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Discourse and Cognitive Mediation in Teacher Scaffolding: A Psycholinguistic Analysis of Input Processing in Indonesian L2 Learning

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A B S T R A C T

This study serves the purpose of assessing the use of scaffolding strategies by teachers in video-based learning from a psycholinguistic perspective and indicators such as intentionality, appropriateness, structure, collaboration, and internalization. Specifically, this study aims to analyse how scaffolding strategies are realized in teacher discourse, how these strategies manifest through the key indicators of scaffolding, and how they correlate with learners' psycholinguistic processing and understanding of language input. Accordingly, the study addresses the following research questions: (1) how scaffolding strategies are realized in teacher discourse; (2) how these strategies are manifested through the key indicators of scaffolding; and (3) how these strategies relate to learners' psycholinguistic processing, particularly in directing attention, facilitating input processing, and supporting memory formation. A descriptive qualitative research method was applied with the objective of observing two Indonesian language learning videos. Data were collected indirectly by observing the interactions in the videos, including teachers' speech Structure and collaboration supported deeper cognitive engagement, whereas internalization reflected the consolidation of input into memory as learners moved toward independent language use. Overall, the success of adapting Indonesian as a second language to digital video-based learning depends on the quality of teacher teaching and the teacher's ability to think carefully about and implement scaffolding methods adaptively.

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1. Introduction

The emergence of digital technologies has greatly transformed the language learning scenario in Indonesia as a second language teaching context (Hung & Nguyen, 2022; Ollonen & Kangas, 2025). Digital video promotes the presence of multimodal inputs, including text, images, and sound, to support learner engagement and enable the construction of meaning (Mayer & Logan Fiorella, 2021). However, the role structure of such environments must be organized using pedagogical concepts to make effective usage depend on more than just the availability of technological affordances (Stickler, 2022; Kaldaras et al., 2024). The importance of scaffolding in this regard is crucial in helping learners process linguistic input and gradually develop their language capability (van de Pol et al., 2010; Sarmiento-Campos et al., 2022). This role becomes particularly salient in video-based learning contexts, where interaction is mediated primarily through teacher discourse rather than direct face-to-face engagement (Doo et al., 2020).

There is evidence on the advantages of using scaffolding as a teaching and learning strategy for second language students, especially those involved in guided interaction, feedback, and modelling (Sarmiento-Campos et al., 2022). Meanwhile, research in the field of digital video instruction is emphasizing the potential effect of multimodal input in stimulating comprehension and linguistic form linkage with context (Mayer & Logan Fiorella, 2021). Despite these advances, existing research remains fragmented, with scaffolding, multimodal learning, and psycholinguistic processes often examined separately rather than as an integrated system of language learning (Li & Zhang, 2023). Consequently, existing models fail to provide a clear account of the way learners 'think' about and internalize language in digitally mediated contexts (Such, 2021; Papi & Hiver, 2025).

However, much of the previous research on scaffolding has centred on instructional effectiveness and tangible learning outcomes, such as language proficiency and academic attainment, leaving aside the cognitive mechanisms that drive these processes (van de Pol et al., 2010; Doo et al., 2020). Scaffolding has been described in terms of a procedure for teaching rather than as mediational, influencing learners' attention, processing of information, and meaning construction (Ahmadi Safa & Motaghi, 2024; Gong et al., 2026). Simultaneously, studies of second language acquisition tend to compartmentalize interactional frameworks (which focus on collaborative processes and negotiation of meaning) from psycholinguistic

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models that orient around internal processes (i.e., noticing and intake) (Schmidt, 2001). This conceptual separation has limited the development of integrative explanations linking instructional support with both social interaction and cognitive processing (Pugh et al., 2022; Al-Khresheh, 2025). In contrast to these prior studies, which predominantly conceptualize scaffolding at a macro-instructional level or evaluate its effectiveness through learning outcomes, the present study advances a micro-level operationalization by examining how scaffolding is linguistically realized in teacher discourse and how it functions moment-by-moment in mediating learners' cognitive processing. This focus on discourse-level realization represents a key point of departure, as it enables a more precise mapping between instructional moves and psycholinguistic mechanisms such as attention, input processing, and memory formation, which have rarely been analysed in an integrated manner in previous research.

Despite the growing body of research on digital video-based language learning, scaffolding, and psycholinguistic processing, a critical gap persists in the lack of integrative analyses that connect micro-level discourse practices with learners' cognitive mechanisms. Existing studies tend to operate within conceptual silos: scaffolding is predominantly examined as an instructional strategy linked to learning outcomes, multimodal input is treated as a feature of media effectiveness, and psycholinguistic research focuses on internal processes such as attention, noticing, and intake (Mayer & Logan Fiorella, 2021). This fragmentation results in limited explanatory power regarding how teacher discourse—particularly at the micro-interactional level—functions as a mediational tool that shapes learners' cognitive processing in real time. In digital video contexts, where interaction is constrained and input is multimodally dense, this gap becomes even more pronounced, as learners must navigate complex input streams without immediate dialogic support (Doo et al., 2020). However, little empirical work has systematically examined how specific linguistic and interactional features of teacher talk—such as directive framing, input simplification, or contingent feedback—operate to direct attention, regulate cognitive load, and facilitate the transformation of input into intake. Consequently, there remains a lack of theoretically grounded and empirically detailed accounts that explain how scaffolding functions simultaneously as a discourse practice and a cognitive mediation mechanism in digitally mediated second language learning environments (Lantolf et al., 2021; Li & Zhang, 2023).

This limitation becomes increasingly evident when considering digital video-based learning environments, in which multisystem input adds to the processing burden and where learners interact with multiple modes of input at the same time (Mayer & Logan Fiorella, 2021). Although prior studies have focused on media effectiveness or instructional design, there is still limited research examining how scaffolding operates through teacher discourse as a mechanism for mediating learners' cognition in real time (D. Li & Zhang, 2022;Mahan, 2022; Wu et al., 2025). Furthermore, there is little analysis at the micro level about teacher talk in how linguistic and interactional features help direct the attention (Hall, 2022; Richards, 2022) reduce cognitive load and internalize the language.

To overcome these limitations, a more integrative study that integrates scaffolding with psycholinguistic processes on authentic instructional contexts is necessary (Roberts, 2012; Liu et al., 2024), and in return narrows the interaction and cognitive aspects for second language learning. This study aims therefore to analyse the implementation of scaffolding in teacher discourse in the domain of Indonesian as second language learning from digital video. More specifically, this study addresses three questions: (1) How are scaffolding strategies realized in teacher discourse in digital video-based Indonesian second language learning? (2) How are these strategies manifested through the key indicators of scaffolding—intentionality, appropriateness, structure, collaboration, and internalization? (3) How do these strategies correlate with learners' psycholinguistic processing and understanding of language. Drawing on these considerations, in a theoretical sense, this research is situated along the bridge between sociocultural and psycholinguistic approaches to second language acquisition.

It assumes that scaffolding is not just a procedure of instruction but an intermediary mechanism across which social activity and cognitive processing are intertwined with one another (Ellis, 2000; Paesani, 2020; Lantolf et al., 2021). Therefore, teacher discourse is an instructional approach to input language, in which linguistic inputs are organized to attend to focus (Tedick & Lyster, 2019; Mudinillah et al., 2024), support input processing, and transform inputs into intake. By positioning scaffolding as a mediational process within discourse, this study emphasizes its role in linking interactional practices with cognitive mechanisms rather than treating it solely as a pedagogical technique. Within this framework, the present study conceptualizes a systematic linkage between scaffolding indicators and psycholinguistic processes: intentionality functions as a mechanism for directing learners' attention to salient linguistic features; appropriateness regulates cognitive load by aligning input complexity with learners' processing capacity, thereby facilitating intake; structure and collaboration support deeper input processing through organized interaction and negotiated meaning; and internalization reflects the consolidation of processed input into memory as learners gradually shift toward autonomous language use. In establishing scaffolding within this holistic context, the study strengthens the current systems of language learning that tend to divide interactional and cognitive processes in isolation. In framing scaffolding as a cognitive, interactional process and not simply as a pedagogical tool, by this point the present study presents a richer representation of how language learning is influenced in digital environments.

Building on the preceding discussion, this study proposes a conceptual framework that integrates scaffolding as an interactional practice with psycholinguistic processes as internal cognitive mechanisms. Specifically, the framework conceptualizes scaffolding not merely as an instructional technique but as a mediational system in which teacher discourse functions as the interface between external interaction and internal cognitive processing. Within this model, the five scaffolding indicators—intentionality,

appropriateness, structure, collaboration, and internalization—are systematically linked to distinct yet interconnected psycholinguistic processes, namely attention regulation, input processing, schema activation and memory organization, deep processing through meaning negotiation, and intake formation.

2. Methods

2.1. Research Design

To examine this issue, a qualitative descriptive study was conducted through discourse and psycholinguistic analysis (Creswell, 2018; Paul, 2010). The integration of discourse analysis and psycholinguistics is methodologically appropriate because the research questions require a dual-level explanation: identifying how scaffolding strategies are linguistically realized in teacher discourse and explaining how these realizations influence learners' internal cognitive processing. Discourse analysis enables the systematic examination of micro-level features of teacher talk—such as directive framing, questioning patterns, feedback, and sequencing—which constitute observable scaffolding practices in interaction. However, these observable features alone do not account for how learning occurs internally; therefore, a psycholinguistic perspective is necessary to interpret how such discourse features function as mediational tools that direct attention, regulate cognitive load, and facilitate input processing and intake. This qualitative approach was chosen to reflect on the complexity of teacher scaffolding practices in terms of how they are expressed and enacted in classrooms as well as the language that mediates learning activities (Forbes, 2022). By combining these two approaches, the study is able to bridge the gap between interactional processes and cognitive mechanisms, thereby moving beyond descriptive accounts toward a more explanatory analysis of how scaffolding operates in second language learning. In this sense, discourse analysis provides access to what teachers do in interaction, while psycholinguistic analysis explains how these actions shape learners' comprehension, processing, and memory formation. Whereas previous research has sought to measure learning outcomes in a quantifiable manner (Sezen-Barrie et al., 2020), this study aimed to investigate the patterns, functions, and meanings of scaffolding as enacted through teachers' discourse and its connection to learners' cognitive processing in second language acquisition. This integrative approach is therefore directly aligned with the research questions, as it enables the study to connect instructional discourse with learners' psycholinguistic processing in a coherent and theoretically grounded manner. Such approaches are well-suited to the research questions (Creswell, 2018), which focus on assessing the interactional and cognitive dimensions of scaffolding within a contextualized learning environment.

2.2. Data Source and Selection

The data for the study included two instructional videos of Indonesian as a second language (L2), sourced from the UKIN PPG In-Service Program at the senior high school level and publicly accessible on YouTube. The videos are about 30 and 41 minutes long at the given time each. It is acknowledged that the use of only two videos represents a limitation in terms of data breadth and generalizability. However, this study adopts a qualitative, micro-analytic orientation that prioritizes depth over breadth, allowing for a detailed examination of scaffolding practices as they unfold in naturally occurring instructional discourse. Each video provides a rich and extended interactional dataset in which multiple instances of teacher talk, scaffolding moves, and learner responses can be systematically analyzed at the level of linguistic detail and cognitive function. This depth-oriented approach is particularly appropriate for capturing the complexity of discourse-mediated cognitive processes, which would be difficult to observe through larger but less intensively analyzed datasets. Furthermore, the selected videos are considered information-rich cases that exemplify authentic teaching practices in digital learning contexts, thereby enabling analytical generalization rather than statistical generalization. Details of the data sources are presented in the following table.

Table 1. Data Details and Data Source

	Video Caption	Duration	Download Link
1.	Video Praktik Pembelajaran UKIN PPG Guru Tertentu 2024 oleh Ibu Wa Ode Widya Wiraswati Ali	30:03	https://youtu.be/X-x2D4HA0O8?si=KeQaK04AgFi8hW2g
2.	Video Pembelajaran BAHASA INDONESIA UKIN PPG Dalam Jabatan | Ibu Kurniawati, S.Pd. LPTK UNTAD	41:05	https://youtu.be/Uf87UqIELGI?si=Vm_TCiAoU5-93HkZ

These were purposively chosen based on three criteria: (1) the existence of explicit teacher–student interaction, (2) the representation of scaffolding practices in instructional discourse, and (3) the presence of multimodal aspects, such as verbal explanations, gestures, visual text, and audio support (Miles, 2014) . The inclusion of a minimal number of video clips was not incidental or methodological. A reduced number of videos can yield in-depth micro-level analysis that is critical in qualitative discourse as well as

psycholinguistic research (Guest et al., 2006). This method allows the researcher to make rigorous and recurrent reflections on linguistic and interactional elements to maintain analytical depth and sensitivity to context. In qualitatively oriented inquiry, especially on matters of discourse and psycholinguistic study, depth of analysis is regarded as more important than quantitative data in order to capture subtle patterns of meaning and cognitive mediation (Flick, 2014).

2.3. Data Collection

Data sources of information were collected by observing the instructional videos indirectly (Guest et al., 2006). The focus of the observation was on teacher discourse, such as verbal language, questioning approaches, explanations, and feedback, as well as on non-verbal factors, such as gestures, intonation, and visuals. All applicable sections were transcribed verbatim to ensure accuracy and to capture linguistic aspects (Poland, 1995). Excerpt selection was conducted through a purposive micro-analytic procedure, in which segments of interaction were identified based on the presence of clear scaffolding moves (e.g., goal-setting, simplification, prompting, feedback, and withdrawal of support) and their relevance to the five scaffolding indicators. From the full corpus of two videos, a total of 15–20 salient excerpts were selected as representative analytical units, with each excerpt corresponding to one or more instances of scaffolding. In total, approximately 60–80 scaffolding instances were identified and analysed across the dataset, allowing for repeated pattern verification and cross-case comparison between videos. Transcription also involved the recognition of interactional sequences consistent with scaffolding. The selection of excerpts was iterative and theory-driven, meaning that segments were revisited multiple times to ensure that they adequately captured both the discourse features and their potential cognitive functions, rather than being chosen randomly or solely based on frequency. This approach facilitates the systematic and non-intrusive collection of data, as the researcher can iteratively and unobtrusively retrieve and interpret the videos without disturbing teaching and learning practices. This method is especially useful for assessing genuine instructional talk and for identifying scaffolding patterns in actual teaching situations.

2.4. Data Analysis

Themes were analysed thematically from a discourse-analytic perspective (Forbes, 2022;Paul, 2010). The analysis was conducted in the following stages: (1) transcription and familiarity with the data, (2) coding of teacher utterances and interactional features, (3) categorization of the data according to scaffolding indicators, and (4) interpretation of the findings in relation to psycholinguistic processes (Saldana, 2021). The coding framework followed five scaffolding indicators: intentionality, appropriateness, structure, collaboration, and internalization. For example, the teacher utterance “Okay, now let’s look at our learning objectives for today…” was coded as INT (intentionality) because it explicitly establishes learning goals and directs learners’ attention to relevant linguistic content; similarly, the utterance “Objective here means real, factual,…” was coded as APP (appropriateness) as it simplifies and clarifies meaning to match learners’ cognitive level. An interaction such as “Denis, can you explain what historical research is?” was coded as COL (collaboration) due to its function in prompting learner participation and negotiation of meaning, while a sequence like “Before we move on to new material, let’s first recall yesterday’s lesson”, was categorized as STR (structure) because it activates prior knowledge and organizes instructional flow. Finally, learner-produced responses without teacher assistance were coded as INTZ (internalization), indicating the consolidation of input into independent language use. Data from each example of teacher discourse was analysed to determine whether the text represented the indicators and how it worked as scaffolding for learners’ knowledge and processes of understanding language. The analysis also considered the relationship between scaffolding practices and psycholinguistic mechanisms (directing attention, simplifying input, promoting meaning-making, supporting language internalization, etc.) (Lantolf et al., 2021). Each coded segment was then linked to its corresponding psycholinguistic function, for instance INT → attention regulation, APP → cognitive load management and input processing, STR → schema activation and memory organization, COL → deep processing and meaning negotiation, and INTZ → intake formation and memory consolidation, ensuring a systematic alignment between discourse features and cognitive mechanisms.This integrative analytical orientation enables the study to situate interactional and cognitive viewpoints, providing a more robust insight into scaffolding as a pedagogical and psycholinguistic phenomenon.

2.5. Trustworthiness and Validity

Data and theoretical triangulation were used in this study to enhance the trustworthiness of the findings (Denzin & Norman K, n.d.). Data triangulation consists of comparing scaffolding patterns across the two instructional videos, and theoretical triangulation involves interpreting the data using both scaffolding theory and psycholinguistic frameworks. In practice, this triangulation directly shaped the interpretive process by requiring that each coded instance of scaffolding be validated across multiple sources and perspectives. For example, patterns identified in one video were systematically compared with those in the second video to confirm consistency or identify variation, thereby preventing over-reliance on a single data source. At the same time, interpretations of each scaffolding instance were cross-checked against both theoretical lenses: an utterance initially categorized as a scaffolding move based on discourse features was further examined in terms of its psycholinguistic function (e.g., attention regulation, input processing, or memory consolidation). Only interpretations that were supported by both interactional

evidence and cognitive plausibility were retained, while ambiguous cases were revisited and re-evaluated through iterative coding. This process reduced interpretive bias and strengthened the analytical linkage between observable discourse and inferred cognitive mechanisms. This two-pronged strategy strengthens the validity and interpretative richness of the analyses. Further, the analysis was conducted in a continuous, iterative, and reflexive manner, facilitating reflexive verification of coding and interpretive work throughout the methodology. This process ensures confirmability, with detailed transcription and systematic coding supporting the dependability of findings, along with the transparent characterization of analytical procedures (Nowell et al., 2017).

3. Results and Discussion

The above study's findings come after a qualitative analysis of two teacher utterances delivered in instructional videos of Indonesian as a second language in digital contexts. The data were categorized by five scaffolding criteria: intentionality, appropriateness, structure, collaboration, and internalization. The analysis reveals not only recurring instructional patterns but also contrasts in how each indicator mediates distinct stages of learners' cognitive processing during language acquisition.

3.1. Findings Based on the Intentionality Indicator

The results demonstrate a scaffolding model for intentionality manifested through teacher dialogue that articulates teaching intentions, articulates what knowledge learners are aiming to master, underscores key information, and structures the sequence of instruction. Phrasings (e.g., stating learning objectives and emphasizing specific aspects of the material) indicate that the teacher deliberately establishes the focus of students from the start of the class. Compared with other indicators, intentionality operates primarily at the initial stage of learning by directing attention and framing cognitive orientation rather than facilitating interaction or independent production.

This is an important version of scaffolding that is necessary for the regulation of access to learners' attention and resources in this way of processing input (van de Pol et al., 2010). With clear and explicit articulation of learning outcomes, the teacher eliminates ambiguity, and students learn to focus on the information needed to be successful (Mayer & Logan Fiorella, 2021). From a psycholinguistic perspective, this is consistent with the noticing hypothesis of the process (Schmidt, 2001), which requires learners to attend selectively to the linguistic properties of interest for learning. The findings also suggest that intentional scaffolding not only directs attention but also mentally prepares students for subsequent processing. Therefore, intentionality serves as the underlying cognitive orientation that enables effective processing and comprehension of input.

Table 2. Forms of Scaffolding for the Intentionality Indicator

No.	Data	Form of Scaffolding
1	*Guru: Oke sekarang kita lihat untuk tujuan pembelajaran kita hari ini ya. Nah tujuan pembelajaran yang ingin kita capai di sini yang pertama peserta didik mampu menjelaskan pengertian dari heuristik, kritik, interpretasi, dan historiografi.* **Translation:** Teacher: Okay, now let's look at our learning objectives for today. So, the learning objectives we want to achieve here are, first, students are able to explain the meaning of heuristics, criticism, interpretation, and historiography.	Explicit goal-setting to direct students' cognitive focus
2	*Guru: Tujuan pembelajaran yang keempat itu peserta didik mampu menggunakan pengetahuan tentang langkah-langkah penelitian sejarah dalam kehidupan sehari-hari.* **Translation:** Teacher: The fourth learning objective is that students are able to use their knowledge about the steps of historical research in everyday life.	Orientation toward learning outcomes and the application of knowledge
3	*Guru: Untuk tujuan pembelajarannya setelah kalian mempelajari materi hari ini kalian diharapkan mampu menentukan ide pokok teks laporan hasil observasi dan menentukan struktur teks laporan hasil observasi.* **Translation:** Teacher: For the learning objectives, after you study today's material, you are expected to be able to identify the main idea of an observation report text and determine the structure of an observation report text.	Clarifying the direction of learning from the beginning of the activity

The data in Table 2 indicate a bias towards goal-oriented scaffolding, demonstrating that cognitive guidance appears to be the dominant mode used by the teacher to teach Indonesian as a second language via digital video. This dominance contrasts with later indicators (e.g., collaboration and internalization),

which emphasize interaction and autonomy rather than initial cognitive orientation. An examination of the intentionality indicator table indicated scaffolding that began with clearly articulated learning goals articulated by the teacher. Focusing on these goals can serve to make it clear to the students where the lesson plan and outcomes will lead. When the teacher says, "The learning objective we want to achieve here first is that students can explain the meaning of heuristics, criticism, interpretation, and historiography", it indicates that she is consciously putting learning activities into a clear goal-setting framework. The purpose becomes the basis of scaffolding: it allows students to concentrate on what they want to learn.

However, the teacher also stresses that objectives should be of use to learners, as was evident from her line: "Students are able to use their knowledge about the steps of historical research in everyday life". This statement demonstrates that intentionality is not only for people who know anything but also serves not only to get concepts into their head but also for students to use what they have learned in broader contexts. Analytically, Table 2 demonstrates that intentionality mainly functions as an attentional and orientation mechanism, because the teacher consistently foregrounds learning goals before learners engage in interaction or independent production. Thus, intentionality differs from appropriateness by not modifying input complexity but by prioritizing attentional focus and learning direction. The intentionality indicator therefore shows that the teacher's scaffolding is purposefully designed to build students' cognitive readiness so that they can take the next steps in their learning.

3.2. Research Findings Based on the Appropriateness Indicator

The appropriateness indicator is the degree to which a teacher can adjust the language used according to the level of proficiency of the students. The instructor simplifies explanations, offers specific examples, and frequently checks for understanding. Consequently, these techniques keep the input accessible while facilitating learning. In psycholinguistic terms, these modifications are directly correlated with input processing and cognitive load management (Sweller, 2023). The teacher alleviates the demand placed on learners' working memory through simplified language and meaning contextualization (Baddeley, 2003), thus enabling them to process input more effectively. Unlike intentionality, which prepares learners cognitively before input is processed, appropriateness functions during processing by continuously adjusting input complexity to match learners' cognitive capacity. This distinction highlights appropriateness as a dynamic and adaptive mechanism rather than a static instructional strategy. More specifically, simplification works by reducing the amount of linguistic information processed simultaneously, contextualization links unfamiliar input with learners' prior knowledge, and comprehension checks enable teachers to monitor processing difficulties and adjust support in real time. Through these mechanisms, appropriateness facilitates input processing, reduces cognitive overload, and supports the transformation of comprehensible input into intake.

Table 3. Forms of Scaffolding for the Appropriateness Indicator

No.	Data	Form of Scaffolding
1	*Guru: Peristiwa yang terjadi di masa lalu itu bisa diteliti kembali ya kan, karena ada beberapa langkah yang harus dilalui seperti heuristik, kritik, interpretasi, dan historiografi.* **Translation:** Teacher: Events that happened in the past can be studied again, right? Because there are several steps that need to be followed, such as heuristics, criticism, interpretation, and historiography.	Simplifying abstract concepts through step-by-step explanation
2	*Siswa: Objektif.* *Guru: Objektif di sini berarti secara real, nyata, sesuai dengan pengamatan yang ada di lapangan.* **Translation:** Student: Objective. Teacher: Objective here means real, factual, in accordance with observations in the field.	Clarifying terms according to the student's level of understanding
3	*Guru: Manggis merupakan satu di antara tanaman buah asli Indonesia, jadi ini merupakan kalimat utama, sudah paham atau mau saya jelaskan lagi?* *Siswa: Paham.* **Translation:** Teacher: Mangosteen is one of Indonesia's native fruit plants, so this is the main sentence. Do you understand, or should I explain it again? Student: Understood.	Adjusting support through checking for understanding

As shown in Table 3, the teacher adjusts the complexity of language according to the students' competence. Thus, scaffolding is educational, but flexible also, given the cognitive capacity of the students. In contrast to structure, which organizes sequencing, appropriateness dynamically adapts input in real time based on learner responses. The second is the appropriateness indicator. It was observed that teacher scaffolding in (2) language adjustment, (3) example, (4) level of material complexity per students'

competence. The teacher does not place concepts in an abstract context in front of students but tells them over time and through some context as far back as possible. This can be identified when the statement is made, “Events that happened in the past can be studied again, right? Because there are several steps that need to be followed,” and is intended to simplify historical-research methodology for students to better understand. This is a reflective lesson that emphasizes the historical relevance of student participation in the learning process.

Scaffolding will also respond when teacher explains some things with respect to a student’s answer as described in the dialogue, “Objective here means real, factual, based on observations in the field.” This statement evidences that the teacher responds to the student’s need for understanding by breaking a term that could come from the abstract word. Also: checking for understanding with the question, “Do you understand, or should I explain it again?” shows that scaffolding is adaptable and dynamic. Analytically, Table 3 shows that appropriateness functions through contingent adaptation, where scaffolding changes according to learners’ immediate responses and comprehension difficulties rather than following predetermined instructional sequences. This responsiveness distinguishes appropriateness from intentionality, which is pre-structured rather than contingent. Consequently, the appropriateness indicator corroborates how pedagogical support is adapted to suit students’ cognitive status and enables them to learn efficiently.

3.3. Research Findings Based on the Structure Indicator

The results indicate that scaffolding is systematically structured to develop in sequential stages of instruction, such as activating prior knowledge (van de Pol et al., 2010), building new concepts, and validating comprehension. This graduated scaffolding reflects that scaffolding does not happen by chance but is intentional pedagogy designed. Compared with appropriateness, which is adaptive, structure is procedural and sequential, organizing how input unfolds over time.

Psycholinguistically, there is psycholinguistic support for this structure in incorporating information into already existing cognitive schemas (Baddeley, 2003;Ellis, 2015). Activating prior knowledge helps learners to remember representations stored before instruction that can be accessed and used to process new input. This process can support schema and memory linking, in which learners connect new language information to knowledge.

Furthermore, the graduated sequencing of instruction provides learners with an opportunity to work with input in small amounts, thus helping to lessen cognitive load and ensure a deeper understanding (Sweller, 2023). In the last layer of reinforcement, it strengthens retention by strengthening memory through consolidation. Structured scaffolding can thus play a role in facilitating input sequencing and memory consolidation in language learning.

Table 4. The Structure of Scaffolding in Learning

No	Data	Form of Scaffolding
1	*Guru: Sebelum masuk materi baru, kita ingat dulu pelajaran kemarin.* *Siswa: Tentang cara berpikir sejarah.* **Translation:** Teacher: Before we move on to new material, let’s first recall yesterday’s lesson. Student: About historical thinking skills.	Activating prior knowledge as a foundation for new material
2	*Guru: Sekarang kita lanjut lagi, Denis bisa menjelaskan apa itu penelitian sejarah?* **Translation:** Teacher: Now let’s continue. Denis, can you explain what historical research is?	Systematic transition between learning stages
3	*Guru: Oke, di sini ibu mau simpulkan materi yang sudah kita bahas hari ini yaitu tentang penelitian sejarah.* **Translation:** Teacher: Okay, here I would like to summarize the material we have discussed today about historical research.	Reconstructing concepts through final reinforcement

Scaffolding is presented consistently in relation to the pedagogical sequences shown in Table 4, enabling students to construct their language understanding step-by-step. The use of a structure indicator table shows that the teacher is scaffolding in a step-by-step, systematic, and staged way. This staged progression contrasts with collaboration, where learning unfolds through interaction rather than predefined sequencing. As the teacher starts with activating students’ prior knowledge, “before we move on to new material, let’s first recall yesterday’s lesson.” This activation functions as a conceptual bridge linking content to what has already been covered.

The next period takes place when concepts are also elaborated with questions and explanations as in, “Denis, can you explain what historical research is?” This further motivates students to expound the material. At the close of a lesson, the teacher reinforces the points in the form of a summary, such as, “I would like to summarize the material we have discussed today.” Analytically, Table 4 demonstrates that structure operates through sequential reinforcement, in which learning progresses from activation of prior knowledge to elaboration and finally consolidation, thereby organizing cognitive processing into

manageable stages. This sequence illustrates scaffolding as a supplement to be used in a scaffolding approach, which provides temporary support according to the way the scaffolding is delivered to students in order to create a progression in their understanding.

3.4. Findings: The findings are derived from the collaboration indicator

Dialogue between students as active participants in the learning process in the collaboration indicator was developed. The teacher promotes a two-way interactional environment in which students talk back, ask questions, and elaborate on their understanding. Such a pattern of interplay facilitates psycholinguistic activities associated with deep processing and the negotiation of meaning (Long, 2014). In contrast to structure, collaboration shifts the focus from instructional sequencing to interactional co-construction of meaning. When students must respond and verbalize their understanding, they perform cognitive work. They are not simply receiving input passively. This work facilitates more extensive processing, which is a prerequisite for the retention process.

Furthermore, collaboration creates a space for meaning to be negotiated with other students and misunderstandings to be clarified, so that comprehension may be improved by conversations. This process encourages learners to reprocess input and reorganize their linguistic knowledge (Ellis, 2015; Mackey & Gass, 2015). Thus, collaboration emerges not only as an interactional strategy but also as a vehicle for active cognitive engagement and deeper language processing.

Table 5. The Structure of Scaffolding in Learning

No	Data	Form of Scaffolding
1.	*Guru: Denis, bisa menjelaskan apa itu penelitian sejarah?* *Siswa: Menurut saya penelitian sejarah adalah penelitian yang dilakukan untuk mempelajari kejadian yang terjadi di masa lalu.* **Translation:** Teacher: Denis, can you explain what historical research is? Student: In my opinion, historical research is research conducted to study events that happened in the past.	Involving students as cognitive dialogue partners
2	*Siswa: Apakah langkah-langkah penelitian sejarah harus dilakukan secara berurutan?* *Guru: Langkah-langkah dalam penelitian sejarah itu harus dilakukan secara berurut.* **Translation:** Student: Do the steps of historical research have to be carried out in order? Teacher: The steps in historical research must indeed be carried out sequentially.	Direct response to a student's question
3	*Siswa kelompok 4: Mengapa proses interpretasi harus bersifat selektif?* **Translation:** Student (Group 4): Why must the interpretation process be selective?	Encouraging discussion and conceptual elaboration

As discussed in Table 5, the collaboration indicator shows how the teacher scaffolds in a dialogic way, placing learners as active partners in the learning process. The teacher engages the students in dialogue, responding frequently with open-ended questions, asking, for example, "Denis, can you explain what historical research is?" How the student speaks back here shows that the overall educational context is collaborative and not one-way. Another example of collaboration can be found when students ask critical questions, like, "Do the steps of historical research have to be carried out in order?" which the teacher responded to with clarification. These interactions demonstrate that collaborative scaffolding promotes mutual negotiation of meaning between teachers and students. Even a student group question of "Why must the interpretation process be selective?" suggests that by scaffolding, students have been taught to think analytically. Analytically, Table 5 indicates that collaboration shifts scaffolding from teacher-controlled delivery to dialogic negotiation, where learners actively participate in constructing and refining meaning through interaction. This contrasts with internalization, where interaction decreases and independent production becomes central. Therefore, the collaboration indicator demonstrates that learning involves cognitive cooperation, making higher-level conceptual understanding possible.

3.5. Results from the research using the internalization indicator

This is internalization, which refers to what happens when scaffolding support is removed; learners build up and express their knowledge on their own. When the teacher's guidance on defining concepts, answering questions, and reflecting on what they have learned is minimized, this is the data. Unlike all previous indicators, internalization marks a shift from supported interaction to autonomous cognitive performance. Psycholinguistically, this is the state in which information is converted from input into intake or when learners can internalize and use language knowledge autonomously from their prior self-studies (Schmidt, 2001). Independently producing definitions and responses is evidence that learners have completed the input and used the new information in their cognitive system.

Internalization also reflects the consolidation of linguistic knowledge into memory; that is, the extent to which scaffolding has translated from external support into internal competence (Lantolf et al., 2021). Hence, this indicator shows that scaffolding acts as an end tool of scaffolding to the last stages of language learning; in other words, the knowledge becomes cognitively internalized and is available for use by the learner.

Table 6. The Structure of Scaffolding in Learning

No	Data	Form of Scaffolding
1	*Siswa: Teks laporan hasil observasi adalah teks yang berisi hasil pengamatan yang bersifat faktual, informatif, komunikatif, dan objektif.* **Translation:** Student: An observation report text is a text that contains the results of observations that are factual, informative, communicative, and objective.	Demonstration of students' independent understanding
2	*Guru: Bagaimana perasaan kalian setelah belajar sejarah?* *Siswa: Senang.* **Translation:** Teacher: How do you feel after learning history? Student: Happy.	Learning reflection to strengthen internalization
3	*Guru: Apa hasil kegiatan pembelajaran kita hari ini?* *Siswa: Presentasi.* **Translation:** Teacher: What was the outcome of our learning activities today? Student: Presentation.	Evaluation of learning outcomes without direct assistance

The results in Table 6 show that the internalization indicator analysis indicates that the teacher's scaffolding has reached the stage of support withdrawal; that is, the students are able to build and share their understanding independently. Here is an example of this provided by the student: "An observation report text is a text that contains the results of observations that are factual, informative, communicative, and objective." The utterance denotes the internalization of the concept independently after direct teacher guidance.

Internalization is reflected in the students' responses to the teacher's reflective questions, such as the "happy" response when asked how they felt after having learned and the "presentation" response when asked about the learning activity's outcomes. These were responses indicating that the students not only understood but also reflected on the learning and the learning process and outcomes independently. Analytically, Table 6 highlights the culmination of scaffolding, where learners demonstrate autonomous language production and reflection with minimal teacher intervention, indicating a transition from externally guided performance to internal cognitive control. Compared with earlier indicators, this stage represents the culmination of scaffolding, where cognitive support is no longer externally provided but internally sustained. The internalization indicator indicates that the teacher's scaffolding is sufficiently scaffolding the students to experience learner independence and stable levels of understanding.

3.6. Discussion

This study explored how scaffolding is embodied in teacher discourse from a psycholinguistic perspective. It is situated within the context of second language learning in Indonesia through digital video. It also considers the associated psycholinguistic experiences of learners. The results illustrate that scaffolding functions not only as a teaching strategy in pedagogy but also as a cognitive–interactional mediator system in which attention is regulated, input processing is optimized, and input is transformed into intake. Within the scope of the analysed data, these functions are evidenced through recurring patterns in teacher discourse rather than representing a generalized model across all instructional contexts. Each of the scaffolding indicators corresponds to a related psycholinguistic mechanism, as observed in the specific interactional instances examined in this study, generating an overarching model for language learning in digitally mediated environments.

3.6.1. Intentionality as Attentional Regulation and Noticing

Implicit goals and highlighting important ideas reveal that intentional scaffolding occurs through goal setting. These behaviours guide learners' attention towards linguistically related input. From a psycholinguistic standpoint, this aligns with the noticing hypothesis. This hypothesis states that attentiveness is necessary for transforming input into intake (Schmidt, 2001). Instructional scaffolding increases learners' attentional engagement and the selective processing of input, as recent research has shown (Sarmiento-Campos et al., 2022). In the present data, this is reflected in instances where teachers explicitly state learning objectives at the beginning of instruction, which appear to orient learners' attention toward relevant content. The teacher uses explicit framing of instructional goals. This reduces ambiguity. It also guides learners' attentional focus. As a result, cognitive resources are allocated more efficiently (Sweller, 2023). However, this interpretation is limited to observed discourse patterns and does not directly measure learners' attentional states. This supports the idea that attention is externally regulatable via

pedagogical discourse (Mercer & Dawes, 2014). Thus, intentionality can be interpreted as a potential cognitive control mechanism within the analysed interactions, rather than a universally determining factor.

3.6.2. Appropriateness as Input Processing and Cognitive Load Management

The results indicate that teachers manipulate linguistic input. They do this by simplifying, clarifying, and contextualizing it. This finding aligns with psycholinguistic models of input processing. These models argue that understanding depends on managing cognitive load in working memory (Ellis, 2014). There is empirical evidence for increasing processing efficiency with scaffolding by modifying input complexity for learners' cognitive abilities (Doo et al., 2020). In the analysed excerpts, such adjustments are observable in teacher explanations that simplify abstract concepts and check for understanding, suggesting alignment between input complexity and learners' assumed proficiency levels. When input is simplified and structured, learners experience reduced cognitive overload. This enables more efficient encoding of language (Sweller, 2023). Nevertheless, the study infers processing efficiency from discourse features rather than directly measuring cognitive load, and therefore interpretations should be understood as indicative rather than conclusive. Furthermore, adaptive scaffolding reflects the ongoing alignment of input with learner readiness in real-time comprehension. Within the dataset, this alignment is suggested by teacher responses to student feedback and clarification requests. Therefore, appropriateness operates as a processing optimization tool that ensures that the input remains both accessible and cognitively meaningful (van de Pol et al., 2010), as evidenced within the limited instructional contexts examined.

3.6.3. Structure as Schema Activation and Memory Consolidation

A structured sequence of instruction includes several stages. These stages involve activating prior knowledge, introducing new concepts, and consolidating understanding. This structure supports schema activation. Schema activation is essential for integrating new knowledge with existing cognitive representations (Bransford, 2000). Studies in language learning have shown that structured scaffolding promotes understanding by connecting new information to prior cognitive schemas (van de Pol et al., 2010). In the present findings, this structure is observable in recurring instructional sequences, such as recalling prior lessons before introducing new material. These patterns suggest a potential role in facilitating schema activation, although the study does not directly measure memory processes. In this way, processing is less demanding, and learning can be incremental and in smaller amounts. In addition, reinforcement tasks support memory consolidation. They enhance retention and facilitate retrieval of linguistic knowledge (Roediger & Karpicke, 2006). Within the analysed data, summarizing activities at the end of lessons may function as reinforcement, although their effect on long-term retention cannot be empirically verified in this study. Therefore, scaffolding is structural as a device of organization for cognitive sequencing and schema integration, based on observed instructional patterns rather than direct cognitive evidence.

3.6.4. Collaboration as Deep Processing and Negotiation of Meaning

The results show that student-led communication creates interdependence among learners. This interaction moves beyond passive communication. It emphasizes active participation in meaning construction. Such interactions support deeper processing, which is a requirement for long-term learning (Such, 2021b). Research in second language acquisition indicates that collaborative scaffolding promotes cognitive engagement. It also facilitates the negotiation of meaning (Lantolf et al., 2021; Long, 2014). In the present study, this is reflected in interactional exchanges where students respond to prompts and ask questions, indicating engagement with the learning material. When learners respond, elaborate, and negotiate meaning, they engage in higher-order cognitive processing. This process strengthens linguistic representation (Ellis, 2015).

However, the depth of cognitive processing is inferred from interactional behaviour rather than directly observed, and thus should be interpreted cautiously. This stage represents the initial phase of integration, in which linguistic input is processed and transformed into intake, as suggested by patterns of learner participation within the dataset.

3.6.5. Internalization as the Transformation of Input into Intake

The internalization indicator reflects learners' ability to perform tasks independently. This indicates that scaffolding support has been gradually withdrawn (van de Pol et al., 2010). At this stage, input is transformed into intake. Linguistic knowledge becomes internalized within the learner's cognitive system (Schmidt, 2001 Mackey & Gass, 2015). In the analysed data, internalization is indicated by learner responses that demonstrate independent formulation of concepts and answers without immediate teacher support. Sustained scaffolding has recently shown significant contributions to building learner autonomy and language proficiency (Dongying Li, 2022). Nevertheless, the study does not track longitudinal development, and therefore internalization is inferred from momentary instances of independent performance rather than sustained competence. This shows that internalization is a cumulative cognitive process facilitated by scaffolding. From a psycholinguistic perspective, these observations suggest, rather than confirm, the consolidation of linguistic knowledge into memory (Baddeley, 2003).

3.6.6. Integration: Scaffolding as a Cognitive–Interactional Process

The overall results demonstrate that scaffolding functions as an integrated cognitive–interactional system that mediates language learning over multiple processing stages (Lantolf et al., 2021).

- Intentionality → regulation of attention
- Appropriateness → input processing
- Structure → schema activation & the process of memory
- Collaboration → deep processing & meaning negotiation
- Internalization → intake formation

More specifically, the linkage between each scaffolding indicator and its corresponding cognitive process can be explained through observable discourse mechanisms: intentionality operates through explicit goal-setting and thematic highlighting, which narrow learners' attentional focus toward relevant linguistic features; appropriateness functions through simplification, rephrasing, and comprehension checks that reduce cognitive load and facilitate more efficient input processing; structure works through sequential organization (e.g., activating prior knowledge, introducing new content, summarizing), enabling learners to connect incoming input with existing schemas and support memory consolidation; collaboration is realized through dialogic exchanges such as questioning and feedback, which require learners to actively elaborate, negotiate meaning, and thereby engage in deeper levels of cognitive processing; and internalization emerges when scaffolding support is gradually withdrawn, allowing learners to independently produce language, indicating that processed input has been transformed into intake and stabilized in memory. These mechanisms are inferred from recurring discourse patterns identified in the analysed data and provide an explanatory bridge between interactional practices and psycholinguistic processes.

This model reflects patterns observed within the analysed dataset and should be interpreted as an analytical framework derived from specific instructional instances rather than a universally generalizable system. This holistic model counters the fragmented nature found in the literature, which separates interactional and cognitive perspectives (Ellis, 2014). Rather than claiming full integration across all contexts, the findings suggest that such integration is observable within the analysed instructional practices. By showing that scaffolding works in parallel at both levels, this study opens up a richer and more thorough understanding of how second languages are acquired across digital spaces (Ellis, 2015).

Moreover, the results suggest that teacher discourse itself is the major locus of cognitive mediation and serves as a mediating tool in relation to students' attention, understanding, and internalization. This claim is grounded in the observed interactional data, particularly the recurring role of teacher talk in shaping learning sequences. This highlights the significance of micro-level discourse analysis for a deeper understanding of how learning occurs (Paul, 2010). Rather than viewing scaffolding as a pedagogical method, the findings of this study support an interpretation of scaffolding as a context-dependent cognitive–interactional mechanism, emerging through the interplay of discourse and learner processing in digital environments.

4. Conclusion

Thus, it is clear that the success of scaffolding has to do not just with digital video but is highly important for teachers engaging students, managing their flow of thought, and guiding them to become less reliant on virtual media and to achieve independence in their learning. As a result, scaffolding in virtual instruction can be made successful when teachers are able to effectively apply instructional language that directs students' cognitive processes (Ellis, 2015). However, these conclusions are drawn from a limited dataset consisting of two instructional videos and therefore should be interpreted as context-specific rather than broadly generalizable across all digital learning environments. In particular, the findings are situated within the context of Indonesian as a second language (L2) learners at approximately the B2 proficiency level, where learners are already capable of engaging with extended discourse and abstract concepts. Consequently, the observed effectiveness of scaffolding may differ in contexts involving lower proficiency learners or different instructional modalities. Thus, by facilitating such students' reasoning processes using visual aids and stimuli, students may achieve proficiency in the Indonesian language despite language barriers.

The work also indicates that scaffolding (intentionality, appropriateness, structure, collaboration, and internalization) is not an isolated component of a holistic process. Scaffolding is not delivered in isolation but is undertaken iteratively through a set of components, beginning by establishing goals, modifying language input, shaping the framework of learning, promoting teamwork, and leading to the gradual withdrawal of facilitation to enable students to internalize ideas more fully. These results support the view that scaffolding is a process that is dynamic and focused on aiding students' self-regulation of second language learning and includes the control of the classroom dialogue that the teacher leads to facilitate the learning process (Lantolf et al., 2021). Nevertheless, this iterative pattern is inferred from observable discourse sequences within video-based instruction and does not account for longer-term developmental trajectories of learners' cognitive or linguistic growth. Therefore, the scope of this study is limited to moment-to-moment interactional and cognitive processes as reflected in instructional discourse, rather than sustained learning outcomes over time.

In this sense, this research extends the literature by bringing scaffolding analysis into digital video–based education. In contrast to prior work that tended to emphasize the use of media with attention to learning outcomes (Godwin-Jones, 2025), this experiment finds that teachers' pedagogical talk is effective in both capturing students' attention, facilitating meaning-making, and supporting language internalization(Schmidt, 2001; Ellis, 2015). Importantly, this claim is grounded in qualitative

interpretations of discourse patterns rather than direct measurement of cognitive processes, and thus should be understood as an explanatory interpretation rather than definitive empirical proof of cognitive change. This means that scaffolding is not only performed as an instructional mode of teaching but also has a significant role in shaping the cognitive mechanisms involved in second language learning (L2 acquisition). In this manner, the research contributes to theoretical knowledge about scaffolding as a mechanism for fostering a flexible and intelligent learning environment with respect to the cognitive competency of the students.

For future research, a study on contextual construct may be a good approach, especially comparing scaffolding practices in synchronous online learning and asynchronous video-based learning. Such studies would aid in identifying differences in the attributes of teachers' pedagogical talk across different learning frameworks. Furthermore, it is necessary to employ multimodal analysis considering such factors as intonation, gestures, and visual expressions to further understand how scaffolding is implemented in learning processes. Future studies should also expand the data scope by including a larger number of instructional cases and diverse learner proficiency levels to enhance generalizability and to test whether the identified cognitive–interactional patterns hold across contexts. Future research could also quantitatively relate scaffolding strategies to the learning outcomes of students to understand the direct effect of scaffolding on the linguistic development of students.

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