Understanding linguistic and interactional patterns in classrooms through the lens of spatial semiotics

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Abstract
The classroom spaces do not furnish learning in a neutral vessel but instead act as a semiotic space which shapes learning in terms of how communication occurs. This paper focuses on investigating the role of classroom spatiality in the development of language and interaction pattern during normal instruction processes. Although spoken language, teacher-student communication, and discourse practices have always been the subject of the traditional approach toward educational linguistics, little consideration has been paid to the spatial organisation of the classroom as a mode of communication. The understanding of classroom space has changed, as classrooms are no longer viewed as passive containers, but they are seen as dynamic, as an active materiality that mediates power. The paper employs spatial semiotics and analysis of multimodal interaction to investigate how the seating set-up, spatial closeness and teacher placement serve as meaning bearing signs that influence communicative behaviour. The study is a qualitative, naturalistic observation of one Access Microscholarship English-language class in northern Punjab, Pakistan (25 students aged 13 to 19), drawing on 15 three-hour lessons observed between 1 November and 21 December 2025, five each in rows, clusters and semicircular seating, with the researcher as class teacher. The analysis indicates that spatial formations implicitly guide who speaks, the flow of interaction, and which learners become visible or invisible in interaction. Students' seating position and body orientation are also shown to carry semiotic meaning in terms of visibility, engagement and avoidance. This research suggests that spatiality is an effective communicative resource that works silently but can be effectively employed to understand how the physical surroundings can influence the language behaviour and interaction processes in classrooms in schools.

Keywords*: classroom spatiality, spatial semiotics, multimodal interaction, classroom discourse, educational linguistics, proxemics, classroom communication, spatial organisation*

Introduction

Classrooms have long been known to be complicated communicative spaces where language and interaction and social meaning interact. Although classic studies within the educational linguistics field have concentrated on oral dialogues, pedagogical questioning, and student engagement (Mercer, 2019; Walsh, 2011), more recent approaches to the matter have made it a point to focus on communication as a multimodal and material experience, which goes beyond verbal interactions (Jewitt, 2016). In this growing perspective, classroom spatiality, physical organisation, allocation and orientation of bodies and objects, is an important but frequently ignored factor in influencing everyday communicative practice. Spatiality is not just an instructional background; it is a dynamic type of semiotics with an inherent meaning and a motivating way of interacting (van Leeuwen, 2021). Conceptualizing the way space speaks would thus be major in conceptualizing the way language is practiced and negotiated in school classrooms.

Remarkably, semiotics, which is loosely referred to as the study of signs and meaning-making processes, can offer a strong tool to examine classroom spatiality. Peirce (1955) and Saussure (1959) were

the classical semiotic theorists who theorised about signs, which are anything that represent something to someone, and this can be applied intuitively to the layout of desks, positioning of the teacher desk or how far apart the students are. Kress and van Leeuwen (2006) say that in a modern social semiotics, these various modes of meaning realisation, such as spatial configuration, gaze, gesture, and material layout, interact to make up the way interaction is realised, and that the interaction between these various modes is what contributes to constituting the interaction. In this regard, furniture placement is not an organisational choice that is neutral but a resource that carries a meaning and affects communicative possibilities of the learners.

The accumulating literature on multimodal studies has suggested that classroom designs can shape the visibility, access to participation, and interaction patterns (Bezemer and Jewitt, 2018; Lim et al., 2012). As an illustration, the traditional rows of desks have been linked to teacher-focused communication, a more restrictive turn-taking, and less communication with peers (Byers et al., 2018). Conversely, circular or grouped designs have been determined to help students interact in a collaborative dialogue and enhance the linguistic agency of students (Abbot et al., 2014). Such results resonate with the idea of interactional territories by Goffman (1963) which argues that the spatial organisation determines who was placed to talk, to listen or not to talk. Spatial cues are semiotically functioning: they indicate authority, rights of participation, and expectations of relations even prior to the utterance of any words.

Although it has a solid theoretical basis, there is still a major gap in the research. A large part of the current literature has investigated spatial arrangement as a pedagogical or ergonomic variable but failed to consider spatiality through the prism of a semiotic perspective that previews the act of meaning-making. Research is more inclined to report on what occurs in various layouts as compared to explaining why such communicative patterns arise or what semiotic messages spatial arrangement may convey to learners. Also, the study of classroom discourse continues to give disproportionate attention to spoken language and, in most cases, space is viewed as a peripheral issue as opposed to a communicative tool (Walsh, 2011). Consequently, semiotic meanings that are entrenched in classroom spatiality have gone under-theorised and under-examined.

Semiotic approach has a potential to redefine classroom space as a linguistic space, a space where physical location serves as a non-verbal means of communication. To illustrate, when the teacher is moving around the classroom, it could be seen by students as a sign of their permission to interact or as a sign of surveillance or a sign of authority depending on the space distance and the direction the learner is facing the centre. In the same way, the location of students in seating arrangements can also be viewed as an indicator of comfort, confidence, resistance or disengagement. These interpretations are similar to the theory of proxemics created by Hall (1966), who assumed that the social relationships were conveyed by distances between bodies. In the classroom setting, proxemic selections can mutually control the right to be a participant in communication.

In addition to the physical setup, the classroom experience is an ongoing process of semiotic that is construed by the learners. Fast (2010) assumes that students are active readers of signs, as they interpret the appearance of the teacher, actions, and relative space in the room. This meaning makes the difference in terms of the classroom being viewed as a hierarchical or the thinking environment in which an egalitarian thinking should occur. These are the non-verbal cues that teachers need to comprehend in order to create an environment of mutual linguistic agency. The study of the spatiality as a language also corresponds to the larger change of multimodal views on education. Multimodal learning spaces acknowledge communication as dispersed through both verbal and non-verbal means such as spatial, visual and embodied (Jewitt, 2016). Through the study of spatial semiotics, scholars are able to reveal how classroom settings influence language possibilities that learners have. This is especially applicable in multilingual classrooms, where spatial configurations can have an impact on not only speaking people but also speaking languages, to whom, and how (Creese & Blackledge, 2015).

The observational character of the study gives the possibility to perform the fine-grained analysis of the classroom behaviour in natural events, keeping the authenticity of interactional patterns in their natural form. The spatial mapping and systematic observation will offer information about the adaptive communicative changes of learners in various classroom set-ups and the mediating role of the spatial presence of the teacher. The method recognises that as a dynamic semiotic space, the space of the classroom is constantly influenced by spatial cues, material configurations, and embodied practices to guide the course of the discourse. Space is not a fixed variable but is instead an interactive phenomenon of the classroom life.

The current study is a contribution to the broader picture of the knowledge about school communication in the intersection of the relatively uncharted area of spatiality, semiotics, and linguistic behaviour. It broadens the field of educational linguistics in that classroom space, itself, speaks, organizing what is done, cueing expectations, and facilitating or inhibiting interaction. The foregrounding of spatial semiotics also paves the way to the development of a more holistic perspective on the classroom communication whereby physical space and linguistic action are construed as reciprocally constructive.

Literature review

The anthropology and environmental psychology produced early research on space and communication, as opposed to educational linguistics. The initial theory of proxemics by Hall defined interpersonal distance as a communicative code that is culturally controlled and which indicates the closeness, the social hierarchy, and the position that a person occupies (Hall, 1966). Though it clearly showed that space is a communicative aspect as evident by the work of Hall, he concentrated on broad social interactions and architecture, but not classroom settings. Furthermore, proxemics was much more concerned with the proximity of individuals, rather than with the spatial semiotics of furnishings or material design. Therefore, although there is a conceptual basis to think about the meaning of space in this tradition, it does not directly explain how the layouts in classrooms impact on micro-patterns of interaction.

The more explicitly semiotic orientation was created as a result of the progress of social semiotics and multimodal discourse theory. Kress and van Leeuwen's influential book *Reading Images* held that spatial and visual spaces possess a grammar which is analogous to that of language (Kress and van Leeuwen, 2006). Their contribution justified the belief that layout, framing and positioning can encode the relation of institutions and power. Nonetheless, due to the fact that their framework was not conceived specifically as classroom research, a number of educational studies mention Kress and van Leeuwen in concept but nevertheless focus more on verbal discourse and less on spatial analysis. Spatiality is considered significant yet hardly analysed as a key way of communication in the classroom interaction. According to Marojević (2024), the physical architecture of schools, like the classical corridor-shaped organisation, is a semiotic process that strengthens the relationships of power-over and forms the identity of students. This corresponds to the view that students do not passively receive information around them; on the contrary, they actively process semiotic cues. According to Fast (2010), students base their meaning on the physical location and outlook of the teacher as signs which indicate either the egalitarianism or hierarchical nature of the thinking environment.

Jewitt (2005) developed this point of view with the notion that the classroom is a multimodal space where the walls, displays, seating arrangements, and material objects are incorporated to create a semiotic landscape (Jewitt, 2005). This contribution was a big change over regarding classroom space as neutral to seeing it as historically stratified with pedagogic sense. However, Jewitt continued to do little analysis in her early work, as she concentrated more on defining resources, and no longer on analysing how particular spatial set-ups influence turn-taking in real-time, linguistic visibility or participation.

Since the 2010s, multimodal researchers have developed empirical instruments to study the interaction of modes, including speech, gesture, gaze, and materiality, in education (Bezemer & Jewitt,

2010, 2018; Jewitt, 2016; Lim et al., 2012). These contributions made it a legitimate issue to include spatiality in multimodal classroom discourse analysis. Most multimodal research, however, remains focused on spoken communication, space is viewed as a contextual background in contrast to it being an analytic centre of interest. In more elaborate videos of classroom action, floor plans and seating arrangements are frequently referred to informally as opposed to being systematically mapped onto communicative behaviour. It means that multimodality has brought the possibility of the spatial analysis but was not able to completely fulfil the promise of spatial semiotics in classroom research.

Parallel to multimodal research, another set of studies has investigated seating arrangement in a different study; pedagogically or psychologically. Similarly, Fernandes et al. (2011) demonstrated a difference in seating arrangement to the level of participation, on task behaviour and perceived engagement (Fernandes et al., 2011). On the same note, Wheldall and Bradd (2010) established that rows and group tables do have an impact on behavioural performance and attention (Wheldall and Bradd, 2010). These studies are very effective in showing that layout is important, however, they conceptualise space as a behavioural variable and not as a semiotic system. They gauge outcomes (e.g., the participation levels) but not the analysis of meanings that are coded in spatial decisions or the interpretation of the meanings in the process of interaction by students. These studies, therefore, respond to the question, What happens in this layout? but not What does this layout say?

The physical layout of furniture is the physical environment created directly by the flow of participation, turn-taking. Abbot et al. (2014) represent the classroom mapping to reveal that the traditional rows are prone to discouraging the active participation, and the collaborative clusters would promote the varied patterns of interaction. These observations are consistent with Odum et al. (2021), who reported student-to-student engagement 8% higher in a mobile-table classroom than in a mobile-desk classroom (p. 27), although the difference was not statistically significant. This implies that the semiotic definition of a desk arrangement is entwisted with the linguistic agency that will be given to the students. Another important dimension of the importance of space to semiotics concerns the area of space, which is known as the spatial pedagogy; teacher mobility is considered to be a kind of intersemiotic resource that collaborates with a language and gesture. Lim et al. (2012) demonstrate using spatial mapping as the main meaning-making tool that can either initiate or inhibit student engagement by a teacher based on the teacher trajectory. This corporeal closeness or proxemics possesses intense affective and cognitive repercussions. Păstae (2025) demonstrates that lessening the actual distance between the teacher and the student can serve as an indication of being allowed to interact, which contributes to emotional connexion and knowledge retention to a great extent. The naturalistic observations conducted in the classroom and spatial mapping are used to record the impact of various layouts on turn-taking, participation, peer collaboration and verbal and nonverbal communication patterns.

Newer research about the flexible learning space has focused on innovative classrooms that include movable furniture and open spaces. Byers, Imms, and others discovered that flexible spaces are associated with a change in student movement, the patterns of collaboration, and teaching quality perceptions (Byers et al., 2018). The studies are a move towards understanding the pedagogical significance of space. However, they usually use perception polls, self-reflection assessments, or performance statistics as opposed to interaction analysis. Consequently, they uncover the correlations of space and outcomes and fail to demonstrate how linguistic behaviour is determined by spatial cues on the micro-level. The research on flexible space thus accentuates the significance of space yet often lacks the analytical profundity to comprehend space as a form of communication.

This gap was also affirmed by a recent systematic review of studies in multimodal classrooms. The review carried out with the help of a Systemic Functional-Multimodal Discourse Analysis framework has discovered that attention to a gesture, gaze, and visual artefacts is much more attentive, but the physical environment remains a rather stable context instead of an active semiotic resource (Wan et al., 2025). The authors have specifically requested the need to conduct additional research that incorporates

spatiality in the classroom meaning-making. This suggests that, even within well-developed multimodal and semiotic frameworks, spatial analysis specifically remains under-theorised, a gap this study addresses directly (Wan et al., 2025).

Within this wide range of literature, three problematic constraints come to mind. First, the initial semiotic and proxemic theories not only recognize the existence of space meaning but are too general and not classroom-specific (Hall, 1966; Kress and van Leeuwen, 2006). Second, empirical research on seating arrangements works well to establish that layout influences behaviour although it considers space as a technical or ergonomic aspect but not as a sign system (Fernandes et al., 2011; Wheldall and Bradd, 2010). Third, the idea of multimodal and flexible-space studies presents robust conceptual and pedagogical models but does not often make use of fine-grained spatial-linguistic analysis in live classroom interaction (Bezemer and Jewitt, 2018; Byers et al., 2018). Consequently, a small number of linguistic and interactional patterns of the classroom, e.g. turn planning, teacher presence, students-students interaction, or the semiotic meaning that students convey through seating arrangements and direction, have been systematically mapped against classroom spatial arrangements.

To counter such shortfalls, this study has the classroom spatiality squarely presented as a semiotic mode and analyses how it impacts on linguistic and interactive behaviour in regular classroom lessons. The study does not assess the classroom designs as being effective or not but perceives spatial planning as communicative messages that are read, negotiated and acted by the learners in reality. The research seeks to solve the empirical gap of fine-grained studies of space, language, and interaction in classroom through a combination of spatial mapping with the naturalistic observation.

Theoretical framework

The theoretical construct of this paper is based on the spatial semiotics, proxemic theory, and multimodal interaction analysis. Combined, these attitudes will conceive the classroom as a semiotic space where the spatial arrangements actually produce communicative behaviour. Spatial semiotics, which is based on the social semiotic theory, places space as a resource of meaning-making. Kress and van Leeuwen (2006) adopt the view that spatial arrangements have a grammar that captures a social relation, authority and interaction patterns via their encoding in terms of placement, alignment and orientation. In this perspective, spatial arrangement of desks, physical nearness of learners and location of the teacher is considered to serve as cues to control and govern communicative possibilities. The classroom layouts are thus considered as semiotic options that contain and permit the participation.

In addition to this view is the theory of proxemics by Hall (Hall, 1966) which underlines that the spatial distance, territoriality and motion are culturally coded communicative messages. Proxemics offers a lexis of understanding the way teacher movement, or spatial nearness or distance among students can be used as a marker of engagement or authority or avoidance. Although proxemic principles have been originally formulated in wider social settings, they are very relevant to the classroom, where the spatial location of a learner determines their inclination to be invited to speak, checked or excluded.

Multimodal interaction analysis is the third element of the framework as it considers communication as being distributed among speech, gesture, gaze, embodiment, and material arrangement (Bezemer and Jewitt, 2010; Jewitt, 2016). The concept of multimodality has the effect of emphasizing that the interaction in classroom can be influenced not only by language but by a coordination of modes that also involve spatial placement and the physical space. Even though gesture or verbal interaction is widely focused in the multimodal studies, this study takes a step further by making the spatiality centre of examination. The inclusion of spatial semiotics, proxemics, and multimodal theory assists the conceptualization of the classroom space as a means of communication and helps to interpret the means of layout and positioning in shaping linguistic behaviour and interactional resource in a detailed way.

To move from these three perspectives to a systematic analytical framework, each was operationalised into a specific set of observable categories applied consistently across the data. Spatial semiotics (Kress &

van Leeuwen, 2006) was operationalised by coding chair placement, alignment, and orientation into discrete zones (e.g., front-centre, periphery, cluster interior), each treated as a semiotic unit with an associated visibility and access value. Proxemic theory (Hall, 1966) was operationalised by tracking the teacher's relative distance to each zone at 30-minute intervals during observation, so that shifts in proximity could be logged as discrete events rather than treated as impressionistic background. Multimodal interaction analysis (Bezemer & Jewitt, 2010; Jewitt, 2016) was operationalised by pairing each coded spatial event with a parallel record of accompanying embodied resources (gaze direction, body orientation, gesture) and verbal behaviour (turn initiation, response frequency, silence). This three-layer coding procedure, spatial zone, proxemic distance, and multimodal co-occurrence, allowed the three theoretical strands to be applied as a repeatable analytic instrument rather than as a general interpretive lens.

Methodology

The research design followed is a qualitative naturalistic observation design based on spatial semiotic and multimodal principles. This design is aimed at investigating whether classroom spatiality influences linguistic and interactional patterns in routine lessons without providing any external interventions, or gathering any personal information on the participants. Naturalistic approach retains the originality of the classroom setting and lets communication be studied as it occurs in relation to spatial information.

This study specifically addresses the following research questions: (1) How do different classroom spatial arrangements (rows, clusters, and semicircular seating) shape patterns of linguistic participation and turn-taking? (2) In what ways does teacher movement redistribute communicative opportunity across different spatial zones of the classroom? (3) How do students' seating position and body orientation index communicative engagement, authority, or avoidance within a spatial-semiotic framework?

The observed classroom was an Access Microscholarship class in northern Punjab, Pakistan. The Access Microscholarship Program is a U.S. Department of State English-language programme for teenage students. The class comprised 25 students aged 13 to 19. Fifteen lessons, each lasting three hours, were observed between 1 November and 21 December 2025, all on Saturdays and Sundays: five lessons in rows (1, 2, 8, 15 and 16 November), five in clusters (22, 23, 29 and 30 November and 6 December), and five in a semicircular layout (7, 13, 14, 20 and 21 December), as summarised in Table 1. The researcher was also the class teacher, and the three spatial arrangements compared, rows, clusters, and a semicircular layout, were not introduced specifically for this study; they were configurations already in regular pedagogical use in this classroom as part of normal teaching practice.

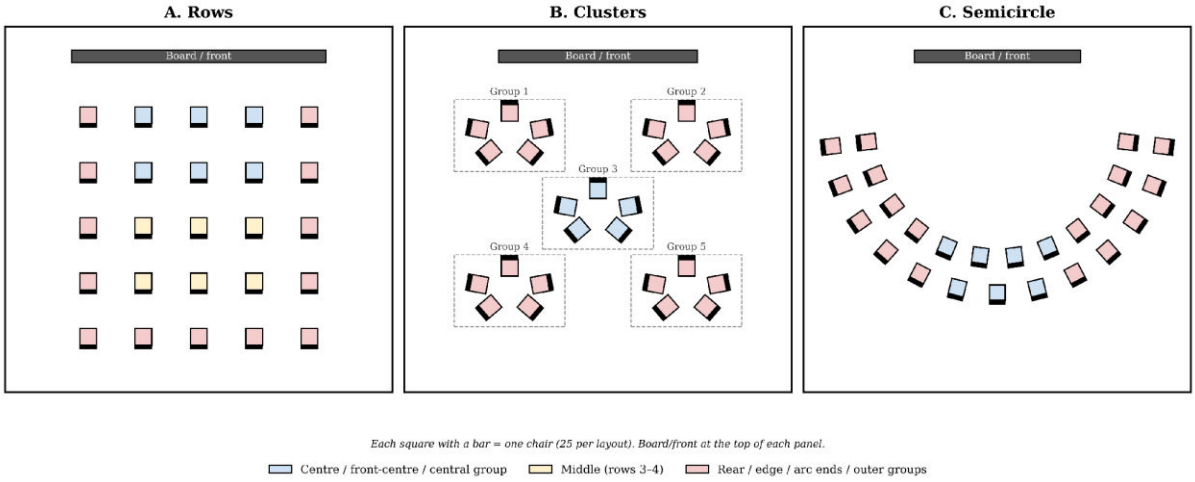
Table 1: Observation schedule by layout (2025)

Layout	Lessons	Dates observed	Lesson length	Observed time
Rows	5	1, 2, 8, 15, 16 Nov	3 h	15 h
Clusters	5	22, 23, 29, 30 Nov; 6 Dec	3 h	15 h
Semicircle	5	7, 13, 14, 20, 21 Dec	3 h	15 h
Total	**15**	**1 Nov – 21 Dec**		**45 h**

The study environment is a single classroom, which is observed during various lessons and with varying spatial layouts such as rows, clusters or semicircular seating. Such naturally existing or instructor-modulated configurations allow the comparative study of the effect of different configurations on participation and interaction. Detailed spatial maps had been created to record the positioning of chairs, the position of the teacher, circulation paths and relative visibility of various areas of the classroom, in each layout observed. These mapped layouts will be used as the major data on determining the semiotic meanings entrenched in the physical environment.

To make the analytical procedure transparent, each classroom layout was documented through a corresponding spatial map (see Figure 1). Structured field notes recorded, for each zone, the observed frequency of verbal turns, the direction of address, and any non-verbal cues (gaze, body orientation) accompanying participation. Brief informal notes were taken at approximately 15-minute intervals during each lesson, and a structured log of teacher position and zone-level participation was completed at 30-minute intervals. Per-lesson counts of whole-class turns (a student speaking to the teacher or the whole class), side-talk (quiet talk to a neighbour not set by the teacher) and peer exchanges (student-to-student exchanges) were entered in an observation log and are reported in Table 2. In rows, the zones were front-centre (the central chairs of the first two rows), middle (the central chairs of rows three and four) and rear/periphery (the last row and the side chairs along the walls); in the semicircle, the centre of the arc (the middle chairs) and the arc ends; in clusters, the cluster interior (the central group of five chairs) and the cluster edge (the four outer groups, 20 chairs).

Figure 1: Spatial maps of the three layouts: rows, clusters, semicircle



Note. Each square with a bar is one chair (25 per layout); the board is at the top of each panel. Shading marks the zones used in the analysis: blue = centre (in clusters, the central group), yellow = middle, pink = rear/edge (in clusters, the four outer groups).

Alongside spatial mapping, systematic classroom observations were conducted to capture communicative behaviour associated with each layout. Observational focus included the distribution of verbal participation across zones, peer-to-peer exchanges, body orientation, gesture, instances of silence, and patterns of teacher movement. Field notes were recorded in a structured manner to identify recurring patterns, shifts in interaction, and episodes where spatial cues appeared to influence communicative choices. No student was approached, recorded, or asked to provide information; the observations focused exclusively on publicly visible behaviour within the classroom.

The analysis proceeded in four integrated stages, reported in the Analysis section. First, each spatial configuration was interpreted using principles from spatial semiotics and proxemics to identify the communicative meanings suggested by layout and positioning. Second, observed interactional patterns were mapped onto the spatial templates to examine how participation corresponded to specific zones, proximities, or lines of sight. Third, spatial cues were associated with linguistic selectivity and participation structures, that is, with who took turns, who engaged in side-talk and who stayed silent. Fourth, insights from spatial interpretation, interactional mapping and this association were synthesised through a multimodal lens to generate a holistic understanding of how classroom spatiality functions as a communicative mode. The study consisted of observation of the researcher's own routine teaching

practice, and the layouts and teaching methods observed were already in regular use in the class. A formal permission letter was obtained from the programme coordinator, who knew that the observations were for research purposes. The students were informed about the research before the observation began, and their parents were informed through the class WhatsApp group. Because only existing pedagogy was observed and no personal data were collected, written parental consent was not taken. No student was approached, recorded or asked for information, and no names or identifying details were collected. All observations were limited to surface-level classroom behaviour occurring in publicly observable learning spaces.

As the researcher was also the class teacher, and the three spatial layouts examined were part of the teacher's routine, already-established classroom practice rather than arrangements introduced for the purposes of this study, no additional institutional ethics review was sought beyond the programme coordinator's formal permission letter. No students were individually approached, named, photographed, or recorded; all data were limited to anonymised, aggregate descriptions of publicly visible classroom behaviour, and no information capable of identifying an individual student was retained at any stage of data collection or analysis.

Analysis

The comparison is based on the ways in which classroom space arrangements relate to observable linguistic and interactional patterns in a spatial-semiotic and multimodal perspective. The information gathered through spatial mapping and naturalistic observation was analysed in a circular format which alternated between the physical landscape, the interactional behaviour and the interpretive schemes given by the spatial semiotics and proxemics. Since every classroom arrangement conveys specific meanings, i.e. in respect of visibility, authority, access and participation, the analysis views spatiality as an expressive structure that has a bearing on the way classroom conversation occurs.

1. Explaining the Semiotic Configurations of Spatial Layouts.

Every classroom formation was initially read as a semiotic set-up whose material form had connoting meanings as to intended communicative relations. The emphasis of this step was on determining how the arrangement of chairs, circulation patterns and the positioning of teachers established the creation of various "zones of interaction" which formed a verbal participation opportunity. The use of spatial grammar as conceived by Kress and van Leeuwen (2006) was sparsely used, and only in cases where it was helpful to the task of interpretation, the interpretations were not abstract, but rather treated as a hypothesis with observable behaviour to be studied.

2. Mapping Interactional Patterns between Spatial Zones.

Interactional patterns were overlaid onto the spatial template once the semiotic meanings of each layout had been determined. The step included recording the focus of participation, the lack of it, and the flow of interaction throughout the room. Themes including responding to questions in the front centre more often, less often in the peripheral areas, or more often in the peer talk in the clustered school seat replicated themselves time and again. Such patterns were perceived as communicative reactions to spatial signals instead of being treated as behavioural preferences. To illustrate, the reduced verbal communication of the back row was not discussed as not being interested but rather due to its semiotic position being a low-visibility, low-access space (Hall, 1966).

Movement of teachers was also very instrumental in changing these patterns of interaction. In cases where the teacher circulated, the participation was spread more equally in the zones; in other cases where the teacher stood, the interaction was found around highly visible zones. The analysis thus did not look at positioning of teachers as simply the physical presence but as a semiotic message that redistributed the communicative opportunity.

3. Association of Spatial Cues and Linguistic Selectivity and Participation Structures.

The third analytical strand was concerned with the correlation of observable linguistic behaviour, i.e. turn-taking, frequency of responding, and peer-to-peer interactions to the spatial indicators incorporated in each layout. This necessitated a detailed observation of body orientation, eye movement and positioning and use of language. Those who were closer to the teacher or towards the centre made more turn initiations and those who were facing their bodies away of the focal point initiated more side-talk or stayed silent. In other words, students in rear and peripheral seats, and those turned away from the focal point, contributed fewer whole-class turns but more side-talk, as reported in the Findings (Table 2). Instead of providing a purely personal interpretation of these behaviours, the analysis placed them in a semiotic space of the classroom. The use of multimodal views bolsters this explanation by acknowledging the fact that communication is organised on spatial and embodied modalities, and not just through speech (Bezemer and Jewitt, 2010).

The quality of linguistic interaction was also associated with spatial cues. The clustered layouts produced spontaneous peer-to-peer interactions more often, which indicated that the proximity in the space supported small-group micro-dialogues. Conversely, linear configurations made communication flow mostly through the teacher and formed more vertical discourse pattern. These results support the view that spatiality is closely bound up with not only who speaks but how speaking comes to be socially and materially organised.

4. Integrating Spatial, Semiotic and Interactional Understandings.

The last analysis phase was a synthesis of spatial and interactional knowledge to an integrated description of classroom communication. Instead, the evidence suggested that spatiality is one of the most eloquent yet silent communicative resources: it guides the attention lines, defines the participation rights, and affects the discourse movement. A semicircular design, such as expressed openness and collective orientation, generated more horizontal interactional designs. On the other hand, a fixed front and back layout expressed hierarchical relationships and generated more teacher centred turn taking patterns. Such findings are echoed by the multimodal research that material arrangements can redistribute communicative agency (Jewitt, 2016), but the current study has gone further and demonstrated how exactly such redistribution takes place in various spatial arrangements.

Findings

The discussion of the spatiality of the classroom in various layouts identified three interdependent results that provide a depiction of how physical set-ups are semiotic resources shaping linguistic behaviour and interactional tendencies. These results show that classroom space is not neutral, in fact, it silently organizes communication by providing notifications of expectations and redistribution of participation opportunities.

The initial important discovery is related to the development of high and low visibility participation areas. In the layouts that were well oriented towards the front-back, the participation typically centred in the frontal area where the students could see the teacher directly. Students in the rear corners or on the periphery contributed far fewer whole-class turns (27 across the five rows lessons, against 96 from the front-centre zone and 58 from the middle zone; Table 2), but they engaged in more side-talk (82 episodes, against 27 in the front-centre zone). Participation therefore did not disappear from low-visibility seats; it appeared to move from the public floor to talk with neighbours. In each of the five rows lessons the front-centre zone produced more whole-class turns than the rear/periphery, and the observation notes do not suggest that this was simply a matter of individual students' ability or motivation, although neither was measured. Because the zones differ in size (6, 6 and 13 chairs), the per-chair picture is also given: the front-centre zone produced about 3.2 whole-class turns per chair per lesson, the middle zone 1.9 and the rear/periphery 0.4, while side-talk per chair was highest in the middle zone (1.7), followed by the rear/periphery (1.3) and the front-centre (0.9). Rather, they mirrored the semiotic resources of the spatial

organisation: the centrality positions became a marker of legitimacy and immediacy, and the peripheral spaces were low-participation zones (Hall, 1966).

Table 2: Whole-class turns, side-talk and peer exchanges by layout and zone (totals across five lessons per layout; mean per lesson in brackets)

Layout	Zone	Chairs	Whole-class turns	Side-talk episodes	Peer exchanges
Rows	Front-centre	6	96 (19.2)	27 (5.4)	
Rows	Middle	6	58 (11.6)	50 (10.0)	
Rows	Rear/periphery	13	27 (5.4)	82 (16.4)	
Rows	**All zones**	**25**	**181 (36.2)**	**159 (31.8)**	**46 (9.2)**
Clusters	Cluster interior	5	65 (13.0)	50 (10.0)	
Clusters	Cluster edge	20	70 (14.0)	60 (12.0)	
Clusters	**All zones**	**25**	**135 (27.0)**	**110 (22.0)**	**120 (24.0)**
Semicircle	Centre of arc	7	82 (16.4)	26 (5.2)	
Semicircle	Arc ends	18	79 (15.8)	29 (5.8)	
Semicircle	**All zones**	**25**	**161 (32.2)**	**55 (11.0)**	**75 (15.0)**

Note. Counts are from the researcher's observation log. Chairs = number of chairs in the zone. Zones differ in size, so per-chair rates are given in the text; peer exchanges were recorded for the whole room.

The second discovery is associated with the redistribution involving teacher movement. The teacher would go around the classroom and interaction became less centralised and broad. The involvement in once silent areas rose, peer-to-peer interactions became decentralised. In comparison, in situations where the teacher stood still (especially at the front) social exchange was directed towards the students who were nearest to this stationary centre. Teacher movement then acted as a semiotic signal and indicated the changing centres of attention and the change in the willingness of students to take turns. This trend emphasises the application of spatial mobility, which can lead to decentralisation of classroom talk, and more equal interaction despite the lack of verbal stimulation. In the two rows lessons in which the teacher mostly circulated, turns from the rear/periphery averaged 7.5 per lesson, against 4.0 in the three lessons in which the teacher stayed mostly at the front, and peer exchanges averaged 10.5 against 8.3 (Table 3). The differences were smaller in clusters and the semicircle, and with so few lessons in each condition these comparisons are suggestive only.

Table 3: Mean rear/periphery (or arc-end) turns and mean peer exchanges per lesson, by layout and teacher movement

Layout	Teacher mostly	Lessons	Rear/edge turns (mean)	Peer exchanges (mean)
Rows	At the front	3	4.0	8.3
Rows	Circulating	2	7.5	10.5
Clusters	At the front	2	12.5	25.0
Clusters	Circulating	3	15.0	23.3
Semicircle	At the front	3	15.3	14.7
Semicircle	Circulating	2	16.5	15.5

The third conclusion deals with the communicative capabilities of clustered and linear seating. The layouts of the cluster enabled greater spontaneous peer communication and interaction coupled with the short, collaborative communication, and the layouts of the linear rows solely led to a teacher-controlled discourse. Peer exchanges totalled 120 across the five cluster lessons (24 per lesson), against 46 in rows (9 per lesson) and 75 in the semicircle (15 per lesson) (Table 2). In the central group (the cluster interior), students produced about 2.6 whole-class turns per chair per lesson, against 0.7 in the four outer groups, and more side-talk per chair (2.0 against 0.6); because this is a single group of five chairs, it may reflect

who sat there as much as where. In cluster placements, the student bodies were oriented towards others thereby forming micro-communication networks that facilitated peer-scaffold, collaborative problem solutions, and low-stakes questions. Conversely, the linear rows directed the attention to the teacher, which supported a vertical mode of interaction. Instead of understanding this contrast as an easy pedagogical choice, the data indicate that each design conveys varying expectations regarding the direction in which two people should be, with whom, and who is to speak to whom, and in which direction. These results are in line with multimodal approaches that claim that spatial orientation and material configuration affect communicative agency (Bezemer and Jewitt, 2010), but here the trends emerged from routine classroom practice rather than a controlled design experiment.

The semicircular layout showed a different pattern. Whole-class turns were spread almost evenly between the middle of the arc and its ends (82 and 79 across the five lessons), and side-talk was the lowest of the three layouts (55 episodes, against 159 in rows and 110 in clusters). The researcher's impression was that students seated in the middle of the arc were the most engaged and initiated conversation most often, and the counts agree once chair numbers are considered: the seven central chairs produced about 2.3 whole-class turns per chair per lesson, against 0.9 for the eighteen chairs at the arc ends. Peer exchanges (15 per lesson) fell between rows and clusters. Together these observations suggest that an open, shared orientation balanced visibility across the room without the dense peer exchange of clusters.

Representative notes from the observation log illustrate these patterns. In a rows lesson with the teacher at the front: "Turns concentrated towards the front; side-talk more frequent in the rear." (Lesson 1, 1 November). In a rows lesson with the teacher circulating: "During circulation, rear-zone turns increased and participation broadened." (Lesson 4, 15 November). In clusters: "Students oriented towards one another and sustained group discussion." (Lesson 7, 23 November). In the semicircle: "Participation was distributed across the arc during teacher movement." (Lesson 12, 13 December).

All these findings indicate that classroom spatiality is a communicative resource that organises interaction, by establishing spaces of visibility, indicating transitional relations dynamics through the movement of teacher and determining whether discourse circulates vertically or horizontally.

Discussion

The results depict that the classroom spatiality is a dynamics semiotic system that promotes linguistic and interactional behaviour in delicate and effective ways. This disputes orthodox ideas of seating arrangement as a way of arranging bodies in a pedagogical convenience. Rather, the findings indicate that the presence of spatial cues conveys anticipations on how to participate, to be seen, and to be positioned in relation to others, which lend support to the social semiotic view that meaning is made not only through words, but also through space (Kress and van Leeuwen, 2006).

The definition of high- and low-visibility zones adds significant detail to the existing knowledge on the participation structures. Earlier studies tend to explain variation in participation by patterns of teacher questioning (Mercer, 2019; Walsh, 2011). The present results suggest, however, that spatial position was strongly associated with participation in this class, although this study did not test position against teacher questioning. The students who sat in semiotically marginal areas, those with less visibility or indirect orientation to the teacher, participated less in whole-class discourse, but their greater side-talk suggests that they were not simply disengaged; the pattern appears to reflect the visibility and access that their positions afforded.

Teacher mobility appeared to decentralise interaction that suggests that movement itself can function as a form of embodied semiotic signalling. Teacher movement reallocated communicative opportunity (although there was no variation in the instructional strategy) by manipulating proximity, gaze lines and focal points. This observation is concordant with proxemic principles stating that the spatial proximity indicates availability, and relational position (Hall, 1966), but it goes beyond it showing how mobility may

act proactively to restructure participation across regions. It indicates that the spatial presence of teachers is consequential to the interactional equity as their verbal facilitation strategies.

The comparison between cluster and linear layouts enhances the existing discussions on classroom design in that spatiality does not only correlate with some communicative behaviours, it appears to shape them. The arrangement of clusters symbolically allows lateral interaction, and the arrangement of rows encourages vertical discourse dominated by the teacher. This is in response to naive suggestions that flexible layouts are by default better at engaging. Instead, it is possible to note that the findings suggest that each layout has its own communicative script; clusters and rows promote peer networks and authoritative structures respectively. These differences resonate with the results of multimodal studies that indicate that spatial configurations mediate communicative agency (Jewitt, 2016), but this paper provides new evidence that illustrates the way these processes appear to take place in real-life classroom interactions. The semicircle, finally, produced the lowest side-talk of the three layouts, and its central chairs generated the most turns per chair, which suggests that an open, shared orientation made the middle of the arc a high-visibility position without the dense peer exchange of clusters.

On a larger scale, the results make spatiality a key aspect of the communicative ecology of the classroom. When the concept of classroom is seen as a multimodal space, the space cues can never be marginal; they are part of the way learners comprehend the rights of participation, the proximities between parties, and speech channels. The research is therefore an extension of the field of educational linguistics in that it places space as a significant communicative tool as opposed to a setting. This opinion challenges the views of educators and researchers to rethink the role of linguistic behaviour created through semiotic messages that are established in the classroom design and the spatial organisation.

These findings also speak directly to a gap identified in the most recent methodological literature. Wan et al.'s (2025) systematic review of twenty-five multimodal classroom discourse studies published between 2016 and 2024 found that, although gesture, gaze, and digital resources are now well represented in classroom discourse research, spatial arrangement itself remains comparatively under-analysed as a primary semiotic resource rather than a background variable. The present findings help to narrow this gap by demonstrating, through sustained naturalistic observation of one class across three layouts, that spatial organisation was systematically associated with who speaks, when, and to whom.

Limitations

This study has several limitations. It is a single-class case study, and the researcher was also the class teacher, so teaching and observation were carried out by the same person, which may have shaped both what was noticed and how students behaved. The three layouts were used in blocks (rows from 1 to 16 November, clusters from 22 November to 6 December, and the semicircle from 7 to 21 December 2025), so differences between layouts are confounded with time and with the students' growing familiarity with one another and with the teacher. No audio or video was recorded; brief informal notes were made at about 15-minute intervals and a structured log was completed at 30-minute intervals, so the counts are best treated as approximate and descriptive, and no statistical tests were applied. Per-chair rates assume that every chair was occupied in every lesson, because attendance was not recorded, and they ignore who sat where. Posture was not systematically recorded, and the students' own views about where they sat were not collected. The findings are therefore indicative and not generalisable, and should be tested with larger samples, recorded data and designs that vary layout independently of time.

Conclusion

The results of this paper indicate that classroom spatiality is an important semiotic resource that shapes linguistic behaviour, participation patterns and interactional courses in the daily lessons. Spatial arrangement does not represent a neutral feature of organisations but expresses implicit assumptions of visibility, power and entry to participation. The constant appearance of the high-visibility and low-visibility

areas emphasize the communicative implications of the space proximity and orientation beyond the agenda of the pedagogical goals. These tendencies reinforce the social semiotic perspective in general, which holds that spatial configurations are meaning-making systems that dictate the distribution of communicative functions (Kress and van Leeuwen, 2006).

Movement among teachers was revealed to be a key part in the redistribution of communicative agency, which implies that spatial mobility has the potential of alleviating the hierarchical tendencies that are commonly supported through fixed formations. This is in line with the proxemic principles, which postulates that relational stance is communicated by spatial distance (Hall, 1966), but in the current study, the findings suggest that mobility between zones can actively influence the willingness of students to engage. The observation that rear-zone participation was somewhat higher in lessons in which the teacher circulated suggests that movement alone, without additional verbal facilitation, may help to redistribute the ownership of participation, although this needs to be tested with more lessons.

The difference between cluster and linear layouts also serves to emphasise the fact that the various spatial arrangements encode different communicative scripts. Clusters encouraged lateral interaction by means of bodily orientation and common physical foci, and linear rows directed discourse to the teacher, which created more vertical turn-taking designs. These tendencies can be related to multimodal scholarship, which recognises material arrangements as part and parcel of meaning-making conditions (Bezemer and Jewitt, 2010), but the present study adds new evidence by tracing the development of such dynamics using naturalistic classroom behaviour instead of artificial design experiments.

In general, the results redefine the concept of classroom space as a communicative practice and not simply a background. Spatial cues (visibility, orientation, proximity and openness) shape how students position themselves linguistically and socially in classroom interaction. This extends educational linguistics by incorporating the physical design of the classroom into the analysis of discourse and interaction. The study can be conceptually and empirically expanded to the current debate on classroom communication because it shows that the possibility of speaking is not only formed by space but also by how and where.

The practical and theoretical implications are both effective. In practice, the concept of spatiality as communication promotes more deliberate movement practices and design, whereby teachers can redistribute the participation without changing the content in the curriculum. Theoretically, the paper highlights that future research should have a more central role of the spatial analysis in multimodal and discourse-based studies of classroom life. Although classroom talk is critical to the study of linguistics, this research suggests that space organisation of both bodies and objects in the learning room is also a vital part of enacting, negotiating, and constraining meaning-making.

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