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# ALACAZAM as an Authentic Learning Space: The Construction of 4C Skills Among Female Pesantren Students

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ABSTRACT

This study explores how female *pesantren* students construct and integrate communication, collaboration, critical thinking, and creativity (4C) through ALACAZAM, an authentic student-led mega-project in an Indonesian Islamic boarding school. Employing Moustakas' transcendental phenomenology, the study involved 15 purposively selected female students. Primary data comprised retrospective in-depth interviews concerning ALACAZAM experiences from 2023 to 2025, supported by contextual informant interviews, documentary evidence from 2024–2025, and observations of preparations for ALACAZAM 2026. Data were analyzed through epoche, horizonalization, meaning clustering, imaginative variation, and the synthesis of textural and structural descriptions, assisted by ATLAS.ti 9. The findings identified the enactment of all four competencies through organizational responsibilities, with two particularly evident integrative patterns. Communication functioned as the infrastructure of collaboration through negotiation, task coordination, and collective responses to organizational challenges. Critical thinking informed adaptive creativity when students evaluated constraints and considered feasible modifications to ideas and resources. The phenomenological synthesis identified five structural conditions associated with these experiences: student responsibility, support without takeover, authentic demands and consequences, institutional accountability, and expanded learning arenas. *Pesantren* values provided contextual meanings associated with responsibility and interpersonal relationships. The study proposes a contextually grounded understanding of integrated 4C competencies as relational-situational

practices within authentic student-led learning, without assuming uniform experiences or causal competency gains.

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**Keywords**
4C Competencies
Adaptive Creativity
ALACAZAM
Authentic Learning
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## Introduction

Communication, collaboration, critical thinking, and creativity (4C) are increasingly recognized as essential competencies for navigating complex educational, social, and professional environments. Their educational significance extends beyond the acquisition of separate skills to the capacity to coordinate ideas, evaluate alternatives, and respond collectively to authentic problems. Shadiev and Wang [1] highlight the importance of twenty-first-century competencies in technology-supported learning, while Kain et al. [2] demonstrate the diversity of conceptualizations and educational approaches associated with these skills [3]. However, understanding how students acquire competencies does not necessarily explain how they experience their interrelationships when undertaking meaningful responsibilities.

Project-based learning (PjBL) offers a relevant foundation for developing 4C competencies through sustained inquiry, collaboration, and practical problem-solving [4]. Zhang and Ma's [5] meta-analysis of 66 studies reported positive effects of PjBL on academic achievement, affective attitudes, and thinking skills. Meanwhile, Markula and Aksela [6] examined how teachers implement key PjBL characteristics in K–12 science education, emphasizing the importance of project design and instructional practices [7]. These studies establish the educational value of project-based approaches, yet their primary emphases differ: the former evaluates learning outcomes, whereas the latter investigates instructional implementation. Neither directly addresses how students interpret the integration of multiple competencies while managing an extensive student-led organizational project.

Recent research provides further insights into relationships among twenty-first-century competencies. Jurkowski et al. [8] investigated transactive communication in collaborative learning, demonstrating the relevance of communication processes to coordinated group activities. Maor et al. [9] examined relationships among metacognition, critical thinking, and creativity in project-based teaching settings; related project-based research has examined critical thinking in online learning [10]. Norris et al. [11] explored collaboration and creative thinking through extracurricular challenges. Collectively, these studies illuminate specific competency relationships and learning arrangements [12].

Nevertheless, they leave room for phenomenological investigation of how students experience communication, collaboration, critical thinking, and creativity as interconnected practices within the same authentic organizational responsibilities.

Student-led projects require participants to plan activities, coordinate peers, manage resources, and respond to uncertainty. Such participation occurs within institutional arrangements, not unrestricted independence [13]. Vare and Burch [14] show the importance of school structures for accommodating student-led projects, highlighting the need to consider responsibility alongside guidance and accountability.

At SMA Pesantren Unggul Al Bayan Putri Sukabumi, ALACAZAM is an annual student-led mega-project encompassing competitions, performances, correspondence, fundraising, sponsorship, and logistics. Its interdependent divisions operate within a *pesantren* environment shaped by communal responsibilities, religious values, and school guidance. Here, mega-project denotes organizational complexity, not a standardized pedagogical category.

Against this background, three interconnected research gaps emerge. First, outcome-oriented PjBL research provides evidence of educational effectiveness but offers limited insight into the first-person meanings students attribute to integrated competency practices, a dimension also relevant to accounts of interdisciplinary project experiences [15]. Second, studies of classroom projects and specific collaborative or creative processes do not fully illuminate the organizational experiences of students who assume consequential responsibilities across multiple project divisions. Third, the relationships among 4C competencies remain insufficiently understood from a phenomenological perspective within female *pesantren* education, where student initiative operates alongside institutional accountability and culturally situated values. These gaps call for an inquiry that connects the experiential dimensions of competency integration with the conditions under which those experiences occur.

The present study addresses these gaps through Moustakas' [16] transcendental phenomenology. Its novelty lies in reconstructing the textural and structural dimensions of situated 4C integration, rather than treating the competencies solely as separately measurable outcomes. Drawing primarily on students' retrospective experiences of ALACAZAM 2023–2025, supplemented by documents from 2024–2025 and contextual observations of preparations for 2026, the study examines how competency relationships are experienced within authentic responsibilities. Accordingly, it asks: How do female *pesantren* students construct and integrate communication, collaboration, critical thinking, and creativity through authentic experiences in the student-led ALACAZAM mega-project? The study seeks a contextually grounded phenomenological understanding, not causal evidence of competency

gains or universally applicable developmental patterns, distinguishing this inquiry from outcome-oriented accounts of transformative learning [17].

## Material and Methods

### A. Research Design and Context

This qualitative study adopted Moustakas' transcendental phenomenology to reconstruct what participants experienced (textural description) and the conditions shaping those experiences (structural description), rather than quantify 4C outcomes [16], [18], [19]. ALACAZAM is an annual student-led event at SMA Pesantren Unggul Al Bayan Putri Sukabumi, involving competitions, performances, correspondence, fundraising, sponsorship, and cross-divisional coordination. Its committee comprises student leaders and functional divisions supported by teacher guidance and school oversight. The public-relations workload included approximately 270 letters in 2025. Events occurred on October 16–21, 2023; October 16–19, 2024; and September 30–October 3, 2025; preparations for the September 30–October 3, 2026 event formed the observational context.

### B. Participants, Instruments, and Collection

Fifteen female students (P1–P15) were purposively selected for direct ALACAZAM involvement and variation in roles, consistent with purposive sampling for experiential relevance [20], including leadership, administration, competitions, creative work, finance, and external coordination. Grade XII students had opportunities to experience the 2023–2025 cycles and Grade XI students the 2024–2025 cycles, although involvement varied. Four contextual informants—the principal, two vice principals, and a teacher mentor—described institutional arrangements. The researcher was the primary instrument, supported by interview guides, observation and document-analysis sheets, recordings, field notes, and a reflective journal; experiential interview quality informed the interviewing approach [21]. Dr. Ika Maryani, M.Pd., approved the instruments through expert judgment on April 11, 2026.

Following preliminary school permission, an initial observation of a committee proposal presentation occurred on March 22, 2026, before instrument validation; this observation was treated as preliminary contextual evidence. Formal institutional approval and informed consent preceded participant interviews conducted April 24–May 20, 2026 (approximately 45–60 minutes each). Interviews retrospectively addressed ALACAZAM 2023–2025. Two further observations documented 2026 preparations: fundraising on May 28 and stage-property production on June 12. Documentary evidence (proposals, accountability records, and audiovisual materials) came from ALACAZAM 2024–2025. The 2026 observations contextualized organizational practices but did not directly verify recalled events from earlier cycles.

### C. Phenomenological Analysis and Article Focus

Analysis involved continuing epoche and reflexive examination of assumptions [22], horizontalization of significant statements, clustering of experiential meaning units, individual and composite textural descriptions, imaginative variation of structural conditions, and textural–structural synthesis [16], [19]. Interview accounts were interpreted holistically before coding; the four competencies guided inquiry without operating as rigid categories. ATLAS.ti 9 aided quotation retrieval and auditability, while co-occurrence searches identified potentially relevant passages, not statistical associations or competency gains [23]. Every intersection was checked against its original context. Contextual interviews, documents, and observations illuminated organizational conditions without replacing first-person evidence. This article focuses on 4C integration within a broader doctoral phenomenological corpus; no additional participants were recruited.

## Results

Phenomenological analysis of 15 female students' experiences of ALACAZAM identified the enactment of communication, collaboration, critical thinking, and creativity through organizational responsibilities and practical challenges. The competencies appeared with varying prominence across participants and situations. Analysis of significant statements and their experiential contexts subsequently revealed two integrative patterns: communication as the infrastructure of collaboration and critical thinking as a guide for adaptive creativity. Imaginative variation further identified five essential structural meaning conditions and one contextual condition shaping these experiences. All participant quotations were translated from Indonesian into English.

### A. The Emergence of Four Competencies in Authentic Organizational Experiences

Participants experienced the four competencies through concrete responsibilities rather than abstract descriptions of skills. Communication involved explaining ideas, clarifying disagreements, and interacting with stakeholders. P1 described reopening discussions to resolve misunderstandings (P1, 1:35), while P9 reported communicating with external parties through public-relations responsibilities (P9, 9:5).

Collaboration involved organizing interdependent responsibilities. P1 recognized that distributing approximately 270 letters required assistance beyond two committee members (P1, 1:25). P8 similarly described dividing competition-related tasks with a younger committee partner and consulting the division leader regarding procedures and assessment (P8, 8:1). These accounts indicate that collaboration involved coordinating contributions toward shared organizational purposes.

Critical thinking appeared when participants evaluated previous approaches, considered constraints, and compared alternatives. P4 reconsidered a competition format after reflecting on limited interest in an earlier quiz (P4, 4:39). P14 compared products of similar quality and selected less expensive alternatives when managing financial responsibilities (P14, 14:9).

Creativity was evident in developing concepts and modifying available resources. P5 described substituting cardboard for impractical rock materials in constructing cave-like decorations (P5, 5:29), while P11 recalled reconsidering an event concept when changes became necessary near a deadline (P11, 11:19).

The competencies also intersected within particular experiences. P9 explained:

> "At first, I was confused because I was not used to ideas like that. But after looking for ways and discussing them with my partner, new ideas began to open up in my mind." (P9, 9:15)

P9's account illustrates idea generation through discussion, informing the situated patterns in Table 1 without proving a preceding evaluative process.

**Table 1.** Situated Patterns of 4C Integration in ALACAZAM

| Integration pattern | Authentic situations and experienced relationship | Illustrative evidence |
|---|---|---|
| Communication as the infrastructure of collaboration | Correspondence, competition coordination, and disagreements; communication supported clarification, negotiation, and collective task organization | P1 (1:25, 1:35); P3 (3:15); P8 (8:1); P12 (12:27) |
| Critical thinking as a guide for adaptive creativity | Competition revision, material substitution, and changes near deadlines; practical evaluation informed feasible modifications | P4 (4:39); P5 (5:15, 5:29); P11 (11:19) |

*Note*. Participant identifiers indicate sources of phenomenological evidence, not the prevalence, frequency, or statistical strength of the patterns.

### B. Communication as the Infrastructure of Collaboration

The first pattern emerged when communication enabled students to coordinate interdependent work, clarify responsibilities, and negotiate disagreements. P1 described the organizational demands of distributing correspondence:

> "There were approximately 270 letters to be sent. If it had only been the two of us, my younger partner and me, handling them would not have been easy. So, we involved all the public-relations committee members to coordinate with the other students in distributing the letters." (P1, 1:25)

Recognizing the limits of two individuals' capacity led P1 to involve additional committee members. Communication thus became a practical means of organizing collective action rather than simply exchanging information.

A similar relationship appeared in P8's competition-management responsibilities, where dividing tasks and consulting the division leader supported coordination (P8, 8:1). P3 described discussion as a means of addressing organizational difficulties (P3, 3:15). However, collaboration was not invariably harmonious. P12 recalled disagreements and frustration, followed by efforts to restore communication and mutual understanding (P12, 12:27).

Together, these accounts indicate that communication supported collaboration through task distribution, consultation, and interpersonal negotiation. The pattern does not imply that communication always resolved conflicts or guaranteed successful collective outcomes.

### C. Critical Thinking as a Guide for Adaptive Creativity

The second pattern concerned situations in which evaluating an existing approach or practical constraint informed consideration of an alternative. This relationship was particularly evident in the accounts of P4, P5, and P11.

P4 reconsidered a competition format after reflecting on limited interest in the previous year's quiz (P4, 4:39). The account connects evaluation of an earlier activity with a revised organizational decision, although its subsequent effectiveness was not established.

P5 encountered material constraints while developing decorations and selected cardboard as an alternative to actual rocks (P5, 5:29). The participant also explained:

> *"Turning something from a digital form into a real one, or actually making it, both require a lot of thinking. What is digital will not necessarily look the same in reality. The quality may not be as good as the digital version. Even with coloring, it is easy to find a color digitally, but in reality it is difficult to find the paint." (P5, 5:15)*

This experience reveals how creative production required consideration of feasibility, material availability, and differences between digital concepts and physical outcomes.

P11 described another situation involving a changing concept and limited time:

> "The concept suddenly had to be changed, and the deadline was already close. So, my friends and I were thinking, 'How can we make the concept different but still finish it by the deadline?" (P11, 11:19)

Here, the need for modification was experienced alongside the requirement to complete the work within an approaching deadline.

The boundaries of this pattern are important. P14's financial comparisons demonstrate evaluation without necessarily establishing creativity (P14, 14:9), whereas P9's discussion-generated ideas do not clearly demonstrate a preceding evaluative process (P9, 9:15). Therefore, critical thinking and creativity were not invariably sequential or jointly experienced. The pattern describes particular relationships between practical judgment and creative modification, rather than a uniform experience across all 15 participants.

### D. Structural Conditions Shaping Integrated 4C Experiences

Imaginative variation identified five conditions considered essential to the character of the documented experiences and one contextual condition associated with *pesantren* values. Table 2 summarizes their empirical grounding.

**Table 2.** Structural Meaning Conditions Shaping Integrated 4C Experiences

| Structural meaning condition | Participant evidence | Supporting contextual evidence |
|---|---|---|
| SMC-1. Student action and responsibility - Essential | P4 (4:10); P6 (6:41); P15 (15:28) | I19 (19:10); observation 26:8 |

| | | |
|---|---|---|
| SMC-2. Support without takeover - Essential | P2 (2:27); P8 (8:2); P10 (10:34) | I16 (16:8); I18 (18:10); I19 (19:16) |
| SMC-3. Authentic demands and consequences - Essential | P5 (5:15); P10 (10:19); P11 (11:19) | I19 (19:14); observation 21:7 |
| SMC-4. Institutional boundaries and accountability - Essential | P6 (6:38); P8 (8:32); P14 (14:1) | Observation 20:5; documents 24:3, 24:6 |
| SMC-5. Expanded learning arenas - Essential | P7 (7:25); P8 (8:42); P9 (9:5) | I19 (19:15); observation 21:4 |
| SMC-6. Pesantren value horizon - Contextual | P3 (3:27); P12 (12:27); P15 (15:5) | I16 (16:9); observation 20:6; document 27:6 |

*Note*. SMC = structural meaning condition; P = student participant; I = contextual informant. Participant interviews concern experiences of ALACAZAM 2023–2025, documents originate from 2024–2025, and observations concern preparations for ALACAZAM 2026. Supporting sources provide organizational context rather than direct verification of identical events. "Essential" refers to the documented phenomenological structure, not universal educational prerequisites.

1. Student Action and Responsibility

Students experienced responsibility through organizational positions and situations requiring independent judgment. P6 recalled:

> "We had to improvise on our own. We could not ask anyone. We could not wait for anyone else's decision." (P6, 6:41)

This statement illustrates decision-making under immediate circumstances. P15 emphasized the personal obligation associated with an entrusted position:

> "With that position, I certainly had a very great responsibility, Sir. So I had to take very good care of it and carry it out as fully as possible." (P15, 15:28)

These accounts distinguish situational judgment from the enduring responsibility attached to a committee role. A contextual informant described opportunities for students to organize activities while consulting school authorities when necessary (I19, 19:10).

2. Support Without Takeover

Students' responsibilities were exercised within relationships involving teachers and school leaders. P2 described attempting to resolve committee problems internally before requesting teacher assistance (P2, 2:27). P10 similarly described consultation with teachers while maintaining responsibility for organizational decisions (P10, 10:34). Contextual informants reported providing guidance and mediation (I16, 16:8; I18, 18:10; I19, 19:16). These sources indicate that accessible adult support could coexist with student decision-making, without establishing that teachers never intervened.

3. Authentic Demands and Consequences

Participants encountered demands extending beyond predetermined exercises. P5 faced material limitations (P5, 5:15), P11 confronted a changing concept near a deadline (P11, 11:19), and P10 experienced sponsorship rejection (P10, 10:19). P14's comparison of financial alternatives further illustrated practical judgments involving resource allocation (P14, 14:9). Observations of student fundraising preparations documented interactions

with buyers (Observation 21:7). These experiences demonstrate uncertainty, external responses, and practical constraints, although difficulty itself cannot be equated with successful learning.

4. Institutional Boundaries and Accountability

Student decision-making operated within organizational responsibilities and reporting requirements. P6 described discretion within assigned divisional work (P6, 6:38), while P8 reported consultation regarding competition arrangements (P8, 8:32). P14 described responsibilities involving financial administration (P14, 14:1). During the 2026 proposal presentation, student leaders responded to teachers' questions (Observation 20:5); accountability documents from earlier cycles recorded reporting and financial procedures (Documents 24:3, 24:6). These sources indicate that opportunities for action were accompanied by institutional oversight.

5. Expanded Learning Arenas

ALACAZAM connected classroom knowledge with organizational situations and interactions beyond ordinary lessons. P7 explained:

> "In class, there is usually a lot of theory, Sir. We sometimes wonder where we can put that theory into practice. But during this event, we could actually apply the theories we had learned in class." (P7, 7:25)

P2 described applying Informatics knowledge to competition certificates (P2, 2:22), while P8 used subject knowledge in preparing competition materials (P8, 8:21). P9's public-relations responsibilities involved external communication (P9, 9:5). These accounts show varied applications of knowledge and social interaction, without independently demonstrating improved academic achievement.

6. The *Pesantren* Value Horizon

The *pesantren* environment provided cultural meanings associated with organizational experiences. P15 interpreted responsibility through **amanah**, or entrusted responsibility (P15, 15:5). P12 described responding to disagreement through renewed communication and mutual acceptance (P12, 12:27). A contextual informant referred to deliberation in student organizational arrangements (I16, 16:9), while an event document included religious expressions of gratitude (Document 27:6). These sources support the relevance of moral and cultural meanings for particular experiences, but not their uniform expression among participants. The *pesantren* value horizon was therefore identified as contextual rather than an essential prerequisite for 4C integration.

**E. Phenomenological Synthesis**

The synthesis of textural and structural descriptions suggests that the four competencies were experienced as distinguishable yet interconnected organizational practices. Communication supported collaboration when students coordinated responsibilities and

negotiated differences; critical thinking informed creative modification in particular situations involving practical constraints.

These relationships occurred within opportunities for student action, accessible guidance, consequential demands, institutional accountability, and expanded learning settings. *Pesantren* values contributed additional meanings associated with responsibility and interpersonal relationships. Some participants also reported applying aspects of their experiences in other settings, but such accounts represent perceived applications rather than independently measured competency gains.

Overall, ALACAZAM was experienced as an authentic learning space in which integrated 4C practices emerged through meaningful organizational responsibilities. The findings support a contextually grounded phenomenological interpretation, not a universal developmental sequence or causal model.

## Discussion

### A. Integrated 4C Competencies as Situated Organizational Practices

The findings suggest that communication, collaboration, critical thinking, and creativity were experienced as distinguishable yet interconnected practices within ALACAZAM. Rather than being enacted exclusively through separate activities, these competencies intersected when students coordinated responsibilities, negotiated disagreements, evaluated constraints, and modified organizational approaches. This interpretation complements scholarship on integrated 4C instruction [24] and Kain et al.'s [25] review of twenty-first-century skills in secondary education, which highlights the diversity of competency conceptualizations. It also extends Ye and Xu's [26] discussion of interdisciplinary learning for cultivating 4C skills by foregrounding students' lived experiences within a student-led organizational project.

Two relationships were particularly evident. Communication supported collaboration through clarification and coordination, while critical thinking informed creative modification in specific situations involving practical constraints. These patterns should not be interpreted as an exhaustive classification of 4C integration or as evidence of equivalent competency development among participants. Their contribution lies in illustrating how the relationships among competencies were experienced within meaningful organizational responsibilities.

### B. Communication as the Infrastructure of Collaboration

The first pattern indicates that communication functioned as a practical resource for organizing collaborative action. P1's experience of coordinating approximately 270 letters illustrate how recognizing an excessive workload led to broader communication and task distribution. P8 similarly described consultation and coordination across competition-management responsibilities. These experiences suggest that collaboration involved more

than group membership; it required participants to clarify responsibilities and organize interdependent contributions.

This finding resonates with Jurkowski et al. [8], who investigated a training approach designed to strengthen transactive communication in secondary-school collaborative learning. Transactive communication emphasizes engagement with others' contributions rather than merely expressing individual opinions. Although ALACAZAM differed from their structured instructional setting, participants' experiences suggest a comparable communicative function in negotiating responsibilities and coordinating collective work. Norris et al. [11] also examined collaboration and creative thinking through extracurricular challenges, providing a relevant comparison for understanding competency practices beyond conventional lessons.

Importantly, collaboration did not always involve harmonious relationships. P12 described interpersonal tension followed by efforts to restore communication. Such experiences indicate that communication could become particularly significant when differences threatened collective work. Thus, the expression *communication as the infrastructure of collaboration* refers to a situated relationship through which students attempted to sustain coordination, not a guarantee of conflict resolution.

O'Reilly and O'Grady [27] conceptualize authentic student voice through opportunities for meaningful participation in educational decisions. a concern also discussed in relation to children's voice and adult responsibility [28]. ALACAZAM offers a related perspective because some participants described influencing organizational arrangements through discussion and negotiation. Nevertheless, the evidence does not establish equal decision-making authority among students or demonstrate a generalized increase in agency. Student voice is therefore a useful interpretive comparison rather than an independently measured outcome.

### C. Critical Thinking as a Guide for Adaptive Creativity

The second pattern concerns the relationship between evaluating practical conditions and modifying ideas or approaches. P4 reconsidered a competition format after reflecting on an earlier event, P5 substituted cardboard for impractical decorative materials, and P11 confronted the need to revise a concept near a deadline. These experiences suggest that creative responses were sometimes informed by judgments concerning feasibility, available resources, and organizational purposes.

In this study, adaptive creativity is proposed as a contextually grounded interpretive concept emerging from the phenomenological analysis. It refers to *the situated practice of modifying ideas, materials, or organizational approaches in response to recognized practical constraints while attempting to preserve an intended purpose*. The concept describes an experiential relationship rather than a standardized psychological construct or independently measured competency.

Maor et al. [9] investigated relationships among metacognition, critical thinking, and creativity in project-based teaching settings. Their research supports examining these processes relationally, although its participants and analytical focus differ from those of the present study. Similarly, Zhan et al. [29], through a meta-analysis, examined how problem-solving pedagogy relates to creativity. Related design-thinking research offers another perspective on integrating evaluative and creative approaches [30]. These studies provide a broader theoretical context, while ALACAZAM contributes first-person descriptions of how evaluative judgment and creative modification intersected during organizational work.

P5's experience is particularly informative because translating digital decorations into physical products required reconsidering materials, colors, and production possibilities. Creativity was not experienced solely as generating novel ideas but also as adapting an intended design to feasible conditions. P11's account similarly illustrates the tension between conceptual change and an approaching deadline.

However, the relationship was not universal. P14's financial comparisons demonstrated evaluation without necessarily involving creativity, while P9's account of idea generation through discussion did not establish a preceding critical evaluation. Consequently, the findings do not support a fixed sequence in which critical thinking invariably precedes creativity. Adaptive creativity remains a situated interpretive proposition whose relevance beyond these experiences requires further investigation.

**D. ALACAZAM as an Authentic Learning Space**

The structural findings support interpreting ALACAZAM as an authentic learning space because participants encountered responsibilities and problems resembling consequential organizational work. Authenticity was not established merely by the project's scale or its location outside classrooms, consistent with distinctions between designed and spontaneously emerging authenticity in PBL [31]. Rather, it was evident through meaningful responsibilities, interdependent roles, interactions with external stakeholders, open-ended challenges, practical consequences, and opportunities to apply knowledge.

First, students undertook responsibilities involving decisions and accountability. P6 described improvising when immediate judgment was required, while P15 associated an organizational position with substantial personal responsibility. Second, collaboration involved interdependent tasks and real stakeholders, as illustrated by P1's correspondence responsibilities, P8's competition coordination, and P9's external communication. Third, participants encountered problems without predetermined solutions, including material constraints, changing deadlines, financial considerations, and sponsorship rejection.

Fourth, organizational procedures involved practical consequences and accountability. Student proposals, financial administration, and reporting obligations situated decision-

making within institutional expectations. Finally, P7's description of applying classroom theory during ALACAZAM illustrates a perceived connection between academic knowledge and practical activity.

These characteristics resonate with Rahmian et al. [32], who examine authentic learning through configurations of learners' interests, disciplinary practices, and identity. Whereas their research emphasizes inquiry-oriented learning designs, the present findings illuminate authenticity through students' experiences of organizational responsibility and practical constraints. Zhang and Ma's [5] meta-analysis establishes broader evidence concerning project-based learning outcomes, but the present phenomenological study addresses a different question: how participants interpreted the experience of undertaking consequential project responsibilities, a concern also relevant to analyses of project-based learning beyond conventional classrooms [33].

The evidence must nevertheless be distinguished by its source. Student interviews concerned ALACAZAM 2023–2025, documentary materials originated from 2024–2025, and observations documented preparations for ALACAZAM 2026. The latter provided contextual information about organizational arrangements but could not directly verify specific incidents recalled from earlier events. Accordingly, the interpretation of authenticity rests primarily on participants' lived experiences, supported by appropriately bounded contextual evidence.

### E. Accountable Autonomy and Institutional Support

The structural analysis identified five conditions central to the documented experiences: student action and responsibility, support without takeover, authentic demands and consequences, institutional boundaries and accountability, and expanded learning arenas. These conditions suggest that student responsibility operated within relationships of guidance and institutional oversight rather than unrestricted independence.

P2 described attempting to resolve organizational difficulties before seeking teacher assistance, while P10 reported consulting teachers without relinquishing responsibility for decisions. Such experiences support the structural interpretation of *support without takeover*. Similarly, the coexistence of decision-making opportunities and reporting requirements can be described as *accountable autonomy*. Both expressions are interpretive descriptions of relationships documented in the findings, not independently assessed constructs.

Vare and Burch [14] examined how schools accommodate student-led community projects within existing institutional structures. Their research provides a relevant comparison for understanding why student initiative cannot be separated from organizational arrangements, echoing inquiry into student voice and agency in school science [34]. In ALACAZAM, guidance and student responsibility were not necessarily opposing conditions; consultation could coexist with opportunities to make practical decisions.

The notion of institutional trust should be treated more cautiously. Assigning students organizational responsibilities may indicate institutional willingness to entrust them with consequential work. However, the evidence does not demonstrate that all participants experienced this arrangement as trust or that trust caused competency development. The stronger empirical interpretation is that students encountered opportunities for action within accessible guidance and institutional accountability.

### F. *Pesantren* Values and the Cultural Meaning of Participation

The *pesantren* setting contributed a distinctive moral and cultural context to participants' experiences. Some accounts associated organizational responsibility with *amanah* (entrusted responsibility), interpersonal negotiation with deliberation and reconciliation, and achievement with religious gratitude. These meanings illuminate how organizational participation could be interpreted within the institution's value horizon.

P15's understanding of responsibility provides evidence of *amanah* as an experiential meaning. P12's account of interpersonal disagreement and renewed communication illustrates efforts toward reconciliation, while contextual informants described deliberative organizational practices. Nevertheless, the evidence does not justify assuming that every participant interpreted collaboration as *musyawarah* or that *pesantren* values directly caused the emergence of 4C competencies.

This distinction is important for the phenomenological synthesis. The five organizational conditions were identified through imaginative variation as essential to the character of the documented experiences. The *pesantren* value horizon was identified as contextual because it informed particular meanings without constituting a universal prerequisite for integrated 4C practices.

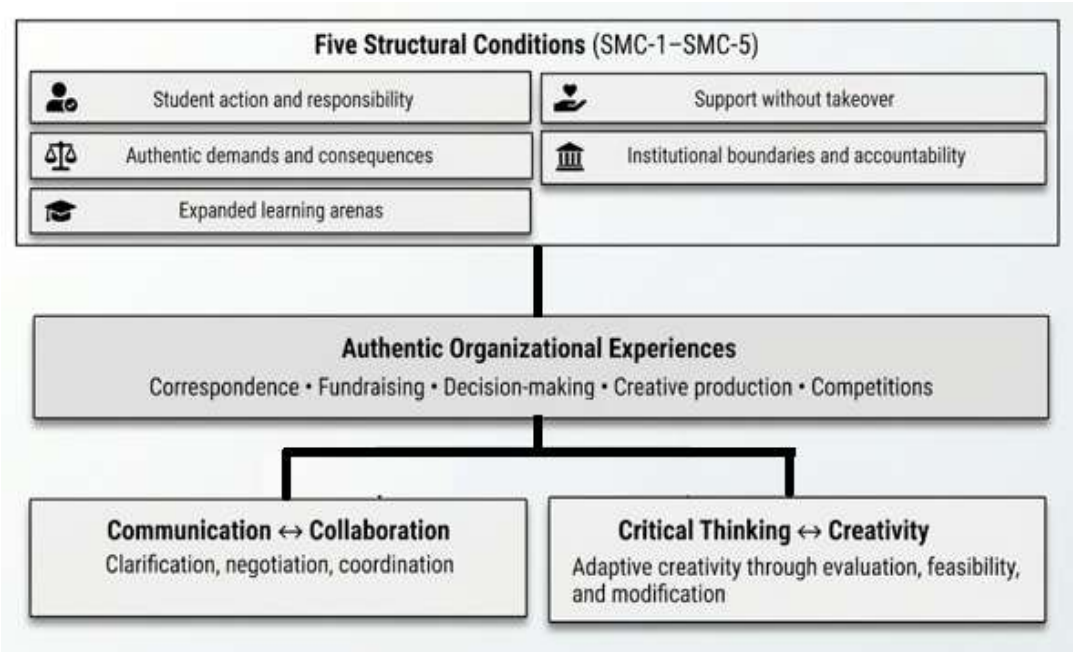
Consequently, the study does not propose a culturally neutral model that can be transferred unchanged to other schools. Rather, it suggests that meaningful organizational responsibility may be interpreted differently across institutional environments. The *pesantren* context illustrates how educational practices and cultural meanings can intersect without being reduced to a simple causal relationship.

### G. Theoretical Contributions and Pedagogical Implications

The principal theoretical contribution is a contextually grounded interpretation of 4C competencies as a relational-situational configuration. Rather than viewing the competencies solely as separate individual attributes, the findings illustrate how communication and collaboration, or critical thinking and creativity, could become interconnected within specific responsibilities. This interpretation complements existing competency-oriented research by emphasizing the experiential relationships through which skills are enacted; studies of future-oriented learning also highlight the situated character of student agency [35].

A second contribution concerns the relationship between textural and structural dimensions. The study identifies not only what students experienced but also the organizational conditions shaping those experiences. Student responsibility, accessible support, authentic demands, accountability, and expanded learning arenas formed part of the circumstances in which integrated practices were encountered.

Third, the study distinguishes organizational conditions from contextual cultural meanings. This distinction enables the ALACAZAM findings to inform broader discussions of authentic student-led learning without presenting *pesantren* values as universal explanatory mechanisms. Fig. 1 presents a contextually grounded conceptual synthesis of five structural meaning conditions, authentic organizational experiences, and two situated patterns of 4C integration. The *pesantren* value horizon frames the meanings attributed to these experiences without functioning as an independently established causal condition. The relationships depicted are interpretive rather than causal and do not imply that all participants experienced identical patterns.




*Note.* The model represents interpretive relationships reconstructed through transcendental phenomenological analysis. Connections do not indicate statistically tested associations, causal pathways, or fixed developmental stages.

**Fig1.** A Contextually Grounded Conceptual Model of Situated 4C Integration in ALACAZAM

Pedagogically, the findings suggest that schools may consider designing projects involving meaningful student responsibilities, interdependent roles, practical decision-making, accessible mentoring, and clear accountability. These implications follow from the documented experiences. Additional strategies, such as structured reflection, progressive autonomy, and standardized 4C assessment, may be valuable but were not evaluated in this

study and should be treated as recommendations requiring further research, , particularly regarding the preparation of teachers to support developmentally responsive learning [36].

### H. Limitations and Future Research

Several limitations qualify these interpretations. The study involved 15 purposively selected students at one female *pesantren*, restricting statistical generalizability. Its primary evidence consisted of retrospective accounts, which may have been influenced by selective recall and subsequent reinterpretation. Social desirability and the researcher's positionality may also have influenced the descriptions and analysis, despite reflexive practices associated with *epoche*. Furthermore, documentary evidence and observations represented different ALACAZAM cycles and could not verify every recalled event. The critical thinking–adaptive creativity relationship was especially visible in selected participants' accounts rather than uniformly across the sample. No standardized competency measures or comparison group were employed; consequently, the study cannot establish causal competency gains. Future comparative and longitudinal research could examine similar student-led projects in other educational settings, explore variations in institutional guidance and cultural meanings, and investigate whether the proposed relationships remain relevant across different organizational experiences.

## Conclusion

This study reveals that female *pesantren* students experienced ALACAZAM as an authentic learning space in which the 4C competencies were enacted as interconnected organizational practices. Two situated patterns were particularly evident: communication supported collaboration through coordination, clarification, and negotiation, while critical thinking informed adaptive creativity through the evaluation and modification of ideas under practical constraints. The textural–structural synthesis identified five structural meaning conditions associated with these experiences: student action and responsibility, support without takeover, authentic demands and consequences, institutional boundaries and accountability, and expanded learning arenas. *Pesantren* values provided a contextual horizon through which participants interpreted responsibility and interpersonal relationships.

The study contributes a phenomenologically grounded understanding of 4C integration as a relational-situational configuration, rather than four independently developing competencies. Its contribution lies in connecting students' lived organizational experiences with the structural conditions under which these experiences acquired educational meaning, without establishing causal relationships or uniform competency gains.

Pedagogically, the findings suggest the value of student-led projects that combine meaningful responsibility, authentic challenges, institutional accountability, and facilitative mentoring. Given the single-school context and retrospective nature of the primary accounts,

further research should examine the transferability of these interpretations across different educational settings and participant groups.

## Conflict of Interest

The authors declare no conflict of interest.

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