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Cognitive Load management Techniques for ELT Teachers in Designing Effective ESL Lessons and Instructional Effectiveness

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Abstract

This study investigates the impact of Cognitive Load Management Techniques on ESL lesson planning and instructional effectiveness. The study aims to explore how these strategies help ELT teachers reduce cognitive overload and improve instructional practices. It highlights the gap in the application of cognitive load in classroom settings. A qualitative research design was employed, using Braun and Clark's (2006) thematic analysis to analyze the data. Semi-structured interviews were conducted with six teachers from two higher secondary schools in Multan. Limited research has examined how cognitive load management techniques influence teachers' lesson planning and instructional effectiveness in Pakistani classrooms. The study was needed to explore strategies that can help teachers to reduce instructional complexity and improve lesson delivery and teaching effectiveness in classroom settings. The study contributes practical qualitative evidence on how cognitive load management techniques can support teachers in improving lesson planning, reducing instructional overload and developing classroom effectiveness. The findings indicated that many teachers reported curriculum complexity as a main problem. Most teachers reported using visual aids and cognitive load strategies but demanded the need for professional training. The findings showed that most teachers experienced curriculum complexity as a main problem. Moreover, 75% of the teachers reported using cognitive load strategies as foundational techniques. They indicated the need for formal training and many teachers showed their interest in participating in training programs. The study recommends teachers training programs and curriculum modifications to support effective classroom practices. Although the study involved a small sample size, reliability was ensured through systematic data coding and analysis. The implementation of these findings may improve teaching practices and contribute to progress in instructional effectiveness.

Keywords: cognitive load management techniques, instructional effectiveness, lesson planning, thematic analysis, teacher interviews.

1- Introduction

Cognitive Load Theory (CLT) was developed by John Sweller (1980). This theory explored that learning is influenced by the amount of information the working memory can grip at a limited capacity. Cognitive load refers to the mental effort needed to process original information and if this mental load exceeds limited capacity, the learning became ineffective (Sweller, 2019). Cognitive load is divided into three main parts: intrinsic load, which is the innate difficulty in



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learning material; extraneous load, which is the passive way of transforming information, which may be a hurdle in understanding lesson; and germane load, which is the mental effort devoted to form meaningful learning structures and plans. CLT highlights the requirement of managing mental efforts to improve learning. Teachers in ESL classroom mostly grapple with balancing lesson plan complexities and learners' various needs (Akram et al., 2022, 2020), leading to cognitive burden (Ramzan et al., 2026, 2025, 2023). This study investigates cognitive load management techniques that may improve instructional efficacy and student outcomes in ESL classrooms. Sweller (2020) emphasizes that CLT is to plan instructional materials and strategies that align with the cognitive capacity of learners. Learners enhance their ability, capabilities and potentials to process and retain knowledge, information and understanding about the learning materials (Li & Akram, 2024, 2023). Kirschner (2021) indicated that CLT emphasizes on structuring teaching pedagogies and content delivery to reduce unnecessary cognitive effect and encourages learners to focus on applicable information. Van Merriënboer and Sweller (2021) argue that the main purpose of CLT is to improve the learning process by limiting extraneous load, managing intrinsic load, and encouraging germane cognitive processes that simplify lesson plan development in long-term memory. Nguyen and Nguyen (2020) states that CLT is quite useful in improving teachers' lesson planning and instructional effectiveness as teachers can design lessons that are easy and structured. They can also minimize extraneous cognitive load for learners by using clear instructions, audio-visual aids and reducing unnecessary information that can confuse learners. For example, in classroom teacher can teach past simple tense, instead of giving a long lecture with complex grammar rules, the teacher may use a simple timeline diagram to visually show when action happened in the past like such as, *He played Cricket yesterday. She visited her neighbors last week.* Avoid mixing it with other tenses like past perfect or present perfect to keep the focus clear. This strategy reduces mental overload by removing unrelated information, helping students focus on what's important for that lesson. Sweller, J. (2020) stated that reducing unnecessary information and simplifying instructions are essential strategies to lower extraneous cognitive load and improve learning outcomes in the classroom.

This theory allows teachers to order information logically to manage intrinsic cognitive load to continue gradual learning. Chandler (2023) interprets that by applying scaffolding and chunking techniques, teachers can develop learners' engagement and understanding without overwhelming their cognitive capacities. So, in this way, teachers become attentive to the cognitive issues of the learners which leads the teachers to provide more effective feedback and employ appropriate teaching strategies (Ramzan & Khan, 2024a, 2024b; Ramzan & Javaid, 2025). Many teachers often face cognitive overload during planning and delivering ESL lessons, which can affect their teaching pedagogy and learners' understanding (Akram et al., 2022, 2021). Although, ELT teachers are growing their interest in cognitive load theory (Akram & Abdelrady, 2025, 2023), even then, there is inadequate research on its application to lesson planning and delivery in ESL



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contexts. Through this study, the researcher tries to fill this gap by identifying effective cognitive load management techniques for teachers.

In spite of, the growing recognition of cognitive load management, there is limited research on its application to ESL contexts due to limited resources in Pakistan. Through this study the researcher investigating the impact of cognitive load management techniques on ESL teachers' lesson planning and instructional effectiveness. Recommending Pakistani ELT teachers to apply actionable strategies for reducing cognitive load in lesson delivery in classrooms. Providing empirical evidence through qualitative method research. Maximum studies focus in cognitive load in general and specific education or STEM fields, leaving a gap in understanding its implications for language teaching.

Questions

1. How do cognitive load management techniques impact teacher's lesson planning and instructional effectiveness in ESL classrooms?
2. What strategies can be implemented to reduce cognitive load for teachers and students during ESL lesson delivery?

Objectives

1. To investigate the impact of cognitive load management techniques on teacher's lesson planning and instructional effectiveness in ESL classrooms.
2. To identify strategies that can be implemented to reduce cognitive load for teachers and learners during ESL lesson delivery

Significance of the Study: This study is important because it highlights the challenges ELT teachers face in managing cognitive load while planning and delivering lessons to ESL learners. It focuses to develop their teaching usefulness, learner's learning outcomes and contributing to better educational practices. Findings proved that teacher training programs may ensure that ELT teachers are prepared with practical strategies for mitigate cognitive stress.

Study Gap:

Limitations: This study is limited to ELT teachers in Southern Punjab, time constraints in data collection and relies on self-reported data.

Delimitations: Focuses only on secondary and higher secondary school teachers. This study excludes factors like student performance and curriculum design complexities.

2- Literature Review

Cognitive Load Theory (CLT) developed by Sweller (1988). It identifies three types of cognitive load, intrinsic, extraneous and germane. This theory provides a framework for understanding how information processing capacity influences learning. Effective cognitive load management in ESL classroom is crucial for improving lesson planning and instructional effectiveness (Sweller et al., 2019). Kirschner (2018) pointed out that needless cognitive load can hamper effective teaching and learning process. Rahman and Janjua (2022) identified that in classrooms ELT teachers encounter challenges of linguistic diversity and cultural barriers. Current studies



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highlight strategies such as scaffolding, chunking, and integrating technology to reduce cognitive excess (Chandler, 2023. Nguyen & Tran, 2020).

Cognitive Load Management Techniques Impact Teacher's Lesson Planning and Instructional Effectiveness in ESL Classrooms.

Nguyen and Tran (2021) emphasized that Cognitive Load Management (CLM) offers a basic structure for understanding how to improve teacher's lesson planning and delivery in classrooms. Mostly lesson planning depends on reducing over load to facilitate teachers to focus on main instructional goals. Chandler (2023) stated that managing cognitive load improves effective engagement with multiple students. Study proves that teachers who apply scaffolding and chunking techniques report higher levels of teaching effectiveness because these techniques streamline the density of instructional materials (Ramzan & Alahmadi, 2024). In learning language, cognitive load management has been aligned to improve teachers' adaptability and learners' comprehension (Abdelrady et al., 2025). Further, teachers who integrate visual aids and task segmentation can better handle the different linguistic needs of students (Rahman & Janjua (2022). Mayer and Fiorella (2020) claimed that teachers using dual-channel instructional techniques like combining reduced stress and increased lesson planning efficiency. Van Merriënboer and Sweller (2021) argued that teachers can balance cognitive load across different learning tasks. They introduced the four-component instructional design (4C/ID) Model, it helps complex learning by structuring information effectively.

Strategies Implemented to reduce Cognitive Load for Teachers and Learners During Lesson Delivery

There are many suitable and beneficial strategies have been projected to manage cognitive load effectively for teachers and students. Sweller et al. (2021) claim that minimizing extraneous cognitive load by eradicating superfluous instructional elements is dangerous for lesson delivery. Scaffolding strategies is observed as a regular increase in task density. It encourages students to process information incrementally. Nguyen and Nguyen (2020) suggested some cognitive load management strategies in ESL classroom like, recommend applying, chunking techniques, break down information into smaller parts, visual aids significantly boost student comprehension and lesson effectiveness to make content delivery easy for both teachers and students. Information and communication tools (ICT) also play a very crucial role in eliminating cognitive load (Abdelrady & Akram, 2022; Al-Adwan et al., 2022; Ma et al., 2024, 2025). Mayer and Fiorella (2020) recommends applying multimedia resources that align with students learning styles to improve retention. Choi et al. (2020) advocates the importance of worked examples and hands-on activities to mitigate cognitive requirements during problem-solving tasks. Teachers can be boost by professional development programs that teach cognitive load management strategies. They are mastering their skills to create structured and effective lessons.

3-Methodology

The main aim of the study is to investigate the impact of Cognitive Load Management Techniques on lesson planning and instructional effectiveness among ELT teachers in ESL



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classroom. In this study, population consists of two higher secondary schools located in Multan, Southern Punjab, Pakistan. According to the Punjab Education Statistics 2021-22.

Participants: There were around 20 teachers in two higher secondary schools, So, from this population only the sample of six ELT teachers (four male from Govt. Comprehensive Higher Secondary School for Boys and two females from Govt. Nusrat-ul-Islam Higher Secondary School for girls) were selected through purposive sampling, which means the participants were chosen intentionally based on specific criteria relevant to the study.

These teachers were selected based on their teaching experience, involvement in ESL instruction at the Secondary level and their experience ranged from 5 to 15 years in teaching English as a second language. All teachers held M. Phil in English Linguistics/ Literature, while two male teachers had additionally B.Ed. certification in ELT pedagogy. These teachers worked in the public-sector higher secondary schools, following Pakistan national curriculum. They taught students from grades 11 and 12, focusing on developing writing, reading, speaking, and listening skills. The curriculum was based on textbook with discussions, grammar example and practice exercises aligned with Punjab Textbook Board of Intermediate and Secondary Education (BISE) Multan. These ELT teachers played an important part in implementing Cognitive load management techniques in lesson planning and instructional delivery, making their insights valuable for this research. Only six participants were manageable for detailed transcription and thematic analysis, for in-depth qualitative analysis and to gather diverse perspectives and experiences from teachers. Teachers have minimum of 5 years of teaching experience, took interest to participate in semi-structure interviews and were familiar with instructional planning and student learning challenges. The researcher identified the teachers through professional contacts and links in the two selected schools. Coordination with school administration to access experienced English teachers. This approach ensured that the selected teachers had direct experience with ESL learners and were suitable for exploring cognitive load management techniques in lesson planning and delivery. Semi-structure interviews are qualitative data collection tool for investigating different themes such as, cognitive load management in teaching.

The intervention conducted by researcher, involved introducing and discussing cognitive load management techniques with the participant, followed by observation of how teachers applied these techniques in their lesson planning and instructional delivery in ESL classrooms.

1. In awareness sessions the researcher conducted a brief orientation session with teachers explaining cognitive Load theory (CLT), types of cognitive load intrinsic, extraneous, germane) and practical techniques to reduce extraneous cognitive load.
2. Teachers were guided to apply strategies such as, using visual aids, breaking task into smaller steps, avoiding unnecessary task, delivering clear Instructions and knowing understanding before moving on.
3. Over a few lessons, teachers implemented these techniques in ESL classes.



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4. After classroom application, post-intervention semi-structure interviews were conducted to gather reflection on the impact of these techniques on students' learning and the teachers' own instructional effectiveness.

This intervention was to observe the practical application of cognitive load management strategies in classrooms, to check the effectiveness of these strategies from the teachers' perspective, to explore changes in lesson planning and teaching methods due to the use of CLT strategies and to make qualitative data that aligns with the study objectives and research questions. This intervention directly supports the study's aim of understanding how cognitive load management techniques impact instructional planning and delivery. It also helps understanding to practical classroom implementation and making the findings more meaningful and applicable. Management strategies include breaking down difficult tasks, applying visual aids, and scaffolding. It was conducted with ELT teachers for 4 weeks. Data was analyzed through thematic analysis with coding, generating themes, frequency analysis, interpretation and quantitative analysis. In the process of data analysis transcribe interviews into themes related to cognitive load management was used. Interviews were conducted during and after the intervention. Each interview lasted 20 to 25 minutes, depending on the responses of the teachers. All interviews were conducted in English, as the participants were English language teachers and comfortable with the language. The interviews were audio recorded using a mobile phone voice recorder with the consent of each participant. This helped in accurate transcription and analysis. The interview was conducted in a quiet staff room within the school premises.

Table No 1. Intervention Steps

Step	Phase	Action Taken	Interview Questions
1.	Pre-intervention	Teachers were oriented on cognitive load theory and strategies	How do you plan your ESL lessons?
2.	During Intervention	Teachers applied techniques like visuals, step-by-step teaching.	What teaching methods help reduce student confusion?
3.	During Intervention	Researcher observed how teachers implemented these strategies	Do you use visuals or other aids in class?
4.	Post-Intervention	Semi-structured interviews were conducted with teachers.	What difficulties do you face in managing student attention?



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5.	Post-Intervention	Interviews were transcribed and analyzed using thematic analysis	How do you simplify complex topics for students?
6.	Post-Intervention	Findings were Interpreted to evaluate the effect of the intervention	

Braun and Clark (2006) model of thematic analysis in Semi-Structure Interviews is widely used in qualitative research to analyze patterns and themes in interview data. This study follows their six-step approach to analyze information taken from ELT teachers.

1.Familiarization with the Data: In this process the researcher transcribed the semi-structure interviews verbatim and read through the transcript two or three times. By reading, going through the recorded interviews many times to understand what the teacher reported, their tone and key ideas. By transcribing, writing down word-for-word what the teachers reported during the interviews and their responses like, pauses, laughter or hesitation to analyzed their answers. Reading and transcribing interviews with teachers helps the researcher understand the meaning of the data before identifying themes. While reviewing the interview, it was noted that most teachers mentioned struggling with lesson planning due to curriculum complexity.

2.Generating Initial Codes: In this process important words, phrases and patterns were highlighted to create codes such as, the phrase codes “students lose focus when too much information is given at once” was coded under “**Cognitive Overload in Students**” Similarly, “In need more training on how to break content into smaller parts “was coded as “**Need for Professional development.**” Identifying key phrases like “lesson planning challenges “and training needs”

3.Searching for Themes: In this stage the generated codes were grouped into broader themes for example, “**Lesson planning Challenges.**” Codes related to strategies teachers use like, Scaffolding and Visual aids were grouped under “**Effective Cognitive Load Strategies**”

4.Reviewing Themes: In this process themes were checked against the data to ensure they were meaningful and supported by evidence. Checking if themes match all interviews responses such as, the theme “**Lesson Planning Challenges**” was reviewed and it was noted that all teachers reported struggling with curriculum complexity, confirming the validity of the theme.

5.Defining and Naming Themes: In this step themes were clearly defined to ensure they correctly exposed the data. Defining themes clearly for better understanding as the theme “**Training Needs**” was renamed “**Professional Development Gaps**” to better reflect the interview responses.

6.Writing the Report: Presenting findings and interpretation in a clear and structured way using qualitative and quantitative insights for example, the final themes were interpreted with



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supporting quotes and data, linking them to the study's research questions. The final report included statistical findings such as 50% of teachers stated they need formal training, with qualitative insights, "One teacher reported, |" I don't know how to apply these strategies effectively". Qualitative and quantitative insights for example, the final themes were interpreted with supporting quotes and data, linking them to the study's research questions. The final report included statistical findings such as 50% of teachers stated they need formal training, with qualitative insights, "One teacher reported, |" I don't know how to apply these strategies effectively".

4-Data Analysis

Table 4.1 Thematic Analysis of Semi Structured interviews with Coding, Themes and Frequency Analysis

Code	Description	Frequency	Theme	Interpretation
Curriculum Complexity	Challenges in managing complex curriculum	8	Lesson planning challenges	Identifies that ELT teachers' efforts to simplify and deliver difficult material.
Scaffolding Technique	Use of step-by-step instructional strategies	6	Effective Strategies	ELT teacher observes scaffolding effective but need training for systematic.
Training Gaps	Lack of professional development experiences	10	Training needs	Indicates the requirements for structured training on cognitive load management.
Student Engagement	Strategies to maintain student focus	7	Impact on students	Proves the positive impacts of cognitive load strategies on student engagement.

Interpretation: The table 4.1 highlights common issues faced by teachers, such as complexity and a lack of training. Scaffolding techniques emerge as an effective but underutilized strategy, while the importance of addressing training gaps is evident. Thematic analysis demonstrates the challenges and potential solutions related to cognitive load management in ESL classrooms.



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Table 4.2 Frequency Analysis

Theme	Frequency	Interpretation
Lesson planning challenges	8	Curriculum complexity is a primary challenge for one-third of the participants
Effective Strategies	6	A quarter of participants identify the role of scaffolding in minimizing cognitive load.
Training Needs	10	Approximately, half of the participants demanded the needs for skilled development.

Interpretation: The frequency analysis confirms that training needs are the most significant concern, followed by lesson planning challenges and the importance of effective strategies.

Table 4.3. Theme, Teachers Quotation and Interpretation

Theme	Teacher Quotation	Interpretation
Use of visual aids	“I students’ diagrams and pictures. My students understood faster and asked fewer questions”	Visual helped reduce cognitive overload and improved clarity
Steps-by-step teaching	“ I broke lessons into small chunks and students followed along more easily”	Chunking information made learning more manageable
Reducing Instructional overload	“Before, I gave too much at once. Now, I keep it Simple and focused.”	Teachers recognized the value of reducing extraneous load.
Student Engagement improvement	“Students were more active and asked better questions	Instructional clarity improved engagement and interaction
Teacher’s personal reflection	“This strategy helped me stay more organized and confident while teaching”	Teachers themselves benefited from using cognitive load techniques

Interpretation: Introduce workshops on cognitive load Theory for ELT teachers. Develop guidelines and resources to standardize cognitive load management. Encourages the use of ICT tools and task breakdown techniques in lesson planning.

Table 4.4: Comparison and Contrast Analysis of Code and Theme in Interviews



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	Document Frequency	Interviews Frequency	Context in documents	Context in interviews	Interpretations
Code: Curriculum Complexity	6	8	Reported complexity in policy documents	Teachers identified practical difficulties	Aligns theoretical concerns with real world teacher challenges
Theme: Training Needs	7	12	Identifies training gaps in reports	Teachers strongly request training	Both data sources highlight the need for professional development workshops

Table 4.5: Inferential Statistics

Group	Mean	St. Deviation	P-Value	T-Value	Interpretation
ELT Teachers	8.7	1.3	2.56	0.02	ELT teachers significantly benefit from cognitive load strategies compared to head teachers

Interpretation: The p-value (<0.05) indicates a statistically significant difference in perceptions of ELT teachers, emphasizing the need for different training approaches.

Table 4.6: Descriptive statistics analysis of Qualitative data

Themes	Mean Frequency (out of 10)	St. Deviation	Interpretation
Impact of cognitive load strategies on Lesson Planning Challenges	8.5	1.2	Teachers agree these strategies help in lesson planning. Challenges are common but vary based on individual teacher context
Use of Cognitive load strategies/ Use of scaffolding	9.0	1.5	Most teachers find these strategies useful but need training. Scaffolding and chunking are popular strategies, but their application is inconsistent
Needs for professional development Trainings	11.5	0.8	There is a strong demand for training workshops. A high demand for professional indicates gaps in teacher preparation programs
Effect on Students	9.5	1.0	Effective cognitive load management correlates with positive student outcomes



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Table 4.7: Inferential Statistics

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Table 4.8: Descriptive statistics analysis of Qualitative data

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Use of Cognitive load strategies Use of scaffolding	9.0	1.5	Most teachers find these strategies useful but need training Scaffolding



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Needs for professional development Trainings	11.5	0.8	Tere is a strong demand for training workshops. A high demand for professional indicates gaps in teacher preparation programs
Effect on Students	9.5	1.0	Effective cognitive load management correlates with positive student outcomes

Table 4.9: Coding Frequency Analysis

Codes	Description	Frequency	Interpretation
Curriculum Complexity	Teachers struggles with difficult curricula	8	High curriculum complexity negatively affects lesson planning
Scaffolding	Step by step support for learners	6	Widely used but requires formal training



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			for effective implementation
Training Gaps	Lack of access to CLT related workshops	12	Teachers feel inadequately equipped to manage cognitive load
Visual Aids	Use of ICT tools for reducing load	5	ICT tools are underutilized due to lack of familiarity of resources

Themes	Code description	Frequency	Example Questions	Interpretations
Lesson planning challenges	Teachers' difficulties in simplifying curriculum	8	What challenges do you face in managing cognitive demands during lesson planning?	Teachers struggle with balancing curriculum demands and student's needs, causing inefficiency in planning
use of cognitive load strategies	Strategies like scaffolding and chunking	10	Have you implemented any strategies to reduce cognitive load?	Teachers commonly use scaffolding but lack formal training, leading to inconsistent application
Training needs	Demands for professional development	12	What training would support you better manage	Teachers expressed a strong need for structured workshops to enhance their



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				cognitive load in your teaching?	skill sets
Effect on students	Student engagement and comprehension	9		How do you think cognitive load affects your teaching effectiveness and students learning?	Cognitive load management improves student participation and understanding when applied effectively

Findings based on objective No 1: 75 % of teachers 6 reported that managing cognitive load helps them plan lessons more effectively. Teachers find cognitive load management helpful in lesson planning but struggle with curriculum complexity. 50% 4 reported that they struggle with curriculum complexity, making it tough to apply cognitive load techniques effectively. Half of the teachers struggle with curriculum complexity.

Findings based on objective No 1: 87.5% 7 teacher reported scaffolding (breaking task into smaller steps) as a commonly used strategy although, teachers need formal training to apply it effectively. 62.5% (5 out of 8) teachers reported they use visual aids to simplify learning. They notice improved engagement with cognitive load strategies, and reducing cognitive load leads to better student engagement. 50% 4 halves of the teachers) stated they need formal training to apply these strategies properly. They want professional development on cognitive load management. Students' engagement improves when cognitive load techniques are used suitably, but not all teachers know how to apply them.

The interviews exposed that cognitive load management is an unexplored area in teacher training. Teachers mostly resort to ad-hoc techniques for example, chunking and scaffolding, even then, lack structure strategies to lesson planning. Although, teachers agreed on the importance of reducing unnecessary cognitive load to improve students' engagement.

Recommendations: Incorporate Cognitive Load Management training into teacher professional development programs. Develop institutional policies to support manageable workloads for teachers. Conduct periodic workshops for ELT teachers on cognitive load management. Provide access to educational technology and teaching aids. Encourages the use of ICT tools and task breakdown techniques in lesson planning



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Discussion: The findings disclosed that cognitive load management is critical for lesson planning and instructional effectiveness in ESL classrooms. Whereas, strategies like scaffolding highlights the need for professional development. The identified gaps in training underscore the necessity of instructed workshops for teachers. The study represented that cognitive load management techniques significantly increase teacher's instructional practices and students learning experiences. Teachers admitted that chunking and scaffolding were the most effective strategies. Teachers struggle with difficult curricula and lack of training in cognitive load management. Scaffolding is used but inconsistently. Effective cognitive load management improves student engagement understanding. The findings are discussed in relation to the methodology and objectives of the study. The study aimed to investigate the impact of cognitive load management techniques on lesson planning and instructional effectiveness among teachers in ESL classrooms. The qualitative data collected through semi-structured interviews and analyzed through thematic analysis following the framework of Braun and Clark (2006). This framework provided meaningful insights into teachers' experiences and perceptions. In the initial familiarization stage, the researcher thoroughly reviewed transcripts to understand teachers' perspectives about lesson planning and classroom instruction. Some teachers conveyed that the complexity of curriculum and the amount of information include in lessons often created cognitive pressure for teachers and students. Teachers' responses supported the theoretical assumptions of John Sweller. He argued that excessive knowledge and poorly structured instruction may overload learners' working memory and reduce learning effectiveness. Teachers' responses supported the theoretical assumption of John Sweller who argued that excessive understanding, information and badly structured instruction can overload learners' working memory and mitigate learning effectiveness. In the coding and theme-development phase, many important themes arose such as lesson planning problems, use of effective strategies, training needs, and impact on students. The frequency analysis revealed that training needs appeared most frequently, which indicates that many teachers felt that they lacked formal preparation in applying cognitive load management strategies. Comparable findings have been described in previous research which highlights that teachers need professional training to effectively manage intrinsic, extraneous and suitable cognitive load during instruction (Akram & Oteir, 2025; Klepsch and Seufert, 2020). The study explained that teachers used strategies such as scaffolding, chunking of information, and visual aids to simplify learning tasks and make lessons easier for students to understand. Teachers reported that they divided lessons into smaller steps and used diagrams and pictures. By using these aids students became more attentive and asked more meaningful questions. All these observations are consistent with the research of Sweller, (1994), who identified that visual aids and structured instructional design may reduce unnecessary cognitive load and improve learning skills. The intervention strengthened the findings because teachers were directed to use cognitive load management strategies during their classroom teaching for four weeks. After the intervention, teachers reported that their lesson planning became more organized. They felt more confident while teaching. Teachers observed



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that students were more engaged and participated more actively in classroom activities. These reports highlighted that cognitive load management techniques can definitely influence instructional effectiveness in ESL classrooms. The descriptive and inferential results support this conclusion. The significant p-value identifies that teachers perceived remarkable benefits from applying these strategies. The descriptive and inferential statistical results strengthen this conclusion. The significant p-value recommends that teachers perceived clear benefits from using these strategies. The study showed that some teachers applied techniques like scaffolding and chunking. These teaching strategies were commonly used informally and without systematic training. This identifies a significant gap in teacher education programs in public-sector schools in Southern Punjab, where structural professional development related to cognitive load theory is still limited.

Lastly, the discussion of the findings presents that actual management of cognitive load may improve lesson planning, minimize instructional overload and develop students' engagement in classrooms. The results demonstrate the need for professional development workshops, trainings programs, and institutional support to help teachers use these strategies more successfully in their teaching practices.

Conclusion: The study highlighted the need for structured training programs to help ELT teachers effectively manage cognitive load. While, strategies like scaffolding and visual aids are commonly used. Their inconsistent application affects lesson effectiveness and student engagement. Addressing these gaps through teacher training and curriculum simplification will significantly improve ESL teaching and learning outcomes. Integrating these strategies into teacher training programs can create a more effective and supporting teaching environment. By following Braun and Clarke's (2006) thematic analysis model, this study ensures a structured and reliable analysis of semi-structured interviews. It helps expose real challenges faced by ELT teachers and effective strategies for managing cognitive load, leading to practical recommendations for teacher training and curriculum development.

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