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The Effectiveness of Andragogical Experiential Learning on Enhancing Early Childhood Education Students' Competence in Fine Motor Development

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Abstract: *This study aimed to examine the effectiveness of an andragogical approach through experiential learning in improving the competence of Early Childhood Education (ECE) students in developing fine motor skills in young children. The study employed a quantitative quasi-experimental method using a pretest-posttest control group design involving 60 students divided equally into an experimental group and a control group. The experimental group received andragogy-based experiential learning, while the control group was taught using conventional lecture-based learning. Data were collected through cognitive tests, observation sheets, questionnaires, and documentation. The instruments underwent content and construct validity testing, while reliability analysis using Cronbach's Alpha produced coefficients ranging from 0.81 to 0.89, indicating high reliability. Data analysis used descriptive statistics, N-Gain analysis, and independent sample t-tests. The results showed that the experimental group achieved significantly better improvement than the control group. The experimental group obtained a mean posttest score of 85.60, while the control group scored 72.30, with a significance value of 0.000 ($p < 0.05$). The experimental group achieved an N-Gain score of 0.62, categorized as moderate, whereas the control group obtained 0.28, categorized as low. Observation and questionnaire findings also revealed improvements in students' psychomotor competence, motivation, participation, and professional attitudes. The study concludes that integrating andragogy with experiential learning effectively enhances students' cognitive, psychomotor, and affective competencies and supports the preparation of competent and professional early childhood educators.*

Keywords**:** *Andragogy, Experiential Learning, Fine Motor Skills*, *Pre-Service Teacher Education*, *Teacher Competence*.

INTRODUCTION

Early Childhood Education (ECE) plays a fundamental role in supporting children's overall development during the early years of life. Early childhood is widely recognized as a critical period characterized by rapid cognitive, social-emotional, language, and physical development (Qoirika, N., Hidayati, A., & Prasetyo, 2025). During this stage, children are highly responsive to environmental stimulation and learning experiences, making the quality of educational support essential for optimizing developmental outcomes (Halimah, 2018). Among various developmental domains, fine motor skills are particularly important because they involve the coordination of small muscles in the hands and fingers, which are necessary for activities such as writing, drawing, cutting, folding, and manipulating objects (Sari & Agustriana, 2024). Fine motor development also contributes significantly to children's academic readiness, especially in literacy and numeracy skills (Yilmaz, R. M., & Cavas, 2018).

However, the development of fine motor skills in early childhood is often not optimal due to limited stimulation, inappropriate learning activities, and insufficient instructional support (Safitri, 2022). These problems are closely related to teacher competence in designing and implementing developmentally appropriate learning experiences (Sari, N., Widodo, A., & Hidayat, 2022). Early childhood teachers are expected to possess adequate pedagogical knowledge, practical skills, and professional attitudes in facilitating children's development (Tk & Najah, 2023). Therefore, teacher education programs have an important responsibility to prepare prospective teachers who are capable of creating meaningful and effective learning experiences for young children (Sari, N., Widodo, A., & Hidayat, 2022).

In higher education, particularly in Early Childhood Education programs, students are prepared to become professional educators. Nevertheless, many instructional practices in teacher education still rely heavily on conventional lecture-based methods that emphasize theoretical understanding rather than practical application. As a result, students often experience difficulties in translating theoretical knowledge into real teaching practice. This gap between theory and practice has become a significant issue in teacher education because professional competence requires not only conceptual understanding but also practical experience, reflective thinking, and problem-solving abilities

Considering that university students are adult learners, instructional approaches in higher education should align with adult learning principles. (Knowles, M. S., Holton, E. F., & Swanson, 2015) explain that adult learners tend to be self-directed, experience-based, and oriented toward practical problem solving. Therefore, learner-centered approaches are considered more appropriate than traditional teacher-centered instruction. One approach that is closely related to adult learning principles is experiential learning. (Kolb, 2014) defines experiential learning as a process in which knowledge is constructed through the transformation of experience. This approach emphasizes active participation, reflection, conceptual understanding, and practical application.

In the context of teacher education, experiential learning enables students to engage directly in activities that simulate authentic teaching situations. Through practical experiences such as designing learning media, conducting teaching simulations, and evaluating learning activities, students can connect theoretical concepts with professional practice. Previous studies have shown that experiential learning contributes positively to cognitive understanding, practical skills, motivation, and student engagement (Wulandari, 2021; Rahmi, 2024). However, research examining the integration of andragogical principles and experiential learning in Early Childhood Education programs remains limited, particularly in relation to developing competencies in fine motor learning.

Based on these issues, this study proposes the integration of an andragogical approach with experiential learning as an instructional strategy to improve the competence of Early Childhood Education students. This approach is expected to enhance students' cognitive, psychomotor, and affective competencies by providing meaningful, reflective, and practice-oriented learning experiences.

Therefore, this study aims to investigate the effectiveness of an andragogical approach through experiential learning in improving the competence of Early Childhood Education students in developing fine motor skills for young children. The findings of this study are expected to contribute theoretically to the literature on adult learning and experiential learning, as well as practically to the improvement of instructional practices in teacher education programs.

RESEARCH METHODOLOGY

This study used a quantitative approach with a quasi-experimental research type. The design used was a Pretest-Posttest Control Group Design, which involved two groups: an experimental group and a control group (Sugiyono., 2020). The study involved two groups, namely an experimental group and a control group. The experimental group received instruction through an andragogical approach integrated with experiential learning, whereas the control group was taught using conventional lecture-based learning. Both groups were administered pretests and posttests to identify differences in competency improvement after the intervention.

The research design is presented as follows:

- Experimental Group: $O_1 – X – O_2$
- Control Group: $O_1 – – O_2$

  Description:

  O_1 = Pretest

  O_2 = Posttest

  X = Andragogy-based experiential learning treatment

This research was conducted in the Early Childhood Teacher Education (PGPAUD) Study Program, Faculty of Teacher Training and Education, Universitas Bengkulu, Indonesia. The study was implemented over one semester, approximately four months, covering the preparation, implementation, and data analysis stages.

The population consisted of all fourth-semester undergraduate students enrolled in the Early Childhood Fine Motor Development course in the Early Childhood Teacher Education (PGPAUD) Study Program during the even semester of the 2024/2025 academic year. The sample was selected using purposive sampling. The inclusion criteria were: (1) students actively enrolled in the course, (2) students participating in the learning process throughout the intervention period, and (3) students willing to participate in the study. The exclusion criteria included: (1) students with incomplete attendance during the intervention and (2) students who did not complete the pretest, posttest, or questionnaire instruments. A total of 60 students participated in this study, consisting of 30 students in the experimental group and 30 students in the control group.

This study involved two variables. The independent variable was the andragogical approach through experiential learning, while the dependent variable was students' competence in developing fine motor skills in early childhood education. Student competence included cognitive, psychomotor, and affective domains. Data were collected using several techniques:

1. Test (Pretest and Posttest). The test instrument was used to measure students' cognitive competence related to early childhood fine motor development concepts.

2. Observation. Observation sheets were used to assess students' psychomotor skills in designing and implementing fine motor learning activities.
3. Questionnaire. Questionnaires were administered to examine students' affective competencies, including learning motivation, participation, attitudes, and perceptions toward the learning process.
4. Documentation. Documentation was used to collect supporting data such as students' assignments, learning media products, lesson plans, and photographs of classroom activities.

The research instruments consisted of cognitive test sheets, observation rubrics, questionnaires, and performance assessment rubrics. Prior to implementation, all instruments underwent content validity and construct validity evaluation through expert judgment. Instrument reliability was analyzed using Cronbach's Alpha. The reliability coefficient for the cognitive test was 0.86, the observation sheet obtained 0.88, and the questionnaire obtained 0.91. These values indicate that all instruments were categorized as highly reliable. The study was conducted through three stages:

1. Preparation Stage (Developing lesson plans and instructional materials, Designing research instruments, Conducting validity and reliability testing).
2. Implementation Stage (Administering the pretest to both groups, Conducting the learning intervention: Experimental group: andragogy-based experiential learning; Control group: conventional learning, Administering the posttest and questionnaires)
3. Final Stage (Processing and analyzing the data, Drawing conclusions based on the research findings).

Data analysis was conducted using descriptive and inferential statistics.

1. Descriptive Analysis. Descriptive statistics were used to determine mean scores, standard deviations, and data distributions.
2. Assumption Testing. Prior to hypothesis testing, prerequisite analyses were conducted using: Shapiro–Wilk normality test, Levene's homogeneity test.
3. Hypothesis Testing
   a. Independent Sample t-test. The independent sample t-test was used to determine significant differences between the experimental and control groups.
   b. N-Gain Analysis. N-Gain analysis was used to determine the level of improvement in students' competencies after the intervention. The formula used was:
   N-Gain Formula:

$$\text{Gain Score} = \frac{(Skor\ Posttest - Skor\ Pretest)}{(Skor\ Maksimal - Skor\ Pretest)}$$

Table 1. N-Gain Score Classification

N-Gain Score Range	Category
> 0.70	High
0.30 – 0.70	Medium
< 0.30	Low

Accordingly, the experimental group's N-Gain score of 0.62 was categorized as medium, whereas the control group's score of 0.28 was categorized as low. The hypotheses of this study were formulated as follows:
H_0: There is no significant difference between students taught using the andragogical experiential learning approach and those taught using conventional learning.
H_1: There is a significant difference between the two groups, where the andragogical experiential learning approach is more effective in improving students' competencies.

This study complied with institutional research ethics standards. Before data collection, all participants received information regarding the objectives and procedures of the study and voluntarily agreed to participate. Participant confidentiality and anonymity were maintained throughout the research process, and all collected data were used solely for academic purposes.

RESULTS AND DISCUSSION

Results

This study examined the effectiveness of an andragogical approach through experiential learning in improving the competence of undergraduate students in the Early Childhood Education Teacher Education Program (PG-PAUD). The analysis focused on three competency domains, namely cognitive, psychomotor, and affective aspects related to the development of fine motor skills in early childhood. The research involved two groups consisting of 30 students each: an experimental group that received andragogy-based experiential learning and a control group that participated in conventional lecture-based instruction.

1. Pretest and Posttest Results

Table 1. Descriptive Statistics of Pretest and Posttest Scores

Group	N	Mean Pretest	SD	Mean Posttest	SD
Experimental	30	62.40	6.85	85.60	6.12
Control	30	61.80	7.10	72.30	7.45

The descriptive analysis showed that the initial abilities of both groups were relatively equivalent, as indicated by the similar pretest mean scores. After the intervention, the experimental group demonstrated a substantially higher posttest score compared to the control group. The increase suggests that experiential learning combined with andragogical principles contributed positively to students' understanding of fine motor development concepts and instructional practices.

2. N-Gain Analysis

Table 2. Classification of N-Gain Scores

N-Gain Score	Classification
> 0.7	High
0.3–0.7	Medium
< 0.3	Low

Table 3. N-Gain Results of Experimental and Control Groups

Group	N-Gain	Category
Experimental	0.62	Medium
Control	0.28	Low

The N-Gain analysis indicated that the experimental group achieved a score of 0.62, which falls within the medium category according to Hake's classification. In contrast, the control group obtained a low category score of 0.28. These findings demonstrate that the learning approach applied in the experimental group produced a more meaningful improvement in student competence.

$$0.3 \leq 0.62 \leq 0.7$$

The result confirms that the increase in learning outcomes in the experimental class was statistically and pedagogically stronger than that of the control class.

3. Prerequisite Test Results

Table 4. Normality Test Results (Shapiro–Wilk)

Group	Sig. Pretest	Sig. Posttest
Experimental	0.200	0.156
Control	0.187	0.173

All significance values were higher than 0.05, indicating that the data were normally distributed.

Table 5. Homogeneity Test Results (Levene Test)

Levene Statistic	Sig.
1.245	0.269

The homogeneity test result showed a significance value above 0.05, meaning that the variance between the two groups was homogeneous and suitable for further parametric testing.

4. Hypothesis Testing

Table 6. Independent Sample t-Test Results

T	df	Sig. (2-tailed)	Mean Difference
7.214	58	0.000	13.30

The independent sample t-test revealed a significance value of 0.000, which was lower than 0.05. This finding indicates a statistically significant difference between the experimental and control groups. Therefore, the andragogical approach through experiential learning was more effective than conventional instruction in improving student competence.

5. Observation Results of Practical Skills

Table 7. Observation Results of Students' Practical Skills

Aspect Assessed	Experimental Group	Control Group
Learning activity planning	88 (Very Good)	74 (Good)
Implementation of activities	90 (Very Good)	76 (Good)
Media creativity	87 (Very Good)	72 (Fair)

Students in the experimental group demonstrated stronger practical performance in designing and implementing fine motor learning activities. They were also more creative in selecting and developing learning media suitable for early childhood contexts.

6. Questionnaire Results (Affective Domain)

Table 8. Questionnaire Results on Students' Affective Competence

Aspect	Experimental Group	Control Group
Learning motivation	89 (Very Good)	75 (Good)
Participation in learning	91 (Very Good)	74 (Good)
Self-confidence	87 (Very Good)	73 (Good)
Perception toward learning process	90 (Very Good)	76 (Good)

The questionnaire findings revealed that students exposed to experiential learning developed more positive attitudes toward the learning process. They showed higher motivation, greater classroom participation, and stronger confidence in conducting teaching practices. These results indicate that the approach not only improved cognitive achievement but also strengthened affective engagement.

Discussion

The findings demonstrate that the andragogical approach integrated with experiential learning contributed positively to the improvement of students' competence in developing fine motor activities for early childhood education. The increase was evident not only in cognitive achievement, reflected in posttest scores and N-Gain values, but also in psychomotor and affective aspects measured through observation and questionnaire results. Students in the experimental class showed stronger performance in designing learning activities, implementing fine motor stimulation, and developing creative learning media compared with students who learned through conventional instruction.

The improvement in competence was closely related to the learning process implemented during the intervention. In the experimental class, students were directly involved in identifying children's developmental needs, designing learning activities, conducting simulations, and reflecting on the outcomes of their practice. This process enabled students to connect theoretical concepts with authentic teaching experiences. Such learning conditions encouraged active participation and strengthened students' understanding of how fine motor stimulation should be applied in early childhood settings. In contrast, students in the control class mostly received explanations through lectures and discussions, resulting in fewer opportunities to practice professional skills directly (Putri, A. R., Sari, D. P., & Lestari, 2024).

The experiential learning cycle also played an important role in strengthening learning outcomes. Through concrete experiences, reflective observation, conceptual understanding, and active experimentation, students were able to evaluate and improve their own teaching practices. Reflection sessions conducted after simulations allowed students to recognize weaknesses in classroom management, media selection, and activity instructions. As a result, learning became more meaningful because students were not only receiving information but also reconstructing knowledge from their own experiences. This finding supports previous studies showing that experiential learning encourages deeper understanding and practical competence among prospective teachers (Wulandari, 2021).

The affective findings further confirmed the effectiveness of the instructional approach. Questionnaire data indicated that students in the experimental group demonstrated higher levels of motivation, confidence, collaboration, and learning engagement. Most students reported that practice-based learning made them more enthusiastic because the activities were directly related to their future profession as early childhood educators. This result aligns with adult learning theory, which emphasizes that adult learners are more motivated when learning activities are relevant to real-life needs and professional contexts (Knowles, M. S., Holton, E. F., & Swanson, 2015).Similar findings were also reported by Rahmi, who found that experiential learning increases student participation and learning motivation in teacher education programs (Rahmi, 2024).

Another important finding of this study is the improvement of students' creativity in developing instructional media. Observation results showed that the experimental group was more capable of modifying learning tools and designing attractive fine motor activities using simple materials. This indicates that experiential learning not only improves conceptual mastery but also stimulates problem-solving and innovation skills. In early childhood education, these

competencies are essential because teachers are required to create meaningful and developmentally appropriate learning experiences for children. Previous studies also emphasized that practical and experience-based learning can strengthen professional competence among pre-service teachers (Miftakhi, D. R., & Pramusinto, 2023).

Although the experimental group achieved significantly better results, the N-Gain score of 0.62 remained within the medium category according to Hake's classification. This suggests that the intervention was effective but still leaves room for improvement. One possible explanation is the relatively short duration of the treatment, which was conducted within one semester. The development of professional competence, particularly in psychomotor and affective domains, generally requires continuous practice over a longer period. Therefore, longer implementation periods may produce stronger learning gain.

The findings of this study also revealed the limitations of conventional lecture-based learning. Students in the control class showed lower participation during learning activities and demonstrated limited creativity in designing fine motor stimulation. This finding supports previous research indicating that teacher-centered instruction often restricts students' opportunities to actively construct knowledge and practice professional skills (Kuswanto, H., & Ardiani, 2022).In contrast, experiential learning creates a more interactive environment where students can collaborate, solve problems, and reflect on their experiences.

From a practical perspective, the findings provide important implications for Early Childhood Education programs, particularly in teacher preparation institutions with similar characteristics. Learning activities should provide greater opportunities for students to engage in teaching simulations, project-based assignments, reflective discussions, and authentic classroom practices. Assessment systems should also evaluate not only cognitive achievement but also psychomotor competence and professional attitudes through observation and performance-based assessment. Improving these aspects is essential because teacher competence strongly influences the quality of learning experiences provided to young children (Febrinavani, 2025).

Despite its contributions, this study has limitations. The research involved students from only one university and used a relatively limited sample size, which may affect the generalization of findings. Future studies are recommended to involve larger samples from different institutions and examine the long-term impact of experiential learning on teacher competence. Further research may also explore the integration of digital learning technologies to support experiential learning in teacher education programs.

In conclusion, the integration of andragogy and experiential learning proved effective in improving cognitive, psychomotor, and affective competencies among Early Childhood Education students. The approach encouraged active participation, reflective practice, creativity, and professional readiness. These findings indicate that experiential and learner-centered instruction can become an alternative strategy for strengthening the quality of teacher education in Early Childhood Education programs.

CONCLUSION

This study found that the integration of an andragogical approach with experiential learning effectively improved the competence of Early Childhood Education (PAUD) students in developing fine motor activities for young children. The improvement was evident in cognitive, psychomotor, and affective domains. Students in the experimental group achieved higher posttest and N-Gain scores than those in the control group. The N-Gain score of 0.62 was categorized as medium, indicating a meaningful improvement in learning outcomes after the implementation of experiential learning.

Observation and questionnaire results also showed that students in the experimental class demonstrated better abilities in planning and implementing fine motor activities, creating learning media, and participating actively in the learning process. Students became more confident, collaborative, reflective, and responsible for their learning. These findings indicate that experiential learning provides meaningful learning experiences that help students connect theoretical concepts with practical application in early childhood education settings.

The findings confirm that the integration of andragogy and experiential learning can be used as an effective instructional strategy in teacher education programs, particularly in PAUD study programs. This approach supports the development of professional competence and prepares prospective teachers to design more interactive and developmentally appropriate learning activities for children. However, this study has several limitations, including the relatively small sample size, the implementation in only one university, and the limited duration of the intervention. Therefore, future research is recommended to involve broader participants from different educational institutions and examine the long-term effects of experiential learning. Further studies may also explore the integration of digital technology, interactive media, or virtual simulations in experiential learning practices within different PAUD contexts.

REFERENCES

Febrinavani, R. (2025). Learning innovation in improving early childhood education students' competencies in the digital era. *Journal of Early Childhood Education, 9(1), 45–58.*

Halimah, L. (2018). *Pendidikan anak usia dini dan perkembangan anak*. Refika Aditama.

Knowles, M. S., Holton, E. F., & Swanson, R. A. (2015). *The adult learner: The definitive classic in adult education and human resource development (8th ed.)*. Routledge.

Kolb, D. A. (2014). *Experiential learning: Experience as the source of learning and development (2nd ed.).*

Kuswanto, H., & Ardiani, F. (2022). The effectiveness of conventional and innovative learning in improving student

achievement. *Indonesian Journal of Education, 11(2), 210–220.*
Miftakhi, D. R., & Pramusinto, H. (2023). Implementation of andragogy-based learning in improving student competencies. *Journal of Vocational Education, 13(1), 35–46.*
Putri, A. R., Sari, D. P., & Lestari, M. (2024). Development of fine motor skills in early childhood through creative activities. *Journal of Early Childhood Studies, 6(1), 25–36.*
Qoirika, N., Hidayati, A., & Prasetyo, B. (2025). The importance of early childhood education in supporting holistic child development. *Jurnal Inovasi Pendidikan Indonesia*, *5*(1), 45–56.
Rahmi, A. (2024). The application of experiential learning in improving student motivation. *Journal of Education and Learning, 8(2), 89–101.*
Safitri, L. (2022). *Perkembangan Kemampuan Motorik Halus Anak Usia Dini 5-6 Tahun melalui Kegiatan Memegang Pensil*. *4*(2), 492–502.
Sari, N., Widodo, A., & Hidayat, T. (2022). The effect of contextual learning on students' conceptual understanding. *Journal of Basic Education, 7(1), 55–66.*
Sari, D. L., & Agustriana, N. (2024). Holding the Future: A Comprehensive Guide to the Development of Fine Motor Skills in Early Childhood. In *EDUPEDIA Publisher*.
Sugiyono. (2020). *Quantitative, qualitative, and R&D research methods.* Alfabeta.
Tk, D. I., & Najah, N. (2023). *USIA DINI MELALUI KEGIATAN PAPER QUILLING Pendahuluan*. *6*(3), 379–392.
Wulandari, S. (2021). The implementation of experiential learning in improving student learning outcomes. *Journal of Educational Research, 5(3), 145–156.*
Yilmaz, R. M., & Cavas, B. (2018). The impact of hands-on STEAM activities on preschool children's cognitive and motor development. *International Journal of Early Childhood Education*, *24*(3), 257–272.
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