

Aesthetic Discipline and Creative Development: A Calligraphy-Based Intervention in Teacher Education

Lia Mareza^{1*} Agung Nugroho¹ Masanori Fukui²

¹Universitas Muhammadiyah Purwokerto, Indonesia

²MIE University, Japan

*email: liamareza@ump.ac.id

DOI: <https://doi.org/10.31603/7syrte25>



ABSTRACT

Article Info:

Submitted:

05/02/2026

Revised:

16/05/2026

Published:

30/06/2026

Preparing teachers who are creative, reflective, and ethically grounded remains a major challenge in teacher education. This study examined the effectiveness of an Islamic calligraphy-based learning program in fostering creativity and professional character among pre-service elementary teachers. A quasi-experimental pretest-posttest control group design was employed with 60 participants, comprising 30 students in the experimental group and 30 in the control group. The experimental group participated in an eight-session Islamic calligraphy program, whereas the control group received conventional visual arts instruction. Creativity was assessed across four dimensions fluency, flexibility, originality, and elaboration while professional character was measured through discipline, perseverance, responsibility, reflective awareness, and aesthetic sensitivity. Data were analyzed using paired-sample and independent-sample t-tests, effect size analysis, and Pearson correlation analysis. The findings showed that participants in the experimental group demonstrated significantly greater improvements in creativity and professional character than those in the control group. The largest gains were observed in originality, elaboration, discipline, and perseverance. Creativity was also positively associated with professional character development. These findings suggest that Islamic calligraphy can serve as an effective aesthetic pedagogical approach to fostering creativity and professional character in teacher education.

Keywords: *Islamic Calligraphy; Creativity; Professional Character; Teacher Education; Aesthetic Pedagogy*

ABSTRAK

*Mempersiapkan calon guru yang kreatif, reflektif, dan berlandaskan etika masih menjadi tantangan utama dalam pendidikan guru. Penelitian ini bertujuan menguji efektivitas program pembelajaran berbasis kaligrafi Islam dalam mengembangkan kreativitas dan karakter profesional calon guru sekolah dasar. Penelitian ini menggunakan desain kuasi-eksperimen dengan pretest-posttest control group yang melibatkan 60 peserta, terdiri atas 30 mahasiswa pada kelompok eksperimen dan 30 mahasiswa pada kelompok kontrol. Kelompok eksperimen mengikuti program pembelajaran kaligrafi Islam selama delapan sesi, sedangkan kelompok kontrol memperoleh pembelajaran seni rupa konvensional. Kreativitas diukur berdasarkan empat dimensi, yaitu kelancaran (*fluency*), fleksibilitas (*flexibility*), orisinalitas (*originality*), dan elaborasi (*elaboration*), sedangkan karakter profesional*

diukur melalui disiplin, ketekunan, tanggung jawab, kesadaran reflektif, dan sensitivitas estetik. Data dianalisis menggunakan uji paired-sample t-test, independent-sample t-test, analisis ukuran efek (*effect size*), dan analisis korelasi Pearson. Hasil penelitian menunjukkan bahwa peserta pada kelompok eksperimen mengalami peningkatan kreativitas dan karakter profesional yang secara signifikan lebih tinggi dibandingkan dengan kelompok kontrol. Peningkatan terbesar ditemukan pada aspek orisinalitas, elaborasi, disiplin, dan ketekunan. Kreativitas juga memiliki hubungan positif dengan perkembangan karakter profesional. Temuan ini menunjukkan bahwa kaligrafi Islam dapat menjadi pendekatan pedagogi estetika yang efektif dalam mengembangkan kreativitas dan karakter profesional pada pendidikan guru.

Kata-kata Kunci: Kaligrafi Islam; Kreativitas; Karakter Profesional; Pendidikan Guru; Pedagogi Estetika

1. INTRODUCTION

The accelerating complexity of contemporary educational environments has fundamentally reshaped expectations of the teaching profession, particularly within Islamic educational contexts that increasingly demand the integration of pedagogical innovation, moral integrity, and spiritual sensitivity. In the context of globalization, rapid technological transformation, and sociocultural fragmentation, teachers are no longer positioned merely as transmitters of knowledge but as transformative moral-intellectual agents responsible for cultivating holistic human development grounded in ethical and spiritual values. Recent international reports indicate that education systems worldwide continue to face substantial challenges in preparing teachers with adaptive expertise, creativity, and the capacity to respond effectively to increasingly diverse and technology-mediated learning environments. UNESCO and the International Task Force on Teachers for Education 2030 estimate that an additional 44 million qualified teachers are needed globally and emphasize the urgent strengthening of teacher preparation and professional development systems. Contemporary educational reform discourse consistently emphasizes the necessity of equipping future educators with higher-order cognitive flexibility, adaptive expertise, and moral commitment, recognizing that effective teaching requires more than technical pedagogical competence alone (Darling-Hammond et al., 2020; Karwowski & Beghetto, 2019). Within Islamic education, this expectation becomes even more significant because teachers are simultaneously entrusted with the formation of *adab*, *akhlāq*, and spiritual consciousness alongside cognitive development (Halstead, 2004).

In Islamic educational philosophy, the educator occupies a central role not only as an instructor but also as a *murabbi* responsible for nurturing intellectual, ethical, aesthetic, and spiritual dimensions of learners. This multidimensional conception of teaching aligns with contemporary scholarship emphasizing teacher identity formation as an integration of cognitive, emotional, moral, and sociocultural dimensions (Beauchamp & Thomas, 2009). Consequently, Islamic teacher education cannot be restricted to

procedural pedagogical training but must include the cultivation of creativity, reflective discipline, aesthetic sensitivity, and moral responsibility as integrated components of professional formation. This imperative is reinforced by international research indicating that many teacher education programs continue to prioritize technical competence and standards-based accountability while providing limited opportunities for the development of creativity, critical reflection, and holistic professional identity formation (Cochran-Smith et al., 2020; Korthagen, 2017). Studies further suggest that the marginalization of aesthetic and reflective dimensions within teacher preparation may constrain teachers' capacity to respond adaptively to complex educational contexts and diverse learner needs (Biesta, 2022; Kelchtermans, 2019). Recent scholarship on Islamic pedagogy further highlights that educational excellence in Muslim societies requires harmonizing innovation with ethical-spiritual orientation rather than treating creativity and religiosity as dichotomous constructs (Sahin, 2018; Tan, 2020).

Empirical studies have increasingly examined creativity development within teacher education and educational leadership contexts. For example, Beghetto and Kaufman (2014), through conceptual and educational intervention studies, demonstrated that creativity can be systematically nurtured when learning environments encourage risk-taking, reflective inquiry, and adaptive problem-solving. Similarly, Henriksen, Richardson, and Mehta (2017), using a systematic review of teacher creativity research, found that creative teaching is strongly associated with teachers' capacity to integrate disciplinary knowledge, pedagogical flexibility, and innovative instructional design. Their review highlighted that creativity is not merely an individual trait but emerges from interactions between educators, institutional cultures, and learning ecologies. Research within higher education has also explored creativity through sociocultural and professional identity perspectives. Glăveanu (2018), employing a sociocultural theoretical analysis, argued that creative practices are embedded within cultural norms, social participation, and meaning-making processes rather than solely cognitive processes. Furthermore, Anderson, Potočnik, and Zhou (2014), based on an extensive review of creativity studies across organizational and educational settings, concluded that creativity develops through the interaction of individual characteristics, contextual support, and collaborative environments. These findings suggest that creativity education requires attention not only to instructional techniques but also to broader institutional and cultural conditions.

Within Islamic education, however, empirical investigations remain relatively limited. Existing studies predominantly employ conceptual, philosophical, or literature-review approaches to examine the relationship between creativity, Islamic values, and aesthetic formation (Sahin, 2018; Tan, 2020; Adi, Rahmawati, & Hidayat, 2024). These studies consistently emphasize that creativity should be integrated with ethical responsibility, spiritual consciousness, and social benefit. However, much of the current

literature focuses on theoretical elaboration rather than empirical examination of how creativity is cultivated through specific educational practices within Islamic higher education institutions. Furthermore, previous studies rarely investigate artistic learning environments as spaces where creativity, aesthetic sensitivity, reflective discipline, and professional identity formation are developed simultaneously. Consequently, a significant research gap remains concerning how Islamic arts-based educational experiences contribute to the holistic development of future teachers, particularly within contemporary Islamic teacher education programs.

One underexplored form of Islamic aesthetic pedagogy is Islamic calligraphy. Existing scholarship on Islamic calligraphy has primarily examined its historical development, artistic styles, religious symbolism, and cultural significance within Islamic civilization (Blair, 2006; Schimmel, 1990). More recent studies have explored calligraphy as a medium for preserving Islamic cultural heritage, strengthening religious identity, and transmitting aesthetic values across generations (Roxburgh, 2008; George, 2010). In educational contexts, research has largely focused on technical skill acquisition, visual design principles, and the role of calligraphy in Islamic arts instruction (Adi, Rahmawati, & Hidayat, 2024). However, despite these contributions, limited attention has been given to understanding Islamic calligraphy as a pedagogical practice that simultaneously cultivates creativity, aesthetic sensitivity, reflective discipline, and professional identity formation among future educators. Most studies have employed historical, artistic, or cultural analyses, while empirical investigations examining how engagement with calligraphic practice contributes to holistic teacher development remain scarce. Furthermore, little is known about how calligraphy functions as an educational space where artistic creativity is integrated with ethical reflection and spiritual intentionality within contemporary Islamic higher education. This gap is particularly significant in teacher education settings, where aesthetic experiences may shape not only artistic competence but also broader dimensions of professional and moral formation. To date, no study has specifically examined how participation in Islamic calligraphy learning contributes to the development of creativity, aesthetic sensitivity, reflective discipline, and professional identity among preservice teachers in Islamic higher education.

Islamic calligraphy historically occupies a privileged position within Islamic civilization because it represents the visual embodiment of sacred language and spiritual beauty. Unlike purely decorative artistic forms, Arabic calligraphy integrates discipline, proportion, rhythm, patience, and contemplative focus within a structured artistic process deeply connected to Qur'anic textuality and Islamic intellectual culture (Blair, 2006). The act of producing calligraphic forms requires attentional control, repetitive refinement, precision, and reflective patience, making it not only an artistic activity but also an embodied pedagogical discipline. In classical Islamic educational traditions, mastery of handwriting and calligraphy was frequently associated with *adab* formation, self-

regulation, humility, and spiritual discipline ([Schimmel, 1990](#)). Thus, calligraphy represents a unique intersection between aesthetics, spirituality, cognition, and character formation.

This perspective is especially relevant to contemporary Islamic teacher education, where concerns increasingly emerge regarding the fragmentation between cognitive achievement and moral-spiritual formation. While many teacher education programs emphasize pedagogical innovation, digital competence, and technological adaptation in response to the demands of twenty-first-century education, evidence suggests that the integration of creativity with moral and character formation remains insufficiently addressed. International reviews of teacher education have noted a growing emphasis on measurable competencies, instructional effectiveness, and technology-enhanced learning, often at the expense of broader dimensions of professional identity, ethical development, and reflective practice ([Cochran-Smith et al., 2020](#); [Biesta, 2022](#)). Similarly, [Korthagen \(2017\)](#) argues that teacher preparation frequently prioritizes technical and cognitive aspects of teaching while providing fewer opportunities for cultivating deeper personal, moral, and character-related dimensions of professional growth. Research on creativity education further indicates that although creativity is increasingly promoted as a key educational competency, it is commonly addressed as a cognitive or innovation-oriented skill rather than as a process connected to ethical responsibility, self-discipline, and character formation ([Beghetto, 2019](#); [Glăveanu, 2018](#)). Consequently, fewer studies examine how Islamic aesthetic practices may contribute simultaneously to creative cognition and professional character development. This gap is particularly evident in Islamic higher education, where the potential of aesthetic learning experiences to integrate creativity, spirituality, ethical reflection, and teacher identity formation remains insufficiently explored. Existing literature on creativity in teacher education often remains dominated by secular pedagogical and psychological paradigms emphasizing divergent ideation and instructional innovation while overlooking the ethical-aesthetic dimensions central to Islamic educational philosophy. Similarly, character education research frequently focuses on abstract moral reasoning or policy-oriented frameworks without sufficiently examining embodied pedagogical practices capable of internalizing discipline, perseverance, and reflective responsibility.

The integration of Islamic arts into teacher education therefore represents a significant theoretical and pedagogical direction. Contemporary Islamic education scholars increasingly argue that aesthetic experience constitutes an essential dimension of tarbiyah because beauty possesses transformative pedagogical power capable of shaping perception, emotional regulation, and ethical awareness ([Sahin, 2018](#)). Empirical studies in arts education further support this proposition. Research has shown that sustained engagement in structured artistic practices contributes to creativity development, reflective thinking, self-regulation, and perseverance through iterative

processes of practice, feedback, and refinement (Winner, Goldstein, & Vincent-Lancrin, 2013; Hetland et al., 2013). Similarly, studies on visual arts education indicate that artistic production encourages cognitive flexibility, attentional control, and metacognitive awareness, all of which are closely associated with creative performance and professional learning (Bresler, 2018).

In this regard, Islamic calligraphy offers a particularly compelling pedagogical medium because it integrates the core characteristics identified in previous creativity and arts education research. The process of forming each calligraphic stroke requires deliberate control, precision, balance, rhythm, and continuous self-correction while simultaneously allowing opportunities for stylistic interpretation and creative variation. These characteristics align with contemporary constraint-based creativity theories suggesting that creativity frequently emerges not from unrestricted freedom but through disciplined engagement within meaningful structures (Stokes, 2006; Acar et al., 2017). Consequently, calligraphic practice provides a learning environment in which creativity is cultivated through structured exploration rather than spontaneous expression alone. Recent studies in neuroaesthetics and executive function further support the educational relevance of structured artistic disciplines. Nadal and Skov (2018) demonstrate that aesthetic engagement involves interactions between executive control systems and meaning-making processes, while Brattico and Pearce (2013) show that disciplined artistic practice enhances attentional persistence and emotional regulation capacities. Complementing these findings, studies of self-regulated learning suggest that repetitive artistic activities requiring sustained concentration, monitoring, and revision strengthen reflective habits and self-discipline (Zimmerman, 2008). Within Islamic educational contexts, these findings resonate strongly with the pedagogical emphasis on *mujāhadah* (disciplined striving), reflective self-regulation, and the cultivation of ethical intentionality through repetitive practice. The repetitive refinement inherent in calligraphic practice mirrors reflective cycles central to both self-regulated learning and Islamic character education (Asman, Hasanah, & Nurhadi, 2021).

From the perspective of teacher professional formation, previous research indicates that professional identity develops not only through cognitive knowledge acquisition but also through embodied experiences, reflective practices, and value-oriented activities that shape professional dispositions (Beauchamp & Thomas, 2009; Korthagen, 2017). Studies in arts-based teacher education further suggest that aesthetic and creative experiences can foster empathy, patience, reflective awareness, and ethical sensitivity among future educators (Bresler, 2018; Eisner, 2002). Building on these findings, integrating Islamic calligraphy into teacher education may contribute not only to creativity development but also to cultivating Islamic professional virtues such as patience (*ṣabr*), discipline (*intizām*), responsibility (*amānah*), and reflective awareness (*muḥāsabah*). Despite this theoretical and empirical potential, few studies have directly

investigated how Islamic calligraphy functions as a pedagogical intervention for simultaneously enhancing creativity and professional character formation among preservice teachers in Islamic higher education. This unexplored intersection constitutes the primary focus of the present study.

Despite these theoretical convergences, existing research on Islamic calligraphy has predominantly focused on its historical development, aesthetic principles, cultural heritage preservation, and religious symbolism (Schimmel, 1990; Blair, 2006; George, 2010). More recent educational studies have examined calligraphy primarily as an artistic skill, a medium for transmitting Islamic values, or a component of visual arts instruction within schools and religious educational settings (Adi, Rahmawati, & Hidayat, 2024). While these studies provide valuable insights into the cultural and pedagogical significance of calligraphy, they generally rely on conceptual analyses, descriptive approaches, case studies, or qualitative interpretations. Consequently, they provide limited empirical evidence on the measurable educational outcomes of calligraphic practice. Furthermore, previous research has typically investigated either creativity development or character education as separate constructs. Studies in arts education have demonstrated the potential of artistic engagement to enhance creative thinking, cognitive flexibility, and problem-solving abilities (Hetland et al., 2013; Winner et al., 2013), whereas research on Islamic character education has largely emphasized moral values, ethical dispositions, and spiritual formation (Sahin, 2018; Tan, 2020). However, few studies have examined whether a single Islamic aesthetic practice can simultaneously foster both creative capacities and professional character development. The relationship between structured artistic engagement, creativity enhancement, and the cultivation of professional virtues therefore remains insufficiently understood. Moreover, empirical investigations employing quasi-experimental or intervention-based designs are particularly scarce within the field of Islamic arts education. Existing studies rarely utilize pretest–posttest measurements capable of assessing changes in both creativity and character-related outcomes among preservice teachers. As a result, there remains limited evidence concerning the effectiveness of Islamic calligraphy as a structured pedagogical intervention within teacher education programs.

Addressing this gap, the present study extends previous scholarship by moving beyond historical, cultural, and conceptual analyses of Islamic calligraphy to empirically examine its educational impact. Specifically, this study employs a quasi-experimental design to investigate whether participation in a structured Islamic calligraphy program contributes simultaneously to the development of creativity and professional character among preservice teachers in an Islamic higher education context. In doing so, the study seeks to provide empirical evidence for the pedagogical potential of Islamic aesthetics as an integrated approach to teacher formation. Existing studies on Islamic arts frequently focus on cultural preservation, historical analysis, or aesthetic appreciation rather than

examining measurable cognitive and professional developmental impacts. This gap becomes especially important given the growing demand for evidence-based pedagogical innovation in Islamic higher education institutions and teacher preparation programs.

The present study addresses this gap by investigating the effects of a reflective, structured Islamic calligraphy-based intervention on creativity and professional character among pre-service elementary teachers. Specifically, this study has three objectives: (1) examine the effect of an Islamic calligraphy-based intervention on the creativity of pre-service elementary teachers; (2) assess the effect of the intervention on the development of professional character, including discipline, responsibility, reflective awareness, and ethical disposition; and (3) analyze the relationship between creativity development and professional character formation within the context of Islamic aesthetic pedagogy. By situating calligraphy within the framework of Islamic aesthetic pedagogy and teacher identity formation, this study seeks to contribute not only to creativity research and arts-based education but also to the advancement of Islamic teacher education discourse. Furthermore, the study provides empirical evidence of the educational potential of Islamic aesthetic practices as an integrated approach to fostering creativity and character development in teacher preparation programs. Specifically, the study conceptualizes Islamic calligraphy as a form of embodied aesthetic discipline through which creative cognition, reflective self-regulation, and Islamic character formation converge. Ultimately, this study aims to strengthen scholarly understanding of how Islamic aesthetic traditions can serve as transformative pedagogical resources for developing adaptive, ethical, and spiritually grounded educators.

2. METHOD

The present study employed a quasi-experimental pretest–posttest nonequivalent control group design to examine the effects of a structured Islamic calligraphy-based intervention on creativity and professional character among pre-service elementary teachers. A quasi-experimental approach was selected because random assignment at the individual level was not feasible due to institutional scheduling and intact classroom organization. Such designs are widely recognized as appropriate for educational intervention research conducted in authentic classroom settings, where intact groups must be maintained ([Shadish, Cook, & Campbell, 2002](#)). [Creswell and Creswell \(2018\)](#) further note that pretest–posttest nonequivalent control group designs provide robust estimates of treatment effects when baseline equivalence between groups is statistically established.

The study involved 60 pre-service elementary teachers enrolled in the same teacher education program at Universitas Muhammadiyah Purwokerto (UMP). Participants were assigned to one of two intact classes, with 30 students in the experimental group and 30 students in the control group. All participants were in Semester 4, aged between 19 and 21 years, had completed the same foundational visual

arts course, and had no prior formal experience in Islamic calligraphy. The use of participants with comparable educational backgrounds ensured that the intervention introduced a new form of structured artistic practice rather than initial exposure to visual arts learning. To establish baseline equivalence, participants' demographic characteristics and prior educational experiences were compared between groups and are summarized in Table 1.

Table 1. Demographic Characteristics of Participants

Characteristic	Experimental Group (n = 30)	Control Group (n = 30)	P-value
Mean Age (years)	20.1 ± 0.8	20.0 ± 0.7	0.642
Age Range (years)	19–21	19–21	–
Female, n (%)	18 (60.0%)	26 (86.7%)	.020*
Male, n (%)	12 (40.0%)	4 (13.3%)	.020*
Academic Level	Semester 4	Semester 4	–
Previous Arts Coursework	Completed Basic Arts Education Course	Completed Basic Arts Education Course	–
Prior Calligraphy Experience, n (%)	0 (0%)	0 (0%)	–

As shown in Table 1, the experimental and control groups were comparable with respect to age, academic level, previous arts coursework, and prior calligraphy experience, indicating similar baseline characteristics. Although a significant difference was observed in gender distribution ($p = .020$), both groups shared comparable educational backgrounds and had no previous experience in Islamic calligraphy.

To further confirm baseline equivalence, independent-samples t-tests were conducted on the pretest scores for creativity and professional character. The analyses revealed no statistically significant differences between the experimental and control groups ($p > .05$), indicating comparable initial levels on the primary outcome variables. Consequently, any post-intervention differences could be interpreted more confidently as effects of the intervention rather than pre-existing differences between groups. The overall quasi-experimental design, including the pretest, intervention, and posttest procedures implemented in both groups, is presented in Table 2.

Table 2. Research Design

Group	Pretest	Treatment	Posttest
Experimental (n = 30)	Creativity Test; Professional Character Scale	Eight-session Islamic Calligraphy Intervention	Creativity Test; Professional Character Scale
Control (n = 30)	Creativity Test; Professional Character Scale	Conventional Visual Arts Instruction	Creativity Test; Professional Character Scale

Design: Pretest–Posttest Nonequivalent
Control Group Design.

The research design enabled a systematic evaluation of changes in creativity and professional character by comparing participants' performance before and after the

intervention. The inclusion of a control group receiving conventional visual arts instruction enabled the effects of the structured Islamic calligraphy program to be distinguished from those associated with regular classroom learning experiences.

The experimental intervention consisted of a structured eight-session Islamic calligraphy program designed to foster creativity and professional character through the principles of Islamic aesthetic pedagogy. The instructional sequence, learning activities, and expected learning outcomes are presented in [Table 3](#).

Table 3. Structure of the Islamic Calligraphy Intervention Program

Session	Focus	Main Activities	Expected Outcomes
1	Introduction to Islamic Aesthetics	Discussion of jamāl, adab, and calligraphy traditions	Understanding aesthetic-spiritual foundations
2	Basic Techniques I	Posture, pen control, stroke formation	Attentional control and precision
3	Basic Techniques II	Rhythm, spacing, proportionality	Discipline and technical competence
4	Guided Practice I	Structured imitation exercises	Concentration and persistence
5	Guided Practice II	Repetitive refinement and correction	Self-regulation and patience
6	Semi-independent Composition	Creative variation within constraints	Originality and elaboration
7	Reflective Dialogue	Teacher professionalism and Islamic character reflection	Ethical awareness and reflective thinking
8	Independent Production & Reflection	Final composition and group reflection	Creativity synthesis and professional identity formation

As presented in [Table 3](#), the intervention followed a progressive developmental sequence that moved from foundational aesthetic-spiritual understanding to increasingly autonomous creative production and reflective practice. Participants progressed from acquiring basic technical skills to guided composition, reflective dialogue, and independent calligraphic production. This progression was intentionally designed to cultivate not only artistic competence but also self-regulation, perseverance, reflective thinking, ethical awareness, and professional identity. [Figure 1](#) illustrates the overall research procedure, including participant recruitment, group allocation, intervention implementation, assessment, and data analysis.

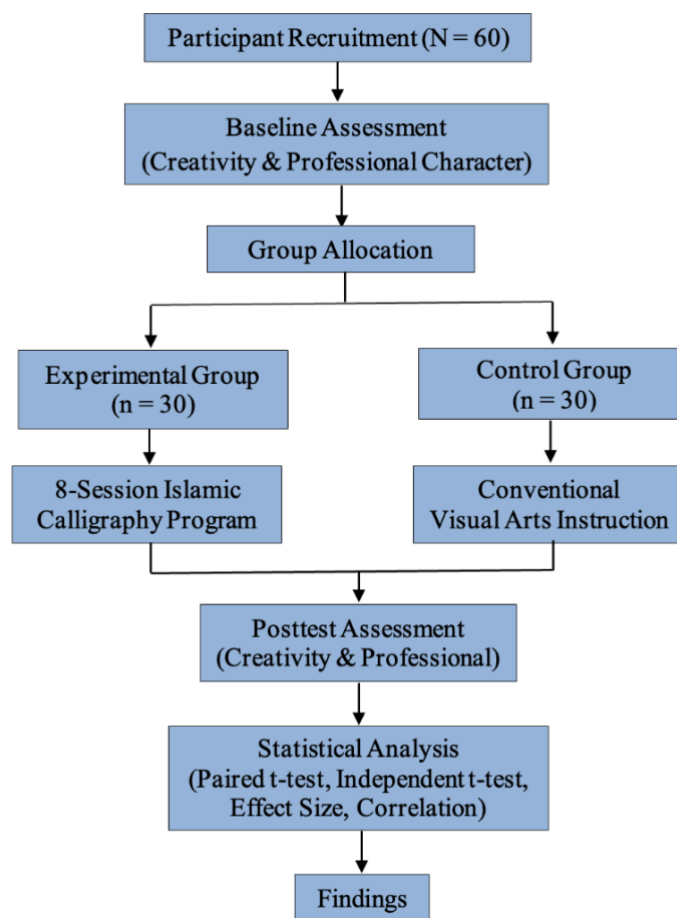


Figure 1. Research Flow Chart

As illustrated in Figure 1, both the experimental and control groups completed identical pretest and posttest assessments. The only difference between the two groups was the instructional treatment received during the intervention period. This design enabled a systematic evaluation of the contribution of structured Islamic calligraphy practice to creativity and professional character while controlling for regular classroom learning experiences.

The intervention was implemented over eight instructional sessions during a four-week period. The instructional content was developed from classical Islamic calligraphic principles, including proportionality (*mīzān*), rhythmic balance, precision, attentional control, and repetitive practice (Blair, 2006; Schimmel, 1990). Each session integrated technical calligraphy exercises with guided reflection to encourage sustained concentration, self-monitoring, disciplined practice, and aesthetic appreciation. Participants progressively advanced from basic stroke formation and proportional letter construction to guided composition and independent calligraphic production.

To ensure consistency across sessions, standardized lesson plans, instructional objectives, learning activities, and assessment procedures were prepared prior to implementation and followed throughout the intervention. In contrast, the control group

received conventional visual arts instruction emphasizing general drawing techniques and aesthetic appreciation without structured Islamic calligraphy practice or guided reflective activities. To strengthen the internal validity of the study, several procedural controls were implemented throughout the intervention. These procedures are summarized in Table 4.

Table 4. Internal Validity Control Procedures

Control Aspect	Procedure Implemented	Purpose
Instructional schedule	Both groups received instruction over the same four-week period with identical session frequency and duration (eight 90-minute sessions).	To control for differences in instructional exposure and learning time.
Learning environment	Experimental and control groups were taught in comparable classroom settings and under similar physical conditions.	To minimize environmental influences on learning outcomes.
Instructor	The same instructor facilitated both the experimental and control groups using standardized instructional procedures.	To reduce instructor-related variability and teaching bias.
Instructional protocol	Standardized lesson plans, learning objectives, and intervention procedures were prepared before implementation and consistently followed throughout the study.	To ensure intervention fidelity and procedural consistency.
Participant blinding	Participants were not informed of the specific research hypotheses.	To reduce expectancy effects and demand characteristics.
Outcome assessment	Creativity and professional character assessments were administered using standardized procedures, and participant responses were coded anonymously before analysis.	To minimize assessment and evaluator bias.
Intervention fidelity	An observational checklist was completed after each intervention session to verify adherence to the planned instructional procedures.	To monitor implementation fidelity and ensure consistency across sessions.

As shown in Table 4, multiple procedural controls were implemented to minimize threats to internal validity. Both groups received instruction over the same four-week period with identical session duration and frequency, were taught by the same instructor using standardized instructional procedures, and completed assessments under equivalent conditions. Participants were not informed of the specific research hypotheses to reduce expectancy effects, while anonymous coding and observational fidelity checklists were employed to minimize assessment bias and monitor adherence to the intervention protocol. Collectively, these procedures enhanced the internal validity of the study by reducing potential sources of bias that differences observed after the intervention were attributable to the Islamic calligraphy program rather than extraneous variables.

Creative thinking was assessed using an adapted Torrance-based framework encompassing four dimensions: fluency, flexibility, originality, and elaboration (Almeida

et al., 2008). Participants completed a structured calligraphy-based performance task in which they produced original calligraphic compositions within predetermined aesthetic constraints. Responses were evaluated using an analytic scoring rubric adapted from the Torrance framework. The operational indicators, assessment tasks, and scoring procedures are presented in Table 5.

Before implementation, the instrument was reviewed by three experts in educational psychology, creativity studies, and arts education. Content validity was evaluated using the Content Validity Index (CVI), with all items exceeding the recommended threshold of .80 (Polit & Beck, 2006). Construct validity was subsequently examined through exploratory factor analysis (EFA) during pilot testing, retaining factor loadings above .50 in accordance with established psychometric standards (Hair et al., 2019). Internal consistency reliability was assessed using Cronbach's alpha, with all coefficients exceeding .80, indicating satisfactory reliability.

Table 5. Specification of the Creativity Assessment Instrument

Creativity Dimension	Indicator	Example of Assessment Task	Number of Items	Scoring Method
Fluency	Ability to generate multiple relevant visual ideas	Produce several alternative calligraphic compositions based on the assigned text	5	Analytic rubric (1–5)
Flexibility	Ability to vary design strategies and compositional approaches	Demonstrate different layout patterns, stroke arrangements, or stylistic variations while maintaining calligraphic conventions	5	Analytic rubric (1–5)
Originality	Ability to create unique and novel calligraphic compositions	Develop a distinctive calligraphic design that differs from standard examples while preserving aesthetic principles	5	Analytic rubric (1–5)
Elaboration	Ability to refine and expand visual details	Enrich the composition through proportional balance, ornamentation, refinement, and completeness	5	Analytic rubric (1–5)

As shown in Table 5, creativity was operationalized as a multidimensional construct comprising idea generation, adaptive thinking, originality, and elaboration. The instrument consisted of 20 performance-based assessment items, distributed equally across the four creativity dimensions. All responses were independently scored by two trained raters using standardized scoring guidelines adapted from the Torrance framework (Almeida et al., 2008). Higher scores indicated higher levels of creative performance. Professional character was measured using a validated five-point Likert-scale questionnaire encompassing five dimensions: discipline, perseverance, responsibility, reflective awareness, and aesthetic sensitivity. The instrument specification is presented in Table 6.

Content validity was established through expert review involving three specialists in Islamic education, educational psychology, and teacher education. Construct validity was subsequently examined through exploratory factor analysis during pilot testing. Content validity indices exceeded the recommended threshold of .80 (Polit & Beck, 2006), while all retained factor loadings were above .50 (Hair et al., 2019). Internal consistency reliability was satisfactory, with Cronbach's alpha coefficients ranging from .78 to .88, exceeding the recommended minimum value of .70 (Nunnally & Bernstein, 1994).

Table 6. Specification of the Professional Character Instrument

Dimension	Indicator	Example Statement	Number of Items	Scale
Discipline	Consistently follows learning procedures and completes tasks according to established standards	<i>I consistently complete learning tasks according to the prescribed procedures and time schedule.</i>	4	5-point Likert
Perseverance	Demonstrates persistence when encountering difficulties and continues improving performance	<i>I continue practicing until I achieve satisfactory results, even when the task is challenging.</i>	4	5-point Likert
Responsibility	Takes responsibility for assigned tasks and learning outcomes	<i>I take responsibility for the quality of my work without depending on others.</i>	4	5-point Likert
Reflective Awareness	Evaluates personal strengths, weaknesses, and learning progress for continuous improvement	<i>I regularly reflect on my learning process to identify areas that need improvement.</i>	4	5-point Likert
Aesthetic Sensitivity	Appreciates beauty, harmony, and precision in artistic and educational activities	<i>I pay close attention to balance, harmony, and precision when completing artistic tasks.</i>	4	5-point Likert

As presented in Table 6, the instrument consisted of 20 questionnaire items distributed equally across five dimensions of professional character. Collectively, the five dimensions assessed participants' discipline, perseverance, responsibility, reflective practice, and aesthetic sensitivity. Negatively worded items were reverse-coded before analysis, and higher scores indicated higher levels of professional character.

Data were analyzed using IBM SPSS Statistics version 26. Before conducting the inferential analyses, the assumptions of normality and homogeneity of variance were examined using the Shapiro-Wilk and Levene's tests, respectively, to verify the suitability of the data for parametric statistical procedures. The statistical procedures were selected according to the research objectives and are summarized in Table 7.

Table 7. Statistical Analysis Procedures

Statistical Test	Justification
Paired-samples <i>t</i> -test	To examine whether significant changes occurred within the same group by comparing participants' pretest and posttest scores.
Independent-samples <i>t</i> -test	To compare gain scores between the experimental and control groups in order to determine the effectiveness of the intervention.
Cohen's <i>d</i>	To estimate the practical magnitude of the intervention effect beyond statistical significance, thereby indicating the educational importance of the findings.
Pearson product–moment correlation	To examine the strength and direction of the relationship between creativity and professional character because both variables were measured on continuous scales.

As presented in [Table 7](#), the analyses addressed three primary objectives: (1) evaluating changes in creativity and professional character within each group, (2) comparing post-intervention outcomes between the experimental and control groups, and (3) examining the relationship between creativity and professional character. Paired-samples *t*-tests were used to assess within-group changes from pretest to posttest, while independent-samples *t*-tests compared posttest scores between groups. The magnitude of the intervention effects was assessed using Cohen's *d*, interpreted according to [Cohen's \(1988\)](#) guidelines. Finally, Pearson product–moment correlation analysis was conducted to examine the relationship between creativity and professional character following the intervention.

Statistical significance was established at $\alpha = .05$, and all tests were two-tailed. Collectively, these statistical procedures provided a comprehensive evaluation of the effectiveness of the Islamic calligraphy intervention in enhancing creativity and professional character among pre-service elementary teachers.

3. RESULTS AND DISCUSSION

Data were analyzed to examine the impact of structured Islamic calligraphy-based aesthetic discipline on creative cognition and professional character development among pre-service elementary teachers. Prior to conducting the inferential analyses, the assumptions of normality, homogeneity of variance, and the absence of extreme outliers were examined to ensure the suitability and robustness of the subsequent parametric procedures. Normality was assessed using the Shapiro–Wilk test, with all significance values exceeding .05, indicating that the dependent variables were normally distributed, consistent with recommendations for small-sample parametric analysis ([Razali & Wah, 2011](#)). As summarized in [Table 8](#), Levene's test also showed no significant differences in variance between the experimental and control groups ($p > .05$), confirming the assumption of homogeneity. In addition, no standardized residuals exceeded ± 3.29 , indicating the absence of extreme outliers in accordance with established multivariate assumptions ([Chatterjee & Vartanian, 2014](#)). Collectively, these results confirmed that

the data met the assumptions required for subsequent parametric analyses. Prior to the inferential analyses, assumption testing was conducted to verify the suitability of the data for parametric statistical procedures. The results are presented in [Table 8](#).

[Table 8](#). Results of Assumption Testing

Assumption	Test	Experimental Group	Control Group	p-value	Decision
Normality (Pretest Creativity)	Shapiro–Wilk	W = 0.972	W = 0.968	.284 / .196	Normal
Normality (Posttest Creativity)	Shapiro–Wilk	W = 0.981	W = 0.976	.521 / .407	Normal
Normality (Pretest Professional Character)	Shapiro–Wilk	W = 0.976	W = 0.973	.398 / .315	Normal
Normality (Posttest Professional Character)	Shapiro–Wilk	W = 0.984	W = 0.979	.614 / .482	Normal
Homogeneity of Variance	Levene's Test	F = 0.684	–	0.411	Homogeneous

As presented in [Table 8](#), all pretest and posttest scores for both creativity and professional character were normally distributed, as indicated by non-significant Shapiro–Wilk test results ($p > .05$). Additionally, Levene's test confirmed the homogeneity of variance assumption, suggesting that the data satisfied the prerequisites for subsequent parametric analyses, including paired-samples t-tests, independent-samples t-tests, and Pearson correlation analysis. [Table 9](#) presents the descriptive statistics for the four dimensions of creative thinking before and after the intervention.

[Table 9](#). Descriptive Statistics for Creative Thinking Dimensions

Dimension	Group	Pretest M (SD)	Posttest M (SD)	Gain
Fluency	Experimental	21.43 (4.12)	27.85 (4.35)	6.42
	Control	21.10 (4.25)	22.05 (4.30)	0.95
Flexibility	Experimental	15.27 (3.10)	19.80 (3.22)	4.53
	Control	15.41 (3.05)	16.10 (3.18)	0.69
Originality	Experimental	13.85 (2.95)	18.96 (3.01)	5.11
	Control	13.72 (3.02)	14.21 (3.05)	0.49
Elaboration	Experimental	17.30 (3.50)	23.02 (3.67)	5.72
	Control	17.42 (3.48)	18.05 (3.60)	0.63

As shown in [Table 9](#), participants in the experimental group demonstrated substantially greater gains across all dimensions of creativity compared with those in the control group. The largest improvements were observed in fluency, elaboration, and originality, suggesting that the structured calligraphy intervention not only enhanced idea

generation and creative expression but also supported the development of more refined, detailed, and original artistic responses. In contrast, the relatively small gains observed in the control group indicate that conventional visual arts instruction alone was less effective in promoting higher-order creative development.

a. Creative Thinking Outcomes

The findings demonstrate that participation in the structured Islamic calligraphy intervention resulted in consistent improvements across all dimensions of creative thinking compared with conventional visual arts instruction. The structured nature of Islamic calligraphy required participants to engage in continuous cycles of observation, execution, evaluation, and refinement. Such iterative learning processes promote sustained cognitive engagement, enabling creativity to emerge through disciplined exploration rather than unrestricted expression. The improvement in fluency may be attributed to repeated opportunities for generating multiple calligraphic compositions and visual alternatives throughout the intervention. Each practice session encouraged participants to produce several acceptable solutions within established calligraphic conventions, thereby strengthening their capacity to generate ideas efficiently. Likewise, the increase in flexibility reflects participants' growing ability to modify compositional arrangements, adapt visual strategies, and explore alternative forms while maintaining the structural principles of Arabic calligraphy. These findings support the proposition that creativity develops through adaptive engagement with meaningful constraints rather than complete freedom (Stokes, 2006; Beghetto, 2019).

The strongest improvement was observed in originality, suggesting that the intervention encouraged participants to move beyond imitation toward the production of personally meaningful artistic interpretations. As technical competence increased across successive sessions, participants became more confident in experimenting with composition, proportional balance, and stylistic variation while remaining within the aesthetic boundaries of Islamic calligraphy. This finding is consistent with constraint-based creativity theory, which argues that structured limitations often stimulate rather than inhibit original thinking by directing cognitive resources toward purposeful exploration (Acar et al., 2017; Glăveanu, 2018). Similarly, the improvement in elaboration indicates that participants increasingly refined and expanded their visual compositions through careful attention to proportion, ornamentation, precision, and compositional completeness. The repetitive practice, instructor feedback, and reflective revision incorporated throughout the intervention encouraged participants to continuously evaluate and improve their work, thereby strengthening metacognitive awareness and reflective problem-solving. This process closely resembles the cyclical processes of planning, monitoring, and self-evaluation described in self-regulated learning theory (Zimmerman, 2002). Taken together, these findings suggest that structured Islamic calligraphy functions not merely as an artistic activity but as an

educational mechanism that integrates creativity, disciplined practice, and reflective learning. Rather than fostering creativity through unrestricted artistic freedom, the intervention cultivated creative cognition by combining technical precision, aesthetic sensitivity, and continuous reflective refinement within an Islamic pedagogical framework. This evidence extends previous research in arts-based education by demonstrating that creativity can be systematically developed through structured aesthetic practice grounded in Islamic educational traditions.

The magnitude of these effect sizes is particularly important in the context of contemporary educational research. According to [Cohen's \(1988\)](#) benchmarks, effect sizes exceeding .80 represent large practical effects, indicating that the intervention generated not only statistical significance but also meaningful educational impact. [Lakens \(2013\)](#) similarly emphasizes that standardized effect sizes strengthen interpretability beyond probability-based significance testing. In the present study, originality and elaboration produced the strongest practical gains, suggesting that structured Islamic calligraphy-based aesthetic discipline may be especially effective in enhancing ideational uniqueness, reflective depth, and conceptual expansion. To further illustrate the intervention process, [Figure 2](#) presents participants engaged in the structured Islamic calligraphy activities during the experimental sessions. The image captures students practicing Arabic calligraphy on plywood media while applying the principles of proportionality (*mīzān*), rhythmic balance, precision, and continuous refinement introduced throughout the intervention. Rather than functioning solely as an artistic exercise, the learning activities required participants to repeatedly evaluate, revise, and refine their work under guided supervision, thereby integrating technical skill development with reflective practice and self-regulation.

[Figures 2–5](#) illustrate the implementation of the Islamic calligraphy intervention during the experimental sessions. These images document the progression from guided practice to independent calligraphic production.



[Figure 2](#). Islamic Calligraphy Practice



[Figure 3](#). Calligraphic Colour Practice



Figure 4. Calligraphic Composition Exercise



Figure 5. Group Calligraphy Activity

Figures 2–5 illustrate participants engaged in Islamic calligraphy practice on plywood media as part of the structured aesthetic discipline intervention designed to foster creativity, reflective practice, and professional character development.

As illustrated in Figures 2–5, participants were actively engaged in an iterative learning process involving observation, execution, self-evaluation, instructor feedback, and repeated refinement of their calligraphic compositions. These structured activities provided opportunities to generate multiple visual solutions, experiment with compositional variations, and progressively improve artistic quality while adhering to established calligraphic conventions. Such learning experiences are consistent with the principles of constraint-based creativity, which posit that meaningful constraints can stimulate rather than restrict creative thinking (Stokes, 2006; Beghetto, 2019). The combination of disciplined technical practice and reflective revision likely contributed to the observed improvements in fluency, flexibility, originality, and elaboration reported in the experimental group. Furthermore, the collaborative studio environment encouraged sustained attention, peer interaction, and reflective dialogue, reinforcing the development of both creative cognition and professional dispositions throughout the intervention. The activities depicted in Figure 4 and Figure 5 correspond primarily to Sessions 4–8 of the intervention during which participants progressed from guided imitation to semi-independent composition, reflective evaluation, and independent artistic production.

These findings provide empirical support for constraint-based creativity theory, which argues that productive constraints may stimulate rather than inhibit divergent thinking (Stokes, 2006). Within the present intervention, participants were required to operate within highly structured aesthetic principles derived from Islamic calligraphic traditions, including proportional balance, rhythmic sequencing, pressure control, and compositional harmony. Rather than limiting ideational flexibility, these formal constraints appear to have scaffolded cognitive exploration by directing attentional

resources toward meaningful variation and disciplined experimentation. The present findings extend previous research demonstrating that moderate instructional structure can enhance creative performance more effectively than unrestricted artistic freedom (Acar et al., 2017; Beghetto, 2019). However, the contribution of this study goes beyond confirming the positive role of structured learning environments. Whereas earlier studies primarily examined creativity within general educational or psychological contexts, the present intervention embedded structured constraints within the distinctive aesthetic, ethical, and spiritual traditions of Islamic calligraphy. Consequently, creativity was cultivated not only through divergent idea generation but also through disciplined practice, reflective revision, and aesthetic intentionality.

The magnitude of the intervention effects further reinforces this contribution. Across the four creativity dimensions, the observed effect sizes ranged from moderate to large, with the strongest effects found for originality and elaboration (Cohen's $d = .76-.84$). According to Cohen (1988), effect sizes approaching or exceeding .80 indicate substantial educational impact. These findings are comparable to, and in some dimensions exceed, those reported in previous arts-based educational interventions, which generally demonstrate moderate improvements in creative performance through visual arts, design thinking, or studio-based learning environments (Winner, Goldstein, & Vincent-Lancrin, 2013; Hetland et al., 2013). A plausible explanation for the relatively strong effects observed in the present study is that the intervention combined technical skill acquisition with continuous reflective practice and structured self-regulation rather than emphasizing artistic production alone. Another distinction from previous research concerns the underlying pedagogical mechanism. Much of the existing literature attributes creativity gains to opportunities for open-ended exploration, collaborative learning, or project-based artistic experiences (Winner et al., 2013; Bresler, 2018). In contrast, the present findings suggest that creativity can also emerge through disciplined engagement with clearly defined aesthetic rules and repetitive refinement. This supports the constraint-based creativity perspective proposed by Stokes (2006) while extending its application to Islamic aesthetic pedagogy. The findings therefore suggest that structured artistic traditions need not restrict creativity; instead, they may provide the cognitive and reflective scaffolding necessary for producing more original, flexible, and elaborated creative outcomes.

Importantly, these findings also contribute to contemporary discourse in Islamic education regarding the relationship between creativity, discipline, and aesthetic pedagogy. Within many educational contexts, creativity is frequently conceptualized as spontaneous self-expression detached from discipline or tradition. However, Islamic intellectual and artistic traditions historically positioned creativity within frameworks of ethical intentionality, discipline, balance, and spiritual refinement (Nasr, 1987). Islamic calligraphy, in particular, represents a pedagogical synthesis between aesthetic order and

creative interpretation, requiring both technical precision and expressive variation. Consequently, the present findings challenge the assumption that creativity and discipline represent opposing educational goals. The significant improvement observed across creativity dimensions also reflects broader educational concerns regarding the development of adaptive expertise among future educators. Contemporary Islamic education increasingly demands teachers capable of integrating innovation, reflective thinking, and contextual responsiveness within pedagogical practice (Sahin, 2018; Tan, 2020). In this regard, the intervention demonstrates how structured aesthetic disciplines rooted in Islamic traditions may function as pedagogical tools for strengthening teacher creativity while simultaneously preserving ethical and cultural grounding. Recent studies have highlighted the importance of innovative and arts-based pedagogical approaches in strengthening meaningful learning experiences and deep understanding among students (Prasetyo et al., 2025). Likewise, contemporary Islamic educational discourse increasingly advocates reconstructive pedagogies capable of integrating creativity, spirituality, reflective learning, and contextual engagement (Mala et al., 2024). The present findings extend this discussion by providing quasi-experimental evidence that Islamic aesthetic traditions such as calligraphy can function not merely as cultural enrichment but as empirically measurable mechanisms for enhancing creative cognition and pedagogical adaptability.

b. Character Development Outcomes

The present findings are also consistent with recent empirical evidence demonstrating that sustained artistic practice contributes to the development of self-regulation, professional dispositions, and character formation in educational settings. For example, longitudinal and classroom-based studies in arts education have shown that participation in structured visual arts activities strengthens learners' persistence, self-monitoring, emotional regulation, and reflective decision-making because artistic production requires continuous planning, evaluation, and revision (Hetland et al., 2013; Winner, Goldstein, & Vincent-Lancrin, 2013). Similarly, Bresler (2018) reported that arts-based learning environments promote ethical sensitivity and reflective professional growth by engaging learners in iterative cycles of observation, interpretation, critique, and refinement. These empirical findings support the present results, in which participants demonstrated significant improvements in discipline, perseverance, responsibility, and aesthetic sensitivity following the structured Islamic calligraphy intervention.

Recent research in teacher education likewise emphasizes that professional identity develops through authentic learning experiences that integrate cognitive, emotional, and ethical dimensions rather than through theoretical instruction alone. Beauchamp and Thomas (2009) argue that professional identity is constructed through reflective engagement with meaningful educational experiences, while more recent empirical studies indicate that reflective practice, self-regulation, and value-oriented

learning significantly strengthen teachers' professional commitment, resilience, and ethical decision-making (Kelchtermans, 2019; Yuan & Lee, 2021). Within the present study, Islamic calligraphy functioned as an embodied pedagogical activity through which participants repeatedly planned, executed, evaluated, and refined their work while simultaneously reflecting on the educational values embedded in the practice. Such experiences may explain why improvements in professional character accompanied gains in creativity, suggesting that artistic practice can facilitate the simultaneous development of cognitive competence and professional identity. These findings extend previous empirical research by demonstrating that structured Islamic artistic practice provides a distinctive mechanism through which creativity, self-regulation, and professional character can be cultivated simultaneously. Whereas many previous studies have examined arts education, character education, and teacher professional identity as separate domains, the present study suggests that Islamic calligraphy offers an integrated pedagogical approach in which disciplined artistic practice, reflective learning, and ethical formation reinforce one another. This integrated developmental process contributes to the growing international literature advocating holistic teacher education that combines creativity, reflective practice, and moral responsibility within authentic learning environments. Table 10 presents the descriptive statistics for each professional character dimension before and after the intervention.

Table 10. Descriptive Statistics for Character Development Dimensions

Dimension	Group	Pretest M (SD)	Posttest M (SD)	Gain
Discipline	Experimental	3.42 (.42)	4.12 (.38)	0.7
	Control	3.40 (.44)	3.48 (.41)	0.08
Perseverance	Experimental	3.36 (.45)	4.08 (.40)	0.72
	Control	3.35 (.43)	3.46 (.42)	0.11
Responsibility	Experimental	3.60 (.39)	4.05 (.36)	0.45
	Control	3.59 (.40)	3.66 (.38)	0.07
Aesthetic Sensitivity	Experimental	3.50 (.41)	3.95 (.39)	0.45
	Control	3.48 (.42)	3.55 (.40)	0.07

As presented in Table 10, the experimental group demonstrated consistently greater improvements across all dimensions of professional character compared with the control group. The most substantial gains were observed in discipline and perseverance, indicating that sustained engagement in structured calligraphic practice may have strengthened participants' self-regulation, persistence, and commitment to task completion. Improvements in responsibility and aesthetic sensitivity further suggest that the intervention contributed not only to behavioral consistency but also to the development of reflective and value-oriented dispositions that are essential for future educators. Paired-samples t-tests indicated statistically significant improvements in

discipline, $t(29) = 7.48$, $p < .001$, $d = .72$, and perseverance, $t(29) = 8.01$, $p < .001$, $d = .76$. Responsibility and aesthetic sensitivity similarly demonstrated moderate yet statistically meaningful gains ($d \approx .55-.60$). No comparable improvements were identified in the control group. The observed improvement in discipline, perseverance, and responsibility is highly relevant to contemporary concerns within Islamic education regarding the strengthening of character formation (*tarbiyah al-akhlāq*) amid increasing moral fragmentation, digital individualism, and weakening ethical engagement among students. Current Islamic educational discourse increasingly emphasizes that educational success should not be measured solely through academic achievement but also through the cultivation of reflective morality, self-regulation, empathy, and ethical responsibility (Mawardi et al., 2021). The present findings therefore demonstrate that structured Islamic aesthetic practice may function as an embodied pedagogical mechanism through which such values become internalized experientially rather than merely transmitted conceptually.

Islamic educational philosophy has historically emphasized the inseparability of knowledge, ethics, and disciplined action. Within classical Islamic traditions, artistic practices such as calligraphy were not viewed merely as decorative skills but as forms of moral-spiritual training cultivating patience (*ṣabr*), attentional discipline, humility, and contemplative awareness (Schimmel, 1990). The repetitive refinement required in calligraphic production mirrors reflective educational concepts such as *muḥāsabah* (self-evaluation) and *mujāhadah* (disciplined striving), both of which remain central within Islamic conceptions of character formation. Consequently, the significant gains observed in the experimental group suggest that aesthetic repetition and structured artistic engagement may operate as forms of embodied self-regulation training. These findings are also consistent with Zimmerman's (2002) self-regulated learning framework emphasizing cyclical processes of planning, monitoring, reflection, and correction. Each calligraphic exercise required participants to plan visual composition, execute motor precision, monitor proportional balance, identify inaccuracies, and revise errors through repeated practice. Neuroaesthetic research similarly suggests that repeated structured artistic engagement strengthens attentional persistence and executive functioning capacities (Nadal & Skov, 2018). The present findings therefore support the proposition that disciplined aesthetic engagement may cultivate both cognitive flexibility and self-regulatory character simultaneously.

Moreover, the findings respond directly to current educational debates concerning the revitalization of teacher identity within Islamic education. Professional identity formation involves more than technical instructional competence; it requires integration between pedagogical expertise, ethical commitment, emotional regulation, and moral accountability (Beauchamp & Thomas, 2009). Within many teacher education programs, character education remains confined to abstract theoretical instruction detached from

lived pedagogical experience. By contrast, the present intervention provided participants with visible and experiential accountability. Errors required correction, precision demanded persistence, and improvement depended upon disciplined attentional control. Such embodied learning experiences may therefore cultivate professional responsibility more effectively than purely discursive moral instruction.

Recent studies have emphasized the importance of integrating Islamic values, social responsibility, and innovative pedagogical practices within contemporary educational environments (Imron et al., 2024). Similarly, strategies emphasizing habituation, reflective reinforcement, and ethical exemplification significantly strengthen character development in Islamic educational settings (Mawardi et al., 2021). The present study extends these discussions by demonstrating that Islamic calligraphy-based aesthetic discipline may provide a concrete pedagogical pathway through which creativity and character formation co-develop.

c. Correlation Analysis

Pearson product-moment correlations were computed between gain scores in creative thinking and character dimensions. A significant positive correlation was identified between originality gain and perseverance gain ($r = .48, p < .01$). Fluency gain similarly correlated moderately with discipline gain ($r = .41, p < .05$). According to Cohen's (1988) classification, correlations ranging from .30 to .50 indicate moderate associations. These findings suggest that creative development and character strengthening may co-evolve through shared self-regulatory processes. The correlation between originality and perseverance is theoretically significant because it supports emerging perspectives in creativity research suggesting that sustained creative performance depends not only on ideational fluency but also on persistence, attentional regulation, and reflective self-monitoring (Karwowski et al., 2020). Recent empirical studies further demonstrate that individuals who persist through repeated revision and tolerate cognitive uncertainty are more likely to produce original and high-quality creative outcomes (Beghetto, 2019; Glăveanu, 2018). In educational settings, creative achievement therefore requires more than the spontaneous generation of ideas; it develops through iterative refinement, sustained engagement with challenging tasks, and continuous evaluation of one's own work. The present findings reinforce this perspective by indicating that originality emerged alongside perseverance, suggesting that structured artistic practice encouraged participants to maintain effort despite repeated correction and refinement during the calligraphy intervention.

The observed relationship between fluency and discipline also has important pedagogical implications. Fluency is commonly associated with the ability to generate multiple ideas efficiently, yet the present findings suggest that such productivity is facilitated by disciplined learning habits rather than unrestricted expression alone. Throughout the intervention, participants engaged in repeated cycles of planning,

execution, monitoring, feedback, and revision. These activities closely resemble the phases of self-regulated learning described by Zimmerman (2002), in which disciplined goal setting, self-monitoring, and reflective evaluation support sustained cognitive performance. Consequently, the significant association between fluency and discipline indicates that creative productivity may be strengthened when learners develop consistent habits of focused practice, attentional control, and task persistence.

These findings also contribute to the growing body of empirical research linking artistic practice with professional identity and character development. Studies in arts-based teacher education have shown that sustained engagement in structured artistic activities promotes reflective thinking, resilience, ethical sensitivity, and professional commitment by requiring learners to balance technical precision with personal expression (Hetland et al., 2013; Winner, Goldstein, & Vincent-Lancrin, 2013). Likewise, research on teacher professional identity emphasizes that reflective practice and self-regulation are essential mechanisms through which future teachers internalize professional values and develop resilient professional dispositions (Beauchamp & Thomas, 2009; Kelchtermans, 2019). The present findings extend this literature by demonstrating that Islamic calligraphy can function not only as an artistic activity but also as a pedagogical practice that simultaneously strengthens creativity, perseverance, discipline, and professional character within teacher education. From the perspective of Islamic educational discourse, these relationships are particularly meaningful because Islamic pedagogical traditions have historically viewed intellectual excellence (*ta'lim*) and moral cultivation (*tarbiyah* and *ta'dīb*) as mutually reinforcing dimensions of holistic education rather than separate educational goals. The disciplined repetition required in calligraphic practice reflects the Islamic concept of *mujāhadah* (purposeful striving), whereas continuous reflection and self-correction parallel the practice of *muḥāsabah* (self-evaluation). Consequently, the observed relationships between originality, perseverance, discipline, and creativity suggest that aesthetic practice can serve as a practical educational mechanism through which cognitive development and ethical formation evolve simultaneously. Rather than treating creativity and character as independent outcomes, the present findings support an integrated model of Islamic teacher education in which artistic practice, self-regulation, reflective learning, and moral responsibility reinforce one another throughout the process of professional identity development. This integrated perspective contributes to contemporary discussions on holistic teacher education by providing empirical evidence that Islamic aesthetic pedagogy can simultaneously foster creative competence and professional character.

d. Structured Constraint as Catalyst for Divergent Thinking

The findings provide empirical support for the argument that structured aesthetic discipline enhances divergent cognition rather than suppressing it. Contrary to assumptions that creativity requires unrestricted autonomy, the results demonstrate that

disciplined frameworks may strengthen originality, elaboration, and reflective flexibility. These findings support [Stokes' \(2006\)](#) creative constraint hypothesis and align with [Glăveanu's \(2018\)](#) sociocultural model positioning creativity as structured engagement with symbolic and cultural systems. [Beghetto \(2019\)](#) argues that adaptive creativity emerges within environments balancing uncertainty and structure. The present findings offer quasi-experimental evidence supporting this claim within the context of Islamic aesthetic pedagogy. The rule-governed structure of Islamic calligraphy may reduce extraneous cognitive load while channeling ideational exploration within meaningful symbolic boundaries. Cognitive Load Theory similarly suggests that structured scaffolding optimizes working memory allocation, thereby facilitating deeper elaboration and conceptual integration ([Sweller, 2011; Diamond, A, 2013](#)).

These findings are especially relevant to contemporary Islamic education because many institutions continue to struggle with balancing tradition and innovation. The present study demonstrates that Islamic artistic traditions need not function as static cultural preservation alone but may instead become dynamic pedagogical resources fostering twenty-first century competencies such as creativity, adaptability, reflective awareness, and disciplined problem solving.

Embodied Self-Regulation and Character Formation. The significant gains observed in discipline and perseverance further suggest that aesthetic repetition functions as embodied self-regulation training. [Zimmerman's \(2002\)](#) SRL model emphasizes cyclical processes involving planning, monitoring, reflection, and strategic adjustment. Islamic calligraphy inherently mirrors these processes through stroke planning, compositional evaluation, correction, and repetitive refinement. Recent scholarship in Islamic education increasingly emphasizes the necessity of pedagogical approaches capable of internalizing values experientially rather than relying exclusively on verbal moral instruction. The present intervention therefore contributes to broader educational efforts to strengthen reflective and transformative pedagogies within Islamic teacher education. By integrating reflective dialogue, disciplined artistic practice, and aesthetic contemplation, the intervention provided participants with opportunities to experience ethical formation through action-based learning.

Professional Identity Development. Professional identity formation requires integration between pedagogical competence, ethical commitment, emotional regulation, and reflective self-awareness ([Beauchamp & Thomas, 2009](#)). The present findings suggest that structured Islamic aesthetic practice may provide experiential grounding for such integration. Disciplined artistic engagement creates visible accountability because mistakes require correction rather than rationalization. Improvement emerges gradually through sustained practice, attentional discipline, and reflective persistence. This process holds particular relevance within contemporary Islamic teacher education, where increasing demands exist for educators capable of balancing technological adaptation,

pedagogical innovation, ethical leadership, and cultural rootedness simultaneously. Contemporary educational reforms increasingly recognize teacher creativity as an essential professional competency (Henriksen et al., 2020; Eisner, 2002). However, creativity within Islamic educational settings is sometimes incorrectly perceived as incompatible with discipline or religious tradition. The present findings challenge this assumption by demonstrating that structured Islamic artistic traditions may simultaneously cultivate originality, reflective awareness, and disciplined professionalism.

e. Theoretical Implications

This study introduces the Aesthetic Discipline Model linking structured Islamic artistic practice to creative cognition, self-regulated learning, and professional character formation. The model expands creativity theory by empirically demonstrating that disciplined repetition and aesthetic constraint may function as catalysts for divergent cognition rather than barriers to originality (Mareza, L., Mumpuniarti, Suwarjo, Mustadi, A., & Dewi, D. S. E, 2025). The study further integrates neuroaesthetic evidence, educational psychology, Islamic educational philosophy, and teacher identity formation within a unified pedagogical framework. The findings also contribute to contemporary Islamic educational theory by illustrating how Islamic aesthetic traditions may be recontextualized as innovative pedagogical resources responsive to modern educational challenges. Rather than positioning Islamic traditions as oppositional to educational innovation, the present study demonstrates that Islamic intellectual and artistic heritage may provide theoretically rich and empirically effective foundations for contemporary teacher development.

To clarify the theoretical contribution of this study, Figure 6 presents the proposed Aesthetic Discipline Model, which synthesizes the empirical findings with perspectives from creativity research, self-regulated learning, Islamic educational philosophy, and teacher professional identity. The model illustrates the sequential pedagogical mechanism through which structured Islamic calligraphy practice contributes to holistic teacher development. Figure 6 illustrates the proposed Aesthetic Discipline Model, which depicts the pedagogical mechanism through which structured Islamic calligraphy practice promotes self-regulated learning, creative cognition, and professional character formation among pre-service teachers.

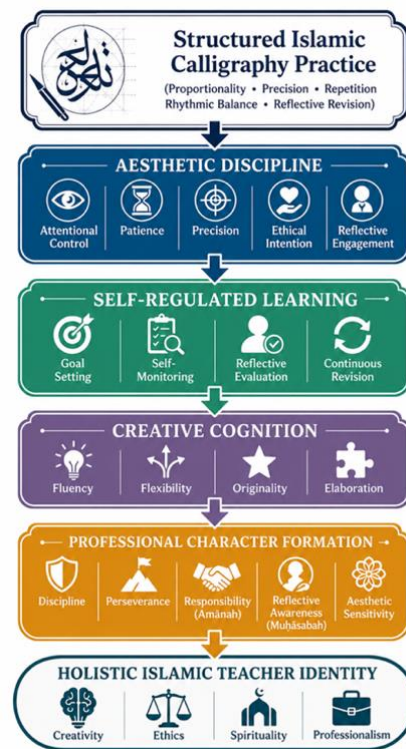


Figure 6. Aesthetic Discipline Framework for Creative Cognition and Professional Character Development in Teacher Education

As illustrated in [Figure 6](#), structured Islamic calligraphy practice serves as the initial pedagogical stimulus that cultivates aesthetic discipline through repetitive practice, attentional control, precision, and reflective engagement. These experiences activate self-regulated learning processes involving goal setting, self-monitoring, reflective evaluation, and continuous revision ([Zimmerman, 2002](#)). The repeated interaction between disciplined practice and reflective regulation subsequently facilitates the development of creative cognition, reflected in improvements in fluency, flexibility, originality, and elaboration. In turn, sustained engagement in these processes contributes to the formation of professional character, including discipline, perseverance, responsibility (*amānah*), reflective awareness (*muḥāsabah*), and aesthetic sensitivity.

This study therefore introduces the Aesthetic Discipline Model, linking structured Islamic artistic practice to creative cognition, self-regulated learning, and professional character formation. The model expands creativity theory by empirically demonstrating that disciplined repetition and aesthetic constraint may function as catalysts for divergent cognition rather than barriers to originality ([Mareza et al., 2025](#)). Furthermore, the model integrates evidence from creativity research, neuroaesthetics, educational psychology, Islamic educational philosophy, and teacher identity development into a unified pedagogical framework. Rather than positioning Islamic traditions as oppositional to educational innovation, the proposed model demonstrates that Islamic artistic heritage

can function as an empirically supported pedagogical resource for cultivating creativity, ethical responsibility, and professional identity in contemporary teacher education.

Teacher education programs should consider integrating structured aesthetic modules grounded in Islamic artistic traditions that combine technical precision, reflective dialogue, and character formation. Constraint-based artistic practice may function as executive function training capable of strengthening persistence, attentional regulation, reflective awareness, and adaptive creativity (Winner, E., Goldstein, T., & Vincent-Lancrin, S, 2013). Within broader Islamic educational contexts, the findings support renewed attention toward arts-based and aesthetic pedagogies as legitimate components of holistic educational reform. Educational institutions should therefore move beyond narrowly cognitive instructional paradigms and recognize the pedagogical significance of beauty, reflective discipline, and embodied learning within Islamic education.

f. Limitations and Future Research

Several limitations should be acknowledged. The study employed a modest sample size within a single institutional context, limiting broader generalizability. The intervention duration was relatively short, and character outcomes relied partially on self-report measures. Future studies should therefore employ longitudinal designs examining long-term developmental effects. Further research should also investigate mediating mechanisms such as self-regulated learning, reflective awareness, and executive function development. Neurocognitive approaches using EEG or fNIRS technologies may provide deeper insight into attentional and regulatory processes activated during structured aesthetic practice. Comparative studies involving other Islamic artistic disciplines such as music, geometric art, or drama-based pedagogy may further expand understanding regarding the educational potential of Islamic aesthetics within contemporary teacher education. Several limitations should be acknowledged. The study employed a modest sample size within a single institutional context, limiting the generalizability of the findings. In addition, the intervention duration was relatively short, and character outcomes relied partly on self-report measures. Future research should therefore employ longitudinal designs with larger and more diverse samples to examine the long-term sustainability of the observed outcomes. Further studies should also investigate mediating mechanisms, such as self-regulated learning, reflective awareness, and executive function development. Neurocognitive approaches using EEG or fNIRS technologies may provide deeper insights into the attentional and regulatory processes activated during structured aesthetic practice. Comparative studies involving other forms of Islamic aesthetic practice, such as geometric art, music, or drama-based pedagogy, may further broaden understanding of the educational potential of Islamic arts in contemporary teacher education.

4. CONCLUSION

The structured Islamic calligraphy intervention significantly improved both creative thinking and professional character among pre-service elementary teachers. Participants in the experimental group demonstrated substantial gains across the four dimensions of creativity fluency, flexibility, originality, and elaboration as well as meaningful improvements in discipline, perseverance, responsibility, and aesthetic sensitivity. Furthermore, the positive correlation between creativity and professional character suggests that these developmental domains evolve through interconnected self-regulatory processes rather than independently. These findings demonstrate that Islamic calligraphy functions as more than an artistic activity. When implemented through structured, reflective, and pedagogically guided practice, it serves as an effective educational medium for simultaneously fostering creative cognition, self-regulation, and professional character. This study provides empirical evidence supporting the integration of Islamic aesthetic practice into teacher education to strengthen both the cognitive and ethical dimensions of professional preparation. A key theoretical contribution of this study is the proposed Aesthetic Discipline Model, which explains how structured aesthetic practice promotes professional growth through the sequential relationship among Aesthetic Discipline, Self-Regulated Learning, Creative Cognition, and Professional Character Formation. The model provides an integrated framework linking creativity, Islamic pedagogy, and teacher professional development, thereby extending existing perspectives that have traditionally examined creativity and character education as separate domains. From a practical perspective, the findings suggest that Islamic teacher education programs should integrate structured aesthetic learning experiences into professional preparation curricula. Such experiences enable prospective teachers to cultivate creativity, reflective practice, ethical responsibility, and professional identity within authentic learning contexts, thereby supporting more holistic teacher development. This study has several limitations. It was conducted within a single teacher education institution, involved a relatively modest sample size, and implemented a four-week intervention, which may limit the generalizability of the findings. Future research should involve larger and more diverse samples, longitudinal research designs, and multi-institutional settings to examine the long-term sustainability of the observed outcomes. Further studies may also investigate the mediating role of self-regulated learning and compare Islamic calligraphy with other forms of Islamic aesthetic practice, such as geometric art, music, or drama-based pedagogy, to broaden understanding of the educational potential of Islamic arts in teacher education. Overall, the findings demonstrate that structured Islamic calligraphy-based aesthetic discipline represents more than an artistic enrichment activity; it constitutes a theoretically grounded and empirically supported pedagogical approach for simultaneously strengthening creativity, professional character, reflective practice, and pedagogical adaptability within

contemporary Islamic teacher education. Conceptually, this study advances the Aesthetic Discipline Model as an integrated developmental framework linking structured aesthetic practice, self-regulated learning, creative cognition, and professional character formation.

5. REFERENCES

- Acar, S., Burnett, C., & Cabra, J. F. (2017). Ingredients of creativity: Originality and more. *Creativity Research Journal*, 29(2), 133–144. <https://doi.org/10.1080/10400419.2017.1302776>
- Adi, M., Rahmawati, N., & Hidayat, T. (2024). The implementation of environment-based madrasah culture in Islamic religious education learning to develop students' character. *Jurnal Tarbiyatuna*, 15(1), 45–61. <https://doi.org/10.31603/tarbiyatuna.v15i1.10999>
- Almeida, J., Mahon, B. Z., Nakayama, K., & Caramazza, A. (2008). Unconscious processing dissociates along categorical lines. *Proceedings of the National Academy of Sciences*, 105(39), 15214–15218. <https://doi.org/10.1073/pnas.0805867105>
- Anderson, N., Potočník, K., & Zhou, J. (2014). Innovation and creativity in organizations: A state-of-the-science review, prospective commentary, and guiding framework. *Journal of Management*, 40(5), 1297–1333. <https://doi.org/10.1177/0149206314527128>
- Asman, A., Hasanah, U., & Nurhadi, M. (2021). Character education as brain education: Spiritual neuroscience studies in Islamic education. *Jurnal Tarbiyatuna*, 12(2), 178–193. <https://doi.org/10.31603/tarbiyatuna.v12i2.4278>
- Beauchamp, C., & Thomas, L. (2009). Understanding teacher identity: An overview of issues in the literature and implications for teacher education. *Cambridge Journal of Education*, 39(2), 175–189. <https://doi.org/10.1080/03057640902902252>
- Beghetto, R. A. (2019). Structured uncertainty: How creativity thrives under constraints and uncertainty. Springer. <https://doi.org/10.1007/978-3-319-90272-2>
- Beghetto, R. A., & Kaufman, J. C. (2014). Classroom contexts for creativity. *High Ability Studies*, 25(1), 53–69. <https://doi.org/10.1080/13598139.2014.905247>
- Berkowitz, M. W., & Bier, M. C. (2014). Research-based character education. *The ANNALS of the American Academy of Political and Social Science*, 591(1), 72–85. <https://doi.org/10.1177/0002716203260082>
- Biesta, G. (2022). *World-centred education: A view for the present*. Routledge.
- Blair, S. S. (2006). *Islamic calligraphy*. Edinburgh University Press. <https://doi.org/10.1515/9781474464475>
- Brattico, E., & Pearce, M. (2013). The neuroaesthetics of music. *Psychology of Aesthetics, Creativity, and the Arts*, 7(1), 48–61. <https://doi.org/10.1037/a0031624>
- Bresler, L. (2018). Aesthetic-based research as pedagogy: The interplay of knowing and unknowing toward expanded seeing. In P. Leavy (Ed.), *The handbook of arts-based research* (pp. 649–672). Guilford Press.
- Chatterjee, A., & Vartanian, O. (2014). Neuroaesthetics. *Trends in Cognitive Sciences*, 18(7), 370–375. <https://doi.org/10.1016/j.tics.2014.03.003>

- Cochran-Smith, M., Keefe, E. S., Carney, M. C., Sánchez, J. G., Olivo, M., Smith, R. J., & Baker, M. (2020). Teacher preparation at the crossroads. *Journal of Teacher Education*, 71(1), 6–19. <https://doi.org/10.1177/0022487119883345>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Routledge. <https://doi.org/10.4324/9780203771587>
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approach* (5th ed.). Sage.
- Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science*, 24(2), 97–140. <https://doi.org/10.1080/10888691.2018.1537791>
- Diamond, A. (2013). Executive functions. *Annual Review of Psychology*, 64, 135–168. <https://doi.org/10.1146/annurev-psych-113011-143750>
- Eisner, E. W. (2002). *The arts and the creation of mind*. Yale University Press.
- George, A. (2010). *The rise of Islamic calligraphy*. Saqi Books.
- Glăveanu, V. P. (2018). Educating which creativity? *Thinking Skills and Creativity*, 27, 25–32. <https://doi.org/10.1016/j.tsc.2017.11.006>
- Hair, J. F., Babin, B. J., Anderson, R. E., & Black, W. C. (2019). *Multivariate data analysis* (8th ed.). Cengage Learning.
- Halstead, J. M. (2004). An Islamic concept of education. *Comparative Education*, 40(4), 517–529. <https://doi.org/10.1080/0305006042000284510>
- Henriksen, D., Richardson, C., & Mehta, R. (2017). Design thinking: A creative approach to educational problems of practice. *Thinking Skills and Creativity*, 26, 140–153. <https://doi.org/10.1016/j.tsc.2017.10.001>
- Henriksen, D., Richardson, C., & Shack, K. (2020). Mindfulness and creativity in education. *Thinking Skills and Creativity*, 37, 100689. <https://doi.org/10.1016/j.tsc.2020.100689>
- Hetland, L., Winner, E., Veenema, S., & Sheridan, K. M. (2013). *Studio thinking 2: The real benefits of visual arts education*. Teachers College Press.
- Imron, A., Muarifah, S., Oktradiksa, A., & Romdhoni, A. (2024). Cultivating social character through project-based learning in Islamic elementary schools in Semarang. *Jurnal Tarbiyatuna*, 15(1), 85–102. <https://doi.org/10.31603/tarbiyatuna.v15i1.10166>
- Karwowski, M., Lebeda, I., & Beghetto, R. A. (2019). Creative self-beliefs. *Psychology of Aesthetics, Creativity, and the Arts*, 13(3), 317–327. <https://doi.org/10.1017/9781316979839.021>
- Karwowski, M., Czerwinka, M., Lebeda, I., Jankowska, D. M., & Gajda, A. (2020). Does thinking about Einstein make people entity theorists? Examining the malleability of creative mindsets. *Psychology of Aesthetics, Creativity, and the Arts*, 14(3), 361–366. <https://doi.org/10.1037/aca0000226>
- Kelchtermans, G. (2019). Early career teachers and their need for support: Thinking again. In A. Sullivan, B. Johnson, & M. Simons (Eds.), *Attracting and keeping the*

- best teachers: Issues and opportunities (pp. 83–98). Springer. https://doi.org/10.1007/978-981-13-8621-3_5
- Korthagen, F. A. J. (2017). Inconvenient truths about teacher learning: Towards professional development 3.0. *Teachers and Teaching*, 23(4), 387–405. <https://doi.org/10.1080/13540602.2016.1211523>
- Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science. *Frontiers in Psychology*, 4, Article 863. <https://doi.org/10.3389/fpsyg.2013.00863>
- Leandro S. Almeida, L. P. Prieto, M. Ferrando, E. Oliveira, & C. Ferrándiz. (2008). Torrance Test of Creative Thinking: The question of its construct validity. *Thinking Skills and Creativity*, 3(1), 53–58. <https://doi.org/10.1016/j.tsc.2008.03.003>
- Mala, A., Fauziyah, N., & Rahman, M. (2024). Towards sustainable inclusive education: Challenges and reconstruction of PAI learning methods in Islamic boarding school education. *Jurnal Tarbiyatuna*, 15(2), 120–138. <https://doi.org/10.31603/tarbiyatuna.v15i2.11181>
- Mareza, L., Mumpuniarti, Suwarjo, Mustadi, A., & Dewi, D. S. E. (2025). Arts education for children with disabilities: A systematic literature review. *Center for Educational Policy Studies Journal*, 15(3), 227–254. <https://doi.org/10.26529/cepsj.1667>
- Mawardi, I., Raharjo, A. B., & Fahm, A. G. O. (2021). Teachers' strategies in strengthening character education based on Islamic values in online learning during the COVID-19 pandemic. *Jurnal Tarbiyatuna*, 12(2), 151–167. <https://doi.org/10.31603/tarbiyatuna.v12i2.5991>
- Nadal, M., & Skov, M. (2018). The role of context in art perception. *Trends in Cognitive Sciences*, 22(11), 1047–1059.
- Nasr, S. H. (1987). *Islamic art and spirituality*. State University of New York Press.
- Nunnally, J.C. and Bernstein, I.H. (1994) The Assessment of Reliability. *Psychometric Theory*, 3, 248-292.
- Polit, D. F., & Beck, C. T. (2006). The content validity index: Are you sure you know what's being reported? Critique and recommendations. *Research in Nursing & Health*, 29(5), 489–497. <https://doi.org/10.1002/nur.20147>
- Prasetyo, D., Suryani, L., & Wahyudi, A. (2025). Mapping joyful art learning strategies to strengthen students' deep understanding in elementary schools. *Jurnal Tarbiyatuna*, 16(2), 33–49. <https://doi.org/10.31603/tarbiyatuna.v16i2.15389>
- Razali, N. M., & Wah, Y. B. (2011). Power comparisons of Shapiro–Wilk, Kolmogorov–Smirnov, Lilliefors, and Anderson–Darling tests. *Journal of Statistical Modeling and Analytics*, 2(1), 21–33.
- Roxburgh, D. J. (2008). " The Eye Is Favored for Seeing the Writing's Form": On the Sensual and the Sensuous in Islamic Calligraphy. *Muqarnas*, 25, 275-298.
- Runco, M. A., & Jaeger, G. J. (2012). The standard definition of creativity. *Creativity Research Journal*, 24(1), 92–96. <https://doi.org/10.1080/10400419.2012.650092>
- Sahin, A. (2018). Critical issues in Islamic education studies. *Religion & Education*, 45(2), 198–214. <https://doi.org/10.1080/15507394.2018.1465393>
- Schimmel, A. (1990). *Calligraphy and Islamic culture*. New York University Press.

- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Houghton Mifflin.
- Stokes, P. D. (2006). *Creativity from constraints: The psychology of breakthrough*. Springer.
- Sweller, J. (2011). Cognitive load theory. *Psychology of Learning and Motivation*, 55, 37–76. <https://doi.org/10.1016/B978-0-12-387691-1.00002-8>
- Tabachnick, B. G., & Fidell, L. S. (2019). *Using multivariate statistics* (7th ed.). Pearson.
- Tan, C. (2020). *Islamic education and indoctrination: The case in Indonesia*. Routledge.
- Umamah, Z. (2019). Internalisasi life skills dalam pembelajaran: Studi atas penguatan pendidikan karakter di MIN 1 Kota Madiun. *Jurnal Tarbiyatuna*, 9(2), 145–160. <https://doi.org/10.31603/tarbiyatuna.v9i2.2380>
- Winner, E., Goldstein, T. R., & Vincent-Lancrin, S. (2013). Art for art's sake? The impact of arts education. OECD Publishing. <https://doi.org/10.1787/9789264180789-en>
- Yuan, R., & Lee, I. (2021). *Becoming and Being a TESOL Teacher Educator: Research and Practice*. Routledge. <https://doi.org/10.4324/9781003004677>
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, 41(2), 64–70. https://doi.org/10.1207/S15430421TIP4102_2



This work is licensed under a [Creative Commons Attribution-NonCommercial 4.0 International License](https://creativecommons.org/licenses/by-nc/4.0/)