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Reconstructing Labor Literacy Cultivation Scenarios in the Artificial Intelligence Era

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Abstract

Chinese labor education policy requires schools to address the new forms of labor created by technological change, yet cultivation still relies largely on fixed venues and one-off activities. This paper reframes the problem as one of scenario supply rather than program quantity. Drawing on an empirically derived four-dimensional model of labor literacy, on quasi-experimental evidence from scenario-based labor education courses, and on frameworks from research on artificial intelligence in education, it proposes a cultivation system in which three interlocking scenarios—authentic labor, virtual simulation, and online collaboration—map onto the four dimensions of labor literacy and are linked by a unified literacy portfolio and an evaluation feedback loop. The design treats AI as augmentation rather than replacement of teachers and specifies implementation conditions: a functioning evaluation and supervision mechanism, teacher AI competence, and coordination across pedagogical, governance, and operational levels. The paper connects two previously separate research lines and states how the design should be evaluated, claiming no effects it has not measured.

Keywords

Work education; virtual simulation; online collaborative learning; formative evaluation; human–AI collaboration

1. Introduction

China's 2020 national guideline on labor education asks schools to adapt labor education to technological development and industrial change, to address new forms of labor, and to draw on emerging technologies in doing so. This requirement responds to a measurable shift in work itself. Establishment-level vacancy data show that establishments adopting AI reduce hiring for non-AI positions and rewrite the skill requirements of the postings that remain, even though aggregate substitution effects are still too small to detect (Acemoglu et al., 2022). The jobs students will enter are thus being re-specified rather than simply eliminated, which places the burden of adaptation on how labor competence is formed. In schools, generative AI tools have entered learning, teaching, assessment, and administration, and teachers report that responding to them requires interdisciplinary teaching and new forms of assessment (Chiu, 2023). The content of labor literacy—what students need in order to work well—is therefore being redefined while the means of cultivating it remain largely unchanged.

Evidence from Chinese higher vocational education locates the bottleneck more precisely. In a survey of 749 students, the dimension of labor concepts carried the largest weight in overall labor literacy yet was also the weakest and most dispersed dimension; students who used on-campus practicum venues more frequently, and those studying under better-developed evaluation and supervision mechanisms, scored significantly higher (Wu et al., 2024). Two

conditions—access to practice scenarios and functioning evaluation feedback—appear to matter more than the sheer number of labor-themed activities. Cultivation organized mainly around fixed venues and one-off activities constrains both conditions.

This paper treats the problem as one of scenario supply. It designs a cultivation system built from three interlocking scenarios—authentic labor, virtual simulation, and online collaboration—mapped onto a four-dimensional model of labor literacy and supported by evaluation feedback and governance arrangements. The evidence base is policy documents and published research rather than field implementation, so the claims that follow concern design logic and the conditions under which it should hold, not measured outcomes.

2. Literature Review

Two research lines supply the building blocks. The first defines and measures labor literacy. Wu et al. (2024) operationalize labor literacy as four dimensions—labor concepts; labor habits and qualities; labor knowledge and skills; labor emotions and attitudes—with labor concepts weighted most heavily (0.5466), and show that literacy depends less on demographics than on the availability of practicum venues and the quality of evaluation mechanisms. At the course level, Xue (2022) combined STEAM-based interdisciplinary integration organized around authentic scenario themes with a Bayesian-network online self-study model and non-directive teaching; in a quasi-experiment with 153 undergraduates, the experimental class outperformed the control class on course performance and on six learning-effect dimensions, including labor skills, autonomous learning, and teamwork. Authentic scenarios and technology-supported self-study thus already have empirical support within single courses; what is missing is a system-level arrangement of scenarios across a program. Policy, meanwhile, has already fixed the institutional frame: the 2020 guideline makes labor education compulsory, requires at least one weekly class hour in primary and secondary schools, requires at least 16 dedicated hours of labor-spirit education in vocational institutions and at least 32 class hours at the undergraduate level, and establishes an annual labor week. The open question is what these guaranteed hours should contain when the labor being taught is itself changing.

The second line concerns artificial intelligence in education. Ng et al. (2021) conceptualize AI literacy through four aspects—knowing and understanding AI, using and applying it, evaluating and creating with it, and attending to ethical issues—mapped onto Bloom's taxonomy, and identify teacher competence as a key bottleneck. Holmes and Tuomi (2022) classify applications of AI in education into student-facing, teacher-facing, and institution-facing types, observe that AI-assisted simulations such as virtual and augmented reality and game-based learning are already commercially available, and caution that independent evidence for the efficacy of such applications remains thin; their conclusion favors augmenting teachers rather than replacing them. Surveying 457 students and 180 teachers, Chan (2023) found broad agreement that AI competence matters for future careers and proposed an ecological policy framework coordinating pedagogical, governance, and operational dimensions. These studies supply tools and governance models but stop at labor education's door: AI education research has not asked what happens to labor cultivation, and labor literacy research has not asked what AI changes in it. Each leaves the other's central variable untouched, and that mutual blind spot—not any single tool—is what the design below has to work around.

3. Design Rationale: Targets, Tools, and Constraints

The design rests on three layers. The target layer adopts the four-dimensional structure of labor literacy (Wu et al., 2024) and integrates the four aspects of AI literacy (Ng et al., 2021), on two grounds: working with AI-driven tools is becoming part of labor knowledge and skills, and judging AI outputs responsibly now belongs to labor concepts and attitudes. The integration is specific rather than decorative. Knowing and understanding AI extends labor knowledge; using and applying AI extends labor skills; evaluating and creating with AI strengthens the evaluative component of labor concepts; and the ethical aspect—fairness, accountability, and transparency in AI use—directly shapes labor emotions and attitudes toward work that is increasingly shared with machines. The tool layer selects technologies according to the AIED taxonomy (Holmes & Tuomi, 2022): student-facing applications support practice and reflection, teacher-facing applications support classroom orchestration, and institution-facing applications maintain the literacy portfolio described below. This taxonomy disciplines procurement and scheduling decisions, because each candidate tool must first be assigned to one of the three functions before its role in a scenario is defined.

The constraint layer follows from the evidence and from policy. Because independent evidence for AIED efficacy

is limited (Holmes & Tuomi, 2022), and because teachers and students alike reject the idea of AI replacing teachers (Chan, 2023), the system is designed for augmentation. Two principles follow. First, technology serves literacy targets: a tool enters a scenario only where it addresses an identified dimension of labor literacy. Second, scenarios serve authentic labor rather than substituting for it, which reflects both the policy emphasis on hands-on participation in daily-life, production, and service labor and the empirical finding that actual use of practicum venues predicts higher literacy (Wu et al., 2024). A third design element, the evaluation feedback loop, is treated not as an add-on but as a structural component, because the quality of evaluation and supervision mechanisms significantly predicts students' labor literacy (Wu et al., 2024).

4. Three Interlocking Cultivation Scenarios

4.1 Authentic Labor Scenarios as the Backbone

Authentic labor scenarios—daily-life labor, production labor, and service labor, following the policy classification—remain the backbone of the system. They carry the dimensions of labor habits and qualities, which form through repeated participation and do not form through simulation alone. In vocational institutions, these scenarios center on practicum courses and internship bases; in schools, they follow the graded progression from labor awareness in primary years to career experience in senior years set out in the guideline. Two arrangements raise their cultivation yield. First, authentic scenarios should be scheduled as recurring series rather than isolated events, so that habits can actually accumulate. Second, each session should be registered in the literacy portfolio with a short structured reflection, so that participation turns into assessable evidence of the habits-and-qualities dimension rather than an unrecorded occurrence.

4.2 Virtual Simulation Scenarios for Inaccessible Work Processes

Virtual simulation scenarios extend cultivation to work processes that are hazardous, costly, or geographically out of reach. AI-assisted simulation, including virtual and augmented reality combined with machine learning and image recognition, is among the commercially available categories of educational AI (Holmes & Tuomi, 2022). These scenarios primarily carry labor knowledge and skills: students can rehearse the decomposition of a production process, observe how AI-driven equipment changes a job's task structure, and compare simulated workflows with their authentic counterparts. The comparison is the educational point: students see concretely which tasks a machine now performs and which still require human judgment, which makes the shifting boundary between human and machine work an explicit object of study rather than an abstract warning. As an illustration of the intended use—and only as an illustration—students in a smart-manufacturing program could rehearse CNC cutting settings in simulation and watch how tool wear propagates into dimensional error before they operate the corresponding machine, while an agriculture program could use a simulated greenhouse to test how irrigation and ventilation choices interact across a crop cycle. Simulation prepares and extends authentic labor; under the second design principle, it does not replace it.

4.3 Online Collaboration Scenarios for Reflection and Judgment

Online collaboration scenarios carry the dimensions that authentic and simulated settings reach least directly: labor concepts and labor emotions and attitudes, which develop through articulation, comparison, and feedback. Cross-school collaborative projects let students document and compare local forms of labor—for example, tracing how the same crop or craft is handled across regions—so that differences in tools, organization, and labor norms become discussable material (Ting, 2026). AI-supported self-study, for which the Bayesian-network model of Xue (2022) is a course-level precedent, can sequence preparatory material to each student's state; guided critique of AI-generated outputs builds the evaluative stance that AI literacy frameworks treat as the higher-order aspect of competence (Ng et al., 2021; Chan, 2023). Teachers orchestrate these activities—deciding when to open discussion, when to intervene, and when to return students to authentic tasks—which is precisely the teacher-facing role that the augmentation position reserves for human judgment (Holmes & Tuomi, 2022).

4.4 Linkage Through the Literacy Portfolio

The three scenarios interlock through a unified literacy portfolio and an evaluation feedback loop. The portfolio

records evidence from all three scenarios against the four dimensions; periodic review identifies which dimension is lagging for a given student or cohort, and scenario assignments are adjusted accordingly. Responsibility for the loop is explicit: subject teachers record scenario evidence, a designated advisor conducts the periodic review, and institution-level staff audit access to the portfolio. This linkage operationalizes the two conditions that predict labor literacy in the available evidence—practice access and evaluation quality (Wu et al., 2024)—and it gives teachers and administrators a shared, auditable basis for decisions rather than activity counts. The appropriate mix of scenarios differs by school type, following the policy's division of labor between vocational institutions and schools; the portfolio specification stays constant while scenario weights vary.

5. Discussion

Three implementation conditions determine whether the design can function. The first is the evaluation and supervision mechanism itself: it must be built before or alongside the scenarios, since it is both a design component and an empirical predictor of literacy (Wu et al., 2024). The second is teacher competence: teachers need working knowledge of AI concepts and age-appropriate pedagogy before they can orchestrate technology-rich scenarios, and teacher education is a recognized bottleneck in AI literacy development (Ng et al., 2021). The third is coordination across pedagogical, governance, and operational levels, without which scenario systems tend to fragment into isolated pilots (Chan, 2023). The governance level carries a specific obligation here: a literacy portfolio that records student participation and reflection across scenarios is personal data, and its collection, access, and retention rules belong to the institution-facing layer rather than to individual teachers' discretion.

The design's boundaries follow from its evidence base. No cohort has yet been taught through this arrangement; the efficacy evidence for educational AI in general remains limited (Holmes & Tuomi, 2022); the strongest scenario-based course evidence comes from a single course at a single institution (Xue, 2022); and the labor literacy model it adopts was estimated in higher vocational education, so its weights should be re-estimated before use at other school levels. These limits restrict generalization rather than the logic of the design. They also define the evaluation agenda: a defensible first test would compare portfolio-assessed growth on the four dimensions between cohorts assigned different scenario mixes, with the authentic labor share held constant.

6. Conclusion

Labor literacy cultivation in the AI era can be usefully reframed as a problem of scenario supply. The system proposed here links the policy demand for labor education that reflects new forms of work to the tools that AI in education already offers, while keeping authentic labor at the center and AI in an augmenting role. Its contribution is to connect two research lines—labor literacy structure and AI in education—into an actionable arrangement of scenarios, portfolios, and feedback. Implementation and empirical testing remain future work, and the evaluation direction specified above offers a starting point for both. Although the policy frame is Chinese, the underlying question—how labor literacy can be cultivated when work itself is being re-specified—faces any education system that is adopting AI tools.

References

Acemoglu, D., Autor, D., Hazell, J., & Restrepo, P. (2022). Artificial intelligence and jobs: Evidence from online vacancies. *Journal of Labor Economics*, *40*(S1), S293-S340.

Chan, C. K. Y. (2023). A comprehensive AI policy education framework for university teaching and learning. *International Journal of Educational Technology in Higher Education*, *20*, 38.

Chiu, T. K. F. (2023). The impact of Generative AI (GenAI) on practices, policies and research direction in education: A case of ChatGPT and Midjourney. *Interactive Learning Environments*, *32*(10), 6187-6203.

Holmes, W., & Tuomi, I. (2022). State of the art and practice in AI in education. *European Journal of Education*, *57*(4), 542-570.

Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). Conceptualizing AI literacy: An exploratory review. *Computers and Education: Artificial Intelligence*, *2*, 100041.

Ting, F. S. T. (2026). Collaborative Generative AI in HyFlex Learning: Designing AI-Mediated Group Learning Activities. In *AI-Powered HyFlex Learning for Student Engagement* (pp. 73-104). IGI Global Scientific Publishing.

Wu, S., Duan, J., & Luo, M. (2024). Evaluating and analyzing student labor literacy in China's higher vocational education: An assessment model approach. *Frontiers in Education*, *9*, 1361224.

Xue, H. (2022). A new integrated teaching mode for labor education course based on STEAM education. *International Journal of Emerging Technologies in Learning*, *17*(2), 128-142.