Edutech PUBLISHING

Cognitive Development Journal
Vol. 4 No. 1 (2026), pp. 32-40 | e-ISSN: 3025-8693
https://ojs.edutechpublishing.com/index.php/cognitive

The Effectiveness of The Blended–Kolb Experiential Learning Model in Improving Work Readiness in The Field of Fashion Technology

Fidia Kusniawati[1*], Tri Joko Raharjo[2], Mintarsih Arbarini[3], Decky Avrilianda[4]
[1,2,3,4]Universitas Negeri Semarang, Indonesia
E-mail: [1*]fidiakusniawati2@students.unnes.ac.id, [2]trijokoraharjo@mail.unnes.ac.id,
[3]arbarini.mint@mail.unnes.ac.id, [4]decky.avrilianda@mail.unnes.ac.id
*Coresponding Author

ARTICLE INFO

History
Received : 2026-05-11
Revised : 2026-06-26
Accepted : 2026-06-28
Published : 2026-06-30

Keywords
Blended Learning, Experiential Learning, Fashion Technology Training, Vocational Education, Work Readiness

ABSTRACT

Industry 5.0 requires vocational graduates to possess not only technical skills but also multidimensional work readiness. However, evidence regarding the integration of blended learning and experiential learning in vocational fashion technology training remains limited. This study examined the implementation of the Blended–Kolb Experiential Learning model and its association with trainees' work readiness at BBPVP Semarang. A quantitative pre-experimental one-group pretest–posttest design was employed with 16 trainees. Data were collected through cognitive tests, psychomotor and affective observations, and a work-readiness questionnaire. The results showed improvements in cognitive (47.81–89.69), psychomotor (37.18–94.25), affective (33.00–91.75), and work-readiness scores (39.53–92.38). N-Gain values ranged from 0.81 to 0.91, while the paired-sample t-test indicated a significant difference between pretest and posttest scores ($p < .001$). The findings suggest that the model was associated with positive improvements in trainees' competencies and work-readiness indicators. The study supports the integration of digital learning, experiential activities, reflection, and project-based practice in vocational education.

1. INTRODUCTION

A review of the literature indicates that both blended learning and experiential learning have received considerable attention in vocational and higher education research. Blended learning has been widely reported to improve learning outcomes, digital literacy, learner engagement, and instructional flexibility across various educational settings (Smith & Hill, 2019; Yick et al., 2019; Widiatmaka et al., 2022). Similarly, experiential learning has been recognized as an effective approach for enhancing problem-solving skills, creativity, collaboration, and reflective learning processes (Xue, 2022; Mahmood et al., 2024). Recent studies have also begun to explore the combination of technology-enhanced learning and experiential approaches in vocational and professional education contexts. However, existing evidence remains fragmented and is predominantly concentrated in general technical, engineering, business, or higher education settings rather than in vocational fashion technology training.

Moreover, previous studies have generally focused on specific learning outcomes such as academic achievement, digital literacy, creativity, or technical competence, while limited attention has been given to the development of multidimensional work readiness that encompasses cognitive, psychomotor, affective, and workplace soft-skill dimensions simultaneously. In the context of vocational fashion education, empirical evidence

examining how blended learning can be systematically integrated with Kolb's experiential learning cycle to support Industry 5.0-oriented workforce preparation remains relatively limited.

Another limitation of the existing literature is that most studies evaluate learning effectiveness primarily from educational perspectives without explicitly linking instructional design to the changing competency demands of the modern fashion industry, including adaptability, collaboration, digital literacy, and problem-solving capabilities. Consequently, there is still insufficient evidence regarding how an integrated learning model can prepare vocational trainees to meet contemporary workplace expectations in fashion technology environments.

These conditions indicate the need for the development of a learning model capable of systematically integrating blended learning and experiential learning in the context of vocational fashion technology education. Therefore, this study proposes the Blended–Kolb Experiential Learning model as an innovative learning approach designed to improve trainees' work readiness through the integration of digital learning, practical experience, reflection, and work competency reinforcement based on the needs of Industry 5.0.

Based on the problems and research gaps described above, this study aims to analyze the effectiveness of the Blended–Kolb Experiential Learning model in improving the work readiness of fashion technology trainees at *Balai Besar Pelatihan Vokasi dan Produktivitas Semarang*. This study focuses on measuring improvements in the cognitive, psychomotor, affective, and work readiness aspects of trainees after the implementation of the learning model. Unlike many previous studies that examined learning outcomes or technical competencies separately, this study evaluates work readiness as a multidimensional construct while investigating the integration of blended learning and experiential learning within a vocational fashion technology training context. In addition, the study also examines the implementation of the integration of blended learning and Kolb's experiential learning in vocational learning based on the needs of modern industries. The findings are expected to provide practical contributions to the development of vocational learning models that are more adaptive, contextual, and oriented toward workplace demands. Theoretically, this study is expected to strengthen the development of blended learning and experiential learning studies in the context of vocational education and training. Thus, this research is expected to offer a relevant, innovative learning alternative for improving the quality of vocational training graduates in the field of fashion technology.

2. METHODS

This study employed a quantitative approach using a pre-experimental method with a one-group pretest–posttest design to analyze the effectiveness of the Blended–Kolb Experiential Learning model on the work readiness of trainees in the field of fashion technology. The research design involved measuring participants' initial conditions through a pretest, administering treatment in the form of the implementation of the learning model, and conducting a final measurement through a posttest. The research design was expressed in the pattern O_1–X–O_2, which was used to identify changes in outcomes before and after the implementation of the learning model. The selection of the pre-experimental design was based on the characteristics of vocational training conducted within a single active training class, making the establishment of a control group impractical. Although this design enables the measurement of learning improvement before and after the intervention, it has limited internal validity because changes in outcomes cannot be attributed exclusively to the learning model and may also be influenced by external factors occurring during the training period. Therefore, the findings should be interpreted as evidence of improvement associated with the implementation of the

Blended–Kolb Experiential Learning model rather than definitive causal effects. Nevertheless, the design was considered appropriate for obtaining an initial empirical evaluation of the model in the context of vocational fashion technology training.

The study was conducted at *Balai Besar Pelatihan Vokasi dan Produktivitas Semarang* in a fashion technology training program oriented toward the development of work competencies based on industrial needs. The research subjects consisted of 16 trainees, all of whom were selected as the research sample using a saturated sampling technique. This technique was chosen because the population size was relatively limited and all active participants were involved in the implementation of the learning model throughout the research process. The homogeneous characteristics of the trainees in terms of program, learning materials, and instructional process also supported the use of saturated sampling to obtain a comprehensive representation of classroom conditions. Participants were enrolled in the same fashion technology training cohort and completed all learning activities throughout the intervention period. The study focused on vocational trainees because this group had a strong need for work readiness enhancement aligned with the objectives of the learning model development. Thus, the selection of research subjects was intended to provide an empirical description of the effectiveness of the Blended–Kolb Experiential Learning model in the context of vocational fashion technology training.

The implementation of the Blended–Kolb Experiential Learning model was carried out through the integration of online and offline learning based on Kolb's experiential learning cycle. The learning process was conducted through the stages of orientation, concrete experience, reflective observation, abstract conceptualization, active experimentation, online reflection, and project evaluation. These stages were implemented in project-based learning activities involving fashion sketching practices, reflection on work results, concept reinforcement, and design development. Online learning was utilized to support access to learning materials, learning reflection, and communication among trainees. Meanwhile, offline learning focused on direct practice, discussions, and evaluation of trainees' work outcomes. The integration of these two approaches was designed to create active, reflective, collaborative, and contextual learning experiences aligned with the competency needs of the fashion technology field.

Data collection was conducted using cognitive tests, psychomotor and affective observation sheets, and a work readiness questionnaire to measure trainees' abilities after the implementation of the learning model. The cognitive test was designed to assess conceptual understanding of fashion technology materials, whereas the psychomotor observation sheet evaluated practical performance during design and garment-production activities. The affective observation sheet measured learning attitudes, responsibility, discipline, and participation. In addition, the work readiness questionnaire consisted of dimensions related to communication, collaboration, problem solving, adaptability, digital literacy, and workplace attitudes considered essential for employment in the fashion industry. The research instruments therefore covered conceptual understanding, practical skills, work attitudes, communication, collaboration, problem solving, adaptability, and digital literacy relevant to competency requirements in the field of fashion technology.

Instrument validity was tested through expert validation and the Pearson Product Moment correlation test, while instrument reliability was analyzed using the Cronbach's Alpha coefficient. Content validity was first examined by vocational education and fashion technology experts to ensure the relevance and clarity of the instrument indicators. Subsequently, empirical validity testing was conducted using item-total correlation analysis. Items that met the established validity criteria were retained for further analysis. Reliability testing indicated that the instruments achieved acceptable levels of internal

consistency based on Cronbach's Alpha coefficients, demonstrating that the instruments were suitable for measuring trainees' learning outcomes and work readiness.

The research procedure consisted of four stages. First, participants completed pretest assessments and the work readiness questionnaire to establish baseline conditions. Second, the Blended–Kolb Experiential Learning model was implemented throughout the training activities. Third, observations of psychomotor and affective performance were conducted during the learning process. Finally, posttest assessments and the work readiness questionnaire were administered to measure changes following the intervention.

The research data were analyzed using IBM SPSS Statistics through normality tests, homogeneity tests, N-Gain tests, and paired sample t-tests at a significance level of 0.05. The normality and homogeneity tests were conducted to ensure that the data analysis prerequisites were fulfilled, whereas the N-Gain test and paired sample t-test were used to measure the level of improvement and differences in outcomes before and after the implementation of the learning model. Therefore, the data analysis techniques were employed to obtain an empirical description of the effectiveness of the Blended–Kolb Experiential Learning model on the work readiness of trainees in the field of fashion technology.

3. RESULTS AND DISCUSSION

3.1 Results

3.1.1 Implementation of the Blended–Kolb Experiential Learning Model

The Blended–Kolb Experiential Learning model was implemented through the integration of online and offline learning activities based on Kolb's experiential learning cycle in the fashion technology training program at BBPVP Semarang. Prior to face-to-face sessions, trainees engaged in online learning activities to access learning materials and prepare for practical tasks. During classroom sessions, learning was organized through the stages of concrete experience, reflective observation, abstract conceptualization, and active experimentation. These stages were applied in project-based activities involving fashion sketching, design development, reflection on learning experiences, discussion of work outcomes, and evaluation of project performance. The integration of digital learning and experiential activities enabled trainees to participate actively in the learning process while strengthening both technical competencies and workplace-related skills such as communication, collaboration, and reflective thinking.

3.1.2 Pretest and Posttest Results of Work Readiness

The effectiveness of the learning model was initially examined through comparisons between pretest and posttest scores across cognitive, psychomotor, affective, and work-readiness dimensions.

Table 1. Pretest and Posttest Results of Work Readiness

Assessment Aspect	Mean Pretest	Mean Posttest
Cognitive	47,81	89,69
Psychomotor	37,18	94,25
Affective	33	91,75
Work Readiness	39,53	92,38

As shown in Table 1, improvements were observed across all assessment aspects following the implementation of the Blended–Kolb Experiential Learning model. The

cognitive aspect increased from 47.81 to 89.69, indicating substantial improvement in trainees' conceptual understanding. The psychomotor aspect increased from 37.18 to 94.25, while the affective aspect improved from 33.00 to 91.75. Similarly, overall work readiness increased from 39.53 to 92.38. These findings indicate that trainees achieved higher levels of performance after participating in the learning intervention across all measured dimensions.

3.1.3 N-Gain Test Results

To determine the effectiveness of learning improvement, N-Gain analysis was conducted for each assessment aspect.

Table 2. N-Gain Test Results

Assessment Aspect	N-Gain Score	Category
Cognitive	0,81	High
Psychomotor	0,91	High
Affective	0,87	High
Work Readiness	0,87	High

The N-Gain analysis revealed high improvement across all dimensions. The psychomotor aspect obtained the highest N-Gain score (0.91), followed by affective and work-readiness aspects (0.87), while the cognitive aspect also demonstrated a high improvement score (0.81). These results suggest that trainees experienced substantial learning gains throughout the implementation of the Blended–Kolb Experiential Learning model, particularly in practical performance and workplace-related competencies.

3.1.4 Results of Normality and Homogeneity Tests

Prior to hypothesis testing, prerequisite analyses were conducted to ensure that the assumptions for parametric testing were met.

Table 3. Results of Normality and Homogeneity Tests

Type of Test	Significance Value	Description
Normality	0,200	Normally distributed
H omogeneity	0,389	Homogeneous

The normality test produced a significance value of 0.200, which exceeded the 0.05 threshold, indicating that the data were normally distributed. Similarly, the homogeneity test yielded a significance value of 0.389, indicating homogeneous data. Therefore, the dataset satisfied the assumptions required for conducting a paired-sample t-test.

3.1.5 Hypothesis Test Results

A paired-sample t-test was conducted to examine whether significant differences existed between pretest and posttest scores following the implementation of the learning model.

Table 4. Paired Sample t-Test Results

Aspect	T-value	Sig. (2-tailed)	Description
Work Readiness	-61,423	0,000	Significant

The paired-sample t-test results showed a significance value of 0.000, indicating a statistically significant difference between pretest and posttest work-readiness scores. The large absolute t-value (-61.423) reflects the substantial difference between pretest and posttest means, combined with the relatively small variability in score differences among participants. This pattern suggests that improvements occurred consistently across trainees rather than being concentrated among only a few individuals. Consequently, the posttest scores were considerably higher than the pretest scores after the implementation of the Blended–Kolb Experiential Learning model.

Overall, the results demonstrate positive changes across all measured aspects following the implementation of the Blended–Kolb Experiential Learning model. Descriptive statistics showed notable increases in cognitive, psychomotor, affective, and work-readiness scores. The N-Gain analysis indicated high levels of improvement across all dimensions, with the psychomotor aspect showing the greatest gain. Furthermore, the paired-sample t-test confirmed a statistically significant difference between pretest and posttest work-readiness scores. Taken together, these findings provide empirical evidence that the implementation of the Blended–Kolb Experiential Learning model was associated with improved learning outcomes and enhanced work-readiness indicators among trainees in the fashion technology training program.

3.2 Discussion

3.2.1 Interpretation of the Main Findings

This study examined the effectiveness of the Blended–Kolb Experiential Learning model in improving the work readiness of fashion technology trainees at BBPVP Semarang. The findings demonstrated substantial improvements in cognitive, psychomotor, affective, and overall work-readiness outcomes following the implementation of the model. The consistently high N-Gain scores across all dimensions and the significant difference between pretest and posttest results indicate that the integration of blended learning and experiential learning created a learning environment that supported the development of both technical and non-technical competencies required in vocational education.

One important finding is that the largest improvement occurred in the psychomotor aspect. This result suggests that combining online preparation with face-to-face experiential activities enabled trainees to devote more time to authentic practice and skill application. In vocational education, practical competence develops most effectively when learners repeatedly engage in real or simulated workplace tasks. The learning cycle implemented in this study provided opportunities for trainees to experience, reflect, conceptualize, and reapply knowledge in successive stages, thereby strengthening practical skill acquisition. This finding supports Kolb's experiential learning theory, which emphasizes that knowledge is constructed through the transformation of experience and continuous reflection (Xue, 2022).

The significant improvement in affective and work-readiness dimensions is equally important. Work readiness extends beyond technical competence and includes communication, collaboration, adaptability, problem-solving, and professional attitudes. The project-based activities implemented throughout the learning process required trainees to work collaboratively, discuss ideas, evaluate outcomes, and respond to challenges encountered during practice. Such experiences likely contributed to the development of workplace behaviors and attitudes that are increasingly valued in Industry 5.0 environments. International vocational education studies have similarly emphasized that employability skills are strengthened when learning activities integrate authentic tasks, reflection, collaboration, and technology-supported learning environments (Mahmood et al., 2024; Smith & Hill, 2019).

3.2.2 Comparison with Previous Studies

The findings are consistent with previous studies reporting that blended learning improves learning flexibility, learner engagement, and digital literacy (Smith & Hill, 2019; Yick et al., 2019). Likewise, experiential learning has been widely recognized as an effective approach for enhancing practical skills, creativity, problem-solving abilities, and learner autonomy (Xue, 2022). However, much of the existing literature has examined these approaches separately. Studies on blended learning have often focused on digital learning effectiveness, whereas experiential learning research has primarily emphasized hands-on experience and reflective practice.

This study extends previous research by demonstrating that the integration of blended learning and experiential learning can support multidimensional work-readiness development within vocational fashion education. Unlike many earlier studies that concentrated primarily on cognitive outcomes, the present study assessed work readiness across cognitive, psychomotor, affective, digital literacy, and workplace soft-skill dimensions. Therefore, the findings provide empirical evidence that combining digital learning environments with structured experiential cycles may offer a more comprehensive approach to vocational competency development.

The findings also contribute to international discussions regarding vocational education in the Industry 5.0 era. Recent literature highlights the growing need for graduates who possess not only technical expertise but also adaptability, collaboration skills, creativity, and technological competence. The present findings suggest that these competencies can be strengthened simultaneously when learning activities integrate technology-supported instruction with authentic experiential learning processes.

3.2.3 Theoretical and Practical Implications

From a theoretical perspective, this study contributes to vocational education literature by demonstrating how blended learning and experiential learning can function as complementary rather than separate pedagogical approaches. The findings support the argument that effective vocational learning requires not only access to digital resources but also structured opportunities for reflection, experimentation, and workplace-oriented practice. The study therefore extends the application of Kolb's experiential learning framework within vocational fashion technology education and provides evidence for its integration with blended learning environments.

From a practical perspective, the findings suggest that vocational training institutions should design learning environments that combine digital preparation, authentic practice, reflection, and project evaluation. Trainers and instructors may utilize online learning platforms not merely for content delivery but also to facilitate reflective learning, collaborative discussion, and continuous feedback. Furthermore, curriculum developers should consider incorporating workplace simulation activities and project-based assignments that strengthen both technical competencies and employability skills.

For vocational education policymakers, the findings indicate that improving graduate employability requires learning models that address multidimensional competencies rather than focusing exclusively on technical performance. The integration of digital literacy, collaboration, adaptability, and problem-solving skills into vocational training programs may help align educational outcomes more closely with contemporary industrial demands.

3.2.4 Limitations of the Study

Several limitations should be acknowledged. First, the study involved only 16 trainees from a single fashion technology training program, limiting the generalizability of the findings to broader vocational education contexts. Second, the use of a pre-experimental one-group pretest–posttest design restricts the ability to attribute improvements exclusively

to the intervention because no comparison group was included. External factors and learning experiences outside the intervention may also have contributed to the observed improvements. Third, the relatively short duration of the intervention did not allow for examination of the long-term sustainability of work-readiness development.

Recommendations for Future Research

Future studies should employ quasi-experimental or experimental designs involving larger and more diverse participant groups to strengthen causal inferences and external validity. Comparative studies across different vocational fields would also help determine whether the effectiveness of the Blended–Kolb Experiential Learning model is consistent across training contexts. In addition, longitudinal research is needed to examine whether improvements in work readiness are maintained over time and whether they translate into successful workplace performance after graduation. Further research may also investigate specific dimensions of employability, digital competence, and industry-based skills to provide a more comprehensive understanding of vocational work-readiness development in the Industry 5.0 era.

4. CONCLUSION

This study examined the implementation of the Blended–Kolb Experiential Learning model and its association with the work readiness of fashion technology trainees at BBPVP Semarang. The findings showed improvements in cognitive, psychomotor, affective, and overall work-readiness dimensions, with high N-Gain scores and significant differences between pretest and posttest results indicating positive learning gains following the intervention. The largest improvement occurred in the psychomotor aspect, suggesting that the integration of digital learning and experiential practice may support the development of vocational competencies. This study contributes to vocational education literature by demonstrating the potential value of integrating blended learning and Kolb's experiential learning cycle to support multidimensional work readiness, including technical and workplace-related competencies. Practically, the findings suggest that vocational training institutions may benefit from combining digital learning, reflective activities, authentic practice, and project-based experiences to better align training outcomes with Industry 5.0 demands. However, the findings should be interpreted cautiously because the study involved a small sample from a single institution and employed a one-group pretest–posttest design without a comparison group. Future research should involve larger and more diverse samples, stronger experimental designs, and longitudinal approaches to examine the sustainability of work-readiness development and its relationship to actual workplace performance.

5. CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

6. REFERENCES

Hadari, I. R., Sakti, E. M. S., & Marnis, M. (2024). Analisis kompetensi SDM di era Industri 5.0. *Journal of Management and Innovation Entrepreneurship (JMIE), 2*(1), 1740–1748. https://doi.org/10.70248/jmie.v2i1.1506

Kementerian Ketenagakerjaan Republik Indonesia. (2025). *Data kebutuhan tenaga kerja industri 2025* (pp. 1–44).

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice Hall.

Mahmood, A., Hashim, H. N. M., & Zakuan, Z. Z. A. (2024). Utilizing experiential learning methods to teach substantive law courses to undergraduate students. *Asian Journal of Legal Education, 11*(1), 97–113. https://doi.org/10.1177/23220058231175984

Maulana, A. (2023). Peran pelatihan konvensional dalam pengembangan organisasi dan dunia industri. *Coopetition: Jurnal Ilmiah Manajemen, 14*(2), 199–206. https://doi.org/10.32670/coopetition.v14i2.3160

Miati, S., Siregar, E., & Kustandi, C. (2023). Analyzing trends in blended learning for professional growth: A Scopus bibliometric review. *Al Ibtida: Jurnal Pendidikan Guru MI, 10*(2), 337–350. https://doi.org/10.24235/al.ibtida.snj.v10i2.14984

Mintarsih, Suminar, T., & Cahyani, A. D. (2025). Competency-based training and self-efficacy on work readiness through employability skills in the Center for Vocational Training and Productivity. *Jurnal Ilmiah Pendidikan dan Pembelajaran, 9*(1), 129–140. https://doi.org/10.23887/jipp.v9i1.86823

Puri, S. A., & Suhartini, R. (2018). Pengembangan media pembelajaran berbasis blended learning pada mata kuliah tailoring. *Jurnal Tata Busana, 7*(3), 8–15. https://jurnalmahasiswa.unesa.ac.id/index.php/jurnal-tata-busana/article/view/25281

Rayanto, Y. H. (2020). *Penelitian pengembangan model ADDIE dan R2D2: Teori & praktik*. Lembaga Academic & Research Institute.

Smith, K., & Hill, J. (2019). Defining the nature of blended learning through its depiction in current research. *Higher Education Research & Development, 38*(2), 383–397. https://doi.org/10.1080/07294360.2018.1517732

Tinggi, S., Ekonomi, I., & Surabaya, M. (2023). Systematic review technical and vocational education and training as human capital development strategy in SMEs Indonesia. *Jurnal Ekonomi, 12*(4), 1–10. http://ejournal.seaninstitute.or.id/index.php/Ekonomi

Widiatmaka, F. P., Raharjo, T. J., Sudana, I., Sumbodo, W., & Setiadi, R. (2022). Blended learning model in seafarers training program for level II technical expert based on the needs of the shipping industry. *Jurnal Pendidikan Vokasi, 12*(3), 302–314. https://doi.org/10.21831/jpv.v12i3.55338

Xiang, W. K. (2018). Industry 4.0: Systematic review in technical and vocational education and training. *Assiut Journal of Environmental Studies, 1*, 43–58.

Xue, W. (2022). Enhancing design ability through experiential learning in textile design education. *Journal of Textile Science & Fashion Technology, 9*(5), 3–9. https://doi.org/10.33552/JTSFT.2022.09.000721

Yick, K., Lun, J., Yip, J., Au, S. C., Lai, Y. Y., & Yu, A. (2019). Effectiveness of blended learning in the first year of fashion education. *International Journal of Fashion Design, Technology and Education, 12*(2), 178–188. https://doi.org/10.1080/17543266.2018.1546910