Development of a Creativity Enhancement Training Model for Printmaking Major Students of Public Art Universities in Southwest China

Puyiqiu Liu[1], Thamrong Rattanaparnudet[2] and Velankanni Alex[3]

Receive March 20, 2025; Retrieved June 11, 2025; Accepted June 27, 2025

Abstract

This study aimed to develop a creativity enhancement training model for printmaking major students in public art universities in Southwest China. The specific objectives were to: (1) develop and validate a creativity measurement scale for printmaking students; (2) assess the current status of creativity among these students; (3) examine how innovative climate, intrinsic motivation, and self-efficacy influence creativity; and (4) design a comprehensive training model incorporating these key components. Methodologically, this research employed a quantitative approach with a validated creativity scale constructed through expert interviews, scale pre-testing, item analysis, factor analysis, and reliability testing. Data were collected from 299 printmaking students across three public art universities in Southwest China using convenience sampling. Statistical analysis included descriptive statistics, Pearson correlation, and hierarchical regression. Results revealed that students' creativity remained at a moderate level, highlighting the need for systematic intervention. All three factors significantly and positively influenced creativity, with innovative climate demonstrating the strongest impact, followed by self-efficacy and intrinsic motivation. Based on these findings, a comprehensive creativity enhancement training model was developed with three integrated dimensions. The model incorporates specific teaching strategies including expert lectures, collaborative learning environments, technical skill development, interdisciplinary activities, personalized projects, and constructive feedback mechanisms. This study contributes to understanding the multidimensional nature of creativity in arts education and provides a structured yet flexible framework that can be adapted to various educational contexts to

[1,] student, [2,3]Advisor, Stamford International University Bangkok, Thailand

Email: 1003535299@qq.com

enhance students' creative potential.

Keywords: Creativity Enhancement, Printmaking Education, Training Model, Innovative Climate, Intrinsic Motivation, Self-Efficacy

Introduction

In the contemporary landscape of global education, creativity has emerged as an essential competence for the 21st century. This growing emphasis is evidenced by the Programme for International Student Assessment (PISA), which in 2022 integrated creative thinking assessment into its evaluation framework, defining it as a key capability through which students generate, refine, and apply innovative ideas for problem-solving (Creative Thinking - PISA, 2022). Similarly, the Education 4.0 framework positions creativity as central to STEAM (Science, Technology, Engineering, Arts, and Mathematics) education, identifying it as both the driving force for interdisciplinary innovation and the foundation of artistic expression (Abdullah et al., 2023).

Within the domain of higher education, particularly in art universities, creativity enhancement represents not merely an academic objective but a fundamental necessity for developing future professionals capable of meaningful artistic contribution. Printmaking education in Southwest China presents a unique context where traditional artistic practices intersect with contemporary creative demands, requiring specialized approaches to training model development. Despite the acknowledged importance of creativity, research investigating structured methods to measure and enhance creativity remains limited, particularly within specialized artistic disciplines like printmaking.

A concerning gap exists between the acknowledged importance of creativity and students' actual creative development in arts education. Numerous studies have documented that art students demonstrate lower-than-expected levels of creativity, with many facing significant challenges in idea generation and self-assessment of their creative capabilities (Fan & Cai, 2022). For printmaking major students specifically, creativity represents a fundamental skill essential for future professional success, yet the factors that influence their creative development. including innovative climate, intrinsic motivation, and self-efficacy—remain insufficiently investigated in the context of Southwest China's public art universities.

The cultivation of creativity demands a supportive, multidimensional environment;

however, most higher education institutions struggle with inconsistent creativity measurement standards and inadequate assessment systems, which complicate systematic development efforts (Ritter, S.M. et al., 2020). This challenge is particularly pronounced in printmaking education, where the technical demands of the medium must be balanced with creative exploration. Without a structured training model that addresses the specific needs of printmaking students, educational institutions may fail to fully develop students' creative potential.

For printmaking major students in particular, creativity represents not merely an academic requirement but a fundamental skill essential for future professional success in the arts. Existing research suggests that creativity among these students is influenced by multiple factors, notably environmental conditions such as innovative climate, along with personal factors including intrinsic motivation and self-efficacy (Deng et al., 2022; J. Zhang, 2023). Research has established that these factors can directly stimulate creativity and indirectly enhance it by fostering students' interest and confidence in the creative process.

This study addresses these identified gaps by developing a dedicated creativity scale to evaluate the current state of creativity among printmaking students and examining the effects of innovative climate, intrinsic motivation, and self-efficacy on their creative abilities. Through this research, we aim to provide both theoretical insights and practical guidance for enhancing creativity in art education, thereby supporting students in developing adaptability and innovation skills essential for success in a rapidly evolving society. The findings will contribute to the development of a structured creativity enhancement training model with potential applications across art education contexts, ultimately benefiting both educational institutions and students pursuing careers in creative fields.

Research Objectives

1. To develop and validate a creativity measurement scale specifically tailored for printmaking major students in public art universities.
2. To assess the current status of creativity among printmaking major students in public art universities in Southwest China.
3. To examine the influence of innovative climate, intrinsic motivation, and self-efficacy on the creativity of printmaking major students.
4. To identify the relative importance of these three factors in fostering creativity among

printmaking students.

5. To design a comprehensive Creativity Enhancement Training Model incorporating the key components necessary for developing creativity in printmaking education.

Scope of Research

This study is confined to examining creativity enhancement in printmaking major students at three public art universities in Southwest China: Sichuan Fine Arts Institute, The School of Fine Arts at Southwest University, and Yunnan Arts University. These institutions were specifically selected as they are the only public art universities in the region with fully equipped printmaking workshops. The research employs a quantitative approach, with primary data collection via questionnaires from 299 printmaking students using convenience sampling. The temporal scope encompasses the academic year 2023-2024, providing a contemporary assessment of creativity factors in higher education art settings.

The scope of variables includes three key factors influencing creativity: innovative climate, intrinsic motivation, and self-efficacy, as identified through literature review and theoretical frameworks including Trait Activation Theory, Self-Determination Theory, and Social Cognitive Theory. Each factor is comprehensively measured through validated scales adapted specifically for the printmaking education context. The study focuses on understanding both the individual and collective impact of these factors on students' creative development.

This research does not extend to examining other potential creativity factors such as personality traits, cognitive flexibility, or cultural background variables. It also does not include experimental implementation of the proposed training model, limiting its scope to model development based on empirical findings rather than effectiveness testing. Additionally, the study focuses exclusively on printmaking education within higher education settings, and its findings may not be directly generalizable to other artistic disciplines or educational contexts outside of Southwest China.

Literature Review

This study is based on the Trait Activation Theory, Self-Determination Theory, and Social Cognitive Theory, which together provide a comprehensive framework for understanding how innovative climate, intrinsic motivation, and self-efficacy influence the creativity of

printmaking students.

Trait Activation Theory (Tett & Burnett, 2003) emphasizes the role of situational factors in activating individual traits, making it particularly relevant for analyzing how an innovative climate stimulates students' creativity. Self-Determination Theory (Deci & Ryan, 2013) explains how individuals regulate their motivation in response to external environments. Intrinsic motivation, as a core component of this theory, represents the distinction between what individuals want to do and what they are capable of doing (Amabile & Gryskiewicz, 1989). This theory supports the notion that autonomy and competence foster creativity, highlighting the importance of an environment that nurtures students' internal drive for creative work. Social Cognitive Theory (Bandura, 1997) further contributes to this framework by introducing the concept of self-efficacy, which explains how students' confidence in their artistic abilities influences their creative performance. A strong sense of self-efficacy encourages students to take creative risks, persist in problem-solving, and engage more deeply in artistic exploration.

Innovative Climate and Creativity

Innovative climate is typically defined as an environment that supports individuals in generating new ideas, experimenting with novel approaches, and engaging in creative expression. Key elements include open communication, positive feedback, resource availability, and tolerance for trial and error, all of which are considered crucial external factors in fostering creativity (Amabile & Gryskiewicz, 1989).

Previous research has demonstrated that an innovative climate in art education significantly enhances students' creative performance (X. Zhang & Bartol, 2010). A supportive environment stimulates creative thinking, encouraging students to explore new methods. Furthermore, an innovative climate that offers abundant resources, constructive feedback, and open discourse enhances students' psychological safety, fostering their willingness to engage in creative exploration and action (Amabile, 2018; Isaksen, 1999).

Intrinsic Motivation and Creativity

Intrinsic motivation refers to an individual's drive to engage in a task out of personal interest, satisfaction, or internal value recognition, rather than external rewards or pressures. It reflects the degree of autonomy and enthusiasm a person has for a given activity and is regarded as a key factor in self-driven engagement (Deci & Ryan, 2013).

In the fields of educational psychology and creativity research, intrinsic motivation has been recognized as a fundamental factor in encouraging exploration, embracing challenges,

and achieving self-improvement (Amabile & Amabile, 1983). When students experience genuine interest and fulfillment in the creative process, they are more likely to engage in deep thinking and innovation (Karimi et al., 2022).

According to Self-Determination Theory, intrinsic motivation is a strong predictor of creativity. When individuals are provided with autonomy and creative space, their intrinsic motivation is activated, leading to greater creative engagement (Deci & Ryan, 2013). In art education, intrinsic motivation is closely linked to creative performance, as students who are passionate about their work are more inclined to experiment with new methods and persist in their artistic pursuits (Karimi et al., 2022).

Self-Efficacy and Creativity

Self-efficacy refers to an individual's belief in their ability to execute specific tasks and achieve desired goals. It plays a crucial role in shaping how individuals perceive their own capabilities, approach challenges, and persist in the face of difficulties. In this study, self-efficacy is defined as students' confidence in completing creative tasks, making it a key determinant of their creative performance.

According to Social Cognitive Theory, students with high self-efficacy are more likely to embrace creative challenges, demonstrating greater resilience and a willingness to take risks in their artistic endeavors (Bandura, 1997). Research has shown that students with strong self-efficacy are more inclined to experiment with new techniques and materials, leading to enhanced creative performance (Wang, D. et al., 2020).

Research Methodology

This study employed a mixed-methods approach to address the problem of insufficient creativity development among printmaking students. The methodology examined how innovative climate, intrinsic motivation, and self-efficacy influence creativity levels, with the goal of developing an evidence-based training model.

Literature review was conducted using academic databases including ERIC, Scopus, CNKI, and Web of Science, focusing on three theoretical frameworks: Trait Activation Theory, Self-Determination Theory, and Social Cognitive Theory. This review identified significant gaps in creativity measurement tools and training models specific to printmaking education.

Quantitative data were collected from printmaking students at three universities in Southwest China: Sichuan Fine Arts Institute, Southwest University, and Yunnan Arts

University—selected as the only public art universities in the region with fully equipped printmaking workshops. Using convenience sampling, 334 questionnaires were distributed, yielding 299 valid responses (89.52% response rate).

This research addresses three critical problems: (1) lack of validated creativity measurement instruments for printmaking students; (2) insufficient understanding of factors influencing creativity in this context; and (3) absence of structured training models. The methodology benefits educational administrators by providing evidence for curriculum development, offers instructors practical guidance for fostering creativity, and addresses students' essential professional skill development needs.

Ethical Consideration

This study received approval from the Human Research Ethics Committee of Stamford International University, ensuring compliance with international research ethics guidelines outlined in the Belmont Report. All data collection procedures followed ethical standards, with informed consent obtained from all participants, anonymity maintained, and confidentiality of responses protected.

Research results

The questionnaire of this study consists of 45 questions, except for the creativity questionnaire for printmaking students, all the scales are questionnaire developed using validated mature scales, the questionnaires mainly including the following four parts:

Innovative Climate Questionnaire:

According to the innovative climate scale developed and validated by Liu (2010), the Cronbach's α value in three dimensions was above 0.85. The innovative climateis scale divided into three dimensions of peer support, teacher support and institutional support, with Cronbach's α values of 0.86, 0.88 and 0.87. This questionnaire has 12 items, see at Table 1.

Table 1: Innovative Climate Questionnaire

Scale	Dimension	Item	Reference
Innovative Climate	Peer Support	My classmates support and help each other during the creative process. In artistic creation, my classmates are willing to share their methods and artistic techniques. My classmates frequently communicate and discuss issues related to their creative work. When I have new ideas, my classmates actively provide suggestions and feedback.	Liu (2010)
	Teacher Support	My teacher respects and accepts the different ideas and opinions we propose. My teacher encourages us to come up with new ideas to improve our artistic creations or performances. 7. My teacher supports and helps us to realize new ideas in our artistic creation. 8. My teacher is an excellent role model of innovation and often inspires us to try new creations.	
	Institutional Support	9. The university encourages trying new things and learning from mistakes to make improvements. The university recognizes and rewards students who are creative and have a spirit of initiative. The university typically provides support for students' innovative ideas, such as exhibition opportunities or financial assistance. The university values a free, open, and innovative artistic climate.	

Creativity Questionnaire for printmaking students:

The preliminary draft questionnaire used in this study mainly refers to the Chinese version of the original questionnaire of Wu, H. T. et al. (2015). Referring to the scale development process of Devellis' Scale Development: Theory and Application, those steps are followed to produce this questionnaire for printmaking major students: questions design, expert interviews, scale pre-testing and item analysis, validation factor analysis, and reliability testing.

For the expert interviews, five experts with extensive experience in the field of arts and education are invited to participate in this study. These experts all of whom hold doctoral degrees and have titles ranging from associate professor to professor, include two female and three males, with an age span from 30 to 50 years old. Three of them have more than 5 years of experience teaching art and two have more than 25 years of experience working in art and higher education. These experts independently assessed the validity of the questionnaire entries via an email, which provided the initial scale items and invited the experts to suggest modifications and recommendations to these questions. During the evaluation process, the experts based their independent assessment on three main criteria: first, to ensure that each item of the scale clearly expresses its intent so that it can be accurately understood by the respondents; second, the scale items should be closely related to creativity; and lastly, the scale items should be adapted to the realities of art higher education in China. In addition, there was an open comment or suggestion column in the assessment to allow experts to freely express their views or make suggestions.

Reliability Analysis

According to the range of Cronbach's α coefficient, α coefficients of 0.9 and above indicate excellent reliability; α coefficients between 0.8 and 0.89 indicate good reliability; and α coefficients between 0.7 and 0.79 indicate uncertain reliability (Hair et al., 2014). The reliability of this scale is 0.952 (Table 2), which indicates that the questionnaire reliability is good from an overall perspective.

Table 2: Reliability

Cronbach's α	Item	Sample Size
0.952	17	299

The KMO value is 0.975, (Table 3), with a probability of significance of P < 0.001, indicating the presence of common factors between the variables (Nkansah, 2018), and the scale is well suited for validated factor analysis.

Table 3: KMO and Bartlett Tests

KMO Value		0.975
Bartlett' s Test of Sphericity		3356.726
	df	136
	P	0.000***

Note: ***, **, and * represent 1%, 5%, and 10% significance levels, respectively

Exploratory Factor Analysis (EFA)

Table 4 data shows that the first three factors collectively explain 65.104% of the total variance, both before and after rotation. The first factor explains 25.218% of the variance after rotation, the second factor explains 21.514% and the third factor explains 18.372%. This result points out that the structural properties of the data can be better captured by extracting the three common factors.

As an important criterion for determining the number of factors, the first factor has the largest eigen value of 6.464, which is much larger than 1, and is the main factor explaining the co-variance among the variables. The second and third factors have an eigen value of 1.478 and 1.205, respectively, which are still greater than 1, indicating that they also play an important role in explaining the data structure (Onatski, 2010). The subsequent factor eigen value gradually decrease, with the explanatory rate decreasing from the fourth factor until the seventeenth factor's explanatory rate is almost zero, indicating that these factors contribute relatively little to the total variance.

Table 4: Total Variance Explained

Component	Explanation rate of variance before rotation			Explanation rate of variance after rotation		
	Eigen Value	% of Variance	Cumulative %	Eigen Value	% of Variance	Cumulative %
1	6.464	38.026	38.026	3.667	25.218	25.218
2	1.478	18.385	56.411	3.351	21.514	46.732
3	1.205	8.693	65.104	3.123	18.372	65.104
4	0.930	5.468	70.572	-	-	-
5	0.806	4.743	75.315	-	-	-
6	0.686	4.036	79.351			
7	0.572	3.366	82.717	-	-	-
8	0.503	2.958	85.675	-	-	-
9	0.457	2.591	88.266	-	-	-
10	0.409	2.307	90.573	-	-	-
11	0.368	2.064	92.637	-	-	-
12	0.302	1.774	94.411	-	-	-
13	0.260	1.510	95.921			
14	0.238	1.494	97.415	-	-	-
15	0.212	1.341	98.756			
16	0.135	0.791	99.547			
17	0.097	0.453	100.00			

Exploratory Factor Analysis (EFA) dimensionalized the ability to innovate in the art-making process, and a table of rotated factor loading coefficients revealed three main factors (Table 5): creative inspiration and practice (Factor 1), creative thinking and solutions (Factor 2), and innovation in artistic expression and skills (Factor 3). Based on preliminary research findings, the item “Develop a detailed implementation plan and timeline for new creative projects” was removed due to inconsistent factor loadings. The items under each factor in the formal survey showed high factor loading coefficients. Indicating that the items were closely related to their corresponding factors, reflecting the multidimensional structure of the creative ability in the process of artistic creation.

Specifically, Factor 1 focuses on drawing inspiration from everyday life and artistic experiences and translating them into specific artistic practices, such as visiting an art museum or gallery for inspiration (0.693), and demonstrating creativity at all stages of painting creation (0.772). The degree of commonality (common factor variance) suggests that these items contribute more to explaining creativity. Factor 2 focuses on creative thinking and the ability to solve challenges of art-making, such as being able to come up with creative solutions when faced with art-making challenges (0.702) and being able to offer personal and unique insights into classic works of art (0.688). Factor 3, on the other hand, focuses on the creative application of artistic skills and methods, such as the ability to propose innovative ways to achieve the goals of artistic expression during the artistic creation process (0.790), and attempt to create well-composed paintings from unique perspectives or approaches (0.799).

Table 5: Factor's Loading Coefficients after Rotation

Item	Factor's Loading Coefficients after Rotation			Communality (Common Factor Variance)
	Factor 1	Factor 2	Factor 3	
6.Actively share creative ideas with others, display artwork, and be open to receiving feedback from others.	0.698			0.626
7.Demonstrate creativity in all phases of painting creation.	0.772			0.750
11.Enjoy exploring and practicing different artistic styles and forms of expression.	0.658			0.559
14.Be able to appreciate and analyze in depth the aesthetics and artistic techniques of a painting.	0.788			0.701
16.Be inspired when visiting art	0.693			0.551

museums or galleries and translate this into new ways of creating art.				
17.I think I'm creative	0.544			0.500
8.Frequently generates new and creative ideas.		0.574		0.575
9.Is able to come up with creative solutions when faced with challenges in creating art.		0.702		0.534
10.Is accustomed to reflecting on and evaluating his or her art projects in order to make improvements in future creations.		0.658		0.559
12.Conducts thorough research before creating artwork to ensure that it is informative and has depth.		0.664		0.520
13.Be able to offer personal and unique insights into classic works of art.		0.688		0.530

Table 5: Factor's Loading Coefficients after Rotation (Continued)

Item	Factor's Loading Coefficients after Rotation			Communality (Common Factor Variance)
	Factor 1	Factor 2	Factor 3	
1.Be able to propose creative ways to realize the goals of artistic expression in the process of artistic creation.			0.790	0.714

2.Be able to propose innovative and practical ideas to enrich and enhance the expression of art works.	0.826	0.764
3.Attempt to apply new painting techniques, processes or materials to create unique works of art.	0.598	0.526
4.Be able to innovate in the creation of paintings to enhance the quality and artistic expression of the work.	0.562	0.644
5.Have the courage to try out novel ideas in artistic creation without fear of failure.	0.589	0.648
15.Attempt to create well-composed paintings from unique perspectives or approaches.	0.799	0.665

Confirmatory Factor Analysis (CFA)

Through Confirmatory Factor Analysis (CFA), 3 factors with 17 items are validated, and the factor loading coefficients demonstrated the correlation situation between the factors (latent variables) and the analyzed items (explicit variables /measured items), and the correlation between the factors and the analyzed items (measured items) is usually expressed using the value of the standardized loading coefficients (Rhemtulla et al., 2012). The results of the validated factor analysis (Table 6), the absolute value of the standardized loading coefficient is greater than 0.6 and shows significance, implying a good measurement relationship (McNeish et al., 2018).

Table 6: Factor Loading Coefficient

Factor	Variable	Non-standardized load factor	Standardized load factor	z	Std. Error	P
Factor 1	8. Actively share creative ideas with others, display artwork, and be open to receiving feedback from others.	1	0.761	-	-	-
	9. Demonstrate creativity in all phases of painting creation.	0.834	0.684	6.023	0.166	0.000***
	13. Enjoy exploring and practicing different artistic styles and forms of expression.	1.093	0.781	13.545	0.081	0.000***
Factor 1	16. Be able to appreciate and analyze in depth the aesthetics and artistic techniques of a painting.	0.995	0.722	12.539	0.079	0.000***
	18. Be inspired when visiting art museums or galleries and translate this into new ways of creating art.	0.996	0.716	12.425	0.08	0.000***
	19. I think I'm creative	0.974	0.698	12.120	0.08	0.000***
Factor 2	10. Frequently generates new and creative ideas.	1	0.701	-	-	-

	11. Is able to come up with creative solutions when faced with challenges in creating art.	1.014	0.741	12.867	0.079	0.000***
	12. Is accustomed to reflecting on and evaluating his or her art projects in order to make improvements in future creations.	0.886	0.679	11.793	0.075	0.000***
	14. Conducts thorough research before creating artwork to ensure that it is informative and has depth.	1.093	0.781	13.545	0.081	0.000***
	15. Be able to offer personal and unique insights into classic works of art.	1.044	0.747	12.966	0.081	0.000***
Factor 3	3. Be able to propose creative ways to realize the goals of artistic expression in the process of artistic creation.	1	0.706	-	-	-
	4. Be able to propose innovative and practical ideas to enrich and enhance the expression of works of art.	1.086	0.757	13.133	0.083	0.000***

5. Attempt to apply new painting techniques, processes or materials to create unique works of art.	1.047	0.743	12.902	0.081	0.000***
6. Be able to innovate in the creation of paintings to enhance the quality and artistic expression of the work.	1.077	0.78	13.525	0.08	0.000***
7. Have the courage to try out novel ideas in artistic creation without fear of failure.	1.094	0.786	13.631	0.08	0.000***
17. Attempt to create well-composed paintings from unique perspectives or approaches.	1.031	0.744	12.919	0.08	0.000***

Note: ***, **, * represent 1%, 5%, and 10% significance levels, respectively.

Validity Analysis

AVE (Average Variance Extraction) and CR (Combined Reliability) are used for the analysis of convergent validity (convergent validity), which is usually higher when the AVE is greater than 0.5 and the CR value is greater than 0.7 (Malhotra, 2010). The internal consistency coefficients of the dimensions of this scale range from 0.529 to 0.567, and the corresponding AVE values of the three factors are all greater than 0.5, and the CR values are all higher than 0.7 (Table 7). This indicates that the scale has good convergent (converging) validity and good internal consistency.

The AVE values for Factor 1, Factor 2, and Factor 3 were 0.529, 0.534, and 0.567, respectively, which all exceeded the recommended threshold of 0.5, suggesting that each factor explains the variance of its indicator variable well. This result points to a strong

convergent validity of the construct, i.e., the factors do capture the concepts they are intended to reflect.

Meanwhile, the CR values for Factor 1, Factor 2, and Factor 3 are 0.849, 0.873, and 0.887, respectively, which are above the criterion of 0.7, indicating that the model has good internal consistency. This further indicates that the reliability of the indicator variables as their corresponding factor representations is high, ensuring the combined reliability of the measurements.

Table 7: AVE and CR Statistics

Factor	AVE	CR
Factor1	0.529	0.849
Factor2	0.534	0.873
Factor3	0.567	0.887

According to Table 4.9 it can be seen that the model fitting indicating that this questionnaire has good structural validity. The model indicators show that the value of $\chi 2/df$ is 1.385, which is below the threshold of 3, confirming that the model fits well. The GFI is 0.941, the CFI is 0.986, and the NFI is 0.952, all of which are greater than 0.9, further indicating that the model has a good fit. Meanwhile, the RMSEA value is 0.035, which is less than 0.05, indicating that the model has a small error.

Table 8: Indicators of Model Fit

Common Indicators	$\chi 2$	Df	p	$\chi 2/df$	GFI	RMSEA	RMR	CFI	NFI	NNFI
Judgment Criteria	-	-	>0.05	<3	>0.9	<0.10	<0.05	>0.9	>0.9	>0.9
Refere				Klin	Shevlin	Steig	Bro	Hu	Lev	Bro

nce				e (2016)	and Miles (1998)	er (2007)	wn (2015)	and Bentler (1999)	y (2011)	wn (2015)
Value	164.851	119	0	1.385	0.941	0.035	0.046	0.986	0.952	0.984
Model Fit				Good	Good	Good	Good	Good	Good	Good
Other Indicator	TLI	AGFI	IFI	SRMR	RMSEA 90% CI					
Judgment Criteria	>0.9	>0.9	>0.9	<0.1	-					
Reference	Brown (2015)	Levy (2011)	Brown (2015)	Brown (2015)						
Value	0.984	0.855	0.986	0.027	0.021 ~ 0.047					
Model Fit	Good	Acceptable	Good	Good	Good					
Default Model: χ2(153) =3437.546, p=1.000										

The numbers on the diagonal line in Table 9 represent the root sign values of the average variance extracted (AVE) for each factor, which are 0.727 for factor 1, 0.73 for factor 2 and 0.753 for factor 3, while the other numbers in the table represent the Pearson correlation coefficients between the different factors. The correlation coefficients between Factor 1 and Factor 2 are 0.689, between Factor 1 and Factor 3 are 0.694, and between Factor 2 and Factor

3 are 0.678, and all the correlation coefficients are significant at 1% level of significance.

According to the requirement of discriminant validity, the relationship between different constructs (i.e., Pearson's correlation coefficient) should be lower than the strength of the relationship between the constructs and their indicator variables (i.e., the root value of AVE). In this study, the correlation coefficients between the factors were lower than the root value of the AVE of the corresponding factor, which meets the criteria for discriminant validity (Hair et al., 2014). This suggests that despite the significant correlations between the factors, they are statistically distinguishable and each factor captures a unique dimension of artistic creativity.

Table 9: Discriminant Validity Pearson's Correlation & AVE Root Value

	Factor 1	Factor2	Factor3
Factor1	0.727		
Factor2	0.689(0.000***)	0.730	
Factor3	0.694(0.000***)	0.678(0.000***)	0.753

Note: ***, **, * represent 1%, 5%, and 10% significance levels respectively The numbers on the diagonal are the root values of the AVE for the factor

The results of the formal survey, along with the statistical analysis and validation of the scale's reliability and validity, demonstrate that the creativity measurement scale for printmaking major students has been successfully developed.

Self-Efficacy Questionnaire:

The questionnaire was developed based on Tierney and Farmer (2002) Creative Self-efficacy Scale, with a Cronbach's **α** value of 0.81. Three-dimension Measure of Creative Self-efficacy. There are 9 items., see at Table 10.

Table 10 Self-Efficacy Questionnaire

Scale	Item	Reference
Self-Efficacy	1. I am capable of accomplishing most of the goals I set in my artistic endeavors. 2. I am confident that I can accomplish complex artistic	Tierney and Farmer (2002)

	tasks when faced with them. 3. I believe that I can effectively learn and apply new painting materials and techniques. 4. In general, I believe that I can achieve the results I want in my artwork. 5. I believe that if I am determined to work hard, I can succeed in most of my artistic endeavors. 6. I am able to successfully overcome many of the challenges encountered in the process of creating art. 7. I believe that I can perform well in many different artistic tasks. 8. I believe that I can do well in most artistic endeavors relative to others. 9. I believe that I can do quite well at art-making tasks even when they are challenging.

Intrinsic Motivation Questionnaire:

The questionnaire was developed based on the revised version of Internal Motivation Scale by X. Zhang and Bartol (2010), with a Cronbach's **α** value of 0.79. There are 6 items, see at Table 11.

Table 11 Intrinsic Motivation Questionnaire

Scale	Item	Reference
Intrinsic Motivation	1. I enjoy exploring solutions to difficult problems. 2. I enjoy coming up with creative solutions for my art projects. 3. Critical thinking is enjoyable for me. 4. I enjoy improving creative methods or exploring new means of expression in my artistic practice.	X. Zhang and Bartol (2010)

	5. I enjoy exploring and experimenting with new art materials and techniques in order to expand my creative possibilities.
	6. I am passionate about optimizing the steps of my artistic process to make it more creative and efficient.

The above scales are combined into a single questionnaire to be distributed using a Likert 5-point scale from 1-5 indicating a progressive degree of compliance, with "1" indicating very non-compliant and "5" indicating very compliant, see at Table 12.

Table 12: Questionnaire Scores and Interpretation Criteria

Answers	Scores	Range	Interpretation
Strongly Agree	5	4.51 ~ 5.00	Very High
Agree	4	3.51 ~ 4.50	High
Neutral	3	2.51 ~ 3.50	Moderate
Disagree	2	1.51 ~ 2.50	Low
Strongly Disagree	1	1.00 ~ 1.50	Very Low

Creativity Measurement Scale Validation Results

Creativity measurement scale consisted of 17 items, and captured three key dimensions: creative inspiration and practice, creative thinking and solutions, and innovation in artistic expression and skills. The reliability (Cronbach's α) of the scale was 0.952, indicating strong internal consistency and sampling adequacy. Results from EFA and CFA, along with AVE and CR values, confirmed that the scale had good construct validity and reliability, making it a robust tool for assessing creativity in printmaking students.

Current Status of Creativity in Printmaking Major Students

Table 13 presents the descriptive statistics results of the creativity among printmaking major students at public art universities, showing that the students reached a mean creativity score of 2.891, with a standard deviation of 1.287, indicating that students' creativity was suboptimal and remained at a moderate level.

In addition, the standard deviation data shows a large variation in individual student performance (with most items having a standard deviation between 1.2 and 1.3). Given this, when implementing creativity enhancement model, the individual differences among students at different levels need to be considered. Educators can adopt differentiated instructional designs and personalized guidance to address students' weaknesses and provide targeted development.

Table 13: Descriptive Statistics for Creativity Survey (n=299)

Variable	Item	Mean	SD	Interpretation
	Q1	3.025	1.324	Moderate
	Q2	2.959	1.342	Moderate
	Q3	3.009	1.316	Moderate
	Q4	2.987	1.291	Moderate
	Q5	2.853	1.301	Moderate
	Q6	2.925	1.259	Moderate
	Q7	2.474	1.131	Low
	Q8	2.387	1.317	Low
Creativity	Q9	2.837	1.278	Moderate
	Q10	2.978	1.219	Moderate
	Q11	3.034	1.309	Moderate
	Q12	2.837	1.312	Moderate
	Q13	2.978	1.307	Moderate
	Q14	2.950	1.288	Moderate
	Q15	3.034	1.294	Moderate
	Q16	2.966	1.301	Moderate
	Q17	2.912	1.305	Moderate
Total		2.891	1.287	Moderate

The Influence of Intrinsic Motivation, Self-Efficacy, and Innovative Climate on Creativity

Table 14 presents the Pearson correlation coefficients among creativity (Y), innovative

climate (X1), intrinsic motivation (X2), and self-efficacy (X3). All correlations are highly significant ($p < 0.01$), indicating strong interrelationships among the variables.

Creativity shows a strong positive correlation with innovative climate ($r = 0.926$), intrinsic motivation ($r = 0.907$), and self-efficacy ($r = 0.928$), suggesting that students with higher perceptions of an innovative environment, greater intrinsic motivation, and stronger creative confidence tend to demonstrate higher creativity levels. Additionally, intrinsic motivation and self-efficacy are positively correlated ($r = 0.888$), as are innovative climate and intrinsic motivation ($r = 0.901$), and innovative climate and self-efficacy ($r = 0.915$), highlighting their mutually reinforcing effects.

These findings indicate that innovative climate, intrinsic motivation, and self-efficacy collectively contribute to creativity development, emphasizing the need for educators to simultaneously foster a supportive environment, intrinsic drive, and confidence-building strategies to enhance students' creative potential.

Table 14: Pearson Correlation Matrix Analysis

	Y (Creativity)	X1 (Innovative Climate)	X2 (Intrinsic Motivation)	X3 (Self-Efficacy)
Y (Creativity)	1			
X1 (Innovative Climate)	0.926**	1		
X2 (Intrinsic Motivation)	0.907**	0.901**	1	
X3 (Self-Efficacy)	0.928**	0.915**	0.888**	1

* p<0.05 ** p<0.01

Hierarchical regression analysis (Table 15) was conducted to examine the effects of innovative climate (X1), intrinsic motivation (X2), and self-efficacy (X3) on creativity (Y).

In Model 1, X1 (innovative climate) was entered as the sole predictor, yielding a significant model ($F = 1894.288$, $p < 0.05$) with a strong positive effect ($\beta = 0.926$, $p = 0.000$). Adding X2 (intrinsic motivation) in Model 2 significantly improved model fit ($\Delta R^2 = 0.028$, $F = 1216.383$, $p = 0.000$), confirming its positive contribution ($\beta = 0.388$, $p = 0.000$). In Model 3, the inclusion of X3 (self-efficacy) further enhanced explanatory power ($\Delta R^2 = 0.023$, $F = 1035.607$, $p = 0.000$), with $\beta = 0.403$ ($p = 0.000$), indicating its substantial influence on creativity.

The final model explains 90.8% of the variance in creativity ($R^2 = 0.908$), with X1, X3, and X2 all exerting significant positive effects. The influence ranks as X1 (innovative climate) > X3 (self-efficacy) > X2 (intrinsic motivation), suggesting that while intrinsic motivation is crucial, a supportive environment and confidence building factors play a more decisive role in fostering creativity among printmaking students.

Table 15: Results of Hierarchical Regression Analysis (n=299)

	Layer 1				Layer 2				Layer 3			
	B	Standard Error	p	β	B	Standard Error	p	β	B	Standard Error	p	β
Constants	0.256**	0.065	0	-	0.187**	0.059	0.002	-	0.145**	0.053	0.006	-
X1	0.909**	0.021	0	0.926	0.566**	0.043	0	0.576	0.324**	0.047	0	0.329
X2					0.363**	0.041	0	0.388	0.236**	0.039	0	0.253
X3									0.385**	0.043	0	0.403
R^2	0.857				0.885				0.908			
Adjustment R^2	0.856				0.884				0.907			
F-value	F (1,317)=1894.288,p=0.000				F (2,316)=1216.383,p=0.000				F (3,315)=1035.607,p=0.000			
$\triangle R^2$	0.857				0.028				0.023			
$\triangle$F value	F (1,317)=1894.288,p=0.000				F (1,316)=78.050,p=0.000				F (1,315)=78.375,p=0.000			

Note: Dependent variable = Y

* p<0.05 ** p<0.01

Key Components of a Creativity Enhancement Training Model

Based on theoretical foundations, survey findings, and expert interviews, the Creativity Enhancement Training Model is designed to enhance creativity among printmaking students through a structured approach. The model consists of three core dimensions: Innovative Climate, Intrinsic Motivation, and Self-Efficacy, each supported by specific teaching strategies (Figure 1).

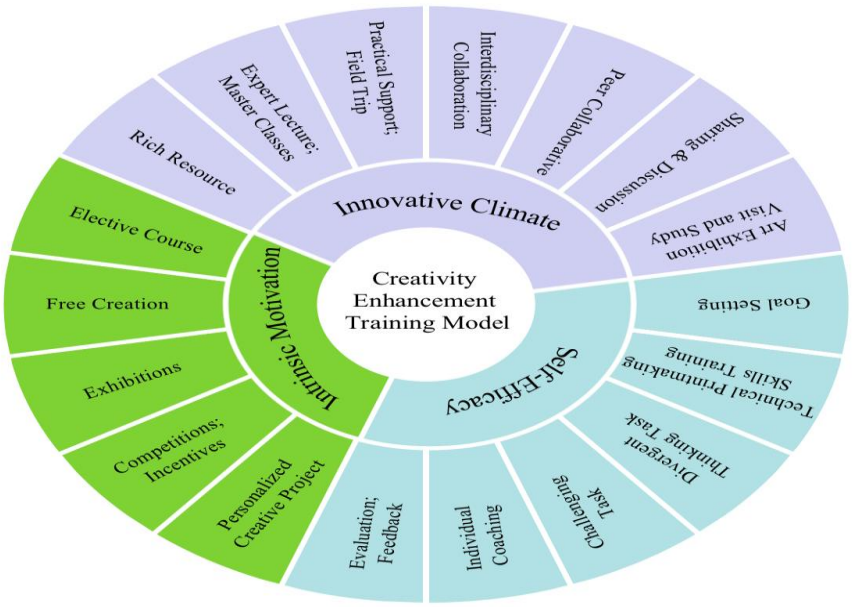

Figure 1 Creativity Enhancement Training Model

The model was constructed based on the data analysis results, which revealed that innovative climate had the strongest impact on creativity, followed by self-efficacy and intrinsic motivation. Given this ranking, the model prioritizes establishing an innovative and resource-rich learning environment, which serves as the foundation for fostering intrinsic motivation and enhancing students' self-efficacy.

Additionally, expert validation played a crucial role in refining the model. Seven experts (three educational administrators and four printmaking instructors, all associate professors or higher) provided valuable insights into optimizing the training framework. Their collective experience, ranging from 5 to 25 years in art education, helped ensure that the model aligns with contemporary pedagogical best practices.

The experts emphasized that a stimulating and well-supported environment is the cornerstone of creative development. The experts proposed structured technical training,

where students first develop fundamental printmaking skills before progressing to more complex tasks. They also recommended frequent feedback sessions, interactive demonstrations by professional artists, and problem-based learning activities to foster students' confidence in their creative abilities. Then, Experts highlighted that motivation increases when students are given autonomy in creative projects. Assignments should encourage personalized themes, while recognition mechanisms such as competitions, exhibitions, and awards further incentivize student engagement. Furthermore, they suggested integrating interdisciplinary collaboration, peer discussions, and external exhibitions to expose students to diverse creative influences.

Core Dimensions and Their Implementation

Innovative Climate

A supportive and stimulating learning environment plays a crucial role in fostering creativity. This model integrates the following strategies:

Rich Resources: Providing diverse materials, tools, and references to inspire experimentation.

Expert Lectures & Master Classes: Engaging professional artists and educators to share creative insights and technical expertise.

Practical Support & Field Trips: Organizing hands-on learning experiences beyond the classroom to broaden artistic perspectives.

Interdisciplinary Collaboration: Encouraging cooperation across artistic disciplines to promote creative synergy.

Peer Collaboration & Discussion: Implementing group critiques and brainstorming sessions to foster diverse perspectives.

Art Exhibition Visits & Studies: Exposing students to historical and contemporary works to inspire their own artistic development.

Intrinsic Motivation

Intrinsic motivation drives students to engage in creative tasks with enthusiasm. This model enhances motivation through:

Personalized Creative Projects: Allowing students to develop self-directed projects aligned with their artistic interests.

Competitions & Incentives: Encouraging participation in creative challenges to boost

engagement and recognition.

Exhibitions: Providing platforms for students to showcase their work and receive external validation.

Free Creation: Offering unstructured time for students to explore ideas without constraints.

Elective Courses: Enabling students to tailor their learning experiences to their creative aspirations.

Self-Efficacy

Building students' confidence in their creative abilities is essential for sustained innovation. This is achieved through:

Goal Setting: Helping students define personal and artistic objectives.

Technical Printmaking Skills Training: Strengthening foundational skills to improve creative execution.

Divergent Thinking Tasks: Encouraging open-ended problem-solving and idea generation.

Challenging Tasks: Assigning complex creative challenges to push students beyond their comfort zones.

Individual Coaching: Providing personalized mentorship and guidance.

Evaluation & Feedback: Offering constructive critiques to reinforce self-belief and artistic growth.

Conclusion

The findings of this study systematically address all five research objectives. The validation of the creativity measurement scale (Objective 1) was achieved through comprehensive psychometric testing, demonstrating excellent reliability (α=0.952) and a robust three-factor structure. Assessment of creativity status (Objective 2) revealed moderate levels among printmaking students (mean=2.891), indicating room for improvement. Statistical analysis confirmed that innovative climate, intrinsic motivation, and self-efficacy all positively influence creativity (Objective 3), with correlation coefficients ranging from 0.907 to 0.928. Hierarchical regression determined the relative importance of these factors (Objective 4), identifying innovative climate as the strongest predictor (β=0.329), followed by self-efficacy (β=0.403) and intrinsic motivation (β=0.253). These empirical findings informed the

development of a comprehensive training model (Objective 5) incorporating three dimensions with specific teaching strategies for each component. The following sections detail these findings.

Summarize Discussion and Recommendations

Summarize

This study developed a creativity enhancement training model for printmaking major students based on empirical evidence that innovative climate, intrinsic motivation, and self-efficacy significantly impact creative performance. Findings confirmed that an innovative climate exerts the strongest influence on creativity, followed by self-efficacy and intrinsic motivation. The proposed model offers a structured framework incorporating expert lectures, collaborative projects, technical training, and personalized feedback to foster creativity development. This research provides both theoretical insights into the multidimensional nature of creativity and practical guidance for educators seeking to enhance creative potential in printmaking education

Discussion

This study's findings reveal several significant insights that warrant detailed discussion in relation to existing literature. The hierarchical relationship identified among innovative climate, self-efficacy, and intrinsic motivation offers a particularly interesting perspective on creativity development in printmaking education. Our findings highlight that the impact of an innovative climate on students' creativity is not isolated but closely intertwined with intrinsic motivation and self-efficacy. The strong correlation between students' perception of an innovative climate and their creativity ($r=0.926$) underscores the importance of a supportive, resource-rich environment in fostering both motivation and confidence, which, in turn, sustains creative engagement and innovation.

These results align with previous research suggesting that a stimulating learning environment not only enhances creativity directly but also strengthens students' internal drive and belief in their creative abilities (Hennessey & Amabile, 2010; Karimi et al., 2021). He et al. (2019) further emphasized that an innovative climate reinforces students' confidence in their creative potential, encouraging persistence in creative endeavors. Additionally, Chen et al. (2023) proposed that creative self-efficacy acts as a catalyst for intrinsic motivation, thereby boosting students' creative performance.

The finding that creativity among printmaking students currently remains at a moderate level (mean=2.891) despite specialized training in art universities corroborates earlier studies documenting the gap between expected and actual creative development in arts education (Fan & Cai, 2022). This result supports Wisesa, A.M. et al. (2021) assertion that inconsistent creativity measurement standards and inadequate assessment systems in higher education complicate systematic development efforts.

The role of structured educational interventions in fostering creativity has also been widely recognized (Gündoğdu & Merç, 2022; Hennessey, 2010). Deng et al. (2022) found that systematic creativity-focused interventions can significantly enhance art students' creative abilities. Our proposed training model, which incorporates innovative climate, intrinsic motivation, and self-efficacy dimensions, reinforces that creativity development is a multidimensional process, where sustained educational support helps students not only refine technical skills but also develop a more personalized creative approach.

Ultimately, this study underscores the dynamic interplay between innovative climate, intrinsic motivation, and self-efficacy, forming a mutually reinforcing cycle. An innovative climate nurtures intrinsic motivation, which, in turn, strengthens self-efficacy and confidence in creative abilities. By leveraging these interconnected factors, educators can design comprehensive training models that enhance students' creative potential and support long-term artistic growth.

Recommendations

Based on the findings of this study, several recommendations are offered to enhance creativity among printmaking students in higher education. First, art universities should prioritize establishing supportive, resource-rich environments that encourage experimentation and risk-taking, as innovative climate emerged as the strongest predictor of student creativity. This could include developing well-equipped studios, organizing regular artist demonstrations, and creating dedicated spaces for interdisciplinary collaboration. Second, educational administrators should implement structured technical training programs that balance skill development with creative exploration, ensuring students possess the necessary technical foundations to execute their creative visions. Third, instructors should adopt personalized coaching approaches that provide regular constructive feedback while respecting students' artistic autonomy, thereby strengthening their creative self-efficacy. Fourth, curriculum designers should incorporate more project-based assignments with real-world applications,

such as community exhibitions or collaborative industry projects, to enhance intrinsic motivation through meaningful engagement. Fifth, educational institutions should establish formal evaluation systems that recognize and reward creative achievement through exhibitions, competitions, and public recognition opportunities. Finally, future research should experimentally implement and evaluate the proposed Creativity Enhancement Training Model through longitudinal studies to assess its long-term effectiveness and adaptability across different educational contexts and artistic disciplines.

Recommendations for Future Research

Sample Generalizability: The study focuses on three public art universities in Southwest China, which may limit broader applicability. Future research could explore creativity models in different cultural and institutional contexts.

Limitations of Other Factors Influencing Creativity: While this study focused on innovative climate, intrinsic motivation, and self-efficacy, other factors (e.g., personality traits, cognitive flexibility) may also influence creativity. Future research could adopt a more comprehensive model incorporating additional variables.

Experimental Validation of the Training Model: This study proposed a creativity enhancement training model based on empirical findings; however, its effectiveness has yet to be systematically tested through implementation. Future research should conduct an experimental study, implementing the model in a real classroom setting and using a pre-test and post-test design to measure changes in students' creativity over time. This would provide direct evidence of the model’s impact and further refine its structure for broader application in art education.

Recommendations Practical Implications

The proposed model provides a structured yet flexible framework for fostering creativity in printmaking education. By integrating an innovative climate, intrinsic motivation, and self-efficacy, it offers a comprehensive approach to developing students’ creative potential. Future research can explore the long-term impact of this model and its adaptability to other art disciplines.

New Knowledge from Research

This study contributes significant new knowledge through the development of a comprehensive creativity enhancement training model specifically tailored for printmaking

education, grounded in empirical evidence that innovative climate, self-efficacy, and intrinsic motivation collectively explain 90.7% of variance in students' creativity. The research established a hierarchical relationship among these factors—with innovative climate demonstrating the strongest influence (β=0.329), followed by self-efficacy (β=0.403) and intrinsic motivation (β=0.253)—challenging previous assumptions that intrinsic motivation is the primary driver of creativity in educational contexts. This finding informed the model's three-dimensional structure, which prioritizes environmental interventions (expert lectures, collaborative learning environments, art exhibition visits) while simultaneously addressing psychological factors through technical skill development, personalized projects, constructive feedback mechanisms, and goal-setting strategies. The validated creativity measurement scale with its three-factor structure (creative inspiration and practice, creative thinking and solutions, and innovation in artistic expression and skills) provides educators with a reliable instrument to assess and track students' creative development, addressing the critical gap between educational objectives and outcomes in printmaking education where creativity levels currently remain at moderate levels despite specialized training.

Reference

Abdullah, M., et.al. (2023). An expanded drawing terminology from the arts and design perspective for higher education and professionals. *International Journal of Academic Research in Progressive Education and Development, 12(2),* 1331-1340.

Amabile, T. M. (2018). *Creativity in context: Update to the social psychology of creativity*: Routledge.

Amabile, T. M., & Amabile, T. M. (1983). *The case for a social psychology of creativity*. The Social Psychology of Creativity, 3-15.

Amabile, T. M., & Gryskiewicz, N. D. (1989). The creative environment scales: Work environment

inventory. *Creativity research journal, 2(4)*, 231-253.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. In: Freeman.

Deci, E. L., & Ryan, R. M. (2013). *Intrinsic motivation and self-determination in human behavior*: Springer Science & Business Media.

Deng, B., et.al. (2022). The influence of innovation climate on creative role identity: the mediating role of flow. *Frontiers in Psychology, 13*, 866464.

Fan, M., & Cai, W. (2022). How does a creative learning environment foster student creativity? An examination on multiple explanatory mechanisms. *Current Psychology, 41(7),* 4667-4676.

Gündoğdu, B., & Merç, A. (2022). A systematic review of tech-supported collaborative creativity practices in the field of education. *Journal of Learning and Teaching in Digital Age, 7(1*), 76-89.

Hair, J. F., et.al. (2014). Common beliefs and reality about partial least squares: comments on Rönkkö and Evermann.

Hennessey, B. A. (2010). The creativity-motivation connection. *The Cambridge handbook of creativity, 2010,* 342-365.

Isaksen, S. G. (1999). A Review of Creativity Research: State of the Art and Future Directions. *Journal of Educational Research, 43(4)*, 357–374.

Karimi, S.,et. al. (2022). The relationship between proactive personality and employees' creativity: the mediating role of intrinsic motivation and creative self-efficacy. *Economic research-Ekonomska istraživanja, 35(1)*, 4500-4519.

Liu, Y. (2010). An Empirical Research on the Relationship Between Organizational Innovative Climate and Employee Innovative Behavior [PhD].

McNeish, D., An, J., & Hancock, G. (2018). The Thorny Relation Between Measurement Quality and Fit Index Cutoffs in Latent Variable Models. *Journal of Personality Assessment, 100*, 43-52. doi:10.1080/00223891.2017.1281286

Nkansah, B. (2018). On the Kaiser-Meier-Olkin's Measure of Sampling Adequacy. *Mathematical theory and modeling, 8*, 52-76. Retrieved from https://consensus.app/papers/on-the-kaisermeierolkin-%E2%80%99-s-measure-of-sampling-adequacy-nkansah/86860bb5913353d0afc436b1cfb1ec0c/

Onatski, A. (2010). Determining the Number of Factors from Empirical Distribution of Eigenvalues. *The Review of Economics and Statistics, 92,* 1004-1016. doi:10.1162/REST_a_00043

Rhemtulla, M., et. al. (2012). When can categorical variables be treated as continuous? A comparison of robust continuous and categorical SEM estimation methods under suboptimal conditions. *Psychological methods, 17(3)*, 354-373. doi:10.1037/a0029315

Ritter, S. M., et. al. (2020). Fostering students' creative thinking skills by means of a one-year creativity training program. *PLoS ONE, 15(3*), e0229773.

Tett, R. P., & Burnett, D. D. (2003). A personality trait-based interactionist model of job performance. *Journal of applied psychology, 88(3*), 500.

Tierney, P., & Farmer, S. M. (2002). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of management Journal, 45(6*), 1137-

1148.

Wang, D., et.al. (2020). The effect of innovative self-efficacy on creative achievement: the moderating effect of perseverance. *Chinese Social Psychology Review, 19(2*), 194–217.

Wisesa, A. M., et. al. (2021). *Making Prints: How Learning Printmaking During Pandemic Can Boost Students' Creativity.* Proceedings of the Ninth International Conference on Language and Arts (ICLA 2020). doi:10.2991/ASSEHR.K.210325.064

Wu, H.-T., et.al. (2015). Development of a Psychological Well-being Scale for College Students in Taiwan. *Asian journal of management sciences & education, 4*, 1-8. Retrieved from https://consensus.app/papers/development-of-a-psychological-wellbeing-scale-for-wu-wu/cd49b0e2968050999eeb1a10f9d7ea33/

Zhang, J. (2023). A study on the impact of organizational support on employee loyalty: using organizational identity as a mediation. The EUrASEANs. *Journal on global socio-economic dynamics, 6(43)*, 104-110.

Zhang, X., & Bartol, K. M. (2010). Linking empowering leadership and employee creativity: The influence of psychological empowerment, intrinsic motivation, and creative process engagement. *Academy of management Journal, 53(1*), 107-128.