

Components and Indicators of Learning Management Competency for Promoting Creative Thinking Among Art Department Teachers in Schools Under the Provincial Administrative Organization

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Abstract

This research aimed to: 1) study the components and indicators of learning management competency for promoting creative thinking skills among art department teachers, and 2) examine the model fit of these components and indicators with empirical data. The sample consisted of 130 art department teachers from schools under the Provincial Administrative Organization, determined using a 10:1 parameter ratio and selected through multi-stage random sampling. The research instrument was a questionnaire for developing components and indicators of learning management competency, with an index of item-objective congruence (IOC) ranging from 0.80 to 1.00, discrimination values using Pearson Product Moment Correlation between 0.37 and 0.82, and a reliability coefficient (Cronbach's alpha) of 0.97. Data were analyzed using confirmatory factor analysis (CFA).

The findings revealed that: 1) Through document synthesis and related research, three components of learning management competency were identified: curriculum, learning management, and assessment and evaluation, comprising 13 indicators. 2) The model fit indices showed strong alignment with empirical data: $\chi^2 = 43.485$, $df = 46$, $\chi^2/df = 0.945$, $p = 0.578$, $GFI = 0.951$, $CFI = 1.000$, $NFI = 0.957$, $RMR = 0.028$, and $RMSEA = 0.000$. These results validate the instrument's effectiveness for assessing learning management competency in promoting creative thinking skills among art department teachers.

Keywords: Learning Management Competency, Creative Thinking, Art Department Teachers, Confirmatory Factor Analysis, Schools under the Provincial Administrative Organization

1. Introduction

The reform of learning aims to transform the learning culture of the Thai population as a whole, improving the quality of Thai people and driving sustainable national development, as outlined in the National Education Act of B.E. 2542 (1999). In this educational reform, teachers are the key personnel as they are directly responsible for learning management for students. Learning reform can only materialize when teachers develop themselves and transform their teaching and learning practices. Teaching is a specific process designed within the educational system to facilitate student learning. Therefore, student learning cannot develop or change without adequately developing teachers' learning management capabilities. According to The Third International Mathematics and Science Study, student learning can develop significantly only when teachers receive opportunities and support to enhance their skills effectively (Stigler & Hiebert, 1999). For teachers to reform both learning and teaching management practices, they must possess various teaching competencies. The College Academic Council has proposed that 21st-century teaching competencies require teachers to understand different student learning styles, apply knowledge in appropriate learning management, employ diverse teaching strategies, evaluate learning outcomes using valid and reliable assessment tools and techniques, and work both independently and collaboratively in developing and applying knowledge to help diverse learners achieve their learning objectives.

A review of learning reform literature reveals that contemporary learning management emphasizes student-centered learning. Students should be encouraged to develop higher-order thinking skills such as creative thinking, problem-solving, and critical thinking. Therefore, teachers play a crucial role in finding appropriate learning management approaches and developing students' higher-order thinking skills. Consequently, educational management must integrate various disciplines, including both in-class and out-of-class learning integration, and should employ multiple learning approaches rather than relying on a single method (Gonzalez, 2012). These

learning management approaches align with the National Education Act B.E. 2542 (1999), Chapter 4, Section 23, which emphasizes learning processes and appropriate integration at each educational level, including formal, non-formal, and informal education. Section 24(4) further specifies that learning management should integrate various knowledge aspects in balanced proportion while instilling morality, good values, and desirable characteristics across all subjects (Office of the National Education Commission, 2002).

The “Future Skills: Employment in 2030” report studies the transformation of occupations and essential future skills, including 1) Learning strategies, 2) Originality, 3) Fluency of ideas, and 4) Active Learning. Learning strategies and active learning represent self-management abilities in seeking additional knowledge for problem-solving, while originality and fluency of ideas relate to creative problem-solving abilities (Bakhshi, 2017). The World Economic Forum report (2020–2030) indicates changing labor market demands, noting that workers lacking essential skills for 2025 risk unemployment. The necessary skills for the future world are divided into four main groups, with creativity remaining one of the 4Cs skills believed essential for the 21st century, comprising Critical Thinking, Communication (communication skills), Collaboration (teamwork skills), and Critical Thinking (analytical thinking skills) (World Economic Forum, 2020). Creativity helps individuals be flexible and adapt to rapidly changing world conditions, which explains why creativity is a top priority that educational institutions should emphasize and promote. Creativity helps learners and personnel discover and develop their potential, leading to success in both education and work. Schools thus play a vital role in development and preparation.

Currently, the Thai education system defines eight learning areas according to the Basic Education Core Curriculum B.E. 2551 (2008), which sets learning standards for each area. The art department is a learning area specifically aimed at fostering creativity, artistic imagination, appreciation of beauty, and aesthetic values, while also promoting personal and societal values. This learning area focuses directly on encouraging innovative thinking and comprises three areas of study: visual arts, music, and performing arts, each uniquely characterized by different approaches to expression and perception. The learning management of the art department plays a critical role in translating the curriculum into practice. Art teachers are tasked with carefully selecting learning processes that enable students to engage with the specified content while cultivating desirable characteristics, enhancing aesthetic appreciation, and developing essential competencies to ensure that students achieve the intended educational outcomes (Ministry of Education, 2008).

Therefore, from the aforementioned issues, the researcher recognizes and is interested in studying the components and indicators of learning management competency for promoting creative thinking among art department teachers, examining what components and indicators should be included. This study aims to benefit the education sector, enabling teachers to provide quality education in both professional knowledge and life skills, ensuring they can live happily in society.

2. Objectives

- 1) To study the components and indicators of learning management competency for promoting creative thinking among art department teachers in schools under the Provincial Administrative Organization.
- 2) To examine the model fit between the model of components and indicators of learning management competency for promoting creative thinking among art department teachers in schools under the Provincial Administrative Organization and the empirical data.

3. Scope of the Research

This research studied the components and indicators of learning management competency for promoting creative thinking among art department teachers in schools under the Provincial Administrative Organization. The research scope was as follows:

Step 1: Study of components and indicators of learning management competency for promoting creative thinking among art department teachers in schools under the Provincial Administrative Organization

1) Content Scope

The researcher synthesized components of innovation competency from various scholars (British Council, 2009; Ekwannung, 2017; Ministry of National Education, Turkish Republic, 2006; Nakmuang, 2009; Office of Professional Standards, Teachers Council of Thailand Secretariat, 2013, 2019; Office of the Basic Education Commission, 2010; Panich, 2012; Partnership for 21st Century Skills, 2011; Pefianco, 2009; Teacher Professional Competencies According to Professional Experience Standards, 2019; Teachers Council of Thailand Regulations on Professional Standards, 2019) into three components: 1) Curriculum, 2) Learning Management, and 3) Measurement and Evaluation.

Step 2: Examination of model fit between components and indicators of learning management competency for promoting creative thinking among art department teachers and empirical data

1) Content Scope

The verification and confirmation of components and indicators of learning management competency for promoting creative thinking among art department teachers in schools under the Provincial Administrative Organization, through document analysis and synthesis of related research, revealed 3 components: 1) Curriculum 2) Learning Management 3) Measurement and Evaluation

2) Population/Sample and Informants Scope

2.1) Population consisted of 217 art department teachers from 217 schools in 20 Provincial Administrative Organizations across 20 provinces in 2023 (Local Administrative Organization, 2023)

2.2) The sample for confirmatory factor analysis comprised 130 art department teachers under the Provincial Administrative Organization in 2023. The sample size was determined using Hair et al. (2010) criteria with a 10:1 ratio of parameters. The study identified 13 parameters, thus requiring a sample size of 130 participants, selected through multi-stage random sampling.

4. Conceptual Framework

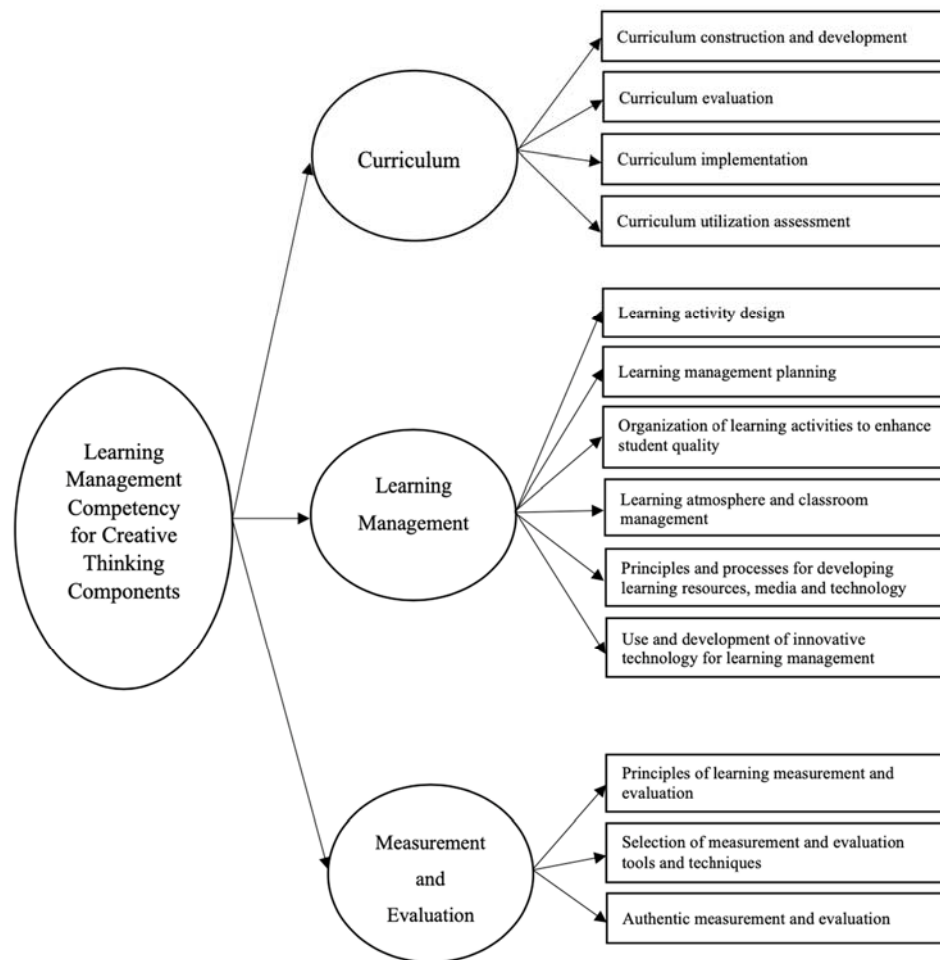


Figure 1. Conceptual framework for the research

5. Method

This research employed structural validity analysis to examine theoretical relationships among three components, divided into two phases:

Step 1: Study of components and indicators of learning management competency for promoting creative thinking

among art department teachers in schools under the Provincial Administrative Organization

1) *Research Data Sources*

The researcher studied documents, textbooks, books, articles, and related research concerning components and indicators of learning management competency for promoting creative thinking.

2) *Research Instrument*

The research instrument was a document synthesis recording form for related literature and research.

3) *Data Collection*

The researcher studied both domestic and international documents and research to synthesize data on learning management competency components for promoting creative thinking.

4) *Data Analysis*

The researcher summarized components and indicators of learning management competency for promoting creative thinking through content analysis of documents, textbooks, books, articles, and related research, using descriptive statistics for frequency distribution and presenting data in descriptive form.

Step 2: Examination of model fit between components and indicators of learning management competency for promoting creative thinking and empirical data

1) *Population and Sample*

Population comprised 217 art department teachers from 217 schools in 20 Provincial Administrative Organizations across 20 provinces in 2023 (Local Administrative Organization, 2023).

Sample consisted of 130 art department teachers under the Provincial Administrative Organization in 2023. This phase employed confirmatory factor analysis, following Hair et al.'s (2010) recommendation that sample size should not be less than 100 and should maintain a 10–20:1 ratio of samples per parameter. With 13 parameters and using a 10:1 ratio, the sample size was set at 130 art department teachers, selected through four-stage random sampling.

2) *Research Instrument and Development*

The research instrument was a questionnaire for developing components and indicators of learning management competency for promoting creative thinking, consisting of two parts:

- Part 1: Six checklist items for respondents' basic information
- Part 2: 50 items using a 5-point Likert scale about components and indicators of learning management competency

The questionnaire underwent content validity checking using the Index of Item-Objective Congruence (IOC), yielding scores between 0.80–1.00 with an overall IOC of 0.98. It was then piloted with 50 non-sample art teachers. Item discrimination was analyzed using Pearson Product Moment Correlation, showing discrimination values between 0.37–0.82, and reliability was tested using Cronbach's alpha coefficient, yielding an overall reliability of 0.97.

3) *Data Collection*

After receiving human research ethics approval, the researcher distributed questionnaires with cover letters from the Faculty of Education, Mahasarakham University, to the sample group using Google Forms, achieving a 100% response rate (130 responses).

4) *Data Analysis*

The researcher analyzed the data using Confirmatory Factor Analysis (CFA) to examine model fit between components and indicators, analyzing factor loadings through first-order confirmatory factor measurement models. Fit indices including Chi-square (χ^2), CMIN/df, GFI, AGFI, IFI, CFI, TLI, and RMSEA were assessed using AMOS software.

6. Results

Step 1: Study of components and indicators of learning management competency for promoting creative thinking among art department teachers in schools under the Provincial Administrative Organization

1) Content analysis results from the synthesis of documents, textbooks, academic articles, and both domestic and international research reports revealed 3 components with 13 indicators, as shown in Table 1.

Table 1. Components and Indicators of Learning Management Competency for Promoting Creative Thinking

Components (3 Components)	Indicators (13 Indicators)
1. Curriculum	1) Curriculum construction and development 2) Curriculum evaluation 3) Curriculum implementation 4) Curriculum utilization assessment
2. Learning Management	1) Design of learning activities 2) Learning management planning 3) Organization of learning activities to enhance student quality 4) Learning atmosphere and classroom management 5) Principles and processes for developing learning resources, media and technology 6) Use and development of innovative technology for learning management
3. Measurement and Evaluation	1) Principles of learning measurement and evaluation 2) Selection of techniques and tools for measurement and evaluation 3) Authentic measurement and evaluation

Step 2: Examination of model fit between components and indicators of learning management competency for promoting creative thinking and empirical data

The analysis of the three components and indicators of learning management competency for promoting creative thinking revealed statistically significant factor loadings. The model fit indices demonstrated excellent alignment with empirical data, with a Chi-square (χ^2) value of 43.485 and 46 degrees of freedom (df), yielding a relative Chi-square (χ^2/df) of 0.945. The model achieved statistical significance with a p-value of 0.578. Further goodness-of-fit measures supported the model's robust fit: the Goodness of Fit Index (GFI) was 0.951, while the Adjusted Goodness of Fit Index (AGFI) reached 0.903. The model also demonstrated strong incremental fit indices, with the Incremental Fit Index (IFI) at 1.003, Tucker-Lewis Index (TLI) at 1.005, and Comparative Fit Index (CFI) at 1.000. Additionally, the Normed Fit Index (NFI) was 0.957, the Root Mean Square Residual (RMR) was 0.028, and the Root Mean Square Error of Approximation (RMSEA) was 0.000.

These comprehensive results indicate that all three components and their respective indicators serve as statistically significant measures of learning management competency for promoting creative thinking. The excellent fit indices confirm that the developed model demonstrates strong consistency with empirical data. The detailed model of components and indicators is presented in Table 2.

Table 2. Second-Order Confirmatory Factor Analysis Results of Combined Indicators for Learning Management Competency in Promoting Creative Thinking Across Three Components

Variables	Indicators	Factor Loading	R ²	Error (e)
Curriculum (Cur)		.797	.636	.636
Y1	1.1 Curriculum construction and development	.806	.649	.649
Y2	1.2 Curriculum evaluation	.787	.619	.619
Y3	1.3 Curriculum implementation	.845	.714	.714
Y4	1.4 Curriculum utilization assessment	.490	.240	.240
Learning Management (Lear)		.868	.754	.754
Y5	2.1 Design of learning activities	.754	.568	.568
Y6	2.2 Learning management planning	.795	.633	.633
Y7	2.3 Organization of learning activities to enhance student quality	.919	.844	.844
Y8	2.4 Learning atmosphere and classroom management	.849	.721	.721
Y9	2.5 Principles and processes for developing learning resources, media and technology	.570	.325	.325
Y10	2.6 Use and development of innovative technology for learning management	.533	.305	.305
Measurement and Evaluation (Cal)		.824	.679	.679
Y11	3.1 Principles of learning measurement and evaluation	.740	.548	.548
Y12	3.2 Selection of measurement and evaluation tools and techniques	.627	.393	.393
Y13	3.3 Authentic measurement and evaluation	.641	.410	.410

Results: $\chi^2 = 43.485$, $df = 46$, $\chi^2/df = 0.945$, $p = 0.578$, $RMSEA = 0.000$, $RMR = 0.028$, $GFI = 0.951$, $AGFI = 0.903$, $NFI = 0.957$, $TLI = 1.005$, $IFI = 1.003$, $CFI = 1.000$

The factor loadings for all indicators across the three components were positive, ranging from 0.83 to 0.94, with statistical significance at the .05 level. These results confirm that all three components and 13 indicators contribute significantly to learning management competency for fostering creative thinking. When analyzing the factor loadings for each component, “Learning Management” showed the highest loading at 0.868, followed by “Assessment and Evaluation” at 0.824, and “Curriculum” at 0.797. The coefficient of determination (R^2) values ranged from 0.240 to 0.844. When ranking the components based on their contributions to learning management competency for fostering creative thinking, “Learning Management” emerged as the most significant, followed by “Assessment and Evaluation” and “Curriculum”, respectively. These findings validate that the three components and their 13 indicators can effectively measure learning management competency for fostering creative thinking, aligning with the theoretical framework established by the researcher, as illustrated in Figure 2.

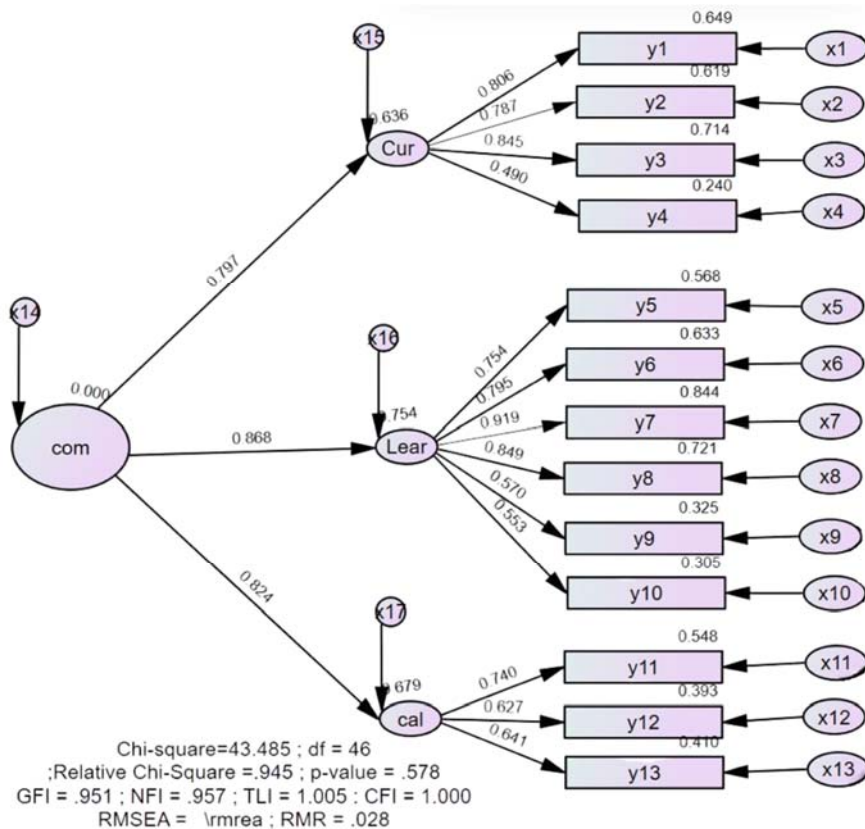


Figure 2. Second-Order Confirmatory Factor Analysis Model of Learning Management Competency for Promoting Creative Thinking

Note. Cur: Curriculum; Lear: Learning Management; Cal: Measurement and Evaluation; $\chi^2=43.485$, P-value = 0.578, CFI = 1.000, RMSEA = 0.000.

The result of the second confirmatory factor analysis on the Learning Management Competency for Promoting Creative Thinking among Art Department Teachers in Schools under the Provincial Administrative Organization that consistent with the empirical data ($\chi^2=43.485$, P-value = 0.578, CFI = 1.000, RMSEA = 0.000) was found that there were 3 elements include Learning Management (Lear), Measurement and Evaluation (Cal), Curriculum (Cur) respectively.

7. Discussion

1) The study of learning management competency components and indicators for fostering creative thinking found that learning management competency for fostering creative thinking refers to teacher behaviors that demonstrate their ability to manage learning processes to promote students’ creative thinking. This competency is derived from knowledge, skills, and attitudes, resulting in student behaviors expressed through innate cognitive processes. These behaviors can be developed and trained at any age or in any profession to foster imagination and encourage

thinking outside the box. This creative thinking can serve as a guideline for solving problems, improving existing work to create unique outputs, and addressing challenges independently.

Teacher development in educational institutions must be conducted as a systematic and continuous process that aligns with teachers' needs while considering the development goals of the school or community. This requires long-term development planning and designing training programs that specifically address teachers' needs and competencies in their professional fields. Furthermore, creative thinking fosters differentiation, ultimately leading to innovation. It is a critical characteristic that must be cultivated in all learners and should be prioritized by teachers to ensure every student develops this competency. Creative thinking is an essential requirement in 21st-century education (Phoyen, 2019).

Creative thinking is vital for holistic child development, as it contributes to desirable traits such as aesthetic appreciation, optimism, a love for learning, curiosity, initiative, pride, and self-confidence. These are key 21st-century skills that should be cultivated from early childhood (Trilling & Fadel, 2015). Teachers' roles extend beyond designing appropriate learning experiences. They must also study methods to foster creativity in all students by creating environments that are most conducive to promoting creative thinking. Based on the synthesis of concepts, theories, and related research, the findings reveal common themes. To develop teachers' learning management competency for fostering creative thinking, it is essential to design development programs that enhance teachers' knowledge, understanding, skills, and positive attitudes toward learning management.

The findings comprise three components and 13 indicators as follows:

- ① Curriculum: curriculum construction and development, curriculum evaluation, curriculum implementation, curriculum utilization assessment.
- ② Learning Management: design of learning activities, learning management planning, organization of learning activities to enhance student quality, learning atmosphere and classroom management, principles and processes for developing learning resources, media, and technology, use and development of innovative technology for learning management.
- ③ Assessment and Evaluation: principles of learning measurement and evaluation, selection of measurement and evaluation tools and techniques, authentic measurement and evaluation.

These findings align with Tanatrop (2021), who identified six components of curriculum and learning management competency enhancement: 1) curriculum construction and development, 2) learning management design, 3) classroom management, 4) student-centered instruction, 5) media and innovation use and development, and 6) learning measurement and evaluation. Similarly, Pakarapho (2021) identified five components of 21st-century teacher learning management: 1) analytical thinking and practical learning management, 2) technology media use and development, 3) authentic assessment, 4) student-centered instructional design, and 5) conducive learning environment management. Additionally, Nogerbek (2022) identified three components for enhancing teachers' creative thinking competency: 1) curriculum, 2) seminars, and 3) creative thinking development meetings.

2) The examination of model fit between the components and indicators with empirical data showed that all three components and 13 indicators had factor loadings above 0.3, indicating good empirical data fit with values ranging from 0.797 to 0.868. Learning Management had the highest loading (0.868), followed by Measurement and Evaluation (0.824), and Curriculum (0.797). The components and indicators in each aspect showed relatively high positive correlations. This model effectively measures learning management competency for promoting creative thinking among art department teachers, revealing strong relationships between learning management and assessment. These findings align with Pupat et al. (2018), who emphasized that developing indicators based on theoretical concepts involves selecting interrelated variables, prioritizing them, and reducing less significant variables to reveal structural relationships. The findings also correspond with Thanyaprasertsiri's (2023) research on developing vocational education instructional design models for promoting creative problem-solving, and Chantarasombat's (2022) study on teacher development for enhancing creative thinking in secondary school students. The model's validity is further supported by its alignment with the characteristics of Thai children in the 21st century (3R8Cs) and desired educational outcomes. As Guilford (1976) noted, while originality is crucial for initiating creative thinking, successful creative thinking requires multiple cognitive characteristics, including divergent thinking comprising originality, fluency, flexibility, and elaboration. These skills influence teachers' learning management development process to meet learners' needs. Therefore, Confirmatory Factor Analysis (CFA) proves most appropriate for validating the structural validity of teachers' learning management competency for promoting creative thinking.

8. Recommendation

8.1 General Recommendations

1) The research findings showed that Learning Management had the highest factor loading among all components. Therefore, it is essential to develop teachers and educational personnel to effectively manage learning that promotes creative thinking, enabling them to apply this in instructional activities and regularly stimulate and raise awareness of their own thinking development.

2) The research revealed that the model of learning management competency components for promoting creative thinking among art department teachers in schools under the Provincial Administrative Organization showed good fit with empirical data. Therefore, educational agencies at all levels can use these components and indicators as targets or guidelines for developing effective education.

8.2 Recommendations for Future Research

1) Future research should focus on developing programs to enhance learning management competency for promoting creative thinking among teachers in other educational jurisdictions to create development programs and tools that accurately measure and evaluate creative thinking aligned with teacher competencies.

2) Research should examine teachers' creative thinking development in relation to organizational culture development and fostering positive attitudes among organization members.

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The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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