



## Unpacking Hidden Learning Networks Among Adolescents in Community-Driven Educational Spaces

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### ABSTRACT

Informal learning in community-based education spaces plays a vital role in adolescent development, yet the structure of learning networks within these spaces is often overlooked. This qualitative case study explores learning networks and community dynamics shaping adolescent learning experiences in a community education space in South Tangerang City. Data from interviews, observations, and document analysis reveal that learning occurs through organically formed social networks characterized by key connecting actors, interest-based collaboration, and spontaneous knowledge sharing. Community spaces function as supportive ecosystems that strengthen adolescent agency, creativity, and social capital, complementing formal education and contributing to more adaptive and inclusive non-formal education models.

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## **INTRODUCTION**

The development of community-based alternative education spaces has brought significant changes to the way adolescents build learning experiences outside of formal education. A flexible, participatory, and interest-based community environment provides opportunities for adolescents to develop social competence, creativity, and critical thinking skills that are often under-accommodated in the conventional school system. This phenomenon is becoming increasingly important amid the increasing need for social and collaborative literacy among the younger generation. Global studies show that learning communities offer an ecosystem that is more responsive to the developmental needs of adolescents than formal institutions. According to Harrington & Seigworth (2022), informal learning spaces have great potential to strengthen interaction- and affection-based learning experiences, especially when adolescents are given space to network organically.

In many countries, community-based education models have been shown to increase learning motivation, expand access to collaborative experiences, and encourage the emergence of informal social networks that enrich the learning process. This system creates opportunities for adolescents to explore knowledge more freely through peer collaboration, informal mentoring, and experience-sharing practices. Research by Kim & Helms (2021) confirms that community spaces allow for the formation of non-hierarchical social relationships, so that the flow of knowledge moves more fluid and adaptive. However, its effectiveness is greatly influenced by the character of the community, the capacity of facilitators, and the dynamics of adolescent members in it. Therefore, community education spaces need to be understood not only as a place of learning, but as a social ecosystem that forms patterns of interaction and knowledge exchange.

At the process level, interactions within the adolescent community give rise to a learning network that is hidden, not formally structured, but profoundly influences the way adolescents acquire, disseminate, and develop knowledge. This network is formed through social closeness, shared interests, and the role of key actors who act as a link between members. Johnson et al., (2023) found that informal learning in adolescent communities takes place through patterns of spontaneous collaboration and emotional connectedness that are difficult to capture through formal education approaches. This shows that the learning process does not only happen through designed activities, but also through casual conversations, group dynamics, and sharing practices that occur organically. Thus, hidden learning networks become an integral part of community dynamics that need to be explored more deeply.

While many studies highlight the benefits of community education, there are significant research gaps regarding how hidden learning networks form, operate, and influence adolescent learning experiences. Most studies focus on aspects of the program, activity model, or improvement of learning outcomes, but have not analyzed the structure of social networks and the mechanisms of knowledge flow within them. A study by O'Neill & Carver (2024) shows that studies of informal relationships and social structures in adolescent communities are still limited, especially in the context of developing countries. In addition,

there is a lack of research that maps the roles of key actors, interest-based collaboration patterns, and how community support affects the formation of adolescent social capital. This limitation shows the need for a more in-depth and interpretive study to understand the dynamics of learning networks in community spaces.

Indonesia's context also has a different character compared to developed countries, especially related to community infrastructure, collectivity culture, and adolescent interaction patterns in urban environments. Community learning spaces in cities like South Tangerang are growing organically in response to local needs for safe, collaborative, and non-hierarchical spaces for adolescents. However, research on adolescent learning networks in Indonesian community spaces is still very limited. A study by Wijaya & Kusumawati (2023) found that adolescent communities in urban areas have intense interaction dynamics, but knowledge exchange patterns are not systematically documented. Meanwhile, Dewantara & Lestari (2022) emphasized that adolescents' social capital is strongly formed in community spaces, but the relationships and flows of knowledge in it have not been widely studied academically. This condition strengthens the urgency of research in the local context of Indonesia.

Based on these conditions, this study explicitly aims to uncover and explain the structure of hidden learning networks formed in community-managed community education spaces. The research examines inter-stakeholder relationships, interest-based collaboration patterns, and knowledge flow mechanisms that emerge through spontaneous interactions between adolescents and facilitators. The qualitative approach of case studies is used to understand phenomena in depth through interviews, observations, and documentation as a source of triangulation. In line with the views of Keller & Browning (2023), an interpretive approach is needed to understand adolescents' learning experiences in complex and informal social environments. This analysis is expected to produce a comprehensive understanding of the dynamics of learning networks that are not visible on the surface.

Theoretically, this research makes an important contribution to the development of the literature on informal learning, social networking, and community education. The results of the study enriched the concept of hidden learning networks in the context of urban adolescents in developing countries, while expanding the understanding of how informal interactions shape the learning process. Practically, the research findings provide recommendations for the development of non-formal education models that are more adaptive, inclusive, and relevant to the needs of adolescents. Parker (2022) emphasized that the value of education will be more optimal when the design of the learning space is able to accommodate social dynamics and the developmental needs of students. Thus, this research is expected to make a real contribution to strengthening community education practices in Indonesia.

## **LITERATURE REVIEW**

### ***Informal Learning in Adolescents***

Informal learning in adolescents takes place through daily activities that are not formally designed, but instead produce meaningful learning experiences because they are directly related to their social lives. Recent research confirms that teens learn more effectively when they have the freedom to choose interest-based activities and get the opportunity to collaborate with peers. According to Sanders & Woods (2022), the informal learning process arises from spontaneous interactions such as short conversations, self-exploration, or spontaneous group work that allows adolescents to build understanding through experience. Another study by Patel (2023) shows that this unstructured learning helps adolescents develop creativity and self-identity, especially when it occurs in a safe and supportive social environment.

### ***Community-Based Education Spaces***

Community-based education spaces serve as a forum that provides more flexible learning opportunities for adolescents, especially since they are not bound by hierarchical rules like formal schools. Research shows that community spaces can create an inclusive, collaborative environment and encourage active participation. According to Larson & Becker (2021), when adolescents engage in community activities, they not only develop social skills, but also feel that they belong to that learning space. Meanwhile, a study by Gomez et al., (2023) found that communities that provide interest-based activities are able to increase adolescents' intrinsic motivation because they feel valued and supported in the learning process. This condition makes the community space a social ecosystem that shapes the way adolescents interact and acquire knowledge.

### ***Hidden Learning Networks in Adolescent Interaction***

Hidden learning networks describe learning networks that are formed without formal planning, but have a strong influence on the way adolescents exchange knowledge. This network arises from friendships, shared interests, and the presence of community members who act as a liaison between individuals. According to Fischer (2022), this kind of informal relationship pattern facilitates a fast and flexible flow of information because it is not limited by organizational structure. A study by Rahman & Ellis (2024) shows that these hidden networks serve as an important mechanism for adolescents to learn from each other spontaneously, for example through sharing experiences, independent projects, or casual discussions. The study emphasizes that informal networks need to be considered because they greatly determine how knowledge moves in adolescent communities.

### ***Social Networks and Social Capital in Adolescent Learning***

Social networks play a big role in helping teens build relationships that allow them to exchange knowledge and gain emotional support. According to Santos & Rivera (2021), adolescents' social networks are formed through close and weak relationships, and both play a role in enriching the learning process based on the interactions that occur. Social capital, such as trust and cooperation,

also strengthen the effectiveness of the network. Chen et al., (2023) stated that social capital makes adolescents more courageous to take an active role in community activities because they feel safe and valued. This combination of social relationships and social capital is what makes the learning process more natural and meaningful, especially in a non-formal environment.

### ***The Indonesian Context and the Urgency of Research***

In Indonesia, community-based education spaces are developing in response to adolescents' need for a more flexible and less rigid learning space like formal schools. However, research on hidden learning networks in Indonesian community spaces is still very limited. According to Kurniawan & Adhistry (2022), adolescent interaction in urban communities such as South Tangerang results in a lot of knowledge exchange, but the practice has not been academically documented. Another study by Saputra & Rahim (2023) shows that adolescent communities in urban areas have strong social dynamics, but the mechanisms of knowledge flow within these communities have not been clearly mapped. Therefore, more in-depth research is needed to understand how hidden learning networks are formed and operate in Indonesia's local context.

## **METHODOLOGY**

### ***Types, Approaches, and Research Design***

This study uses an interpretive qualitative approach with a case study design to understand in depth how hidden learning networks are formed and operate in community education spaces. This approach was chosen because it is able to explore the subjective meaning that arises from adolescents' daily interactions in a non-formal social context. According to Sandelowski (2021), qualitative approaches are very effective for interpreting complex and informal social experiences. The design of the case study allows researchers to analyze phenomena in their natural context through an in-depth exploration of interrelated events, actors, and social dynamics (Roulston & Shelton, 2022). Thus, this approach is aligned with the research objectives that focus on understanding the structure of informal social networks and the mechanisms of knowledge flow among adolescents.

### ***Population, Research Location, and Sampling Techniques***

The research population consisted of adolescents who actively participated in activities in a community education space in urban Indonesia. The study used a non-probability purposive sampling technique to select participants who were considered to have experience and intense involvement in community dynamics. This technique is suitable for use when researchers need participants who can provide in-depth information about certain social phenomena (Morse & Clark, 2022). A total of 6 adolescents and 2 community facilitators were selected based on criteria: active involvement for at least six months, consistency in participating in community activities, and the ability to explain the interaction and learning process that occurs. This sampling is supported by the findings of Arora (2023), who states that small sample sizes can generate rich data in

qualitative studies when the focus of research is in-depth experiential understanding.

### ***Data Collection Techniques and Research Instruments***

Data collection was carried out through in-depth interviews, participatory observations, and documentation analysis. Semi-structured interviews were used to explore participants' learning experiences, interaction patterns, and perceptions of informal social networks. The interview instrument was developed based on the learning network conceptual framework introduced by Martens & Holm (2021), then adapted to the context of the local community. The validity of the content is carried out through expert judgment with two academics who have expertise in community education. Participatory observation was conducted to capture the dynamics of spontaneous interactions, collaboration patterns, and the role of key actors in the community, following the ethnographic observation procedure suggested by Taylor & Renner (2023). Documentation data, such as community activity archives, facilitator records, and program materials, are used as a source of triangulation to increase the credibility of the data.

### ***Research Implementation Procedure***

The research was carried out through several systematic stages. First, the researcher conducted a location survey and obtained research permission from the community manager. Second, the researcher conducted initial data collection through preliminary observations to understand the social context and identify key actors. Third, the researchers conducted in-depth interviews with selected participants, followed by participatory observations that lasted for four weeks. All activities are recorded in field notes, recorded with permission, and transcribed verbatim. Fourth, the researcher triangulated the data between interviews, observations, and documentation to check the consistency of the findings, as recommended by Noble & Mitchell (2020). Finally, the initial findings were re-discussed with two community facilitators through member checking to ensure the accuracy of the interpretation and improve the trustworthiness of the research.

### ***Data Analysis Techniques and Analysis Tools***

Data analysis was carried out using a thematic analysis model that involved the stages of data reduction, coding, categorization, and withdrawal of the main themes that represent the hidden learning network pattern. Thematic analysis was chosen because it is able to capture patterns of meaning from complex social narratives and interactions (Kiger & Varpio, 2020). The researcher used NVivo 14 software to help with the process of coding, organizing data, and visualizing the relationships between concepts. To improve reliability, the coding process was carried out repeatedly and verified by a second researcher through peer debriefing, following the procedure recommended by Sinclair et al. (2023). The analysis focuses on the identification of inter-stakeholder relationships, interest-based collaboration patterns, and knowledge flow mechanisms that arise spontaneously within adolescent communities.

## RESEARCH RESULTS

### *Key Actors as Links in Learning Networks*

The research findings suggest that key actors play an important role as a liaison in naturally emerging learning networks. Analysis of interviews and participatory observations shows that this figure does not arise because of a formal position, but because of social agency, level of activity, ability to initiate conversations, and capacity to facilitate relationships between members. Their existence facilitates the flow of information, connects new teens with established groups, and keeps the network dynamics alive.

A teenager explains how the learning process begins with the invitation of a more active actor: *"I usually start learning new things because I am invited first by friends who understand better. He's a great coach, and we're learning from each other without feeling like we're being bullied."* (R2, interview October 14, 2025). Another quote shows the bridging role they play: *"If there is a new activity, there is usually one person who invites first. He is the one who makes us all connect, so it is easier to join."* (R4, interview October 18, 2025).

The facilitators also reinforced these findings by describing how their roles work informally, supporting the growth of collaborative agencies: *"We only help connect if children have ideas or need collaboration friends. They are actually the most active in moving"* (F1, interview October 20, 2025). This theme shows that the existence of connecting actors not only creates social connections, but also strengthens the creativity and initiative of adolescents, making community networks a vibrant and sustainable learning ecosystem.

### *Interest-Based Collaboration as a Trigger for Spontaneous Learning*

Data analysis shows that interest-based collaboration is the main trigger for spontaneous learning activities. Interaction between adolescents tends to start from a common interest such as art, design, technology, or social activities which then develop into a space for exploration and knowledge production. Participatory observations show that learning groups are not shaped by formal structures but by organic attractions, which enable adolescents to develop creativity, strengthen self-direction, and cultivate new social capital.

This was expressed by one of the teenagers: *"If the interests are the same, the conversation will flow. From there, ideas usually arise to make small projects."* (R1, interview October 9, 2025). This interest-based interaction not only forms social relationships, but also activates agency learning. Another teenager said: *"I often learn new things not because I am told, but because my friends are doing something I like too"* (R5, interview October 22, 2025).

The facilitator emphasized that these dynamics grow organically, not as a result of structural planning: *"The activities here develop from the interests of the children themselves. We only provide the space, they decide what they want to learn and with whom."* (F2, interview October 25, 2025). This theme shows that interest-based collaboration strengthens emotional engagement, increases a sense of ownership of the learning process, and enriches adolescent creativity. When interest is the driving force, learning takes place naturally, deeply, and continuously.

### ***Knowledge Flow through Spontaneous Interaction and Sharing Practices***

The third finding revealed that the flow of knowledge in the community moves through spontaneous interactions, informal conversations, and the practice of sharing experiences. Observational data show that community spaces provide a fluid and supportive social environment, allowing for knowledge exchange without the pressure of formality. This process strengthens adolescents' social capital and allows them to respond flexibly to learning needs.

A youth describes how knowledge is gained from simple but meaningful moments: "*Often studying is just hanging out. Suddenly someone tells a story or shows something, we keep following it.*" (R3, interview October 11, 2025). Another quote confirms the importance of spontaneous conversation as a space for knowledge transfer: "*A lot of the things I learned were actually from regular chat. Sometimes a five-minute conversation can make me understand something new.*" (R6, interview October 17, 2025).

The facilitator assessed that this spontaneous learning mechanism became the main identity of the community: "*The children learn from each other the fastest. They share with each other without being asked, and that's what makes knowledge spread naturally.*"

(F1, interview October 20, 2025). This theme shows that knowledge streams do not require a formal structure to be effective. In contrast, a free, supportive, and trust-based environment makes it easier for teens to develop skills, expand their horizons, and strengthen creativity through daily social interactions.

## **DISCUSSION**

The results of this study show that adolescents' learning processes in community-based educational spaces are formed through naturally occurring social networks, where several members play the role of key connectors that facilitate the flow of information and knowledge. This pattern reinforces the argument that informal learning environments rely heavily on relational structures rather than formal instructional designs. These findings are consistent with the observations of Underwood & Murphy (2023) who emphasize that adolescent learning ecosystems develop through spontaneous interactions as well as informal leadership roles that arise organically within peer groups. This kind of dynamic shows that community spaces are not just physical gathering places, but also social infrastructure that sustains the continuous exchange of ideas and experiences. Thus, the existence of key actors in the network illustrates how informal communities are able to create meaningful learning pathways without formal institutional authority.

The study also shows that interest-based collaboration acts as a powerful catalyst for engagement and knowledge sharing among adolescents. When participants interact based on shared interests, the learning process becomes more intrinsically motivated and personally relevant, thus encouraging deeper and more sustained participation. These findings reinforce the view of Jensen & Cartwright (2022) who found that motivation in nonformal learning environments is strongly influenced by collective interest-based activities that build emotional and cognitive attachment. This mechanism explains why adolescents in the observed communities are able to maintain regular attendance

and active engagement despite the absence of a structured curriculum or external incentives. Thus, interest-based collaboration needs to be understood as a strategic foundation in developing youth learning programs, especially in community spaces that prioritize flexibility and volunteerism.

The flow of knowledge that flows spontaneously through casual conversations, shared activities, and informal mentoring is in harmony with contemporary social learning and community of practice. Instead of relying on planned instruction, information moves through fluid and contextual interactions allowing adolescents to gain practical skills, social competence, and creative insights. This process is in line with Mendoza & Harper's (2021) analysis which confirms that adolescent informal learning grows when knowledge is exchanged through real-life participation rather than through hierarchical teaching. The implications of these findings are significant because they show that hidden learning networks serve as an alternative pathway for educational development that can complement or even surpass the role of formal schools. Thus, the learning that emerges in the community space is not a process of chance, but rather the result of relational and situational dynamics that need to be recognized systematically.

The role of community spaces as a supportive learning ecosystem is increasingly seen through the increase of agency, creativity, and social capital of adolescents. This research shows that communities provide encouragement, validation, and opportunities that may not be found in formal educational settings, especially for adolescents who feel limited by standardized school structures. These findings reinforce the conclusion of Kwok & Singh (2024) who stated that community-based learning spaces offer a safe psychological environment to support autonomy and self-expression. Additionally, community spaces serve as a mediation space where teens can explore identity, build confidence, and develop collaborative skills without the pressure of formal judgment. Thus, the significance of this space goes beyond the acquisition of knowledge, it also includes the holistic development of adolescents.

Several factors seem to affect the effectiveness of this hidden learning network. Reliance on a small number of key actors, for example, suggests that network stability is vulnerable to changes in member participation rates. In addition, the organic nature of interactions causes learning outcomes to be non-uniform and can differ significantly between individuals. These findings are in line with the observations of Rahimi & Lawson (2023) who noted that informal communities often depend on fragile social structures and require sustained engagement to stay functioning. The findings also show that although informal learning is flexible, mechanisms to ensure equal opportunity have not yet been fully established. Therefore, future community programs need to consider systems that encourage inclusive leadership rotation, peer mentoring, and participation.

The study also identified several limitations that affect the interpretation of the findings. The small sample size and focus on one community limits the generalization of results to other contexts with different demographic or cultural characteristics. In addition, the study participants mainly consisted of active

adolescents, thus potentially creating a positive bias in describing the dynamics of community learning. This concern is in line with the criticism of Nolan & Peters (2022) who assert that studies that rely on highly active participants can ignore patterns of disengagement or barriers experienced by less active adolescents. Another limitation is that the study did not examine how socioeconomic differences can affect access to hidden learning networks. These limitations point to the need for cross-site follow-up research involving adolescents with diverse levels of engagement.

Overall, this research makes an important contribution to understanding how hidden learning networks function in community-based education spaces. These findings enrich theoretical discussions about informal learning by showing how natural social connections, collaboration of interests, and spontaneous knowledge exchange collectively shape adolescent learning experiences. This is consistent with the claim of Ellison & Vaughan (2024) that contemporary adolescent education should consider informal ecosystems as an integral part of lifelong learning. In practical terms, this study provides insights for policymakers, educators, and community managers in designing non-formal learning environments that are adaptive, inclusive, and aligned with the developmental needs of adolescents. However, more extensive comparative studies are still needed to explain how these networks differ between contexts and how they can be strengthened to maximize their educational impact.

## **CONCLUSION AND RECOMMENDATION**

The results of this study confirm that adolescent learning networks in community-based educational spaces are formed through social interactions that flow organically, with key actors acting as liaisons in facilitating the flow of knowledge. Interest-based collaboration has proven to be a key mechanism that encourages youth engagement, while the practice of sharing experiences is an important medium for the formation of meaningful learning processes. These findings illustrate that learning structures are not linear, but rather intertwined in the form of fluid, dynamic social relationships, and are influenced by patterns of spontaneous interaction within the community.

In addition, this study emphasizes that community education spaces function as an ecosystem that supports the formation of agency, creativity, and social capital of adolescents more strongly than formal education environments that tend to be more structured. A community environment provides a safe space for adolescents to explore interests, build confidence, and interpret learning experiences through mutually reinforcing social relationships.

## **ADVANCED RESEARCH**

Thus, this study makes a conceptual contribution to the development of non-formal education designs that are more adaptive, inclusive, and responsive to the developmental needs of adolescents, while opening up opportunities for further research to map the dynamics of learning networks in more diverse community contexts.

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