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# Project-Based Learning Applied to School Labor Education a Design and Evaluation of in School Curricula

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**Abstract: Labour education is an essential part of the primary education system. Project-Based Learning (PBL) is a teaching paradigm that's solidly integrated practice with knowledge. It is an effective way to improve the practical and educational value of labor education. This article conducts a review of design principles, implementation framework, teacher development mechanism, home-school-community collaboration mechanism and management support system of primary school labour education school-based curriculum from a Pbl perspective Moreover, it presents a brief overview of its existence, organization, and essential documents, culminating in the principle of mediation and the impact of executive agreements upon treaties. The research demonstrates that the implementation of PBL has notably facilitated the transition of the labor education at primary school from a mere skill-training orientation to the one aimed at competency cultivation. Despite this, effective implementation and scientific evaluation remain challenging due to constraints such as teacher professional capacity, resource integration, and evaluation tool development. Looking into the future, in-depth interdisciplinary teacher collaborative research, intelligent evaluation and tracking tool development, and high-quality longitudinal empirical research will be the key directions for further advancement in this field.**

**Keywords: Project Based Learning; Labor Education; Primary School; School Based Curriculum; Curriculum Design; Multi-Dimensional Evaluation**

## 1. Introduction

Labour Education becomes an independent compulsory subject in primary and secondary schools, which is a re-recognition of labour education's educational value in the education system of China [1]. This reform aims to reverse the long-standing tendency to give priority to intellectual education over labor. This is capable of training well-rounded socialist builders and successors who are morally, intellectually, physically, aesthetically, and labor-educated. In view of the above, how to design high-quality school-based labor education curricula that conform to national standards, connect with students' lives, and stimulate students' intrinsic motivation have become an important issue educators.

Project Based Learning (PBL) is student centred, driven by real world problems, emphasising in-depth inquiry and creative outcomes, all of which are very much in line with the essence of labour education i.e. "learn by doing, use both hands and brain." Introducing problem-based learning (PBL) into the development of primary school labor education school-based curricula can effectively overcome the fragmentation, emptiness and weakening of educational function of traditional labor classes. Moreover, it systematically cultivates students' labor competencies, innovation spirit and problem-solving abilities through the integrated application of knowledge from different disciplines and authentic practical problems. As of 2026, the exploration of this area in domestic primary schools has progressed from first attempts to deep integration, producing a number of innovative practical cases. In this paper, with reference to current research trends, research findings and wisdom gained through

experiences in recent years will be systematically synthesised so as to develop a frozen analytical framework going from theoretical design to practical evaluation. The aim is to give professional educators, curriculum developers and educational administrators a document that is both profound in theory and instructive in practice.

## 2. Core Concepts and Design Principles

Curriculum planning starts with clear conceptual guidance and the right scientific design principles. The design of PBL-based labor education school-based curricula should be guided by several principles to ensure educational orientation and practical effectiveness based on the synthesis of research and practice.

The main principle is authentic context and problem orientation. Curriculum design should start from a driving question or real task that stems from the life experience of students, the school environment or community needs which allow students to learn as they work to solve a real problem. This way of teaching maximally energizes students' intrinsic motivation. It turns labour from mechanical, detached from life operations into creative activities or power. Certain schools, for instance, have developed labor projects that revolve around the "resolution of real campus problems," which links labor practice closely with campus construction and attains good educational results [2]. These training programs must ensure labor education and internship programs are mutually reinforcing. Equally, it must comply with the principle of competency orientation and integration of "five educations". Above all, the focus must be on the cultivation of students' core competencies. These competencies are especially specified in the Labor Education Curriculum Standards. Above all, the focus must be on the cultivation of students' core competencies. These competencies are especially specified in the Labor Education Curriculum Standards. These competencies are particularly assessed on the four major perspectives. Specifically, they include labor concepts, labor abilities, labor habits and qualities, and labor spirit. The characteristics of PBL are inherently interdisciplinary; it should integrate labor education into Chinese, mathematics, science, art, information technology and other subjects through interdisciplinary connection, breaking down subject barriers, and achieving five educations simultaneously. One example of a project that enables the integration and connection of knowledge is the project "The Life of a Peanut," which consists of planting and growing peanuts and includes scientific observation, mathematical measurement, Chinese writing, and drawing [3].

Essentially, labor education should be practice. Therefore, in the process of teaching and curriculum design, full participation and practice of students must be emphasized. That is to say, labour education courses process planning up to embodied or hands-on learning. Students must build knowledge and competence through the combination of "physical effort" and "intellectual thinking". Following this logic reasoning, a whole practical logic chain is built as follows: "Identify needs→formulate plans→learn skills→practice labour→reflect and share→ re-practice-" so that we get a fundamental change from "learning by sitting" to "learning by doing" [4]. Valuing the unique differences of students is an essential modern educational requirement. School-based curriculum design should give students a range of project topics to choose from, and for each project, require both basic and challenging tasks, thus allowing every student to grow within their own "zone of proximal development". Some schools have designed packages with hierarchy of modules – self-care, role-play, vocations, earth, and creation – as per grade-level cognitive development which is a typical example of this principle [5].

Likewise the school-based curricula should not be a set of fragmented activities but a systematically planned and vertically articulated curriculum system. According to the curriculum standards, they are required to be designed in an overall way of the three large classes (daily necessities labor, productive labor, service labor) and the ten task groups distributed by grade level. The curriculum should be progressive. For instance, the task of "organising and storing" should progress from personal stationery and toys in grades 1-2, to wardrobe organisation in grades 3-4, and to study or public area organisation in grades 5-6. Furthermore, it should have increasing difficulty and gradual development of competency. Students' learning outcomes are thoroughly assessed at each stage using various methods [6]. The development of

school-based curricula must ultimately be situated on the school's own resource endowments, teacher qualification, and student realities; that is, local context and school settings. Schools should fully take advantage of the existing campus resources available with the school like the vacant land, rooftop terraces, plants, etc., which can be easily transformed into implicit labour education resources and also ensure the school-based curriculum is tailored to suit the needs of the national curriculum in terms of both breadth and depth.

## 3. Implementation Framework and Content Construction

After clarifying the design principles, a scientific implementation framework and specific content are the key to implementing the curriculum. The scientific design of a curriculum requires precise decomposition of macro-objectives in the curriculum standards, as well as micro-objectives at specific grades and projects. There are many efficient ways to accomplish this, as shown by previous studies. "The three-step decomposition method" recommended by Hunan Provincial Institute of Educational Science is very operational: (1) Decompounding the overall task of the complex project into several .relatively independent sub-tasks and making their objectives specific, observable; (2) clarifying the logical relationship among sub-tasks (e.g., parallel, sequential), determining the order of question implementation; (3) Accurate matching the sub-tasks and their objectives to the labor categories, task groups and the standards of the curriculum grade-level objectives. A preliminary teaching objective framework was constructed. The refinement of the preliminary framework is based on student conditions [7]. The "goal multi-branch tree method" is a structured visualization tool in which the project's big goal (e.g. learn healthy meal pairing) is the trunk, from which branch off several subgoals (e.g. recognize common vegetables, master two cooking methods, design a weekly lunch menu). Each subgoal branches off further into immediate goals and action items. This method shows that every specific goal matters towards achieving this big goal. In terms of specific content arrangement, the school should arrange the three main parts of daily living labor, productive labor, and service labor into students' grades according to their age characteristics and cognitive development. Lower-grade students focus on personal self-care and simple campus services; middle-grade students slowly introduce more complex tasks such as home cooking and class management; and senior-grade students may engage in public services and small-scale productive creation that are more comprehensive and social-oriented. Creating explicit labor checklists for each grade level is useful for systematization and hierarchical ordering of content.

The structure of PBL-based labor education is generally common and comprises of four main stages. Stage one of the initiation and planning of a project is when teachers create an engaging project context through the use of micro-videos or stories, field trip or presenting a real challenge problem. This challenge problem offers guidance in brainstorming sub-questions around a driving question, the result is a K-W-L. Students create project teams based on interests and devise a project plan that breaks-down the project with allocated roles, timeline and expectations. This is a planning and organizing activity itself that students do. The second step is engagement in inquiry practices and learning of skills, which is the heart of PBL. In order to teach the relevant background knowledge and labour skills needed in the field (e.g. tool use, planting techniques, safety rules), external experts or course staff provide the "scaffolds" with micro-lectures, workshops, demonstrations etc. The students then perform specific labor procedures that are coordinated as per the plan. As they carry out their work, they come across several anticipated and unanticipated problems, which require teams to gather, search on, and consult experts to solve. The role of the teacher is that of a facilitator or prompter or resource person. The third stage is product creation and presentation: students creatively express their inquiry process and learning outcomes in various forms. Products not only refer to things but also research reports, posters, films, performances, design models, etc. For example, students may undertake a real charity sale or product fair. When students display and share their work publicly, they derive a strong sense of achievement and value. Moreover, public display and sharing provide students with important opportunities to learn from one another as well as to receive feedback. The fourth stage is reflection, evaluation, and iteration. At the end of the project, students are

guided to review and reflect upon the whole process. They assess their success, the difficulties they encountered, the solutions they found, their teamwork gains and losses, and any new understanding that they acquired about the value of labor. Various methods such as work logs, group discussions and reflection questionnaires can engage students in reflection. Instructors assist learners in contemplating how to use the information and skills acquired in new settings, and even create the next iterative project from this reflection.

## 4. Teacher Development and Collaborative Mechanisms

Teachers play a decisive role in PBL-based labor education implementations' success. The transition from traditional "knowledge transmitters" to "project facilitators" has put forward extremely high demands on teachers' comprehensive ability. Surveys indicate that teachers mostly encounter difficulties in PBL teaching, such as lack of systematic project design skills, insufficient understanding of labor education concepts, inadequate interdisciplinary guidance ability, and unfamiliarity with process-oriented evaluation methods [8]. It is essential to build systematic teacher professional development and collaborative mechanisms. Regular training of teachers and teachers on strengthening teachers' PBL instructional design should be institutionalised and systematised by the regional education authorities and schools. The PBL training should include theory and labor education policies, design driving question and interdisciplinary themes, play facilitator role and construct learning scaffolds, and master process-oriented assessment and performance assessment methods. With respect to the model of training, the comprehensive intervention can adopt "centralized training, classroom observation and assessment, individualized coaching, participation in curriculum improvement, and thematic inquiry practice" [9]. The coaching model SISC+ which is based on the Grow model, through cycles of "plan-implement-evaluate- review-reflect" successfully enhances the capability of teachers for autonomous research and instructional design.

The interdisciplinary nature of PBL-based labor education requires breaking down the barriers of teaching research in single subjects and establishing their interdisciplinary collaborative research mechanism. General-vocational cooperation in addition can also be new goods solution method to engineering primary teachers that have a vocational teacher. In order to promote collaboration between primary schools and local vocational schools, regional education authorities may organize "general-vocational joint teaching research groups" as a regular initiative to plan joint lessons and conduct a multi-lesson research. Vocational school professional teachers (of cooking, horticulture, woodworking, etc.) guide primary school teachers to master relevant skills and teaching methods, while primary school teachers help vocational teachers understand better the cognitive characteristics of young children, giving rise to an intersectional and open teaching-research community [10]. Regional teaching-research departments may also launch "project-based linkage" mechanisms, pulling together cross-department project teams of teaching researchers, research staff, information technology experts, and frontline master teachers founded on research topics for integrated implementation of regional teacher training and curriculum resource development. In teacher training and teaching-research activities, the introduction of teacher professional classroom behavior analysis frameworks can support teachers to reflect and enhance their teaching behavior in an objective and quantifiable manner. The FIAS (Flanders Interaction Analysis System) or S-T behavior analysis method enables scientists to code and study the recordings of PBL classes, quantifying teacher-student verbal behaviour. The learning environment can be qualitatively assessed using the six lenses of VIDEO-LM framework. Through guidance from such frameworks, the teacher can recognize better the critical behaviours and design features through which one can move from lecturer to facilitator.

## 5. Multi-Stakeholder Collaboration and Curriculum Management Support

The educational application of labor is based in life and much more than campus life. Community public services, production practices and the daily life of families constitute indispensable educational resources. Standardized home-school-community collaboration mechanisms are established to expand the space for labor education and realize the "three-in-one". It can be seen as construction

of linkage mechanism of "school-family-community" undertaken with school as the centre, and through in-school teachers, parents, community workers, enterprise technicians, and model workers, we will create a "labour education community". Schools can set up parent committees and parent volunteer organizations, and establish a "school-based curriculum parent mentor system" to employ parents with professional skills as program instructors and thereby get them deeply involved in the curriculum. For the cooperation to be regularly done and standardized, the school must sign a resource co-construction agreement with the community unit and practice base. An effective agreement should include essential clauses such as a shared vision and goals, definitions of roles and responsibilities, inventory lists and mechanisms for sharing of resources, content and forms of cooperation, and safeguards and evaluation. By means of these mechanisms, the "work checklist" and "work weekly log" of the family may be integrated into the school curriculum. Students may be guided to take part in greening the community, sorting waste, taking care of the elderly, and other forms of public service work. Efforts are made to extend the classroom for working education to social life.

The effective implementation of labor education based on project-based learning (PBL) is also determined by the school's systematic field support, including curriculum management, safety assurance, supply logistics, etc. The Ministry of Education stipulates that primary schools must incorporate one class hour of labor education per week, whereas PBL is often planned for big, uninterrupted hours. Schools should adopt flexible integrative time management strategies in order to solve this conflict. An example of this is "long-short classes" and "half-day" scheduling, which breaks the fixed 40/45-minute class periods. Or there is a "4+1" model of four days of basic subject teaching, and a day (or two half-days) in inquiry thematic learning. The second situation is a class-hour reservoir, which integrates the class hours of comprehensive practical activities, labor, class meetings and so on into a flexible reservoir that can be flexibly allocated according to project needs. A third is interdisciplinary integration, which is not only a teaching strategy but also a time management strategy: when a project (e.g., "design a campus water-saving system") naturally integrates science (principles), mathematics (measurement and calculation), Chinese (report writing), and labor (installation practice), class hours from these subjects can be reasonably combined and taught by a team of multi-subject teachers, achieving multiple goals simultaneously and alleviating the overall shortage of class hours.

It can be said that labor practices like outdoor plantation and handicraft have safety hazards. To implement the curriculum, there must be a strong safety assurance system. At schools, teachers should be organized to conduct assessment of specific labor projects and based on which, detailed safety risk identification checklist should be developed. The list should include the safety of common tools used, e.g., scissors, hammers, needles, soldering irons; Safety related to materials and the environment; Safety related to outdoor activities and safety related to labor intensity and hygiene. The assignation of any high-risk tasks should be expressly prohibited, including working from heights, near electricity, or with dangerous substances. For each identifiable risk, there should be established within the proposed site, a clear, operable standardized emergency response plan including accident grading and reporting within a designated point, first-aid actions (for instance, bleeding control, cold compress, heatstroke case), people in charge, happening with out, and drills at a fixed interval. Buying school liability insurance or accident insurance is also a necessary risk-sharing measure.

## 6. Construction of a Multi-Dimensional Evaluation System

Evaluation or assessment is the 'baton' of the curriculum, as it controls the terrain and depth of teaching and learning. The process, comprehensive, competence-oriented, and PBL-based labor education advocated by the party no longer uses single, summative, and quantitative evaluation methods [11]. An effective evaluation system of a specific programme will help in achieving the educational objectives planned for it. The system in question should encompass a diverse range of evaluation subjects, employ a variety of evaluation methods, and feature comprehensive evaluation content.

We should break the traditional teachers-dominated model regarding the subjects of evaluation, forming a multi-subject

structure of teacher evaluation, student self-evaluation, peer evaluation, parent evaluation, community expert/practical mentor evaluation. Different subjects provide different perspectives on student growth, contributing to a fuller and three-dimensional reflection of growth. For instance, student self-evaluation highlights the importance of self-perception and reflection; peer evaluation highlights collaboration and communication; and parent evaluation can observe the extension of work attitudes at home.

Process-oriented and summative evaluations should be combined in evaluation methods. Analysis of the students' participation, labor attitude, collaborative spirit, solving of the problem during the process of the project and process-oriented evaluation can be realized through the observation of behavior. In addition, it can also be achieved by the means of interview, labor logs and completion of the task sheet. Summative evaluation that focuses to final condition is evaluated with regard to the quality of the final labor product, presentation performance and a project summary report. The essence of performance evaluation is to evaluate the student by giving authentic tasks and observing the process and outcome by a teacher. Moreover, the chief tool is a rubric. The portfolio assessment is an effective and comprehensive tool, whereby students collect proof of their labour learning processes and outcomes (design sketches, labour logs, photos, videos, products, reflection reports, etc.), to form a personal 'labour growth portfolio' which displays their developmental trajectory. The qualitative and quantitative evaluations must be complementary, with quality as the mainstay and quantity as supplement. Besides rubrics in which a grade or score is provided, it is more important to offer qualitative comments that are specific and targeted. These should point out strengths and areas for improvement that can encourage continued development.

The evaluation indicator design should match the curriculum standards' four major labor competency content aspects. It can be constructed from four dimensions, which are: first, labor concepts and attitude, with interest, responsibility, respect for labor, labor spirit, social service awareness; second, labor ability and skill, with mastery of basic skill, problem-solving ability and innovative application, planning and organizing; third, process performance and habit, with participation and involvement, teamwork and communication, safety and norm awareness, tidiness and orderliness; fourth, labor product and output, with task completion quality, innovativeness and practicality, presentation and expression quality. These indicators ought to be incorporated into the comprehensive quality evaluation system of students, which is an important reference for awards and further study.

## 7. Performance Assessment Tools and Intelligent Evaluation

Rubrics are the essential instrument for performance assessment and for ensuring objectivity and consistency in evaluation. A well-designed rubric provides students with a clear understanding of the meaning of quality student performance. A typical rubric consists of the following three essential components: (1) criteria what is to be evaluated, which corresponds to the core evaluation indicators; (2) levels of performance usually 3-5 levels (e.g. excellent/good/satisfactory/needs improvement); and (3) descriptors the soul of the rubric, which describes the performance characteristics of each criterion at each level using clear, specific, observable behavioural language. Depending on what your purpose is, you may choose a holistic rubric (gives an overall grade) or an analytic rubric (scores each criterion separately). If the idea is to diagnosis and give feedback on the PBL process, use an analytic rubric.

Creating reliable and valid rubrics is a professional process. First, define the competencies or core abilities that are assessed based on curriculum level and project objectives. The criteria must discriminate well. The quality must also be highly consistent with attainment objectives and performance tasks (principle of alignment). Next, ascertain how many performance levels are required, and write descriptors for each level of each criterion. The descriptors should be clear and observable, avoid ambiguous words, demonstrate qualitative differences among levels, and be written in terms students can understand. Next, Select the type of rubric along with weights to criteria, if required. According to a assessment following suggestion, they should fourth, invite peer teachers or experts to review the draft, build an "anchor" sample library using real student work to improve scorer reliability, pilot the rubric in

an actual evaluation, and revise it iteratively based on the problem. In practice, schools can develop a unified "three-form" system, i.e. the Labor Project Design Form (for teachers), the Labor Practice Task Form (for students) and the Labor Practice Evaluation Form (with the rubric, for multi-subject use) to produce unified curriculum resources.

With the development of the digitalization of education, artificial intelligence (AI) solves the challenges in evaluation of PBL based labour education. Complexity, process-orientation and subjectivity. Creating an intelligent platform for PBL based labor education is the basis of intelligent evaluation The platform shall consist of a full-process data collection and governance module, which adopts IoT devices (such as HD cameras, wearables, embedding smart tools, etc.), online collaboration platform, classroom interaction system and so on to unobtrusively capture multimodal data during students' labor processes. The platform collects operation videos, voice dialogues, text logs, as well as collaboration records covering the entire educational and learning. Further, it shall be equipped with strong data governance capability to efficiently clean, annotate and standardize the large-scale heterogeneous data. The platform ought to integrate the PBL workflow, enabling teachers to publish projects, students to form teams and submit products, and to conduct evaluations across disciplines (self, peer, teacher). It should also employ gamification and incentive systems like points and badges to engage students. The smart analysis and decision-support module acts as the amplified brain of the platform; it converts raw data into meaningful evaluation information and presents them visually to the teachers, students, and parents.

AI technologies that make use of multiple modes can help in the analysis of process behaviour and final product evaluation. For the behavioral analysis of processes using computer vision technology which mainly based on Convolutional Neural Networks and object detection algorithms (e.g. YOLO) are deployed to automatically capture students' body postures and the operations trajectories of their tools from videos, while collecting data to quantitatively evaluate the standardization, fluency, and accuracy of their operations in comparison to expert action models. RNN and LSTM models can be used to represent this time-sequence of behaviour patterns enabling analysis of student focus, problem-solving paths and interaction with peers. Models for sentiment analysis based on Natural Language Processing (NLP) can analyze students' labor logs automatically to judge their attitude, sense of responsibility, and value cognition to labor [12,13]. AI can exploit CNN to extract features of image-based products, like handicrafts, paintings, agricultural produce, for their final product evaluation and intelligently assisted scoring by combining preset rubrics. Multimodal large language models (M-LLM) are capable of scoring submissions, such as illustrated recipe designs, while also automatically providing insightful and personalized feedback [14]. When integrating these technologies, the smart platform virtually generates a "Labour Competency Growth Report" for each student. In this report, students' performance and progress in various projects will be represented in radar charts and growth curves from different points of time, enabling true "one student, one profile" personalised evaluation.

## 8. Curriculum Effectiveness Evaluation and Future Prospects

The main objective of evaluation is to check whether the curriculum effectively encourages student growth. It is of great significance to empirically assess the long-term effectiveness of PBL-based labor education curriculum, especially their effectiveness on students' core competency and non-cognitive ability (e.g. perseverance, cooperation, responsibility). Previous studies reveal that problem-based learning has a significant positive effect on core competencies, including critical thinking, invention, tenacity, and communication and collaboration. A three year, large scale longitudinal study of over 10,000 middle school students (2021-2023) found that students who received high-quality PBL instruction showed significant value-added gains in their critical thinking, innovation, grit and collaboration compared to students in traditional instruction [15]. Targeted empirical studies on labor education have also drawn positive conclusions. For instance, Zhu (2024) found that after being exposed to project-based labor education, students in the experimental group scored significantly higher than their control counterparts. The former group scored better on

labor concept, habits, skills, innovative spirit, and social responsibility [16]. Studies show that spending time on labour was positively related to the development of non-cognitive abilities. Also, various meta-analyses have systematically pointed to the overall positive impact of project-based teaching on non-cognitive abilities.

Notwithstanding the above, there exist substantial research gaps within the existing evaluation of efficacy domain. At this point, we haven't seen a study that satisfies all the conditions of "targeting a specific school-based PBL labor curriculum," "with primary school students as subjects," "with three or more years of longitudinal tracking," and "quantifying the impact on non-cognitive abilities." The reason for this is that existing studies are either with other school levels, not with specifically this type of labor curriculum, or lack rigorous longitudinal designs. The long-term, sustained impact mechanism of PBL-based labor education on non-cognitive abilities of primary students needs more empirical tests. More critically, the field has not yet developed a standardized long-term tracking assessment tool with reliability, validity and norm-building for "labor competencies" or "labor habits" of primary students that has gained wide acceptance. Most available tools are mini-programs or assessment models developed by schools based on small-sample surveys, whose generalizability and scientific rigor are not yet available as evidence for broad application. Absence of such evaluative tools is a major bottleneck that constrains large-scale, high-level empirical research in the area.

The systematic improvement of teachers' professional competence is a key bottleneck; integration and utilization of in- and out-of-school resources require more standardized mechanisms; complexity of evaluation systems imposes additional burden on frontline teachers; and scientific rigor of evaluation of effectiveness is constrained by lack of longitudinal studies and standardized assessment tools. In conclusion, we anticipate and recommend which areas research and practice in this field should target for breakthroughs.

Initially, it is possible to deepen collaborative teacher development models, explore interdisciplinary and cross-stage (general-vocational) professional learning communities, and use virtual teaching-research rooms, AI teaching assistants, and other technological means to reduce collaboration costs and enhance training effectiveness through systematic teacher PBL teaching design and implementation.

Secondly, establish and disseminate standardized assessment tools. In the next 3-5 years, it will be necessary to collect experts together to accomplish this large academic task. Education, psychometrics, computer science experts and others will need to work together. The goal is to create a set of standardized long term tracking scales or digital tools. They must be built with high reliability and validity. Further, they must assess primary students' labor competencies and habits. Finally, this must be done to conduct high-quality empirical research.

Conduct further research on the ethics and implementation of evaluation technologies. As AI continues to get more utilization in evaluation; the respective ethical issues will become more pronounced with time; data privacy, algorithm fairness, alienation of TS relation by technology etc. Future research should create corresponding ethical norms and guiding principles while actively promoting the technological application and ensuring that technology really works for the "people-centric" comprehensive development.

Fourth, undertake extensive, long-term longitudinal tracking studies. With the help of standardized evaluation tools, carry out multiple large-sample, long-cycle studies across different regions and school types, to deeply reveal the long-term impact mechanism of PBL-based labor education on students' cognitive and non-cognitive abilities, academic achievement and even career choices in the future.

In the overall approach, the study of labor education of primary schools under the angle of Project-Based Learning is dynamic and promising. As educational innovation continues to be improved, we firmly believe that it will play an irreplaceable role in fostering the next generation who adapts to future social change, possesses a good personality, and has the ability to innovate.

## 9. Conclusion

This article carefully examines the theoretical and practical developments of PBL-based primary school labor education curriculums through school-based evaluations. The study

indicated that PBL's authenticity, comprehensive nature, and inquiry-based characteristics, have become a powerful engine for the transformation of labour education in primary schools from traditional skills training to modern competency cultivation. A successful curriculum system is scientifically based at the level of design. Authentic contexts, a competency orientation and the integration of disciplines are some important principles of a successful curriculum. It needs accurate alignment of national standards along with school based practice through usage of the "three step decomposition method" and processes for structured implementation to ensure students go through the full "learning by doing" experience. The implementation of the curriculum depends on the common functioning of three major support systems: firstly, teacher development mechanisms characterized by "general-vocational collaboration" and professional behaviour analysis; secondly, home-school-community co-education mechanisms guaranteed by standardized agreements; and thirdly, school management support systems centred on flexible scheduling, refined risk control. Coordination professors have made a consensus on a multi-dimensional evaluation system compatible with curriculum design at the evaluation level. Which emphasizes diversity of subjects, comprehensiveness of methods, and comprehensiveness of indicators. The utilization and development of rubrics, the primary tool in performance assessment, is essential for improving reliability and validity. The evaluation process is now deeply empowered by state-of-the-art technology. In particular, multimodal AI represents an unobtrusive collection and intelligent analysis of process behaviours and products through smart platforms. It enables large-scale personalized evaluation and feedback.

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