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The influence of visual literacy and creativity on the quality of self-photographic compositions in vocational high school

Muhammad Randi Hidayat^{*}, Yuliarma Yuliarma, Yasdinul Huda, M. Giatman
Universitas Negeri Padang, Padang, Indonesia

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ABSTRACT

This study examined the independent and combined associations of visual literacy and creativity with photographic composition quality among vocational high school students. A quantitative correlational design involved 32 students selected through total sampling. Visual literacy and creativity were assessed using validated questionnaires, while photographic composition quality was evaluated using a performance-based rubric. Data were analyzed using multiple linear regression. Visual literacy showed a negative, nonsignificant association ($\beta = -0.531$, $p = 0.204$), whereas creativity demonstrated a positive, nonsignificant association ($\beta = 0.655$, $p = 0.120$). The overall model was nonsignificant ($F(2,29) = 1.335$, $p = 0.279$), explaining 8.4% of the variance ($R^2 = 0.084$). Neither predictor demonstrated statistically significant associations with photographic composition quality. These findings indicate limited explanatory power and highlight the need for broader investigations incorporating technical competencies, practical experience, and objective assessments.



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Corresponding Author:

Muhammad Randi Hidayat,
Universitas Negeri Padang,
Email: Muhammadhidayat96@guru.smk.belajar.id

Introduction

Photography is an essential component of Visual Communication Design education, integrating technical skills, aesthetic judgment, and visual communication competencies. In vocational education, students are expected to apply compositional principles, including the rule of thirds, framing, leading lines, visual balance, and focal points, to produce meaningful photographic works. However, understanding these principles does not necessarily guarantee their effective application in photographic practice. Students may recognize visual concepts but experience difficulties translating them into coherent compositions due to differences in technical proficiency, aesthetic judgment, and practical experience. This discrepancy between conceptual understanding and demonstrated performance represents an important concern in competency-based vocational education. Therefore, identifying factors associated with photographic composition quality is necessary to understand students' ability to transform visual knowledge into practical photographic outcomes (Aji, 2021; Alyatalathaf, 2023; Hoh et al., 2023; Prasetyo & Resmika, 2024; Fania et al., 2025).

Visual literacy and creativity are theoretically distinct but potentially complementary competencies influencing photographic composition. Visual literacy involves recognizing, interpreting, analyzing, and evaluating visual information, enabling students to understand spatial relationships, visual hierarchy, and compositional balance. Creativity, meanwhile, encompasses originality, flexibility, fluency, and elaboration in

generating innovative visual ideas. In photography, visual literacy may support accurate compositional judgments, whereas creativity encourages experimentation with perspectives, framing, and subject arrangement. However, these competencies may not directly translate into photographic performance because conceptual understanding and creative potential differ from technical execution. Furthermore, self-reported competencies may not accurately represent students demonstrated abilities. Examining their statistical relationships with photographic composition quality is therefore essential for understanding the cognitive and creative dimensions of photographic performance (Debes, 1969; Avgerinou & Pettersson, 2011; Brumberger, 2019; Brown, 2024; He & Chiang, 2024).

Previous studies have investigated photography education, visual literacy, creativity, and visual competency assessment through various approaches. Research on photography-based learning and digital portfolios has explored the development of photographic skills and creative expression, while studies on visual exploration have examined originality in artistic production. Other investigations have emphasized performance-based assessment to evaluate observable visual competencies. These studies collectively suggest that photographic performance involves cognitive, creative, aesthetic, and practical dimensions. However, existing research has primarily focused on instructional strategies, creativity development, or visual assessment as separate areas of investigation. Consequently, evidence regarding the independent and combined associations of visual literacy and creativity with photographic composition quality remains limited, particularly in vocational education. This limitation highlights the importance of examining both competencies within a unified statistical framework using authentic photographic outcomes (Ekayanti et al., 2020; Kárpáti & Paál, 2022; van de Kamp et al., 2022; Kasemsarn et al., 2023; Oktora et al., 2026).

Despite these developments, an empirical gap remains concerning how students' perceived visual literacy and creativity relate to their demonstrated photographic composition quality. Previous research has examined visual communication, aesthetic judgment, and creativity assessment, but has provided limited direct evidence of their simultaneous explanatory contributions to performance-based photographic outcomes. This distinction is important because questionnaire-based measurements reflect perceived competencies, whereas photographic assessment evaluates observable compositional skills. Moreover, potential conceptual overlap between visual literacy and creativity may influence their individual statistical associations when analyzed simultaneously. Therefore, examining these variables within a single regression model may clarify their respective explanatory contributions without assuming causal relationships. Addressing this gap offers context-specific evidence concerning the relationship between cognitive, creative, and practical competencies in vocational photography education (Alshawaf, 2021; Tallon et al., 2022; Ramón-Verdú & Villalba-Gómez, 2022; Ul Haq & Pifarré, 2023; Kamalvand & Khany, 2024).

This study examines the independent and simultaneous associations of visual literacy and creativity with photographic composition quality among vocational high school students enrolled in an elective Visual Communication Design subject at SMK Negeri 7 Sijunjung, Indonesia. A quantitative ex post facto correlational design was employed, using structured questionnaires to assess visual literacy and creativity and a performance-based rubric to evaluate students' photographic compositions. The study's novelty lies in integrating both competencies within a unified regression model while distinguishing self-reported abilities from actual photographic performance. Specifically, the analysis investigates their individual statistical associations and combined explanatory contribution to photographic composition quality. Unlike approaches focusing exclusively on perceived competencies or instructional activities, this study incorporates assessment of authentic photographic products. The findings are expected to provide empirical insights into the explanatory relevance of visual literacy and creativity and inform future competency assessment and photography education research (Kress & van Leeuwen, 2006; Kolb & Kolb, 2017; Özsoy & Sarıbaş, 2021; Di, 2022; Gupta et al., 2024).

Method

Study Design

This study employed a quantitative, nonexperimental, ex post facto correlational design to investigate the associations between visual literacy, creativity, and photographic composition quality among vocational high school students. Visual literacy and creativity were specified as predictor variables, while photographic composition quality served as the outcome variable. This design was selected to examine statistical relationships among naturally occurring student characteristics and demonstrated photographic performance without manipulating instructional conditions. Participants were drawn from two existing classes receiving the same instructional activities, with neither class assigned to an experimental or control condition. Multiple linear regression was employed to estimate the independent associations and combined explanatory contribution of both predictors. Given the observational design, the findings were interpreted as statistical associations rather than causal effects.

Study Setting and Participants

The study was conducted at SMK Negeri 7 Sijunjung, West Sumatra, Indonesia, between July 20 and August 20, 2026. The target population comprised Grade XI Computer and Network Engineering students enrolled in the elective Visual Communication Design course. Total sampling was applied to include the entire accessible population of 32 students, consisting of 22 students from Class XI TKJ 1 and 10 students from Class XI TKJ 2. Each student constituted an independent observational unit in the dataset. The sample represented the accessible population rather than a probability-based sample of vocational students. Consequently, the limited sample size, unequal class distribution, and single-school setting were considered when interpreting statistical estimates and their generalizability. An independent pilot study involving 25 students from SMK Negeri 4 Sijunjung was conducted on July 13, 2026, to evaluate the research instruments. Pilot participants were excluded from the main analysis.

Research Instruments

Three instruments were employed to assess the study variables. Visual literacy was measured using a 20-item questionnaire encompassing five dimensions: understanding visual elements, recognizing visual structures, interpreting visual messages, analyzing visual relationships, and evaluating visual quality. Creativity was assessed using a separate 20-item questionnaire covering fluency, flexibility, originality, elaboration, and evaluation of ideas. Both instruments used five-point Likert response scales ranging from 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating stronger perceived competencies.

Photographic composition quality was assessed using a performance-based rubric comprising five components: rule of thirds, framing, leading lines, visual balance, and focal point. Each component was evaluated using a five-point rating scale, with higher scores indicating better compositional performance. Unlike the self-report questionnaires, the photographic rubric evaluated observable characteristics of students' completed photographic works. This distinction was maintained to differentiate perceived visual and creative competencies from demonstrated photographic performance.

Instrument Validity and Reliability

Instrument evaluation involved expert judgment and empirical pilot testing. Content validation examined the correspondence between questionnaire items, assessment criteria, and their underlying theoretical dimensions. The instruments were subsequently piloted with 25 vocational students from a different school who had comparable educational characteristics and photography-related learning experiences.

Questionnaire item screening employed Pearson item-total correlations and corrected item-total correlations. Using a significance level of 0.05 and 23 degrees of freedom, the critical correlation coefficient was 0.3961. All 40 questionnaire items demonstrated positive item-total correlations exceeding this threshold.

Internal consistency was assessed using Cronbach's alpha, with 0.70 established as the minimum operational threshold. The visual literacy and creativity questionnaires yielded coefficients of 0.9729 and 0.9715, respectively, while the photographic composition rubric demonstrated a coefficient of 0.9215. These values indicated high internal consistency within the pilot dataset. Nevertheless, the exceptionally high questionnaire coefficients may indicate substantial overlap among items and should not be interpreted as definitive evidence of construct validity. Furthermore, internal consistency of the photographic rubric does not establish agreement between evaluators, as inter-rater reliability coefficients were not available.

Data Collection Procedures

Data collection involved questionnaire administration, photographic performance assessment, and supporting documentation. All 32 participants completed the visual literacy and creativity questionnaires based on their perceived competencies and photography-related learning experiences. Students subsequently submitted photographic works produced as part of their elective Visual Communication Design assignments.

The photographic products were evaluated using the predefined rubric covering the rule of thirds, framing, leading lines, visual balance, and focal point. More than one evaluator with relevant expertise in photography or visual communication design participated in the assessment process. Component scores were combined to obtain an overall photographic composition quality score for each participant.

Questionnaire responses and photographic assessment results were organized into an individual-level dataset, with each participant represented by one observation. Supporting documentation included student enrollment records, photographic products, and research activity records. However, detailed information concerning photographic equipment, standardized shooting conditions, assessment duration, and procedures for resolving discrepancies between evaluators was not available in the reported methodology. These aspects were therefore considered potential sources of measurement variability.

Statistical Analysis

Statistical analyses were conducted using IBM SPSS Statistics, with statistical significance established at $p < 0.05$. Preliminary data screening examined response completeness, score ranges, and consistency of participant identification. Descriptive statistics, including means, standard deviations, frequencies, percentages, and observed score ranges, were calculated to summarize participant characteristics and the distributions of the study variables.

Multiple linear regression using the Enter method was performed to examine the independent and simultaneous associations of visual literacy and creativity with photographic composition quality. Both predictors were entered simultaneously into the regression model, expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

where Y represents photographic composition quality, X_1 denotes visual literacy, X_2 represents creativity, β_0 is the intercept, β_1 and β_2 are regression coefficients, and ε represents the residual error.

Individual regression coefficients were evaluated using t -tests, while the overall model was assessed using an F -test. Model explanatory performance was summarized using the coefficient of determination (R^2) and adjusted R^2 . Standardized and unstandardized regression coefficients were used to describe the direction and magnitude of the estimated associations.

The interpretation of regression findings requires consideration of linearity, residual normality, homoskedasticity, influential observations, and multicollinearity. However, complete diagnostic results were not available in the reported analysis; therefore, compliance with these assumptions could not be independently established. Given the sample size of 32 participants, regression estimates and nonsignificant findings were interpreted cautiously, particularly regarding statistical precision and the possibility of undetected associations. No causal interpretations were drawn from the observed relationships.

Results and Discussions

Visual Literacy, Creativity, and Photographic Composition Quality among Vocational High School Students

This section presents the findings of a quantitative correlational study examining the relationships between visual literacy, creativity, and photographic composition quality among 32 Grade XI students enrolled in the elective Visual Communication Design (DKV) subject at SMK Negeri 7 Sijunjung, Indonesia. The results are organized into five tables covering participant characteristics, descriptive statistics, multiple regression coefficients, simultaneous hypothesis testing, and model explanatory power. Each table is followed by an academic interpretation based on the statistical findings reported in Chapter IV of the thesis. Statistical significance was evaluated at the 0.05 level.

Participant Characteristics

Table 1. Distribution of Study Participants by Class

Class	Frequency (n)	Percentage (%)
Grade XI TKJ 1	22	68.75
Grade XI TKJ 2	10	31.25
Total	32	100.00

Source: Primary research data reported in Chapter IV of the thesis.

Table 1 presents the distribution of participants across the two Grade XI classes included in the study. A total of 32 students participated, comprising 22 students (68.75%) from Grade XI TKJ 1 and 10 students (31.25%) from Grade XI TKJ 2. All eligible students enrolled in the elective Visual Communication Design subject were included in the analysis, representing the entire accessible study population. Both classes received the same instructional activities, without experimental treatment or assignment to control and intervention groups. Furthermore, all 32 participants were retained in the statistical analysis, with no cases excluded from the reported procedures. These characteristics establish the composition and completeness of the dataset used to examine the relationships between visual literacy, creativity, and photographic composition quality.

Descriptive Statistics of the Study Variables

Table 2 summarizes the descriptive characteristics of the three principal study variables. Visual literacy had a mean score of 66.53 ($SD = 10.692$), with observed scores ranging from 47 to 94, indicating variability in students' self-reported abilities to interpret, analyze, and evaluate visual information. Creativity demonstrated a slightly higher mean score of 69.63 ($SD = 13.127$), with values ranging from 43 to 96, suggesting greater dispersion in

students reported creative tendencies than in their visual literacy scores. Meanwhile, photographic composition quality, assessed through a performance-based rubric, had a mean score of 80.87 (SD = 5.266), reflecting comparatively lower variability in the evaluated photographic work. Although these descriptive findings illustrate differences in score distributions, they do not independently establish statistical relationships between the variables. Furthermore, the different measurement methods require caution when directly comparing questionnaire scores with photographic performance scores.

Table 2. Descriptive Statistics for Visual Literacy, Creativity, and Photographic Composition Quality

Variable	n	Mean	SD	Minimum	Maximum
Visual literacy (X_1)	32	66.53	10.692	47	94
Creativity (X_2)	32	69.63	13.127	43	96
Photographic composition quality (Y)	32	80.87	5.266		

Note: SD = standard deviation. Minimum and maximum values for photographic composition quality were not explicitly established in the available descriptive summary and are therefore not reported.

Multiple Linear Regression Analysis

Table 3 presents the multiple linear regression coefficients examining the independent associations of visual literacy and creativity with photographic composition quality. The regression equation was expressed as $\hat{Y} = 79.997 - 0.262X_1 + 0.263X_2$. Visual literacy exhibited a negative regression coefficient ($B = -0.262$, $\beta = -0.531$), indicating that a one-unit increase in visual literacy was associated with a predicted decrease of 0.262 units in photographic composition quality when creativity was held constant. However, this association was not statistically significant ($t = -1.299$, $p = 0.204$). Conversely, creativity demonstrated a positive regression coefficient ($B = 0.263$, $\beta = 0.655$), indicating that a one-unit increase in creativity was associated with a predicted increase of 0.263 units in photographic composition quality when visual literacy was controlled. Nevertheless, this association was also statistically nonsignificant ($t = 1.600$, $p = 0.120$). These findings indicate that neither visual literacy nor creativity demonstrated a statistically significant independent association with photographic composition quality in the regression model. The standardized coefficients should be interpreted cautiously because the available documentation does not establish whether multicollinearity was adequately assessed.

Table 3. Multiple Linear Regression Coefficients for Predicting Photographic Composition Quality

Predictor	B	Standardized β	t	p-value
Constant	79.997			
Visual literacy (X_1)	-0.262	-0.531	-1.299	0.204
Creativity (X_2)	0.263	0.655	1.600	0.120

Note: B = unstandardized regression coefficient; β = standardized regression coefficient. Dependent variable: photographic composition quality. Significance level: $\alpha = 0.05$.

Simultaneous Effect of Visual Literacy and Creativity on Photographic Composition Quality

Table 4 presents the analysis of variance conducted to determine whether visual literacy and creativity were jointly associated with photographic composition quality. The regression model produced a regression sum of squares of 72.450 and a residual sum of squares of 787.050, resulting in a total sum of squares of 859.500. The overall regression analysis yielded an F-statistic of 1.335 with 2 and 29 degrees of freedom and a corresponding p-value of 0.279. Since the observed probability exceeded the predetermined significance threshold of 0.05, the overall regression model was not statistically significant, $F(2, 29) = 1.335$, $p = 0.279$. Accordingly, the null hypothesis that both regression coefficients were simultaneously equal to zero could not be rejected. These findings suggest that the combined inclusion of visual literacy and creativity did not provide a statistically significant improvement in predicting photographic composition quality compared with an intercept-only model. Therefore, the proposed joint statistical relationship between the two predictors and photographic composition quality was not supported by the available data.

Table 4. Analysis of Variance for the Multiple Linear Regression Model

Source	Sum of Squares	df	Mean Square	F	p-value
Regression	72.450	2	36.225	1.335	0.279
Residual	787.050	29	27.140		
Total	859.500	31			

Note: df = degrees of freedom; F = overall regression F-statistic. Statistical significance was determined at $p < 0.05$.

Model Summary and Explanatory Power

Table 5 summarizes the explanatory capacity of the multiple linear regression model incorporating visual literacy and creativity as predictors of photographic composition quality. The multiple correlation coefficient was 0.290, indicating a relatively weak overall correspondence between the observed composition quality scores and those predicted by the regression model. The coefficient of determination ($R^2 = 0.084$) indicated that visual literacy and creativity collectively accounted for approximately 8.4% of the observed variance in photographic composition quality, while the remaining 91.6% was not explained by the included predictors. After adjustment for the number of predictors and sample size, the adjusted R^2 decreased to 0.021, indicating that the model accounted for approximately 2.1% of the variance after adjustment. Furthermore, the standard error of the estimate was 5.210, reflecting the dispersion of observed composition quality scores around their predicted values. Taken together with the nonsignificant overall F-test, these findings indicate limited explanatory performance of the regression model within the examined sample. The unexplained variance cannot be attributed to particular external factors without additional empirical investigation.

Table 5. Model Fit and Coefficient of Determination for Photographic Composition Quality

Model	R	R^2	Adjusted R^2	Standard Error of Estimate
Visual literacy and creativity	0.290	0.084	0.021	5.210

Note: R = multiple correlation coefficient; R^2 = coefficient of determination. Predictors: visual literacy and creativity. Dependent variable: photographic composition quality.

The findings revealed that visual literacy was not significantly associated with photographic composition quality ($B = -0.262$, $\beta = -0.531$, $t = -1.299$, $p = 0.204$). The mean visual literacy score was 66.53 ($SD = 10.692$), while photographic composition quality reached 80.87 ($SD = 5.266$). These findings suggest that students' perceived understanding of visual elements does not necessarily correspond to their ability to apply compositional principles in photographic practice. The negative coefficient should not be interpreted as evidence of a detrimental effect because the relationship was statistically nonsignificant. This finding highlights the importance of integrating visual interpretation with practical photographic experience to develop visual communication competencies (Chuang & Tang, 2019; Lobinger et al., 2022; Selfe, 2004; Vissers & Wagemans, 2023).

Creativity demonstrated a positive but statistically nonsignificant association with photographic composition quality ($B = 0.263$, $\beta = 0.655$, $t = 1.600$, $p = 0.120$). The mean creativity score was 69.63 ($SD = 13.127$), indicating considerable variation in students' self-reported creative abilities. Although creativity theoretically supports originality, flexibility, and visual exploration, these characteristics may not consistently translate into effective photographic compositions without sufficient technical proficiency and practical experience. This finding suggests that creative potential and demonstrated photographic performance represent related but distinct competencies that require integrated instructional development (Bitemirova et al., 2026; Lewandowski & Lewandowska, 2017; Lugya, 2018; Offen, 2017).

The simultaneous regression analysis indicated that visual literacy and creativity did not significantly predict photographic composition quality, $F(2, 29) = 1.335$, $p = 0.279$. The model explained only 8.4% of the observed variance ($R^2 = 0.084$), with an adjusted R^2 of 0.021, indicating limited explanatory power. These findings suggest that photographic composition quality may also be associated with other factors, including technical skills, practical experience, instructional feedback, and visual problem-solving abilities. However, these potential factors were not directly examined in the present study. The findings reinforce the importance of considering photographic competence as a multidimensional outcome involving cognitive, creative, and practical learning processes (Kotik-Friedgut et al., 2014; Plaksitskaya et al., 2025; Stroupe et al., 2018; Zhou & Yang, 2026).

The findings provide implications for photography education in vocational schools. Despite a mean photographic composition quality score of 80.87 ($SD = 5.266$), neither visual literacy ($p = 0.204$) nor creativity ($p = 0.120$) demonstrated a significant independent association with photographic performance. Therefore, photography instruction should integrate visual analysis, creative exploration, practical assignments, and structured feedback rather than relying exclusively on conceptual understanding. Learning activities involving photographic evaluation, experimentation with composition, and portfolio development may facilitate the application of visual knowledge and creative ideas. These recommendations are consistent with experiential learning principles and previous research emphasizing practice-oriented approaches to photography education (Larsson et al., 2024; Parida et al., 2025; Shahria et al., 2019; Walldén & Winlund, 2025).

Several limitations should be considered when interpreting the findings. The relatively small sample of 32 students from a single vocational school limits statistical power and generalizability. Additionally, visual literacy and creativity were measured through self-report questionnaires, whereas photographic composition quality was assessed using a performance-based rubric. The absence of complete regression diagnostic results and inter-rater

reliability estimates also warrants caution. The limited explanatory power ($R^2 = 0.084$; adjusted $R^2 = 0.021$) indicates the need for further research incorporating larger samples, objective competency assessments, and additional predictors of photographic performance. Future longitudinal and experimental investigations may provide stronger evidence regarding the development and practical application of visual literacy and creativity in vocational photography education (Hiramatsu et al., 2024; Layer, 2025; Setiyawan et al., 2026; Vasilenko et al., 2020).

Conclusions

This study concludes that visual literacy and creativity did not demonstrate statistically significant independent or simultaneous associations with photographic composition quality among vocational high school students. These findings indicate that students' visual understanding and creative abilities, as measured in this study, were insufficient to explain meaningful differences in their photographic composition performance. Photographic composition quality may therefore be associated with additional factors, including technical proficiency, practical experience, aesthetic judgment, and instructional support. The findings highlight the importance of integrating visual literacy, creativity, and practical photography activities within vocational education. Further research involving broader samples and additional learning-related variables is recommended to provide a more comprehensive understanding of the factors associated with students' photographic composition quality.

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