

Artifact-Mediated Speaking Instruction in Junior Secondary EFL: Designing A Rubik's Cube-Assisted Demonstration Module

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HOW TO CITE:

Mira Tania, Muhammad Kristiawan, Eko Risdianto, Sudarwan Danim (2026). Artifact-Mediated Speaking Instruction in Junior Secondary EFL: Designing A Rubik's Cube-Assisted Demonstration Module. International Journal of Special Education, 41(5s), 402-415.

ABSTRACT:

This study proposes a Rubik's Cube-assisted instructional architecture for developing speaking competence in junior secondary English as a foreign language classroom. The framework addresses persistent challenges in speaking instruction, including speaking anxiety, unequal participation, limited communicative engagement, and the absence of structured interactional procedures. Adopting a conceptual design methodology, the study synthesizes theories of communicative competence, task-based language teaching, sociocultural mediation, sociomaterial learning, and cognitive load management to construct a curriculum-aligned speaking module. The instructional design is organized around the thematic units of the Indonesian junior secondary English curriculum and integrates discourse segmentation, scaffolding cycles, rotational participation mechanisms, and artifact-mediated interaction. Within the proposed framework, the Rubik's Cube functions as a pedagogical artifact that generates visible speaking prompts, regulates turn-taking, and supports learners in initiating oral communication. To evaluate the pedagogical effectiveness of the model, a mixed-methods assessment framework is also proposed, incorporating speaking performance measures, participation indicators, the Public Speaking Classroom Anxiety Scale (PSCAS), reflective responses, and semi-structured interviews. The instructional architecture is expected to enhance speaking fluency, reduce foreign language speaking anxiety, and promote more equitable classroom participation. The novelty of the study lies in integrating sociomaterial mediation, discourse scaffolding, participation regulation, and curriculum alignment within a single artifact-mediated instructional framework. The study contributes theoretically to EFL pedagogy by demonstrating how

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tangible classroom artifacts can structure communicative interaction and support speaking development, while practically providing teachers with an innovative and implementable strategy for organizing speaking activities in junior secondary classrooms.

Keywords: artifact-mediated instruction, communicative competence, EFL speaking pedagogy, junior secondary education, Rubik's Cube learning module.

1. Introduction

A. Background and Significance

Developing oral communication competence remains a central objective of English as a Foreign Language (EFL) instruction, particularly in junior secondary education, where learners begin to actively use English for interpersonal communication. Despite curriculum reforms emphasizing communicative competence, many EFL classrooms continue to face persistent challenges related to limited speaking participation, uneven interaction distribution, and high levels of speaking anxiety among students. Previous studies have shown that students frequently experience apprehension when required to speak in English, particularly during classroom presentations or public speaking activities (Horwitz, Horwitz, & Cope, 1986). In many cases, speaking tasks remain structurally ambiguous, leaving learners uncertain about how to initiate responses or organize ideas, which can further increase cognitive pressure and reduce participation. Recent research highlights that speaking anxiety and participation imbalance are not solely individual learner problems but are often shaped by instructional design and classroom interaction structures. When speaking activities lack clear procedural guidance or equitable participation mechanisms, classroom interaction tends to be dominated by a small number of confident learners while others remain passive participants. Such conditions may limit opportunities for learners to practice oral communication and gradually develop speaking confidence. As demonstrated in a systematic review of foreign language speaking anxiety, unclear task expectations and fear of evaluation frequently contribute to students' reluctance to participate in oral communication

tasks (Mira, Danim, & Yensy, 2025). Consequently, effective speaking instruction requires not only meaningful communicative tasks but also structured interactional frameworks that guide participation and reduce anxiety.

Communicative language teaching and task-based language teaching emphasize the importance of meaningful interaction in developing communicative competence (Ellis, 2018). However, scholars have argued that classroom speaking tasks must also be procedurally structured in order to manage learners' cognitive load and support the development of fluency during oral production (Skehan, 2018). When speaking activities provide clear communicative prompts and predictable participation routines, learners are more likely to engage actively in interaction while gradually developing confidence and discourse skills. In addition, sociomaterial perspectives in language learning highlight the role of physical artifacts and classroom tools in shaping interaction patterns and facilitating participation during communicative activities (van Lier, 2004; Toohey, 2019). Instructional artifacts can function as mediating tools that organize classroom interaction and provide visible cues that guide learners' communicative behavior. Within the Indonesian context, English instruction in junior secondary schools has undergone curricular transformation from the 2013 Curriculum (Kurikulum 2013) toward the Merdeka Curriculum (Kurikulum Merdeka), which emphasizes learner autonomy, competency-based learning, and active student participation. Prior to this transition, the 2013 curriculum promoted communicative competence through government-issued textbooks such as *When English Rings a Bell*, which introduced students to

basic communicative functions, including greetings, self-introduction, daily activities, and social interaction. Although the textbook was originally designed for the 2013 curriculum, it remains a relevant reference in studies examining English language teaching materials in Indonesian secondary education. Although these themes provide important communicative contexts, classroom implementation often remains dependent on teacher-led instruction or textbook-based exercises that may not fully encourage active participation among students. Aligning innovative instructional approaches with the national curriculum is therefore essential in order to ensure pedagogical relevance while enabling meaningful comparisons between traditional instructional practices and alternative learning designs (Nation & Newton, 2020).

In response to these pedagogical challenges, the present framework proposes a Rubik's Cube-assisted instructional architecture as a structured mechanism for organizing speaking activities and distributing participation opportunities in junior secondary EFL classrooms. In this approach, the Rubik's Cube functions as a pedagogical artifact that generates rotational speaking prompts, allowing students to practice communicative expressions aligned with the thematic units of the curriculum. Each color of the cube represents a specific communicative expression or sentence pattern that students practice collaboratively during speaking activities. The rotational nature of the cube introduces an element of randomness while simultaneously regulating participation, ensuring that each student has the opportunity to contribute during classroom interaction. From a pedagogical perspective, the integration of a tangible instructional artifact into speaking instruction offers several advantages. First, visible prompts can reduce learners' uncertainty about how to begin speaking by providing clear communicative cues. Second, rotational participation structures can promote more equitable speaking opportunities among students. Third, the repeated practice of structured expressions across thematic lessons can support the gradual development of speaking fluency and communicative confidence. Such artifact-mediated instructional approaches align with sociomaterial

perspectives in language learning, which emphasize that learning processes are shaped not only by cognitive factors but also by the interaction between learners, tools, and classroom environments (Toohey, 2019).

Based on these considerations, the Rubik's Cube-assisted instructional architecture is conceptualized as a curriculum-aligned interactional framework that connects thematic language instruction with structured speaking practice. By integrating artifact-mediated prompts with communicative classroom activities, the framework aims to enhance students' participation, reduce speaking anxiety, and promote more active engagement in EFL learning contexts. To examine the pedagogical feasibility of this approach, the study addresses the following research questions:

1. How can a Rubik's Cube-assisted instructional architecture be systematically designed to integrate discourse segmentation, scaffolding cycles, and participation regulation in junior secondary EFL classrooms?
2. What conceptual framework can be operationalized to assess speaking development and classroom participation in Rubik's Cube-assisted EFL instruction?

Through addressing these questions, the research seeks to contribute to the development of artifact-mediated speaking pedagogy that is both theoretically grounded and practically applicable within curriculum-based EFL classrooms.

B. Literature Review

Speaking competence is widely recognized as a core component of communicative language ability in English as a Foreign Language (EFL) education. In communicative language pedagogy, speaking is not merely the production of grammatically correct sentences but involves the ability to express meaning, negotiate interaction, and respond appropriately within social contexts. Contemporary language learning theories emphasize that speaking development requires opportunities for meaningful interaction and communicative practice. According to Ellis (2018), effective speaking instruction should

integrate form-focused guidance with meaning-focused communication in order to support both fluency and accuracy. Similarly, Nation and Newton (2020) argue that speaking competence develops through repeated exposure to communicative tasks that encourage learners to use language actively in authentic interaction.

However, research indicates that many EFL classrooms still struggle to create effective environments for speaking practice. Large class sizes, limited instructional time, and teacher-centered pedagogies often restrict opportunities for students to participate in oral communication activities. As a result, learners frequently develop receptive language skills such as reading and listening more rapidly than productive speaking skills. Römer (2022) highlights that speaking instruction often lacks structured discourse scaffolding, leaving students uncertain about how to organize their responses during classroom interaction. When learners are unsure how to initiate or maintain communication, they may avoid participating in speaking tasks altogether. Empirical studies in recent years have also emphasized that speaking competence is closely linked to learners' confidence and willingness to communicate. MacIntyre et al. (2017) demonstrate that learners' willingness to communicate in a second language is influenced by classroom interaction patterns and perceived communicative competence. When classroom activities provide predictable interaction routines and supportive scaffolding, learners are more likely to engage actively in oral communication tasks. Consequently, speaking instruction should not only provide communicative opportunities but also include structured mechanisms that guide students in organizing their speech and participating in classroom discourse.

Speaking anxiety is one of the most widely documented psychological barriers affecting oral communication in foreign language classrooms. Students frequently experience fear of making mistakes, negative evaluation, or embarrassment when speaking in front of peers. Such anxiety can significantly reduce learners' willingness to participate in classroom interaction. Dewaele and MacIntyre (2019) note that foreign language anxiety

is often triggered by classroom situations that require spontaneous oral production without sufficient preparation or guidance. When learners perceive speaking tasks as cognitively demanding or socially risky, they may withdraw from participation. Recent studies further demonstrate that speaking anxiety is closely connected to classroom instructional design. Research by Li (2020) indicates that poorly structured speaking activities can increase learners' cognitive pressure because students must simultaneously generate ideas, organize language, and perform in front of others. When tasks provide limited scaffolding, learners may struggle to formulate responses quickly, leading to hesitation and reduced fluency. Conversely, structured speaking activities that provide clear prompts and interaction patterns can help reduce anxiety by simplifying task expectations. Participation inequality is another challenge frequently observed in EFL classrooms. Studies have shown that classroom interaction is often dominated by a small number of confident students while others remain passive listeners. Philp and Duchesne (2016) explain that unequal participation reduces the opportunities for learners to practice speaking and limits the development of communicative competence across the classroom. To address this issue, language educators increasingly advocate instructional designs that regulate turn-taking and distribute speaking opportunities more equitably among students.

Communicative Language Teaching (CLT) and Task-Based Language Teaching (TBLT) are widely recognized as dominant approaches in contemporary language pedagogy. Both frameworks emphasize the importance of meaningful communication and interaction as central mechanisms for language learning. According to Skehan (2018), task-based instruction allows learners to focus on conveying meaning while gradually improving linguistic accuracy through repeated practice. Tasks that involve problem-solving, information exchange, or collaborative interaction encourage learners to use language actively rather than passively receiving knowledge. Despite their pedagogical strengths, several scholars argue that communicative and task-based approaches sometimes provide limited

guidance regarding the procedural organization of speaking tasks. Ellis (2018) notes that classroom tasks often require additional scaffolding in order to support learners with limited language proficiency. Without structured prompts or interactional routines, students may struggle to initiate communication during speaking activities. Recent research therefore emphasizes the importance of integrating communicative tasks with explicit discourse scaffolding. For instance, Newton and Nation (2020) propose that speaking instruction should incorporate structured repetition and guided expression patterns that help learners internalize communicative functions. Such scaffolding can reduce the cognitive complexity of speaking tasks and allow learners to focus on developing fluency and confidence in communication.

Beyond cognitive perspectives, sociocultural theory highlights the role of social interaction and mediation in language learning. From this perspective, learning occurs through collaborative activity in which learners interact with peers, teachers, and cultural tools. Tools and artifacts within the learning environment can function as mediational means that shape how learners participate in communicative practices. Van Lier (2019) explains that language learning environments are not solely cognitive spaces but ecological systems where interaction between learners, tools, and contexts influences the learning process. Within this ecological framework, physical artifacts can guide learners' attention and organize participation during classroom activities. Similarly, Toohey (2019) argues that sociomaterial approaches to language learning emphasize the interaction between human actors and material objects in shaping educational practices. Classroom artifacts such as visual prompts, cards, or manipulable objects can function as mediating tools that support communication and regulate interaction patterns.

C. Research Gap in Current Studies

In recent years, educational researchers have increasingly explored artifact-mediated learning designs in language classrooms. Studies suggest that tangible instructional tools can help structure participation and provide concrete cues that facilitate communication. For example,

manipulative learning materials have been shown to support collaborative interaction and encourage student engagement during communicative tasks (Li, 2020). By externalizing communicative prompts into visible artifacts, learners can focus on producing language rather than generating ideas independently. Instructional artifacts can play an important role in organizing classroom discourse and supporting structured speaking practice. In communicative language pedagogy, artifacts may function as prompts, turn-taking regulators, or interactional organizers. According to Römer (2022), structured speaking activities that incorporate visual or physical prompts can significantly improve learners' ability to initiate communication. When learners receive clear cues about what to say, the cognitive burden associated with planning speech is reduced. Furthermore, artifact-mediated learning environments can help promote equitable participation in classroom interaction. When speaking turns are regulated through visible tools or procedural rules, students have clearer expectations regarding their roles in communicative activities. This approach aligns with research suggesting that structured interactional frameworks can increase participation and improve the distribution of speaking opportunities among learners (Philp & Duchesne, 2016). In the context of junior secondary EFL education, the integration of tangible artifacts may also enhance student engagement. Adolescents often respond positively to interactive learning activities that incorporate physical objects and collaborative tasks. By combining communicative prompts with manipulable artifacts, teachers can transform speaking exercises into structured yet engaging classroom interactions. Such approaches may support the development of communicative competence while simultaneously reducing speaking anxiety and participation imbalance.

Although previous research has examined communicative tasks, speaking anxiety, sociomaterial mediation, and artifact-based learning tools, these elements are often studied separately. Few studies have attempted to integrate discourse scaffolding, participation regulation, and artifact-mediated interaction into a unified instructional architecture for EFL speaking instruction. The

present study addresses this gap by proposing a Rubik's Cube-assisted instructional design that synthesizes these theoretical perspectives into a single pedagogical framework. The Rubik's Cube functions not merely as a classroom activity tool but as a sociomaterial artifact that structures communicative prompts, regulates participation, and scaffolds speaking production. By aligning the instructional design with the thematic progression of the national curriculum, the proposed model aims to provide a theoretically grounded and practically implementable approach to improving speaking participation and communicative competence in junior secondary EFL classrooms.

2. Methodology

This study adopts a conceptual research design aimed at developing a theoretical instructional framework for artifact-mediated speaking instruction in junior secondary EFL classrooms. Rather than conducting empirical experimentation, the study synthesizes existing theoretical perspectives in communicative language teaching, sociocultural mediation, and cognitive learning theory to design a Rubik's Cube-assisted speaking module. The framework conceptualizes the Rubik's Cube as a pedagogical artifact that structures speaking prompts, regulates participation, and supports discourse scaffolding during classroom interaction. Through this design, the study proposes a systematic instructional architecture that aligns communicative speaking activities with the thematic units of the Indonesian junior secondary English curriculum. The development of the instructional model is grounded in theoretical synthesis and instructional design analysis. Relevant literature on communicative competence, task-based language teaching, sociomaterial learning, and speaking anxiety was reviewed to identify key pedagogical principles that support effective speaking instruction. These theoretical perspectives were then integrated to construct a structured classroom procedure in which the Rubik's Cube functions as a visible mediational tool guiding learners' oral production. Each color of the cube represents a communicative expression related to specific thematic lessons, allowing teachers to organize speaking activities through rotational prompts that

encourage equitable participation and reduce learners' uncertainty when initiating speech.

The resulting conceptual framework proposes an artifact-mediated interaction model that connects discourse segmentation, participation regulation, and scaffolding cycles within a single instructional structure. By externalizing communicative prompts into a tangible classroom artifact, the design reduces cognitive load and facilitates more predictable interaction patterns among learners. Previous research indicates that structured communicative tasks and supportive classroom environments can enhance learner engagement and reduce foreign language speaking anxiety (Dewaele & MacIntyre, 2019; Li, 2020; Philp & Duchesne, 2016). Therefore, the proposed framework contributes theoretically to EFL pedagogy by illustrating how tangible instructional artifacts can mediate classroom interaction and support the development of communicative competence in junior secondary language learning contexts.

3. Results in Design Architecture of the Rubik's Cube-Assisted Module

In accordance with the Indonesian national curriculum framework for junior secondary schools, this instructional design is aligned with the learning outcomes stipulated in the Merdeka Curriculum (Kurikulum Merdeka) while maintaining compatibility with the thematic content of the 2013 Curriculum (Kurikulum 2013). The Rubik's Cube-assisted speaking module adopts topics from the official English textbook *When English Rings a Bell*, which has been widely utilized in Indonesian junior secondary education. This alignment ensures curricular relevance and facilitates the integration of communicative speaking activities within existing classroom practices. Aligning an instructional innovation with the existing curriculum is important because it ensures that pedagogical interventions remain contextually relevant and comparable with established classroom practices (Ellis, 2018; Nation & Newton, 2020). By adopting the same thematic progression used in the textbook, the present module enables a systematic comparison between conventional textbook-based instruction and the proposed artifact-mediated speaking architecture. The instructional design therefore aligns the rubric-

based speaking activities with eight thematic chapters commonly taught in junior secondary English classrooms:

1. Chapter I Greeting People
2. Chapter II Introducing Myself
3. Chapter III Telling the Time
4. Chapter IV My Surroundings
5. Chapter V Talking About the Weather
6. Chapter VI Our Daily Activities
7. Chapter VII My Country Indonesia
8. Chapter VIII Being a Good Friend

Although the instructional cube contains six faces, these thematic chapters are implemented through rotational lesson cycles, allowing teachers to reuse the cube while introducing different communicative contexts across multiple lessons. In each session, the rotation of the Rubik's Cube determines the speaking prompt that students must perform. Through this mechanism, the cube functions not merely as a classroom activity tool but as a curriculum organizer that links interactive speaking practice with the thematic progression of the official syllabus. By embedding the thematic content of *When English Rings a Bell* into the cube-based instructional procedure, the design maintains curricular compatibility while introducing a structured mechanism for regulating participation and guiding speaking practice. Research in task-based and communicative language pedagogy suggests that speaking tasks aligned with curriculum themes and supported by clear procedural structures can enhance communicative competence while reducing cognitive burden during oral production (Ellis, 2018; Skehan, 2018). Furthermore, maintaining alignment with existing curricular materials allows instructional innovations to be evaluated more rigorously, as improvements in participation, fluency, and discourse development can be compared directly with outcomes produced through conventional textbook-based instruction (Nation & Newton, 2020; Römer, 2022). This alignment therefore enables the study to assess whether the proposed Rubik's Cube-assisted

instructional architecture can enhance students' speaking participation, fluency, and communicative confidence compared with the standard implementation of the national textbook in junior secondary classrooms.

After practicing the expressions in their groups, the teacher may invite one or two representatives from each color group to come to the front of the class and repeat the conversation using the expressions assigned to their group. This step allows students to demonstrate their speaking performance publicly while reinforcing the communicative sequence practiced during the group activity. Through this process, the cube transforms simple expressions into interactive speaking practice. The visible colors function as physical communicative cues that remind students of the expressions they should produce. As a result, students do not need to spend time deciding what to say. Instead of focusing on grammar rules or complex discourse structures, they can concentrate on expressing clear and meaningful messages within familiar social situations. Importantly, this instructional procedure is repeated systematically across the thematic lessons from Chapter I to Chapter VIII. By applying the same Rubik's Cube-assisted speaking routine to different thematic contexts, students become familiar with the activity structure while practicing various communicative expressions aligned with the curriculum. This repetition supports the gradual development of speaking confidence, fluency, and participation throughout the instructional sequence.

A. The Examples of Implementation: Chapter I - Greeting People

To operationalize this mechanism, each color on the Rubik's instructional cube is associated with a simple communicative expression appropriate for beginner-level EFL learners. The cube functions as a visual speaking prompt that guides students in producing basic interpersonal expressions. At the beginning of the activity, the teacher divides the class into six groups, each representing one color on the cube. Students rotate the cube, and each group selects the color assigned to them. Based on the selected color, students must produce the corresponding sentence together. The class then practices the expressions aloud as a group activity.

This collective repetition allows all learners to become familiar with the expressions before performing them individually.

Group Color	Examples (Students say together)
Yellow	Good morning, Budi.
White	How are you today?
Green	I'm fine, thank you.
Blue	I'm good, thank you.
Orange	How about you?
Red	I'm fine, thank you.
	Nice to see you today.
	See you tomorrow.

Through this process, the cube transforms simple expressions into interactive speaking practice. The visible colors function as physical communicative cues that remind students of the expressions they should produce. As a result, students do not need to spend time deciding what to say. Instead of focusing on grammar rules or complex discourse structures, they can concentrate on expressing clear and meaningful messages within familiar social situations. Importantly, this design simplifies the speaking task while maintaining instructional structure. Many junior secondary learners hesitate when teachers simply ask them to “speak in English” because they are uncertain about how to begin. The instructional cube reduces this hesitation by providing an immediate communicative prompt. When a color appears, students immediately know which expression they should use. Across multiple lessons, the cube also ensures balanced exposure to different communicative situations, including greeting others, asking about well-being, expressing gratitude, apologizing, and ending conversations. These expressions represent fundamental components of everyday communication and form the basis of early communicative competence for beginner-level learners. Within this instructional architecture, the Rubik’s Cube should not be viewed merely as a classroom game. Instead, it functions as a pedagogical artifact that organizes classroom interaction, distributes speaking opportunities, and stabilizes the structure of beginner-level speaking practice. By translating curriculum themes into visible prompts, the cube connects thematic

language instruction with active oral participation. Consequently, the entire class becomes involved in speaking activities, making the learning process more engaging, interactive, and accessible for junior secondary EFL learners.

B. The Examples of Implementation: Chapter II - Introducing Myself

Each face of the Rubik’s instructional cube contains a specific communicative prompt related to self-introduction, enabling beginner-level EFL learners to practice basic speaking expressions in a structured and engaging manner. The cube serves as an interactive learning medium that encourages students to generate personal information orally in English. During the activity, the teacher organizes students into six groups corresponding to the six colors of the cube. After the cube is rotated, each group identifies the color that appears on the designated face and responds to the communicative prompt associated with that color. Group members collaboratively formulate and practice the target expression before presenting it to the class. Through repeated interaction with different prompts, students gradually develop confidence in introducing themselves and responding to simple personal questions in English. The activity promotes active participation, peer collaboration, and meaningful oral language practice within a supportive classroom environment.

Group Color	Examples (Students say together)
Yellow	Hello, my name is Budi.
White	I am twelve years old.
Green	I am a student at junior high school.
Blue	I live in Jakarta.
Orange	My hobby is playing football.
Red	Hi Budi, nice to meet you.

C. The Examples of Implementation: Chapter III - Telling the Time

To facilitate speaking practice on the topic of telling the time and daily schedules, each color of the

Rubik's instructional cube represents a different time-related communicative task. The cube serves as an interactive visual aid that encourages students to express information about daily routines, school activities, and schedules in English. At the start of the lesson, the teacher assigns students to six color-based groups corresponding to the six faces of the cube. After the cube is manipulated, each group identifies the color displayed and responds to the prompt linked to that color. Students work collaboratively to construct and verbalize appropriate sentences, such as stating the time, describing routine activities, or explaining their daily timetable. Following group discussion, representatives from each group present their responses to the class. The activity provides repeated opportunities for oral practice, enabling learners to develop fluency, accuracy, and confidence in discussing time-related information while engaging in collaborative learning.

Group Color	Examples (Students say together)
Yellow	What time is it?
White	It is seven o'clock.
Green	It is half past seven.
Blue	It is a quarter past eight.
Orange	I go to school at seven o'clock.
Red	My class starts at eight o'clock.

D. The Examples of Implementation: Chapter IV - My Surroundings

To support learners in developing descriptive speaking skills, each face of the Rubik's instructional cube contains a prompt related to places and objects commonly found in the school or home environment. The cube serves as an interactive learning tool that stimulates students to produce simple descriptive statements in English. At the beginning of the lesson, students are organized into six groups, with each group corresponding to one of the cube's colors. After the cube is turned, each group responds to the descriptive prompt associated with the color displayed. Group

members collaborate to formulate sentences that describe the location, appearance, or function of a particular place or object. Once the sentences have been prepared, students share their responses orally with their classmates. Through repeated exposure to various descriptive prompts, learners enhance their vocabulary, improve sentence construction, and gain confidence in speaking about familiar surroundings in English.

Group Color	Examples (Students say together)
Yellow	This is my classroom.
White	There is a whiteboard in the classroom.
Green	The library is next to the classroom.
Blue	The school yard is very big.
Orange	My school has many trees.
Red	I like my school environment.

E. The Examples of Implementation: Chapter V - Talking About the Weather

To facilitate oral communication on the topic of weather, each color of the Rubik's instructional cube is linked to a specific weather-related speaking prompt suitable for beginner-level EFL learners. The cube acts as an engaging visual stimulus that encourages students to describe different weather conditions using simple English expressions. At the start of the activity, the teacher organizes students into six groups corresponding to the six colors of the cube. After the cube is rotated, each group identifies the color assigned to them and responds to the weather prompt associated with that color. Students work collaboratively to formulate and practice sentences describing various weather situations, such as sunny, rainy, cloudy, or windy conditions. Following the group discussion, learners present their responses orally to the class. This interactive activity provides repeated opportunities for speaking practice, helping students expand their weather-related vocabulary, improve pronunciation, and develop confidence in expressing environmental conditions in English.

Group Color	Examples (Students say together)
Yellow	How is the weather today?
White	The weather is sunny today.
Green	It is cloudy today.
Blue	It is raining today.
Orange	The weather is very hot today.
Red	The weather is cold this morning.

F. The Examples of Implementation: Chapter VI - Our Daily Activities

To promote speaking practice on the topic of daily activities, each face of the Rubik's instructional cube contains a prompt related to common routines performed by students in their everyday lives. The cube serves as an interactive speaking aid that encourages learners to describe their habitual actions using simple English sentences. At the beginning of the lesson, the teacher arranges students into six color-based groups corresponding to the six sides of the cube. After the cube is rotated, each group responds to the activity prompt linked to the color displayed. Students collaborate to construct sentences about daily routines, such as waking up, going to school, studying, exercising, or helping with household tasks. Once their responses have been prepared, groups take turns sharing them orally with the class. Through continuous engagement with different prompts, learners strengthen their ability to talk about everyday experiences, expand their vocabulary, and develop greater confidence in spoken English.

Group Color	Examples (Students say together)
Yellow	I wake up at six o'clock.
White	I have breakfast in the morning.
Green	I go to school at seven o'clock.
Blue	I study English at school.
Orange	I play with my friends after school.
Red	I do my homework in the evening.

G. The Examples of Implementation: Chapter VII - My Country Indonesia

To encourage learners to speak about their country and national identity, each face of the Rubik's instructional cube is linked to a prompt related to Indonesia's culture, geography, traditions, or national symbols. The cube functions as an interactive speaking medium that helps beginner-level EFL learners express simple information about their country in English. At the beginning of the activity, the teacher organizes students into six groups corresponding to the six colors of the cube. After the cube is rotated, each group identifies the color displayed and responds to the prompt associated with that color. Students work collaboratively to formulate sentences about various aspects of Indonesia, such as its islands, cultural diversity, traditional foods, tourist attractions, or national celebrations. Following group discussion, students present their responses orally to the class. Through repeated participation in these speaking tasks, learners improve their ability to communicate information about their country, expand relevant vocabulary, and develop confidence in expressing ideas related to Indonesian culture and identity in English.

Group Color	Examples (Students say together)
Yellow	Indonesia is my country.
White	I am proud of Indonesia.
Green	Indonesia has many beautiful islands.
Blue	Jakarta is the capital city of Indonesia.
Orange	Indonesian people are friendly.
Red	I love my country, Indonesia.

H. The Examples of Implementation: Chapter VIII-Being a Good Friend

To develop learners' ability to communicate about friendship and positive social values, each face of the Rubik's instructional cube contains a prompt related to cooperation, kindness, respect, and helping others. The cube serves as an engaging speaking tool that encourages beginner-level EFL

learners to express simple ideas about building and maintaining positive relationships with their peers. At the beginning of the activity, the teacher organizes students into six groups corresponding to the six colors of the cube. After the cube is rotated, each group responds to the social interaction prompt associated with the color displayed. Students work together to create and practice sentences describing positive behaviors, such as helping a friend, sharing with others, showing respect, or working cooperatively in a group. Once the sentences have been prepared, learners take turns presenting their responses orally to the class. Through repeated engagement with these communicative tasks, students enhance their speaking skills while simultaneously reinforcing positive social attitudes and interpersonal values in meaningful classroom interactions.

Group Color	Examples (Students say together)
Yellow	You are my good friend.
White	I help my friend at school.
Green	Thank you for helping me.
Blue	I am sorry, my friend.
Orange	Let's study together.
Red	Good friends always help each other.

Overall, the Rubik's Cube assisted instructional procedure provides a structured yet engaging framework for developing beginner-level speaking competence in junior secondary EFL classrooms. By combining curriculum-aligned thematic content with a tangible instructional artifact, the design enables students to practice communicative expressions repeatedly while maintaining high levels of participation. The rotational mechanism of the cube ensures that speaking opportunities are distributed evenly among students, thereby reducing participation imbalance that often occurs in conventional classroom discussions. At the same time, the visible color prompts simplify task expectations and lower cognitive demands, allowing learners to focus on producing meaningful language rather than struggling with how to begin speaking. Such structured speaking tasks are widely

recognized in communicative language pedagogy as effective tools for promoting fluency, interaction, and learner confidence in classroom communication (Ellis, 2018; Skehan, 2018). Furthermore, the use of physical artifacts as mediating tools in language learning environments has been shown to support interactional engagement and scaffold learners' participation by providing concrete cues that guide communication (van Lier, 2004; Toohey, 2019). Therefore, the integration of the Rubik's Cube as a curriculum-aligned instructional artifact offers a pedagogically grounded and practically feasible approach for enhancing speaking participation and communicative competence among junior secondary EFL learners.

4. Discussion on Conceptual Framework for Assessing Speaking Development and Participation in Rubik's Cube-Assisted Instruction

The evaluation of a Rubik's Cube-assisted speaking module for junior secondary EFL classrooms can be guided by a conceptual framework that integrates communicative language pedagogy, artifact-mediated learning, and classroom participation theory. Within this framework, the instructional cube functions as a pedagogical artifact that organizes speaking prompts, regulates turn-taking, and structures classroom interaction. Classroom participation can be measured through the distribution and frequency of speaking opportunities among students. In many traditional classroom discussions, participation tends to be dominated by a small group of confident learners. The Rubik's Cube-assisted procedure is designed to regulate speaking turns through rotational prompts, ensuring that each student has an opportunity to participate. Participation distribution can therefore be assessed by tracking the number of speaking turns per student, the balance of interaction among learners, and the overall level of engagement during classroom activities.

To measure the effectiveness of the instructional module, a mixed-methods evaluation framework can be applied. Quantitative measurement can be conducted using a quasi-experimental pre-test and post-test design, which allows changes in learners'

speaking anxiety, fluency, and participation patterns to be examined before and after the implementation of the instructional intervention. One suitable quantitative instrument for assessing speaking anxiety is the Public Speaking Classroom Anxiety Scale (PSCAS) developed by Yaikhong and Usaha (2012). The PSCAS consists of twenty-five statements measured using a four-point Likert scale ranging from *Strongly Disagree* to *Strongly Agree*. The instrument measures several dimensions of language anxiety, including communication apprehension, discomfort when speaking English, and test-related anxiety. Standardized measurement of foreign language anxiety has been widely used in EFL research to identify psychological barriers that affect learners' oral communication performance (Horwitz, Horwitz, & Cope, 1986).

Quantitative data collection may begin with the administration of a pretest, during which students complete the PSCAS questionnaire in a controlled classroom environment to establish baseline levels of speaking anxiety. Following this stage, the Rubik's Cube-assisted instructional module can be implemented during speaking activities. The cube is used to generate rotational speaking prompts aligned with the thematic units of the curriculum, encouraging structured interaction and equal participation among students. After the instructional period, a post-test can be conducted by administering the PSCAS questionnaire again to measure potential changes in students' speaking anxiety and confidence. In addition to the questionnaire, students may be asked to write short reflective responses describing their experiences during the Rubik-based speaking activities. These reflections can provide valuable qualitative insights into learners' perceptions of the instructional process.

To complement the quantitative findings, semi-structured interviews may also be conducted to explore students' experiences and emotional responses in greater depth. Semi-structured interviews allow participants to describe their challenges, perceptions, and coping strategies when engaging in English-speaking activities (Merriam & Tisdell, 2016). Interview questions may be informed by coping strategies for language anxiety proposed

by Kondo and Ying (2004), enabling the researcher to examine how students manage speaking anxiety during classroom interaction. The collected data can then be analyzed using both quantitative and qualitative methods. Quantitative data may be analyzed using descriptive statistics to identify patterns in anxiety levels and participation indicators. To determine whether significant changes occur between pre-test and post-test scores, a Wilcoxon Signed-Rank Test may be applied, as this non-parametric test is appropriate for small-sample educational studies where the assumption of normal distribution may not be met. Meanwhile, qualitative data obtained from interviews and student reflections can be analyzed through thematic analysis, allowing recurring themes related to speaking confidence, participation patterns, and learner perceptions to be identified.

Finally, the integration of quantitative and qualitative findings through methodological triangulation enables a comprehensive evaluation of the instructional module. By combining statistical evidence with student lived experiences, researchers can obtain a more nuanced understanding of how the Rubik's Cube-assisted instructional architecture influences speaking development, anxiety reduction, and participation equity in junior secondary EFL classrooms. This evaluation framework provides a practical guide for future research aiming to measure the pedagogical effectiveness of artifact-mediated speaking instruction.

5. Conclusion

This study addressed two research questions concerning the design of a Rubik's Cube-assisted instructional architecture and the development of a conceptual framework for assessing speaking instruction in junior secondary EFL classrooms. In response to the first research question, the study demonstrated that the Rubik's Cube can be systematically integrated as a pedagogical artifact that supports discourse scaffolding, participation regulation, and structured speaking practice. Through rotational speaking prompts, color-based participation mechanisms, and curriculum-aligned communicative tasks, the instructional architecture provides learners with clear guidance for oral

production while promoting more equitable participation during classroom interaction. The framework illustrates how a tangible instructional artifact can transform conventional teacher-centered speaking activities into interactive, learner-centered communicative experiences. By reducing uncertainty about how to initiate speech and providing visible communicative cues, the Rubik's Cube-assisted design has the potential to lower cognitive demands and facilitate greater learner engagement during speaking activities.

In response to the second research question, the study proposed a comprehensive assessment framework that combines speaking performance evaluation, participation monitoring, speaking anxiety measurement through the Public Speaking Classroom Anxiety Scale (PSCAS), and qualitative exploration of learners' experiences. Together, these components provide a systematic approach for examining the pedagogical impact of artifact-mediated speaking instruction from both cognitive and affective perspectives. The proposed framework enables researchers and practitioners to assess not only improvements in speaking performance but also changes in learner confidence, willingness to communicate, classroom engagement, and participation equity. As such, the framework contributes to a more holistic understanding of speaking development in EFL contexts.

The study contributes theoretically to the growing body of literature on sociomaterial and artifact-mediated learning by demonstrating how physical

classroom artifacts can function as mediational tools that organize interaction, scaffold communication, and support language development. It also contributes to communicative language teaching and task-based language pedagogy by integrating participation regulation, discourse scaffolding, and curriculum alignment within a unified instructional model. From a practical perspective, the proposed architecture offers English teachers an accessible and low-cost strategy for organizing speaking activities that encourage active participation and reduce barriers to oral communication among beginner-level learners.

Future research should empirically validate the proposed framework through classroom-based quasi-experimental studies involving student populations. Researchers may compare the effectiveness of Rubik's Cube-assisted instruction with conventional textbook-based approaches by examining speaking fluency, pronunciation, vocabulary development, communicative competence, speaking anxiety, and participation patterns over extended instructional periods. Furthermore, future studies may explore the development and validation of a complete Rubik's Cube-assisted English learning package, including lesson plans, teacher manuals, assessment rubrics, and student worksheets, which would also provide valuable practical resources for wider implementation in junior secondary EFL classrooms.

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