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Digital Teaching Reform and Practice of Labour Education in Colleges and Universities under the Background of New Generation Artificial Intelligence

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Abstract This paper realizes the digital teaching reform of labor in colleges and universities through digital twin technology, virtual simulation and intelligent machine tools that simulate human thinking. According to different business scenarios to construct the mechanism model of physical entities and establish data model and relationship model. Construct data model library and knowledge model library to achieve mutual feedback between physical entities and virtual space digital bodies. The results show that 62.8% of the students believe that intelligent labor education can improve labor ability and 63.3% of the students believe that it can enhance labor awareness, therefore, intelligent labor education promotes the development of students and has a significant cultivation effect. There is a significant effect in the dimensions of motivation, willingness, attitude and spirit of labor ($P<0.05$). The frequency of using smart tools to do housework can improve students' value, purpose, attitude, and spirit towards labor ($P<0.01$).

Index Terms digital twin, virtual simulation, intelligent machine tools, labor education

I. Introduction

Artificial intelligence is affecting the development of society at an unprecedented speed, which has a significant impact on the traditional view of time and space, human life and way of thinking [1-2]. When the school labor technology encounters artificial intelligence, it will also face a series of innovations, and more and more repetitive labor will be replaced by machines, thus the connotation of labor technology education and the dissemination pathway will also undergo a significant change [3-5]. When labor technology education enters the era of artificial intelligence, what new connotation will be given? What opportunities and challenges will it face? Where should the future of labor technology education go ...... This series of questions are worth thinking about [6-9]. Therefore, it is necessary for us to base on the era of artificial intelligence, focus on labor technology education, and explore the metamorphosis path of labor technology education in the era of artificial intelligence.

In today's era of rapid development of science and technology, labor technology education is placed under the intelligent time and space, and the nature and form of labor education will change [10-12]. The function of direct creation of material wealth by labor is gradually weakened, and the form of labor technology is no longer the traditional face of the earth, and this series of changes has also given rise to a new view of new labor technology education adapted to the requirements of the age of artificial intelligence [13-15]. In the era of artificial intelligence, the cultivation of labor values is the essential goal of labor technology education; creative labor is the focus of labor technology education; and diversified practice is the methodological guideline of labor technology education.

In the face of increasingly complex labor education, first of all, the integrity of educational content should be ensured. Consciously expand the content of education according to the ever-changing forms of labor in reality, attach great importance to the production of information and knowledge, and consciously incorporate the contents of leisure education, consumer education, and labor aesthetic education into the scope of labor education [16-18]. Secondly, we should diversify the teaching methods. Emphasis should be placed on the use of information technology to expand the methods of labor education, and the use of micro-courses, MOOCs, flipped classrooms and other methods to teach labor technology education well, so as to create a "golden course" of labor technology education in the new era, enhance its interactivity and interest, make it "lively", and improve the actual effect of education [19-21]. At the same time, in the process of implementation, it is also necessary to pay attention to multidisciplinary penetration, and appropriately integrate labor and technical education into other "four educations". Last, but by no means least, is to focus on practice. Labor technical education should be based on labor practice, which is determined by the nature of the discipline and the teaching objectives. Sukhomlinsky noted that "the wisdom of a child is in his fingers." Therefore, in order to ensure the normal development of labor and technical education, teaching should not only rely on a single narrative and simple model demonstration, but must have a labor experimental base that adapts to it, so as to achieve the organic combination of theory and practice [22-23].

In this paper, digital twin, digital virtual simulation technology, intelligent labor tools and other artificial intelligence technologies are used to experience different labor scenarios and labor tools, so as to realize the digital reform of labor in colleges and universities. Digital twin firstly by collecting data from virtual space as well as physical space and preprocessing the data. Then these data are fused to get the data we need. Finally, the training of knowledge models and the process of continuous iterative updating are carried out, by choosing different models to fulfill specific functions and applying them to the network component entities in the physical space. This study mainly adopts the questionnaire survey method and interview method, based on empirical investigation and supported by real data, to provide a comprehensive understanding of the effectiveness of the realization of the functions of labor education in colleges and universities in the context of artificial intelligence and the factors of function play.

II. Intelligent Labor Education-Related Technologies

A. Digital twin network model

"New modernity labor education" carrier innovation and link digitalization of the times. The labor content and key links should "integrate online communication and offline cooperation with digital twins, VR technology, digital virtual simulation technology, etc., so that students can get rid of the limitations of time and space, and through virtual experience of different labor scenarios and labor tools, they can feel the labor knowledge, labor value, labor concepts, etc., which they have learned in the labor education courses, so that the cognitive potential of human beings can be explored to the maximum extent. maximize the cognitive potential of human beings.

The digital twin network consists of three spaces, i.e., the physical space, the digital twin space, the web service space and two platforms, i.e., the management platform and the security platform. These platforms are used to manage the entire lifecycle of the physical and digital twin networks.

The data collection and processing of data collection and processing contain the total quantity and incremental collection, data cleaning and number of data format, and the processed data is transferred to the distributed data warehouse hive. Data collection is collected from each application server or data server, and then the processing is followed. Data cleaning is unified in different configuration formats of various products in the original data, including the definition

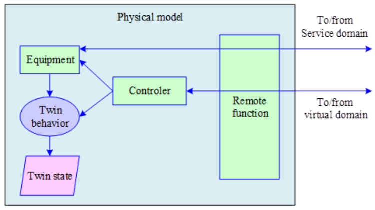

Figure 1: Network component structure

and separation of the unified field, and the deletion of some incomplete or vacant data.

1) Physical space

Physical space includes physical devices such as network devices, terminals, servers, etc. Data analysis, processing and training are performed using artificial intelligence, cloud computing, etc. The training results are stored in a knowledge module. This knowledge module will also be updated iteratively and the resulting knowledge model will be applied to both the digital twin domain and the physical domain. The digital twin module consists of multiple sub-modules that are controlled by the digital twin platform to receive feedback and control the physical domain.

The structure of the network component is shown in Figure 1. The network devices are controlled through a controller, where different behaviors of the network devices can produce different network states, which can be remotely driven by the service layer and the virtual space.

A network component is labeled in the network component layer using the component identifier NID^i, defined as follows:

$$NID^i = \varphi^i \left(N^i_{type}, N^i_{device}, N^i_{behaviour} \right). \tag{1}$$

In the above equation, N^i_{type} represents the type of network component (transport component, storage component, etc.), N^i_{device} represents the network component's own device information, $N^i_{behaviour}$ represents the network component's behavior, and $\varphi^i()$ represents the component identification generation function. Where N_{type} and N_{device} can be uniquely determined in practice by the label of the network device, a network component behavior $N^i_{behaviour}$ is defined as follows:

$$N^i_{behaviour} = \begin{bmatrix} \{b^{NT}_L, b^{NT}_P, b^{NT}_R, b^{NT}_C \ldots\}_T \\ \{b^{NP}_L, b^{NP}_P, b^{NP}_R, b^{NP}_C \ldots\}_P \\ \{b^{NF}_L, b^{NF}_P, b^{NF}_R, b^{NF}_C \ldots\}_F \end{bmatrix}. \tag{2}$$

In the above equation, T, P, and F correspond to the topological behavior, performance behavior, and functional behavior, respectively. For $N^i_{behaviour}$, the topology information includes component location b^{NT}_L, component dependency b^{NT}_P, component adjacency b^{NT}_R, connectivity b^{NT}_C, and so on. Performance information includes bandwidth performance b^{NP}_B, latency performance b^{NP}_D, packet loss performance b^{NP}_L, and stability performance b^{NP}_S. Functional information includes

Figure 2: Data layer analysis processing process

component type b_T^{NF}, component function b_F^{NF}, carrier b_C^{NF}, and security level b_S^{NF}.

Network component behavior:

$$N_{behaviour} = \psi\left(N^i_{behaviour}, N^j_{behaviour}, \ldots, N^s_{behaviour}\right). \tag{3}$$

For network component function N_{RE} is defined as follows:

$$N_F = \phi\left(NID^i, NID^j, \ldots, NID^n\right). \tag{4}$$

2) Digital twin space

Data Layer: The structure of the data layer in the digital twin space mainly includes data in the virtual space and data in the physical space, where the data includes historical data and data generated in real time. Data collection, data fusion and knowledge model training are all carried out in this layer, the specific process is shown in Figure 2. Firstly, the data in the virtual space as well as the physical space are collected and pre-processed. Then these data are fused to get the data we need. Finally, the training of knowledge models and the process of iterative updating are carried out, by selecting different models to fulfill specific functions and applying them to the network component entities in the physical space.

Twin model layer: The model is mainly driven by the software operating platform for control, either by controlling the model through the core simulator or by controlling the model directly, different behaviors of the twin can also produce different twin states, the model space is mainly used to interact with the physical space in real time through virtual communication facilities. A network component is labeled in the twin space using the component identifier $NVID^i$, defined as follows:

$$NVID^i = \varphi^i_V\left(N^i_{type}, N^i_{device}, N^i_{Vbehaviour}\right). \tag{5}$$

In the above equation, N^i_{type} represents the type of the network component in the twin space (transport component, storage component, etc.), N^i_{device} represents the information of the network component's own device in the twin space, which is consistent with the information of the actual network component. $N^i_{Vbehaviour}$ represents the behavior of the network component in the twin space, and $\varphi^i_V()$ represents the component identity generation function in the twin space. The behavior $N^i_{Vbehaviour}$ of a network component in the twin space is defined as follows:

$$N^i_{Vbehaviour} = \begin{bmatrix} \{b_L^{NT}, b_P^{NT}, b_R^{NT}, b_C^{NT} \ldots\}_T \\ \{b_L^{NT}, b_P^{NT}, b_R^{NT}, b_C^{NT} \ldots\}_{T_{vi}} \\ \{b_L^{NT}, b_P^{NT}, b_R^{NT}, b_C^{NT} \ldots\}_{T_{vn}} \\ \{b_L^{NP}, b_P^{NP}, b_R^{NP}, b_C^{NP} \ldots\}_P \\ \{b_L^{NP}, b_P^{NP}, b_R^{NP}, b_C^{NP} \ldots\}_{P_{vi}} \\ \{b_L^{NP}, b_P^{NP}, b_R^{NP}, b_C^{NP} \ldots\}_{P_{vm}} \\ \{b_L^{NF}, b_P^{NF}, b_R^{NF}, b_C^{NF} \ldots\}_F \\ \{b_L^{NF}, b_P^{NF}, b_R^{NF}, b_C^{NF} \ldots\}_{F_{vi}} \\ \{b_L^{NF}, b_P^{NF}, b_R^{NF}, b_C^{NF} \ldots\}_{F_{vq}} \end{bmatrix}. \tag{6}$$

In the above equation, T, P, and F correspond to the topological behavior, performance behavior, and functional behavior, respectively. For $N^i_{Vbehaviour}$, the topology information includes component location b_L^{NT}, component dependency b_P^{NT}, component adjacency b_R^{NT}, connectivity b_C^{NT}, and so on. Performance information includes bandwidth performance b_B^{NP}, latency performance b_D^{NP}, packet loss performance b_L^{NP}, and stability performance b_S^{NP}. The functional information includes component type b_T^{NF}, component function b_F^{NF}, operator b_C^{NF}, and security level b_S^{NF}, etc., which are consistent with the corresponding information of the actual network components, and T_{vi}, P_{vi}, and F_{vi} correspond to the newly added topological behavior, performance behavior, and functional behavior in the twin space, which are not available in reality.

For the network component function N_{VF} in the twin space is defined as follows:

$$N_{VF} = \phi_V\left(NVID^i, NVID^j, \ldots, NVID^n\right), \tag{7}$$

where $\phi_V()$ denotes for the functional function of the network components in the twin space, the appropriate network components are selected and combined to realize a specific function.

The mapping relationship between the physical space and the digital twin space, for the network behavior in the twin space, is to be implemented in the actual network, i.e., selecting the appropriate network components and realizing them through the function of the components. Then there exists a mapping relationship from the twin space to the network component layer which is defined as:

$$\begin{bmatrix} NID^i \\ NID^j \\ \ldots \\ NID^m \end{bmatrix} = \Omega\left(\left[N_{vbehaviour}, \begin{bmatrix} NID^1 \\ NID^2 \\ \ldots \\ NID^n. \end{bmatrix}\right]\right) \tag{8}$$

$\Omega()$ is the behavior clustering function. The main function of this formula is to perform behavioral clustering through the behaviors of the twin space network components, to select the corresponding network components, and to complete the mapping from the twin space behavioral information to the component identification.

Knowledge model layer: knowledge model is a model trained from data according to a specific function, the knowledge model layer consists of a variety of knowledge models, which can be regarded as a collection of knowledge models. We use NVK to identify the knowledge model layer.

The definition is as follows:

$$NVK = \{K_1, K_2, K_3, \ldots, K_n\}. \tag{9}$$

In the above equation, K_n represents a specific knowledge model, such as CNN, DNN, DTL and other models.

The function of the knowledge model is mainly to apply the knowledge model used for decision making to the twin model according to the relevant tasks given by the wisdom service layer, realize the specific function in the digital twin layer (in the virtual space), and then control the component layer to realize the function. Here the intelligent service layer to the knowledge model layer is a mapping relationship, defined as follows:

$$NVK(S_i) = \{K_i \,|S_i \in N_s \,, \mu(S_i, K_i = 1)\}, \tag{10}$$

where $NVK(S_i)$ represents the set of knowledge models required by service S_i in the smart service layer, and $\mu(S_i, K_i = 1)$ represents the relationship with services S_i and K_i, i.e., the knowledge models $K_i\,(i = 1, 2, \ldots, n)$ required by service S_i.

The knowledge model layer to the twin space layer is not a mapping relationship, it should be a relationship that combines with each other, and after the combination, the function N_{VF} is realized in the twin space with the relationship:

$$N_{VF} = T(NVID, K_i, K_j, \ldots, K_s). \tag{11}$$

B. Smart Service Space

The smart service space mainly describes the business, services, applications, etc. of the network. It can give tasks to be realized by the twin space layer and the network component layer, i.e., control functions. It can also receive feedback from both to evaluate the level of realization and continue to control and receive feedback according to the level until the target level is reached.

Using N_S to represent a service, then the model of the service layer is defined as:

$$N_S = (S_1, S_2, S_3, \ldots, S_k), \tag{12}$$

where S_k denotes general web services and applications, and the service layer is the collection of various web services and applications.

The mapping relationship between the smart service layer and the twin model layer is denoted as:

$$NVID(S_i) = \left\{NVID^i \,|S_i \in N_s \,, \mu\left(S_i, NVID^j = 1\right)\right\}, \tag{13}$$

where $NVID(S_i)$ denotes the set of twin network components required by service S_i in the smart service layer, and $\mu\left(S_i, NVID^j = 1\right)$ denotes the relationship with services S_i and $NVID^j$, i.e., the twin network components required by service S_i $NVID^j$ $(j = 1, 2, .., n)$. The mapping relationship between the smart service layer and the network component layer is denoted as:

$$NID(S_i) = \left\{NID^i \,|S_i \in N_S \,, \mu\left(S_i, NID^j = 1\right)\right\}, \tag{14}$$

where $NID(S_i)$ denotes the set of network components required by service S_i in the intelligent service layer, and $\mu\left(S_i, NID^j = 1\right)$ denotes the relationship with services S_i and NID^j, i.e., the network components $NID^j\,(j = 1, 2, \ldots, n)$ required by service S_i.

III. Methods of Digital Pedagogical Reform in Labour Education

1) Enhance the efficiency and quality of labor education The traditional mode of labor education often relies on a large amount of human and material input, but its educational output and efficiency are often unsatisfactory. The application of intelligent labor education-related technologies can greatly improve the efficiency and quality of labor education, for example, through artificial intelligence and big data analysis technology, students' learning behavior and performance can be deeply mined and analyzed to provide teachers with scientific teaching basis and reference, so as to develop a more personalized and more targeted teaching program.
2) Expand the form and content of labor education Traditional labor education is usually based on manual labor and volunteer service, with a single form and boring content. The application of intelligent labor education technology can combine traditional labor forms with digital technology to form diversified forms and contents of labor education. For example, through virtual reality technology, students can experience the work content and environment of various occupations, thus enhancing their understanding and awareness of different occupations. Through digital platforms such as the Internet and mobile devices, students can be provided with more flexible and convenient learning methods, such as online learning and mobile learning. Through big data analysis technology, suitable labor practice projects and learning resources can be recommended for students according to their interests and needs.
3) Enhancement of students' practical ability and innovative spirit On the one hand, intelligent labor education-related technologies can provide students with more realistic and lifelike practice scenarios and practical experiences. For example, simulated workplace environment, virtual experiments and so on. On the other hand, intelligent labor education-related technologies can encourage students to solve problems and complete tasks through innovative ways.
4) Promote education fairness and improve education quality On the one hand, the technology related to intelligent labor education can break through the limitations of time and space, share and disseminate high-quality

education resources, so that more students can receive high-quality labor education. On the other hand, intelligent labor education technology can realize intelligent management and scheduling of teaching resources, optimize the teaching process and resource allocation, and improve the teaching effect and students' learning experience.

IV. Intelligent Reform and Practice of Labor Education in Higher Educational Institutions

A. Analysis of the Effectiveness of Realizing the Cultivation Objectives of Intelligent Labor Education

The target of this survey is full-time undergraduate students as well as graduate students, in order to ensure objectivity and accuracy, this questionnaire adheres to the principle of comprehensiveness and objectivity, the questionnaires are all filled out anonymously, and do not contain the privacy of the respondents, do not contain privacy issues, and do not involve induced questions. This ensures that the questionnaire has a high degree of credibility. Affected by the new Crown Pneumonia epidemic, this survey was conducted by means of network placement, and this questionnaire was placed on the network questionnaire star. It took 13 days from distribution to retrieval, a total of 1,000 copies were retrieved, and according to the questionnaire screening and analyzing the data needed, the results of the survey were analyzed using the data in the questionnaire star. Topics 1-8 are: your labor ability, your labor awareness, your labor emotion, your ability to adapt to the environment, your ability to work in a team, your ability to resist pressure, your sense of responsibility, your ability to innovate and create. The results of the survey on the effectiveness of the cultivation objectives are shown in Figure 3.

A questionnaire was conducted based on the comprehensive practical factors of the results of students' acceptance of intelligent labor education, and "what changes or gains do you think have been made after participating in the practice of intelligent labor education?" According to the survey of students' labor ability, consciousness, labor emotion, teamwork, sense of responsibility, innovation and creativity ability, etc., the survey showed that 24.8% of the students believed that their labor ability had been significantly enhanced, and 62.8% of the students believed that their labor ability had been improved, indicating that the labor education had helped students improve their labor ability. 89.1% of the students believed that labor education had a promoting effect on their labor consciousness. The data of labor emotion, teamwork, pressure resistance, sense of responsibility, and innovation and creativity ability are shown in the table, and it can be seen that labor education has helped to improve students' individual abilities and other aspects, but it is worth noting that 9.9% of students believe that their labor ability has not changed, 8.2% think that their labor consciousness has not changed, and 11.8% think that their innovation and creativity ability has not been improved, 9.9% of people believe that their labor sentiment has not changed, which means that intelligent

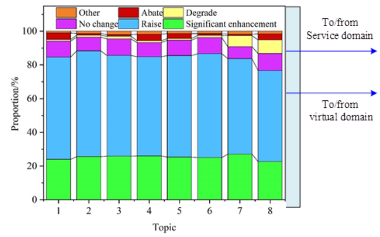

Figure 3: Develop the results of the results of the results

labor education has no significant positive effect on some students, so it is necessary to analyze the reasons according to all levels. There may be a lack of application range and depth of digital technology, lack of sufficient digital education resources, and the intervention of digital technology to make the time and space environment of the labor education become more blurred, providing more flexibility and accessibility, and new challenges and problems. All in all, according to the survey, intelligent labor education has a positive impact on students' labor emotion, ability, consciousness, innovation and creativity ability, and promotes the development of students.

B. Analysis of external factors affecting the functioning of labor education in colleges and universities

1) Analysis of differences in smart labor courses

In this study, whether or not schools offer specialized intelligent labor courses was used as the independent variable, and the independent samples t-test was used to analyze the nine sub-dimensions under the four dimensions of college students' view of labor. When $P>0.05$, there is no significant difference between whether or not schools offer specialized intelligent labor courses on college students' labor views. The results of the independent samples t-test are shown in Figure 4, where dimensions A-I are: value to society, value to the individual, motivation to labor, willingness to labor, attitude to labor itself, attitude to working people, attitude to the fruits of labor, understanding of the spirit of the model worker, the spirit of the craftsman, and learning from the model worker. The difference between whether or not schools offer specialized intelligent labor courses is not significant in the 3 sub-dimensions of value to society, value to the individual, and learning about the labor model (P=0.753, 0.142, 0.108). There are significant differences between whether or not the school offers specialized intelligent labor courses on to the other dimensions (P=0.001, 0.001, 0.000, 0.002, 0.022, 0.004), and the college students whose schools offer specialized intelligent labor courses have higher scores than the college students whose schools don't have specialized intelligent labor courses on to the above dimensions.

2) Difference Analysis of Intelligent Labor Frequency Labor Perspective

In this study, using the use of smart tools to do housework as the independent variable, which was divided into three levels of frequent, occasional, and never, we did a multiple com-

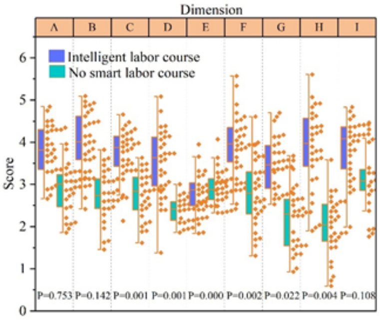

Figure 4: Analysis of the difference between the sense of labor in intelligent times

parative analysis of the four dimensions of college students' view of labor. When P>0.05, there is no significant difference between the frequency of using smart tools to do housework on college students' labor view. The results of multiple comparative analysis are shown in Table 1, the ratings of college students who frequently use smart tools to do housework and those who occasionally use smart tools to do housework in the four dimensions of the value of labor, the purpose of labor, the attitude of labor, and the spirit of model labor reached a highly significant level (P<0.01), and the ratings of college students who frequently use smart tools to do housework and those who never use smart tools to do housework in the four dimensions possessed a significant difference (P<0.01). The university students who occasionally use smart tools for housework and those who never use smart tools for housework reached a significant level (P<0.05) in terms of attitude towards labor. This result indicates that the frequency of using smart tools for housework affects the labor attitudes of college students in the information age. The ratings of college students who frequently use smart tools to do housework in the four aspects of the value of labor, the purpose of labor, the attitude of labor, and the spirit of model labor are higher than those of college students who occasionally use smart tools to do housework and those of college students who never use smart tools to do housework. Students who often use smart tools to do housework are more capable of forming an independent and self-reliant character through their own labor experience, appreciating the hard work of their parents in the process of labor, improving their labor quality, and subconsciously establishing a correct view of labor. The absence of household chores makes children develop bad labor habits, so parents should learn to let go of their children, reasonably allocate household chores, exercise their children's ability to do household chores, and avoid their children's habit of relying on smart furniture when they work.

C. The state of the sub-dimensions of the view of labor in the age of intelligence

Under the dimension of "value of labor", two sub-dimensions of value to society and value to the individual were set up, and five questions were set up under each sub-dimension, and the statistics of sub-dimensions and the mean value of each question are shown in Table 2. Students have a good knowledge of the social value created by labor, students experience the rapid development of science and technology in the era of artificial intelligence, and recognize the important value of labor in promoting the development of all aspects of society. Under the sub-dimension of value to society, college students scored high on the aspects of labor to promote economic development, promote scientific and technological progress, and realize the prosperity and strength of the Chinese nation. The lowest score is 2.717 in the question of "All happiness in this world needs to be created by hard work", which shows that college students have not yet deeply understood the idea that labor is the happiest, and it is necessary to strengthen the education of college students' labor happiness in the cultivation of college students' concept of labor in the digital era. In the sub-dimension of value to the individual, college students scored the highest in the question of "labor can make money to support oneself", with a score of 3.719, which shows that college students have affirmed the economic value that labor creates for individuals through their own experience. The lowest score was 2.762 for the question "Labor brings me a sense of accomplishment and satisfaction", which indicates that college students are not able to devote themselves to the labor process and are not able to experience the fulfillment and pleasure of labor.

Two sub-dimensions, motivation and willingness to work, were set under the dimension of "purpose of labor", and six questions were set under each sub-dimension, and the statistics of the sub-dimensions and the mean values of each question are shown in Table 3. The highest score of 3.806 is in the category of "Participating in labor is to provide services for others and society", which indicates that students have a strong sense of collective honor and social responsibility. Students scored the lowest in "labor is forced" with a score of 2.496, indicating that students do not have the motivation to actively participate in labor. Under the sub-dimension of willingness to work, the highest score of 3.557 was given to the question of "willingness to help others after completing one's own work".

V. 5. Conclusion

This paper establishes an intelligent labor education model in line with the characteristics of the times, which in turn triggers the public survival pattern of terminal mobility, information interconnectivity, virtual and real interaction, and life and work interconnectivity. The results show that it promotes a high degree of integration of teaching and management modes with modern technology, mobilizes students' learning autonomy, improves students' comprehensive quality and ability, improves labor values and reforms labor forms:

1) After intelligent labor education, 62.8% of the students think that their labor ability has been improved, and intelligent labor education is effective for the cultivation goal that can positively influence students' labor emotion, ability, and values.

Dimension	Do you do housework		Mean difference	Significance
Value of labor	Often	Occasionally	1.084*	0.001
		Never	1.211*	0.001
	Occasionally	Often	-1.094*	0.001
		Never	0.132	0.164
	Never	Often	-1.212*	0.001
		Occasionally	-0.134	0.174
Purpose of labor	Often	Occasionally	0.923*	0.002
		Never	1.003*	0.002
	Occasionally	Often	-0.922*	0.002
		Never	0.096	0.213
	Never	Often	-1.011	0.003
		Occasionally	-0.093	0.214
Labor attitude	Often	Occasionally	0.694*	0.002
		Never	0.835*	0.001
	Occasionally	Often	-0.675*	0.002
		Never	0.144*	0.021
	Never	Often	-0.836*	0.001
		Occasionally	-0.146*	0.022
Strain spirit	Often	Occasionally	1.668*	0.001
		Never	1.743*	0.002
	Occasionally	Often	-1.650*	0.001
		Never	0.090	0.393
	Never	Often	-1.741*	0.001
		Occasionally	-0.093	0.402

Table 1: Multiple comparison analysis

Subdimension	Topic	Mean
The value of society	Labor can promote economic development	3.684
	Labor can promote technological progress	3.59
	Labor can improve the soft power of national culture	2.724
	All happiness in the world needs to be created by hard work	2.717
	Labor can realize the prosperity and prosperity of the Chinese nation	3.531
Personal value	Labor makes money to feed itself	3.719
	Labor can make me happy	2.75
	Work gives me a sense of accomplishment and satisfaction	2.684
	Labor can promote my all-round development	2.762
	Labor can cultivate my spirit of hard work	3.488

Table 2: The subdimension and the mean analysis of the problem

2) Whether or not smart education is offered in schools significantly affects six dimensions such as motivation and willingness to work.
3) The frequency of using smart tools to do housework differs significantly in 4 dimensions of value, purpose, attitude, and spirit of labor. In the sub-dimensions of these 4 aspects, students affirmed the economic value created by labor and had a higher sense of social responsibility.

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Subdimension	Topic	Mean
Labor motive	Work in order to exercise your own practice	2.753
	Participate in labor to avoid learning pressure	2.674
	I have the desire to bring happiness to my family	2.737
	I'm a parent force at home	2.496
	The work is to win honor among the class	3.194
	Work in labor is a service for others and society	3.806
Willingness to work	I would like to take the initiative to share the housework	2.476
	After completing my work, I am willing to help other students to clean up	3.557
	I am willing to participate in social labor and broaden my horizons	2.793
	I don't want to take part in any labor, because labor is dirty and tired	2.732
	I don't want to take part in public service because I waste my learning time	2.438
	Work in order to exercise your own practice	2.519

Table 3: Analysis of the motivation of labor and the mean of the topic

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