96.3% of the dominant mobile Internet, Internet users to further mobile devices centralized.

For social applications, WeChat, QQ space and blog became the top three social application platforms with user usage rates of 84.3%, 65.8% and 38.7% respectively. According to statistics, WeChat and QQ space utilization advantage is very obvious, and the latter has opened the gap.

After 90 college students are accompanied by the development of mobile Internet up a new generation. With the continuous decline in the price of smart phones and mobile traffic tariff reduction, college students have become one of the major mobile Internet. In the classrooms, dormitories, restaurants, bus stations or subway, everywhere with a cell phone access to college students, mobile phone-based mobile Internet has been deeply integrated into the daily life of contemporary college students and profoundly affect and change the students learning and lifestyle.

The advent of new media forces ideological and political education workers to change their way of thinking and working methods [19, 20]. When the traditional working methods can not meet the needs of education, they should actively accept the new mode of education. WeChat relies on these unique features and advantages to attract a large number of users, especially undergraduates, to make college students become one of the major user groups of WeChat and also one of the groups that WeChat needs to pay attention to when it applies and develops software.

College students use WeChat survey. College students use the mobile Internet time. The overall time spent by college students on mobile networks is generally high, with only 33% of students having less than 3 h, 43% of students between 3 and 5 h, and 6% of students even up to 8 h or more. According to the location of the Internet during the day, 84% of college students use their mobile phones for "anytime during the day", followed by "before going to bed" (76%) and "When using the toilet" (56%) and "Wake up in the morning" (51%).

3.1 The Reason and Purpose of Using the Mobile Phone to Surf the Internet

Most of the college students choose to use the mobile phone network because of the "can send a boring time" (75%), "Internet access is free from location restrictions" (74%) and

“easy operation” (68%). The main purpose of using the mobile phone network is three. The first is “communication” (89%), the second is “entertainment” (89%) and the third is “access to information” (88%).

3.2 College Students Commonly Used Mobile Internet Applications

The most commonly used mobile phone network applications for higher vocational college students are instant messaging (WeChat, QQ, etc.), personal space like Blog, QQ, search engine, online payment and online music. Among them, every day will use the top five are “instant messaging (WeChat, QQ, etc.)” “Blog, QQ and other personal space” “search engine” “network news” and “online music.” From the aspect of each option, instant messaging tools such as WeChat, QQ and so on are used frequently by college students, which is obviously higher than the 91.2% usage rate of instant messaging by nationwide mobile Internet users. Second, the daily use of mobile phones by college students is mainly based on the three types of communication, access to information and entertainment, which is basically consistent with the motivation and purpose of using mobile phone networks for college students.

3.3 College Students Use Mobile Internet to Connect with Family Members

When asked about how often college students and their parents used mobile Internet, 31.03% of respondents chose to get in touch with their parents daily; 26.97% of college students thought they would get in touch with their parents every other day; and 23.40% Students from time to time communicate with their parents using their mobile Internet with their parents. Only 18.60% of respondents choose to use their mobile Internet technology to communicate with their parents rarely. Their contact information is mobile phone.

3.4 College Students Use Mobile Internet Technology and Contact Content

Survey shows that students and teachers to communicate channels, the use of mobile Internet technology accounted for 98.4%. 45.12% of the content is the daily management of the students; 24.21% of the students are learning content; and 19.74% of the exchange is about the students’ safety and personal development of the content; 10.93% of the content is the development of party members, social and other content.

3.5 Technical Support and Design Principles

Use the terminal. Android is an operating system designed specifically for mobile devices such as mobile phones, PC and laptop, so the system is designed for simplicity, performance and power savings. Android is largely based on Linux (Linux kernel, currently version 3.0.1) and GNU software. In other words, Android is based on the Linux operating system for mobile terminal development. However, Android is not completely compatible with traditional Linux systems, for example, Android has a proprietary driver, no Glibc support, no native windowing system, and more. Therefore, all Linux / GNU applications can not be ported to Android.

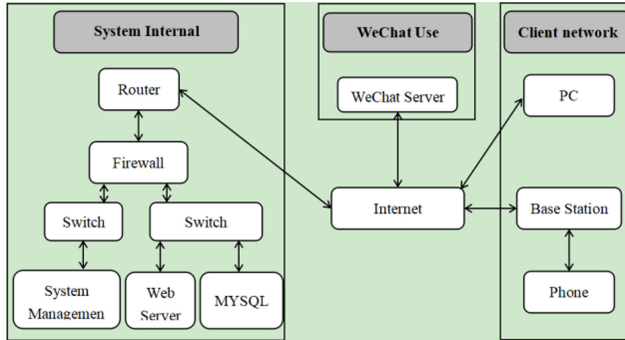


Fig. 2. System physical architecture diagram.

The physical structure of the system. According to the functional requirements of the system, the client can complete the related functions through the WeChat public number and browsing. The server must achieve Internet interconnected, in order to ensure that the server and client network to data transmission and interaction. Users can use system functions from their cell phones, laptops, PCs, etc., and system administrators must use Web applications to manage the system. Therefore, the system physical environment generally includes server devices and network devices. All kinds of client devices access the WEB server through the network. The WEB server interacts with the database server to obtain the data, and then returns the data to the requesting user. Detailed physical architecture (As shown Fig. 2).

Data transmission. In the application architecture, consists of two parts, namely, mobile client and back-end server-side composition. Whether it is a mobile client or a back-end server, the MVC schema is uniformly followed in the technical architecture. MVC (Model View Controller) is a model-view-controller model. MVC is a design paradigm. When organizing code, business logic, data, and display are separated. In this way, when improving and optimizing the interface and user interaction data, No need to rewrite business logic code. MVC has evolved independently for importing, exporting and processing traditional input-output (UI) structures into the user interface. MVC ideas and patterns in the background server-side development of the more mature mode, here focuses on the application of MVC in mobile client, as follows:

- Model: The core part of the application to complete the storage and processing of entity data.
- View: An XML layout file is used to describe the interface in Android. The interface is used to generate user interface with the system. Android provides a rich interface layout and flexible interface control technology.
- Controller: The control layer is actually Activity, which is determined by the life cycle of the Activity. Through the Activity to complete the interaction of the entire business logic, where the interaction with both human interaction, but also interact with the system environment through this interaction to control the realization of the entire system business logic. Use the set Content View method in the Activity to display the

specified design interface, the user input data in the displayed interface, the control interface to display and update the model state.

In recent years, China has vigorously developed vocational education, the number of students in higher vocational education institutions has been constantly expanding, and the problems existing in the management of students in higher vocational education institutions have also become increasingly prominent. Under the new situation, strengthening the management of students in higher vocational education institutions and improving the management effect are the needs of promoting the sustainable development of higher vocational education institutions and ensuring the success of adult students. At a 2016 national conference on ideological and political work in universities, Xi Jinping, China’s president, emphasized that “ideological and political work should be carried out throughout the entire process of education and teaching so as to achieve full-time education and full-scope education.”

4 Construction of FCST Synergy Education System

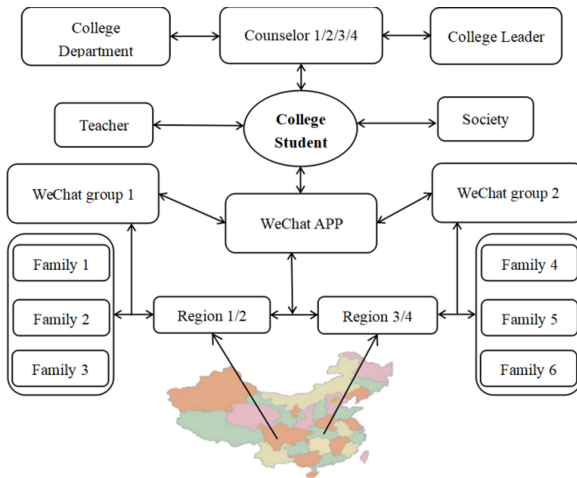


Fig. 3. Construction of “FCST” Synergy Education Model.

In the era of mobile Internet, parents can not only understand the academic status of their children, but also understand the academic status of their classes, colleges and even schools, and fully mobilize the parents’ motivation to participate in school education. The mode of collaborative education for families and colleges and universities in higher vocational education institutions is a starting point for strengthening the ideological and political education in colleges and universities in the new era. It establishes a bridge of cooperation between school-based education and family education, and promotes higher vocational education Colleges and universities trained craftsmen. The paper designed

the higher vocational education colleges and universities and colleges and universities collaborative education “mobile Internet” model, as Fig. 3.

When applying the FCST system, universities should first classify and code the information of students and their families to form a database, so as to realize the sharing of database resources in the whole university; secondly, classify the students and their families database according to the geographical region, and establish several groups; thirdly, collect the wechat accounts of students and their parents for grouping and coding, filter the error information, and form data. The university will input the personal information of teachers into the data matrix, and get the data module of each region. The Internet platform established by colleges and universities is used for constant monitoring and information interaction.

5 Conclusion

With the mobile phone network entering the era of 4G and 5G, higher vocational education institutions can organize teachers and students of the Information Network Institute of our college to develop APP and APP for collaborative education of colleges and universities. Just like Learning Chinese APP software, News, map of our school, student moral education, enrollment and employment, etc. In the column of student moral education, we embed the theoretical content of the ideological and political education and the work experience sharing of the counselors so that the parents can increase the number of students who browse the APP software Understanding of ideological and political education, and enhance their children’s moral education. The true effectiveness of information network platform in the development of family and college collaborative education is reflected in the effective interaction between school and family, which can create a one-to-one, many-to-many and many-to-many interaction with each other. Artificial intelligence internet technology should be fully applied in the campus management of college students, especially in the face of public health emergencies, artificial intelligence technology can be used in the behavior management, teaching management and life management of college students. In the process of campus closed management, Internet technology can not only solve the problem of students’ contact with their families, but also solve the obstacles of academic discussion between teachers and students. Tencent video conference APP, zoom, DingDing video conference APP and Wechat video conference APP are widely used in Chinese universities.

Family and college co-education need to play the leading role of the school, but also need to mobilize the enthusiasm of parents involved. Compared with the school, parents in the family and college collaborative initiative was significantly less than the initiative. The establishment of a parent committee, hiring high education, coordination ability, with strong ideological and political education theory and practical ability of parents to serve as chairman, responsible for the organization and management of family and college co-education of family-related issues. The result of doing so can effectively reduce the workload of counselors and ensure the smooth connection between schools and families, so as to provide guarantee for higher vocational education institutions to train qualified personnel.

Acknowledgment. Hubei Province Colleges and Universities Practice Education Characteristics Project Fund Project “Study on the Optimization and Innovation of Synergy Education Mode in Hubei Higher Vocational Education Institutions under the Background of “Mobile Internet” (2017SJJPB4007).

References

1. Tang, X.Y.: The ideological and political quality of college students in the perspective of core quality. *Theory Pract. Educ.* **37**(10), 29–31 (2017)
2. Terry, H., Mark, T.: Moral phenomenology and moral theory. *Philos. Issues* **1**, 343–351 (2005)
3. Novianto, V., Yogiarni, T., Meidasari, V.E., et al.: Creative economy education-based preservation of gebleg renteng batik culture in Kulon Progo district. *Soc. Values Soc.* **1**(3), 04–06 (2019)
4. Kurniadi, B., Munggaran, N.R.D.: Political education and political participation of millennial generation in the 2019 Indonesian elections. *Soc. Values Soc.* **1**(4), 18–20 (2019)
5. Yadav, U.: A comparative study of ancient & present education system. *Educ. Sustain. Soc.* **1**(1), 160 (2018)
6. Gu, L.M.: Using school websites for home–school communication and parental involvement? *Nordic J. Stud. Educ. Policy* **3**(2), 133–143 (2017)
7. Mark, M.K.: Community-university engagement: a process for building democratic communities. *ASHE High. Educ. Rep.* **2**, 45–52 (2014)
8. Kumar, G., Kumar, M., Sandeep Kamboj, S.: Research in higher and technical education by the help of area of applied and innovative ideas for promoting R&D. *Educ. Sustain. Soc.* **1**(2), 15 (2018)
9. Yin, X.Y.: Research on the application of problem-based teaching in mathematics education. *Educ. Sustain. Soc.* **2**(1), 8–11 (2019)
10. Shi, T.K., Chengyi Li, C.Y., Zhang, X.H., et al.: A practical study on the construction of high-quality medical humanities gold course under internet background. *Soc. Values Soc.* **2**(2), 20–22 (2020)
11. Wu, S.L.: Analysis of mental health status and its influential factors of students in vocational colleges. *China J. Health Psychol.* **01**, 139–142 (2018)
12. Xiao, C., Chen, Z., Meng, W.U.: Investigation on mental health of higher vocational college students. *J. Baotou Med. Coll.* **78**(5), 382–390 (2016)
13. Wang, L.: Research on the divergence of higher vocational college students’ addiction to mobile phones. *J. Yangzhou Coll. Educ.* **35**(2), 64–67 (2017)
14. Jamin, J., Arifin, N.A.M., Mokhtar, S.A., et al.: Privacy concern of personal information in the ICT usage, internet and social media perspective. *Malays. E-Commer. J.* **3**(2), 15–17 (2019)
15. Othman, R.B., Rahim, K.F., Kamarulzaman, R.A.B., et al.: Literature review on internet benefits, risks and issues: a case study for cyber parenting in Malaysia. *Malays. E-Commer. J.* **3**(2), 12–14 (2019)
16. Zeng, X.L.: A study of the innovation of collaborative education in private higher vocational colleges ideological and political theory courses teaching. *J. Jingdezhen Univ.* **02**, 86–89 (2016)
17. Gretchen, M.W., Michael, W.F.: Historical and contemporary developments in home school education. *J. Res. Christian Educ.* **18**(3), 303–315 (2019)
18. Paramitha, M., Agustia, D., Noorlailie Soewarno, N.: Conceptual framework of good governance, organizational culture, and performance at higher education in Indonesia. *Inf. Manag. Comput. Sci.* **1**(1), 18–23 (2018)

19. Huang, W.N., Dai, F.: Research on digital protection of intangible cultural heritage based on blockchain technology. *Inf. Manag. Comput. Sci.* **2**(2), 14–18 (2019)
20. Unn, D.K.B.: Parental involvement practices in formalized home–school cooperation. *Scand. J. Educ. Res.* **54**(6), 549–563 (2010)