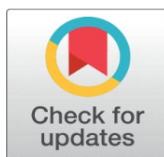# TEACHING REFORM OF ELDERLY INFORMATION TECHNOLOGY CURRICULUM BASED ON CDIO

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ABSTRACT

Elderly education is beneficial for achieving the continued socialization of the elderly, enabling them to adapt more smoothly to retirement life and new social roles. This article focuses on the elderly education information curriculum and proposes to reform traditional curriculum teaching methods based on CDIO theory, following the ideas of Concept, Design, Implementation, and Operate, so that students can master new technologies and skills, build a learning society, and improve the cultural quality of the entire nation.

Keywords: CDIO, Elderly Education, Information Courses, Reform in Education

1. INTRODUCTION

Since the 21st century, China has entered an era of rapid aging. According to data released by the National Bureau of Statistics in 2022, as of the end of 2021, the population aged 60 and above in China reached 267.36 million, accounting for 18.7% of the total population. Among them, the population aged 65 and above was 190.64 million. According to the international standard of "10% of the population aged 60 and above, or 7% of the population aged 65 and above", China has become a country with a high degree of population aging and is currently in a stage of rapid aging development. It is expected that there will be nearly 500 million elderly people in China by 2050.

With the surge in the elderly population, the importance of elderly education is becoming increasingly apparent. Elderly education is an important component of elderly welfare. With the increasing aging population and sustained socio-economic development, the elderly's elderly care needs are extending from material to spiritual and cultural elderly care. However, compared to preschool education, basic education, and higher education, elderly education receives less attention, and there are many shortcomings in both hardware facilities and software services.

To establish a positive outlook on aging, it is necessary to dialectically view population aging. We must not only fully understand the problems and challenges brought about by population aging, but also deeply tap into the potential of aging society and stimulate its vitality. The diversification and demand orientation of elderly education supply are gradually maturing. From the perspective of supply entities, in the past, the international community has explored the construction of open universities for the elderly, with open universities and radio and television universities as the main bodies, and developed and integrated multimedia course resources for remote elderly education to make up for the insufficient supply of elderly education resources. After experiencing the COVID-19, the elderly have gradually learned to use new media such as WeChat. The change in the habits of elderly users has made online elderly education a new favorite. A large number of entrepreneurial enterprises have begun to focus on online elderly education, which has greatly boomed the elderly education market. From the perspective of teaching content, in the past, elderly education mainly focused on leisure and entertainment such as painting, photography, opera, and fitness. Now, it is transitioning towards a knowledge-based and skill-based approach, and courses such as financial management, digital technology, and computer networks are gradually becoming popular.

Digital technology is the foundation of computer technology, multimedia technology, and internet technology, and is a technological means to achieve information digitization, including computer technology, mobile internet technology, cloud computing technology, big data technology, artificial intelligence technology, blockchain technology, virtual reality technology, Internet of Things technology, etc. These technologies are widely used in society and daily life, and are also urgently needed courses for elderly education. Research and practice have shown that the thinking abilities of young elderly people aged 60 to 69 maintain 80% -90% of the peak intelligence of ordinary people, and some people may even enter a new peak in intelligence and innovation. Although China will enter a moderately aging society during the 14th Five Year Plan period, it is still dominated by younger age groups, with younger elderly people accounting for over 55% of the total number of elderly people. The potential for elderly people to participate in society is even broader. Therefore, studying the digital technology curriculum system suitable for elderly universities has high social significance and practical value.

2. TEACHING METHODS BASED ON CDIO

CDIO (Conceive, Design, Implement, Operate) was founded in 2004 with funding from MIT and several Swedish universities under the Wallenburg Foundation, after several years of research, exploration, and practice. This educational model is based on the educational philosophy of conceptualizing, designing, implementing, and operating products, processes, and systems throughout their entire lifecycle. It is based on the CDIO syllabus and standards, allowing students to learn and acquire engineering skills in a proactive, practical,

and organically connected manner, including personal scientific and technological knowledge, lifelong learning ability, communication and team work ability, And the ability to build products and systems in a social and corporate environment Johan and KARL-FREDRIK (2005), Bankel et al. (2005), Villegas (2011), Wang (2009), Junpeng et al. (2012), Berggren et al. (2003), Crawley et al. (2011), Gu et al. (2008), Wang et al. (2008), Liang and Yinru (2012), Sun (2013).

Based on local characteristics and industrial needs, researchers have successively proposed EIP-CDIO concept, CDIO-CMM Capability Maturity Model, CDIO-CBE (capability based CDIO model), SCCIM-CDIO, TOPCARES-CDIO, N+CDIO, etc., providing local models of engineering education for colleges and universities to cultivate students' innovative spirit and practical ability, deepen the reform and internationalization of higher engineering education, and provide local models of engineering education Zuo (2010), Zhu et al. (2012), Tao (2010), Crawley (2002), Bing and Sun (2009), Zha (2008), Peng et al. (2006), Junpeng et al. (2013), Chunxia (2015), Young et al. (2005).

By referring to CDIO's core concept of "practice orientation" and "whole process", researchers have pondered and explored the talent training modes of measurement and control, computer, network engineering, Internet of Things engineering, electrical and electronic, and even new clinical pharmacy, and proposed talent training programs, curriculum systems The model and methods of educational reform, such as the process and measures for cultivating engineering abilities, are based on a three-dimensional and multi-level approach, gradually improving students' engineering practical abilities, and forming a professional CDIO teaching system reform.

With the continuous deepening of education and teaching reform practice, the CDIO engineering education concept has gradually become a practical theory of higher education and teaching reform. For example, in the process of education and teaching reform of public basic courses in mathematics and physics, the MPC-CDIO education and teaching model has been innovatively proposed, and the CDIO engineering education concept has been introduced into the teaching model of the school enterprise dual supervisor system. This effectively improves teaching efficiency, cultivates students' self-learning ability, innovation awareness Teamwork ability and comprehensive literacy.

The history of CDIO reform and development indicates that its systematic, scientific, and operational characteristics can effectively improve the scientific and systematic nature of talent cultivation mode reform. To this day, the CDIO mode and concept have become an important means to promote higher engineering education reform, improve the quality of engineering talent cultivation, and promote engineering professional certification. It has great reference value and practical significance for the construction of new engineering disciplines.

3. CURRICULUM DESIGN FOR ELDERLY EDUCATION BASED ON CDIO

The CDIO engineering education model has achieved good results in traditional engineering education and teaching, and has gradually increased its influence in computer and other professional education and teaching. The core philosophy of CDIO is "learning by doing" and "project-based teaching.

3.1. CONCEIVE

In recent years, most senior universities have successively offered courses such as computer science and smartphone applications. For example, courses focusing on the basics of smartphone operation, mobile photography, and mobile short videos; Online courses focusing on intelligent software operations such as car hailing, ordering, shopping, registration, and consultation. During class, the teacher provided hands-on guidance to the elderly students. After class, the teacher and the elderly students answered questions and exchanged ideas through WeChat and QQ groups, achieving good learning outcomes. How to continuously promote high-quality information literacy courses suitable for the elderly in universities for the elderly needs our deep thinking.

The biggest drawback of traditional teaching models is that they are teacher centered in the classroom, where teachers organize their teaching according to their own teaching arrangements. The output of knowledge is unidirectional, and teachers have absolute control over the teaching process. Students mainly passively absorb knowledge, and in terms of practical skills, they also follow pre arranged content, unable to exert their subjective initiative. Over time, they will form inertia in thinking and develop a strong dependence on the teacher.

3.2. DESIGN

For example, simple information literacy courses such as Basic Knowledge of Computer Operation, Android, Apple Mobile Applications and Introduction to Taobao Shopping have long been offered in most elderly universities around the country. However, due to the lack of experience in running such courses, there is a phenomenon of mutual imitation and homogenization in the course setting of elderly universities around the country. In terms of specific course settings, it is not yet possible to customize learning resources according to the personal interests, hobbies, and needs of elderly students, and usually the offering cycle of such courses is short, making it difficult to meet the learning needs of elderly students at different learning levels.

3.3. IMPLEMENT

Elderly students go to senior universities to study in order to fulfill their interests or dreams during their youth and enrich their leisure time. If you sit in the classroom and feel no need to learn from monotonous and boring textbook knowledge, most elderly students will give up the courses they have learned; If classes are conducted in a 'one talk' manner, over time, one may lose interest in learning. In addition, elderly students often have special preferences for the presentation of classroom teaching content. For example, the lecturers should have high speech intelligibility, slow speech speed, large courseware font, not too complicated written layout, and not too high knowledge density, which put forward higher requirements for the content of information literacy courses in universities for the elderly.

3.4. OPERATE

The teaching method of information literacy courses in universities for the elderly is also very important. For example, in difficult courses, after-school tutoring should be strengthened. Elderly students are older, slow to react, and have poor memory. After listening to the class, the teaching teacher adopts individual tutoring,

teaching and helping each other repeatedly, and learning again until they learn to understand. For example, when teaching, group learning method is adopted, where four or five elderly students are organized to listen together, discuss and research together, learn from each other, and progress faster and better.

On the one hand, it can improve the teaching quality and teaching effect, making it easier for students to understand and absorb. On the other hand, it can also cultivate many abilities required in the CDIO program through some curriculum design, seminars and other methods, such as active learning ability, critical reverse thinking ability, leadership ability, team cooperation ability and communication ability, which conforms to the trend of CDIO education reform, Accelerate the achievement of various training objectives in the CDIO outline.

4. CURRICULUM DESIGN FOR ELDERLY INFORMATION

To set up information literacy courses and hire teachers, we should follow the standards of "hard politics and ideology, high professional quality, sufficient teaching experience, and love education for the elderly", adopt the methods of recommendation by professional departments, open recruitment to the public, teacher training base commission, and selection from outstanding students to establish a high standard teaching team dominated by experts and scholars. To strengthen the management of teaching objectives, strengthen assessment, reward excellent teachers, and dissuade teachers who do not meet the expectations of the assessment and have opinions from students, ensuring the quality of the teaching team; We should adhere to the principle of retaining people through treatment, emotions, and career. We should appropriately increase class salaries, cultivate and select good teachers and high-quality teachers, continuously enhance the sense of existence, acquisition, and social value of elderly university teachers, and motivate and drive more outstanding talents in society to actively participate in the elderly education industry.

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To set up information literacy courses, universities for the elderly at all levels should integrate into communities, streets, nursing homes and day care centers in all towns and streets, take various ways to send intelligent technology to their homes, build a platform for the elderly to learn to use mobile phones, and adopt various forms such as "teaching", "sending", and "helping". According to the actual situation of the elderly, based on centralized training and learning, Help elderly people with "zero foundation" overcome learning difficulties, master basic operational skills, eliminate psychological barriers for them to learn information technology, and further stimulate their enthusiasm for learning.

5. CONCLUSION

Improving the level of information literacy is of great significance to the education of the elderly. Meet the information needs of the elderly population, fully leverage the positive value of the large number of elderly people in the context of

aging, and assist them in welcoming their elderly lives with a positive and optimistic attitude.

CONFLICT OF INTERESTS

None.

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