The Effects of an Instructional Model Using Experiential Learning Theory to Enhance Art Teaching Competency of Undergraduate Students in Early Childhood Education

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Abstract

This study aimed to employ the instructional model and evaluate the effectiveness in enhancing art teaching competency of undergraduate students in early childhood education. The sample comprised 210 second-year students from six classrooms at Lishui University. Two classes were selected through cluster random sampling: one as the experimental group, receiving instruction based on experiential learning theory, and the other as the control group, taught using traditional lesson plans. Both groups received eight lesson plans over eight weeks, totaling 24 instructional hours. All lesson plans were evaluated by five experts and received an average score of 4.80 out of 5.00. Four research instruments were used: an art knowledge test, a micro-teaching and lesson plan evaluation form, a professional self-assessment, and an artistic heritage assessment. All instruments were validated for content, with IOC values ranging from 0.80 to 1.00. The self-assessment and heritage assessment tools also achieved a CVI of 1.00 after expert revision. Inter-rater reliability analysis showed high consistency, with ICC values between 0.78 and 0.81. The research results revealed that:

The students in the experimental group, who were taught using the instructional model based on experiential learning theory, showed a statistically significant improvement in their art teaching competency. Their total competency score increased from 66.66 to 86.47, while the control group, which received instruction through traditional lesson plans, saw an increase from 66.48 to 78.80. These findings demonstrate the effectiveness of the instructional model developed

in this study. Therefore, it can be concluded that implementing an instructional model grounded in experiential learning theory can effectively enhance the art teaching competency of preservice teachers both theoretically and practically and is highly suitable for use as a guideline in training future early childhood educators.

Keywords: Experiential Learning Theory; Instructional Model; Art Teaching Competency; Childhood Education

Introduction

In recent years, China has been focusing more on improving early childhood education, especially by raising the standards and skills of kindergarten teachers. Art education is seen as an important part of early childhood learning, helping kids develop their creativity, express emotions, and grow in a well-rounded way. National policies such as the guidance programme for kindergarten education, the professional standards for kindergarten teachers, and the national medium-and long term education reform and development plan (2010–2020) all emphasize that kindergarten teachers should possess the ability to design appropriate art activities to foster children's creative potential (Zhou, 2011).

Many undergraduate students who are studying early childhood education still struggle with learning art in a meaningful and developmentally appropriate way. A recent study revealed that the provision of arts education activities in kindergartens is uneven across the four major art forms music, visual arts, dance, and drama—often due to teachers' unequal preparation and training backgrounds. Teachers with higher qualifications and those in government-funded schools tend to implement art activities more frequently than others, indicating the impact of teacher demographics on educational practice (Yeung & Bautista, 2024). This suggests a persistent gap between education policy and the actual readiness of future teachers in practical classroom contexts.

Art teachers can improve their abilities and efficacy by using Kolb's (1984) experiential learning theory. Dewey and Rogers' theories serve as the foundation for this notion. It implies that there are four stages of learning that occur regularly over time. The first step is experiencing something in real life. The second step is reflecting on that experience. The third step is forming new ideas from that reflection. The final step is taking action based on those new ideas. This process helps students connect what they learn in theory with what happens in actual classroom situations, which leads to deeper learning and better skills in planning lessons, carrying out

activities, and evaluating how well children are learning art. It also helps students become more creative, better at solving problems, and more confident in their ability to teach (Rodovic, Hummel & Vermeulen, 2021). By placing children in real–life situations and encouraging them to think critically about their experiences, experiential learning in early childhood education supports teaching methods that focus on the child (Ionescu, 2020).

This research is based on a theoretical foundation and aims to develop and evaluate an instructional model that is grounded in experiential learning theory. The primary objective is to improve the teaching competency related to art for undergraduate students in early childhood education programs.

Research Objective

To employ the instructional model and evaluate the effectiveness in enhancing art teaching competency of undergraduate students in early childhood education.

Literature Review

Art Education in Early Childhood Teacher Preparation

Nowadays, art education plays a vital role in helping young children grow because it helps them express their emotions, discover their senses, and develop their creativity. But, in many teacher trainings programs, art is not considered as important as it should be (Radović, Hummel, & Vermeulen, 2021). Leung, Wu, and Ho (2025) note that even experienced kindergarten teachers may not always fully understand how to create art projects that are meaningful and appropriate for children's developmental stages. Rather than emphasizing teaching methods than prioritize the child's needs, many traditional teacher training programs focus more on the teaching process itself. Therefore, Sung and Hwang (2021) stated that this gap may make the future teachers unsure about using creative and expressive methods when teaching young kids.

Experiential Learning Theory

In 1984, Kolb introduced four key parts of experiential learning theory. These parts are: experiencing something real, thinking about that experience, coming up with new ideas or thoughts, and then taking those ideas and putting them into action. Radović et al. (2021) stated that this theory is based on the ideas of Dewey and Rogers. Studies indicate that this theory helps teachers foster their ability to think deeply, work freely, and apply what they learned in real–world contexts. Hämäläinen, Kiili, and Smith (2024) noted that prospective teachers who practice

experiential learning in real or simulated classroom settings gain confidence and sharpen their abilities through getting feedback and continuously refining their approaches.

Application of Experiential Learning in Art Teacher Education

Including hands-on learning in art teacher training has several benefits. As Sung and Hwang (2021) pointed out, activities like working on projects, collaborating with classmates, and reflecting on personal experiences can help teachers understand their subject better and make their teaching more adaptable. Hamalainen et al. (2024) also noted that learning by doing helps connect what is taught in classes with real-life teaching situations, which is especially valuable in subjects like art. The research suggests that experiential learning allows future teachers to move beyond just listening to lectures and instead actively create, use, and evaluate their teaching approaches.

Conceptual Framework

Experiential learning theory, according to Kolb (1984), emphasizes learning via active experimentation, forming abstract ideas, reflecting on experiences, and applying personal knowledge, forms the basis of this study's conceptual framework. Based on this theory, the researcher designed a five-step instructional steps to enhance undergraduate students' art teaching competency in early childhood education. In this study, the instructional model serves as the independent variable, while the dependent variable measures four key aspects of art teaching art competency, including "content knowledge, instructional practice, professional attitude, and artistic heritage integration." The relationships between the mentioned two variables are shown in Figure 1.

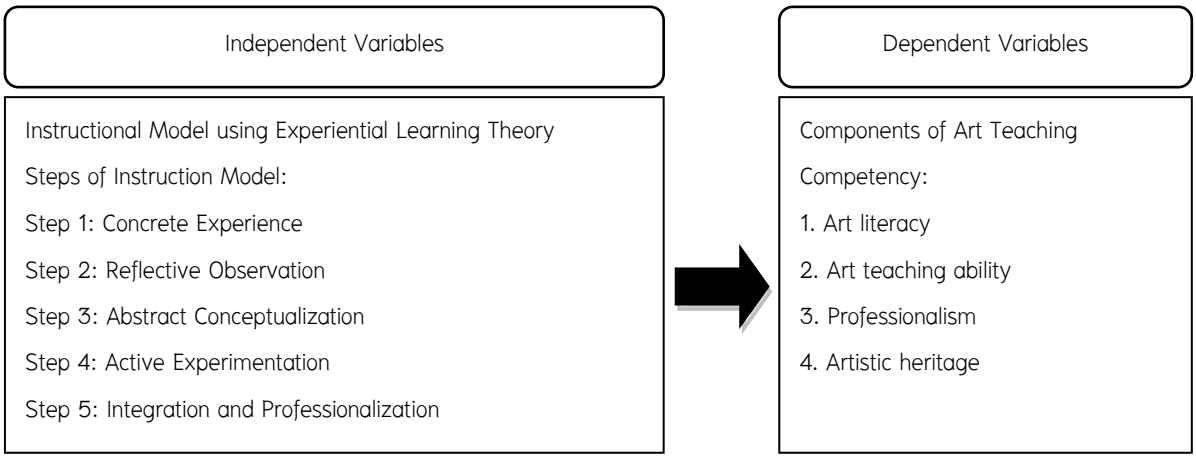


Figure 1 Conceptual framework

Research Methodology

Population and Sample

This study involved a sample of 210 second-year undergraduate students enrolled in the Early Childhood Education Program at Lishui University. The students were divided into six classrooms. Cluster random sampling was employed to select two classrooms containing a heterogeneous mix of students. One classroom, comprising 30 students, was randomly assigned as the experimental group, receiving instruction based on an instructional model grounded in Experiential Learning Theory. The other classroom, also with 30 students, was designated as the control group, receiving instruction through traditional teaching methods. In total, the sample consisted of 60 participants, which meets the minimum recommended size for quasi-experimental research in education (Fraenkel & Wallen, 2009).

Instruments

Two types of instruments were employed in the experiment. The first type was a set of eight lesson plans developed based on Kolb's Experiential Learning Theory. The experimental group was taught each plan over a total of 24 hours, using the five-step learning process. After the instruction, all eight lesson plans were reviewed by five experts using a systematically designed evaluation form, which assessed the appropriateness of the content, clarity, and alignment with Kolb's learning cycle. The average score obtained was 4.01 out of 5, indicating a high level of appropriateness.

The second part was the Art Teaching Competency Assessment Tool, which had four parts:

(1) Art Literacy Knowledge Test – a multiple-choice test with 20 items worth a total of 100 points, designed to check art knowledge and its application in early childhood education contexts.

(2) Micro Teaching Assessment Form and Lesson Plan Marking Scheme – an evaluation rubric for assessing micro teaching performance and scoring lesson plans based on objectives, content, process, and alignment with the Kindergarten Education Guidance Outline.

(3) Professionalism Self-Assessment Form – a 20-item self-rating scale covering professional standards, responsibility, autonomy, and professional beliefs in art teaching.

(4) Artistic Heritage Assessment Form – a performance-based rubric to assess creativity, integration of traditional cultural elements, technical skills, observation, perspective, completeness, and detail in artworks.

Each part was checked carefully for content validity. The IOC for all the instruments ranged from 0.80 to 1.00, which is better than the standard threshold of 0.50 as mentioned by Rovinelli and Hambleton (1977). Additionally, the self-assessment form for professionalism and the form to assess knowledge of artistic heritage achieved a CVI of 1.00 after expert-guided revisions. The analysis of inter-rater reliability using the ICC showed high consistency among raters, with results ranging from 0.78 to 0.81.

Data Collection

Data collection focused on classroom observations and student performance assessments. The researcher delivered instruction over eight weeks, with one 3-hour lesson per week, totaling 24 instructional hours. The assistant researcher observed teaching and learning behaviors throughout the implementation. Upon completion of the instructional period, student competency was assessed using four tools:

1. Art Literacy Knowledge Test (45 minutes; multiple-choice and multiple-response format),

2. Micro Teaching Assessment & Lesson Plan Marking Scheme (20 minutes; rubric-based),

3. Professionalism Self-Assessment Questionnaire (20 minutes), and

4. Artistic Heritage Assessment Form (90 minutes; rubric-based).

The total assessment duration was 180 minutes.

Data Analysis

Statistical analysis was conducted using independent and paired sample t-tests to determine the effectiveness of the instructional model. Prior to the analysis, the Kolmogorov-Smirnov test was used to verify the assumption of normal distribution, and Levene's Test was conducted to assess the homogeneity of variance. The t-test was used to analyze (1) pre- and post-test differences within and between groups, and (2) post-test differences between the experimental and control groups, in order to evaluate the effectiveness of the instructional intervention in enhancing Art teaching competency.

Statistical Procedures

The researcher employed SPSS version 27.0 to analyze the Art teaching competency scores of students in both the experimental and control groups, in order to evaluate the effectiveness of the developed instructional model. The following statistical methods were applied:

1. The Kolmogorov–Smirnov test was used to assess the normality of the data and to ensure that the distribution of the data met the assumption of normality.

2. Levene's Test for Equality of Variances was conducted to test whether the variances of the pre–test and post–test scores between the experimental and control groups were equal, thus satisfying the assumption of homogeneity of variance.

3. An independent samples t–test was used to compare and analyze differences in pre–test scores between the experimental and control groups, to confirm baseline equivalence.

4. An independent samples t–test was also used to compare and analyze post–test scores between the experimental and control groups, in order to evaluate the impact of the instructional model.

5. A paired samples t–test was conducted within the experimental group to compare pre–test and post–test scores, aiming to examine the learning gains after implementing the instructional model.

6. Cohen's d was used to calculate the effect size of the instructional model using Experiential Learning Theory on students' art teaching competency, with calculations performed using G*Power software.

Research Results

Results of Preliminary Assumption Testing for Statistical Data

To make sure that the data analysis was accurate based on the statistical rules, the researchers checked two main things: whether the data followed a normal distribution and if the variances were similar across groups. The analysis was done using SPSS version 27.0. All datasets' p–values were above 0.05, according to the Kolmogorov–Smirnov test results, indicating that the data had a normal distribution. Furthermore, the Levene's test for homogeneity of variance revealed that all of the p–values for each group's pre– and post–test scores were above 0.05, indicating that there were no appreciable variations in the distribution of scores among the groups. As a result, every dataset met the initial criteria and underwent appropriate t–test analysis using the appropriate statistical techniques.

Results of a Comparison between an Instructional Model Using Experiential Learning Theory for Enhancing Art Teaching Competency and the Implementation Effect of a Traditional Instructional Model

In this study, students' Art teaching competency was assessed using pre-test and post-test measures. The paired samples t-test was applied to examine changes within the experimental group before and after the implementation of the instructional model based on Experiential Learning Theory, while the independent samples t-test was used to compare scores between the experimental and control groups.

1. Results of comparing the pre-test differences in early childhood art teaching competency between the experimental group and the control group

To make sure that the two groups were similar in their competency level before the intervention, the researchers looked at the pre-test scores from both the experimental and control groups. The researchers checked the average scores, how spread out the scores were, and did a t-test to compare the two groups. The results showed there was no big difference in their art teaching competency before the new instructional model was introduced. This means it was possible to move forward with the experiment. The details are listed in Table 1.

Table 1 Results of the pre-test measuring the art teaching competency of students in both experimental and control groups

Pair	Group	Mean	S.D.	*t*	*p*
Pre-test art teaching competency	Experimental (n=30)	66.66	4.01	.240	.812
	Control (n=30)	66.48	3.50		
Post-test art teaching competency	Experimental (n=30)	86.47	3.06	14.600	.000
	Control (n=30)	78.80	3.59		

Statistically significant at the .05 level

Before the intervention, there was no significant difference in art teaching competency between the experimental and control groups, as shown in Table 1 ($p = 0.812$). This means both groups stated with similar levels of competency. The results after the test showed that the experimental group had a much higher average score ($M = 86.47$, S.D. = 3.06) than the control group ($M = 78.80$, S.D. = 3.59). The t-test result was very significant ($p < 0.05$), which means the instructional model based on experiential learning theory worked well.

According to the observation, it found that the experimental group had a different skill of making lesson plans. They used different teaching methods, and created a more lively and interactive environments. Whereas, the control group just showed some changed. They still had a traditional and consistent method. This means that the experimental group did well in areas of understanding and appreciating art and heritage of artistic traditions. This group also had a better grasp of the cultural background and artistic worth of artworks.

Furthermore, the experimental group showed stronger skills in classroom management, and were better able to handle unexpected situations in teaching. Generally, the instructional model that was created helped their competency in teaching in a short of time. In contrast, the control group did not make much progress, which shows how effective the experiential learning approach is.

2. The differences between the pre-test and post-test results in the areas of art teaching competency for both the experimental and control groups

To evaluate the effect of the instructional model on each dimension of art teaching competency, the researcher compared the mean, standard deviation, and t-test results between the experimental and control groups, both before and after instruction. Additionally, Cohen's d was calculated to determine the effect size of the instructional model based on Experiential Learning Theory on students' art teaching competency, using the G*Power program. This analysis demonstrates the effectiveness of the instructional model across various competency domains and the differences between the two groups. The results are presented in Table 2.

Table 2 T-test results comparing the pre-test and post-test scores for the sub-dimensions of art teaching among students in both the experimental and control groups

Art teaching competency test	Sample Group	Pre-test		Post-test		Effect Size
		Mean (S.D.)	*t*	Mean (S.D.)	*t*	
1.Art literacy knowledge test	Experimental (n=30)	63.00 (10.80)	1.000	81.83 (8.04)	14.253	1.89
	Control (n=30)	62.50 (8.78)		73.00 (10.80)		1.05
2.Micro teaching assessment form & Lesson plan marking scheme	Experimental (n=30)	67.30 (5.65)	2.067	87.70 (5.37)	10.912	3.58
	Control (n=30)	63.73 (8.61)		78.57 (7.19)		1.84

Art teaching competency test	Sample Group	Pre-test		Post-test		Effect Size
		Mean (S.D.)	*t*	Mean (S.D.)	*t*	
3.Professionalism self-assessment form	Experimental (n=30)	69.13 (7.72)	-1.159	89.70 (5.95)	3.834	2.98
	Control (n=30)	71.70 (7.33)		84.47 (6.44)		1.79
4.Artistic heritage assessment form	Experimental (n=30)	68.70 (7.76)	-1.508	88.33 (6.76)	10.752	2.65
	Control (n=30)	71.33 (7.41)		82.17 (7.35)		1.47
Total	**Experimental (n=30)**	**66.66 (4.01)**	**0.240**	**86.47 (3.06)**	**14.600**	**5.21**
	Control (n=30)	**66.48 (3.50)**		**78.80 (3.59)**		**3.44**

Statistically significant at the .05 level

According to Table 2, the pre-test and post-test scores in experimental group had significantly higher than the control group every dimension of art teaching competency. The aforementioned consisted of art literacy knowledge ($t = 14.253$, $p < 0.05$), micro teaching assessment and lesson plan ($t = 10.912$, $p < 0.05$), professionalism self-assessment ($t = 3.834$, $p < 0.05$), and artistic heritage assessment ($t = 10.752$, $p < 0.05$). These results show that the instructional model that was developed had a significant impact on improving competency of art teaching among students.

Additionally, the observation noted that the experimental group made progress in several areas, particularly in understanding theoretical concepts, planning lessons, managing the classroom, deeply appreciating the cultural values of arts. Nevertheless, the growth in professional skills remained somewhat limited, likely because developing professionalism requires long-term practice and rea-life teaching experience. In a short term, instructional model helped students gain more knowledge and improve their teaching abilities, but more work is needed to develop their professionalism in order to ensure long-term success.

3 . Results of the Comparison of the Post-test of Art teaching competency between Students in the Experimental Group and the Control Group

To examine the impact of the instructional intervention on students' Art teaching competency, post-test scores of the experimental and control groups were compared across key dimensions using mean (M), standard deviation (S.D.), and t-test statistics. The findings are summarized in Table 3.

Table 3 The results of T-test for the post-test measuring students' competency in art teaching between the experimental and control groups

Sample Group	Post-test		
	Mean	S.D.	*t*
Experimental (n=30)	86.47	3.06	14.600
Control (n=30)	78.80	3.59	

Statistically significant at the .05 level

The results reveal that the experimental group scored higher on post-test compared to the control group. The experimental group had an average score of 86.47 with a standard deviation of 3.06, whereas the control group had an average score of 78.80 with a standard deviation of 3.59. The t-value revealed a high significant different of $p < 0.05$. This means that the instructional model had a clear impact on enhancing the competency of art teaching among students. The low standard deviation in the experimental group further notes the consistent and stable performance outcomes.

From what seen in the classroom, the students in the experimental group showed more confidence and skill in creating lesson plans, teaching, and handing classroom situations. They were also able to apply knowledge from theory into real-life situations. In contrast, the students in the control group followed more traditional teaching methods with less creativity and depth. The experimental group's strong results in art teaching and cultural heritage assessments show they have a deep grasp of theory and can effectively apply it in real situations. However, even though most areas revealed significant progress, professional literacy still needs more work, likely because it requires a lot of hands-on experience over time.

As a result, the instructional intervention greatly booted students' overall teaching skills in a short period. Continued training and practical experience, particularly in professional literacy, are recommended to ensure long-term improvement.

4 . Comparison of the results from the test before and after the intervention in the experimental group regarding the art teaching competency

To examine the effectiveness of the instructional model about enhancing art teaching competency in students of experimental group, a pair samples t-test was used to compare pre-test and post-test scores. The analysis examined the mean score, standard deviation, t-value, and significant value (p-value) to determine the impact of instructional model across overall competency and its sub-dimensions. The findings are shown in Table 4.

Table 4 Results of t-test of Art teaching competency before and after the implementation of the instructional model for students in the experimental group

Pair	Mean	N	S.D.	t	df
Pre-test of art teaching competency	66.66	30	4.01	-27.621	29
Post-test of art teaching competency	86.47	30	3.06		

Statistically significant at the .05 level

The results in Table 4 show that the average score increased from 66.66 (with a standard deviation of 4.01) before the intervention to 86.47 (with a standard deviation of 3.06) after the intervention. This is a significant difference, as indicated by a t-value of -27.621 with $p < 0.05$. The relatively large t-value is not unusual in this context, as it results from a substantial improvement in mean scores and a low standard deviation, reflecting that the students' performance improved consistently across the group. This confirms the effectiveness of the instructional model used in the experiment to enhance art teaching competency. The smaller standard deviation in the post-test also indicates that students in the experimental group became more consistent, showing that the instructional model's effects were widespread and balanced.

The findings form observation support the above quantitative results, which students in the experimental group showed marked progress designing instruction, planning lessons, integrating theory into practice. In micro-teaching sessions, students showed better classroom organization and were more flexible when dealing with teaching challenges. Students performed better in assessments related to art literacy and artistic heritage, showing a deeper understanding of cultural and theoretical ideas. This helped them analyze artworks more deeply.

Although their professional skills improved, their professional literacy did not increase as much. This could be because gaining real experience take time. Overall, the instructional model used in the study helped students boost their art teaching competency quickly, but continued

training and hands-on practice are necessary for long-term development of their professional abilities.

Discussions

The findings show that the experimental group using the instructional model based on the experiential learning theory significantly enhanced the art teaching competency of undergraduate students. The post-test mean score of the experimental group was 86.47, which was higher than the control group that had a mean score of 78.70. Additionally, the effect size was larger ($t = -27.621$ vs. $t = -14.694$), and the correlation coefficient was higher ($r = 0.407$ vs. $r = 0.163$), indicating both skill improvement and greater learning stability among students. These results are consistent with the findings of Dong, Zhi, and Gan (2025), who demonstrated that creative and experiential learning frameworks significantly improve analytical thinking, problem-solving, and curriculum innovation in art education. Furthermore, Wang, Juithong, and Sangway (2024) also confirmed that experiential learning can rapidly improve complex skills such as martial arts ability, suggesting its broad applicability.

The experimental group showed a clear improvement in "reflective observation," with the standard deviation of their post-test scores dropping to just 3.06. This might be because of using reflective methods that help build abstract thinking and create deeper understanding, such as teaching journals and peer feedback. Scholz et al. (2024) found that a key factor in helping future teachers grow professionally within college programs is engaging in thoughtful reflection while learning in realistic, hands-on settings. This also corresponds with Hui, Nilnopkoon, and Klangphahol (2023), who observed that experiential learning supports learners' development in both production ability and theoretical application, even in specialized contexts like teapot crafting.

In contrast, the low correlation coefficient in the control group ($r = 0.163$) may reflect high individual variability, which often results from traditional instruction lacking structured support systems. Elmansy (2022) claimed that students who only experience traditional lecture-style teaching rarely gain the ability to apply their knowledge in new situations, even if they have strong technical skills, because they do not get enough chances to reflect on their learning or actively participate in practical activities. These findings also align with the research of Worapongpat and Song (2025), who emphasized that competitive learning strategies that lack experiential depth often lead to fragmented learning outcomes.

After the test, the experimental group scored an average of 86.47, but there is gap for improvement, particularly in applying theoretical knowledge effectively to real–world situations. This is relevant to Jara et al. (2021), who argued that students can use their knowledge more effectively in real–world art teaching contexts when they combine several courses through immersive, hands–on learning, such as STEAM–based activities. Likewise, Hongsanawa, Boontongtherng, and Rittidet (2023) demonstrated that when elementary students engaged in drawing activities using experiential methods, they not only improved their skills but also developed stronger integration between content and context.

The post–test score of the control group was 78.70, showing that the traditional teaching can still be used in teaching. However, it can be more effective if combined with blended learning approaches. This means incorporating digital tools to support reflection and participation. This is in line with Scholz et al. (2024), who stated that we should use interactive digital platforms and real–time feedback systems to strengthen teaching competencies among preservice teachers in virtual settings. Additionally, this view is echoed in the work of Hui et al. (2023), who stressed that integrating hands on activities with digital media enhances not only technical abilities but also learner motivation.

New Knowledge from Research

The instructional model is grounded in experiential learning theory, emphasizing active engagement, reflective thinking, and the transformation of experience into meaningful knowledge. It was developed by integrating theoretical foundations with real–world data to enhance the teaching competency of undergraduate students in early childhood education programs. As illustrated in Figure 2, the model consists of key components such as core principles of experiential learning, instructional strategies, and sequential instructional steps. These components are purposefully aligned with the core competencies in art education, including art literacy, artistic heritage, instructional proficiency, and professional development, ensuring the model's relevance and effectiveness in preparing competent early childhood educators.

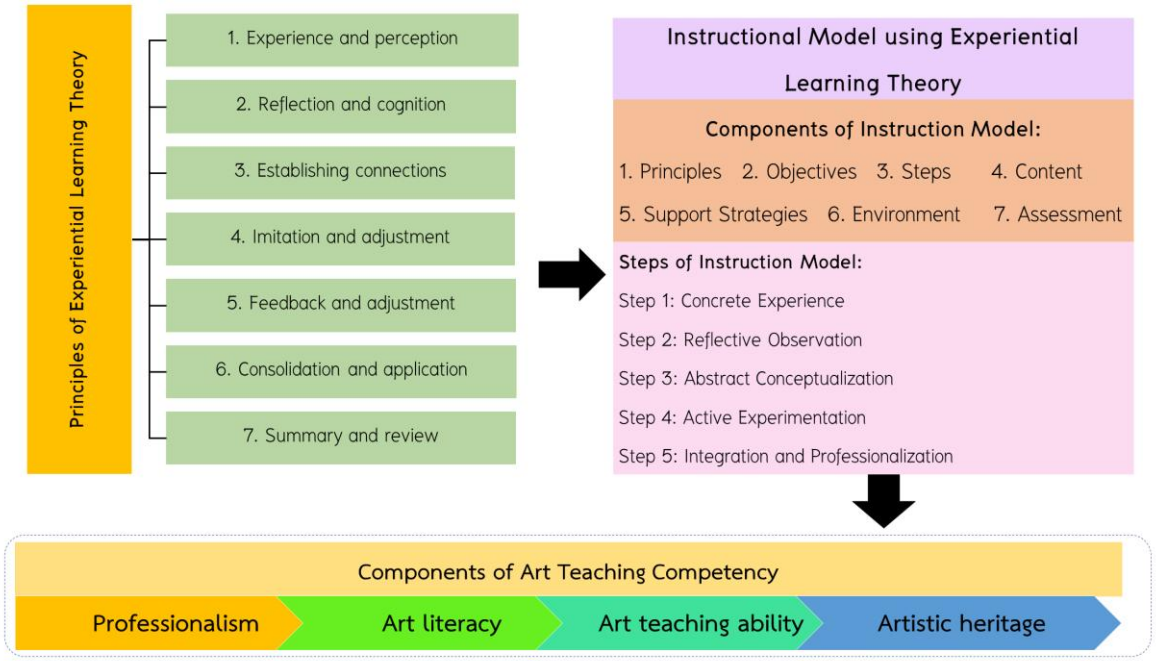


Figure 2 The concept of the development an instructional model

Conclusion

The findings revealed that the experimental group showed a significantly greater improvement in art teaching competency compared to the control group, both statistically and practically. The instructional model based on experiential learning effectively enhanced not only teaching techniques but also reflective thinking and instructional adaptability. Students internalized teaching values and demonstrated innovative practices tailored to children's needs. This confirms the model's potential to develop comprehensive teaching competencies for future early childhood educators.

Suggestions

From the research results the researcher has the following suggestions:

Suggestions for application

The results show that the instructional model developed in this study, which is based on experiential learning theory, works well for art teaching competency. Therefore, educators and curriculum developer should combine the five steps in experiential learning process mentioned earlier into lessons and instructional activities. In addition, the structured reflection tools used in this study should be incorporated to improve critical thinking and promote internalization of pedagogical concepts. The use of this developed instructional model in a form of blended learning using digital technologies can further enhance students' adaptive teaching abilities and reflective practice.

Suggestion for future research

Future research should examine the effectiveness of using this instructional model, which is based on experiential learning theory across various fields and cultural contexts, such as language development or science instruction. Longitudinal study should be conducted to examine the sustained effects of the instructional model on graduates' teaching performance and professional development after entering the teaching profession.

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