



**COMPUTERIZED DYNAMIC ASSESSMENT OF EFL LEARNERS'
GRAMMAR IN USE**

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M.S THESIS

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**BİLGİSAYAR DESTEKLİ DİNAMİK DEĞERLENDİRME İLE
İNGİLİZCEYİ YABANCI DİL OLARAK ÖĞRENENLERİN DİL
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ÖZ

Bu çalışma, İngilizceyi yabancı dil olarak öğrenen bireylerin kullanım temelli dilbilgisi becerilerini geliştirmede Bilgisayarlı Dinamik Değerlendirmenin (C-DA) etkinliğini incelemektedir. Çalışma, yazılı üretim sürecinde dilbilgisel yapıların nasıl uygulandığına özel bir odakla gerçekleştirilmiştir. Sosyokültürel kuram ve Dinamik Değerlendirme (DA) ilkelerine dayanan bu araştırma, teknoloji destekli aracılığın geleneksel test ortamlarının ötesine geçerek dilbilgisi gelişimini nasıl destekleyebileceğine dair literatürdeki boşluğu doldurmayı amaçlamaktadır. Araştırma, Türkiye’deki büyük bir devlet üniversitesinde yürütülmüş ve B1 düzeyinde İngilizce öğrenen on iki öğrenciyle sekiz hafta boyunca gerçekleştirilmiştir. Araştırmada karma yöntem deseni kullanılmış; ön test-son test uygulamaları, bir kompozisyon yazma görevi, haftalık yansıtma günlükleri ve yarı yapılandırılmış görüşmelerden yararlanılmıştır. Nicel bulgular, katılımcıların hem kontrollü hem serbest yazma görevlerinde dilbilgisel doğruluk ve uygunluk açısından ilerleme kaydettiğini ortaya koymuştur. Ortalama ve medyan puanlarda anlamlı artışlar

görülmüş; özellikle şart cümleleri, kipler ve ilgi cümlecikleri gibi yapılarda doğruluk oranları yükselmiştir. Nitel veriler ise öğrencilerin artan üst-dilbilgisel farkındalıklarını, öz denetim becerilerini ve aracılık sürecine dair olumlu algılarını gözler önüne sermiştir. Elde edilen bulgular, C-DA'nın yalnızca bir değerlendirme aracı değil, aynı zamanda öğretimsel bir destek mekanizması olarak da işlev görebileceğini ve bireyselleştirilmiş, bütüncül bir dilbilgisi öğrenme sürecine katkı sağlayabileceğini göstermektedir. Pedagojik açıdan, C-DA yazılı üretim temelli görevlerde dil öğretmenlerine yapılandırılmış fakat esnek bir izleme ve destekleme yaklaşımı sunmaktadır. Yönlendirmenin doğrudan değerlendirme sürecine entegre edilmesiyle, öğretmenler öğrencilerin dil yapılarıyla daha derin bir etkileşim kurmalarını sağlayan gerçek zamanlı geri bildirimler sunabilmektedir. Bu çalışma, İngilizce öğretiminde daha dinamik ve süreç odaklı değerlendirme yaklaşımlarını savunan literatüre katkıda bulunmaktadır.



Anahtar Kelimeler : Bilgisayarlı Dinamik Değerlendirme (C-DA), kullanım temelli dil bilgisi, yazma, İngilizceyi yabancı dil olarak öğrenen öğrenciler, Sosyokültürel Teori

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ABSTRACT

This study investigates the effectiveness of Computerized Dynamic Assessment (C-DA) in enhancing EFL learners’ grammar-in-use, with a particular focus on how grammatical structures are applied in written production. Grounded in sociocultural theory and the principles of Dynamic Assessment (DA), the study responds to a gap in the field by exploring how technology-enhanced mediation can support learners’ grammar development beyond traditional testing environments. The research was carried out at a large public university in Türkiye, involving twelve B1-level EFL learners over the course of eight weeks. A mixed-methods design was adopted, combining pre- and post-tests with an essay writing task, weekly reflection diaries and semi-structured interviews. Quantitative findings revealed improvements in learners’ grammatical accuracy and appropriateness in both controlled and free writing tasks. Mean and median scores increased significantly, and learners demonstrated noticeably higher accuracy in using structures such as conditionals, modals, and relative clauses. Qualitative data supported these results by highlighting learners’ increased metalinguistic awareness, self-monitoring abilities, and positive perceptions of the mediation process. The findings suggest that C-DA can serve not only as an assessment tool but also as an instructional support

mechanism, contributing to a more integrated and individualized grammar learning experience. From a pedagogical standpoint, C-DA offers language instructors a structured but flexible approach to monitor and support learners' grammatical development within writing-based tasks. By integrating mediation directly into assessment activities, instructors are able to provide real-time feedback that fosters deeper engagement with language structures. Overall, the study contributes to the growing body of research advocating for more dynamic, process-oriented approaches to language assessment in EFL contexts.



Key Words : Computerized Dynamic Assessment (C-DA), grammar-in-use, writing, EFL learners, Sociocultural Theory

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CHAPTER I

INTRODUCTION

Assessment is a fundamental tool in education as it facilitates learning, provides feedback, guides instruction, motivates learners, and ensures accountability. In the context of language learning, assessment methods are crucial for evaluating how well learners understand and use a language, identifying learning gaps, and providing targeted feedback. It is vital for understanding mastery and potential in reading, writing, speaking, listening, vocabulary, and grammar.

The traditional static forms of assessment, however, tend to evaluate knowledge at a specific moment and focus more on outcomes than the learning process. While they provide some useful data, they often lack timely and detailed feedback, limiting learners' ability to showcase their developmental potential and hindering guidance for future progress. This type of assessment involves evaluating learners' language proficiency at a single point in time, providing a portrait of their current knowledge and skills. While static assessment fulfils its role in language education, its drawbacks emphasize the importance of exploring alternative assessment approaches.

Dynamic assessment (DA), on the other hand, differs from traditional assessments by actively providing support and guidance during evaluation to observe an individual's

learning and adaptation abilities. In response to the limitations of traditional assessments, DA has emerged as a more flexible, process-oriented approach. This method emphasizes the interaction between the assessor and the learner since the assessor offers assistance, hints, or scaffolding to aid task completion. Unlike static assessments that focus solely on current skills, dynamic assessment prioritizes learning potential, highlighting how much learners can achieve with assistance and offering real-time, responsive feedback that helps to identify both strengths and areas needing improvement (Haywood & Lidz, 2007). DA aims to evaluate learners' knowledge and their capacity for growth, emphasizing a dynamic and continuous learning process.

DA is flexible, adjusting based on individual performance, and is often viewed as more culturally sensitive, acknowledging diverse learning styles (Poehner, 2008). Particularly crucial in second language learning, dynamic assessment identifies specific learning needs, especially for learners with diverse backgrounds or challenges, adapting to individual learning styles and promoting active engagement. Teachers can use this approach to monitor progress over time and tailor instructional strategies accordingly. By providing interactive support, dynamic assessment fosters a positive learning environment that respects and addresses each learner's unique strengths and needs. Overall, it provides a more comprehensive and adaptive way to understand and support the learner.

Dynamic Assessment encompasses two main approaches: interactionist and interventionist. They both aim to understand and support learning potential. The interactionist approach highlights the interactive dialogue between learner and assessor, fostering critical thinking and self-regulation with minimal guidance (Lantolf & Poehner, 2004). This method assesses learners' abilities to tackle the challenges independently, revealing their current skills and potential. Conversely, the interventionist approach focuses on providing explicit support, guiding learners directly to help them bridge knowledge gaps (Poehner, 2008). This method emphasizes structured assistance, aiming to extend learners' capabilities and promote development within their Zone of Proximal Development (ZPD) (Malmir, 2020).

While both approaches are based on Vygotsky's ZPD concept, they vary in intervention levels and feedback types, with interactionist promoting independence, and interventionist emphasizing active assessor support.

The integration of technology in education has revolutionized assessment methods, making learning more accessible and personalized. Computerized Dynamic Assessment (C-DA) exemplifies this transformation, providing real-time, adaptive feedback that enhances the assessment process through its interactivity and flexibility. C-DA refers to the use of digital technology and interactive computer programs to implement DA methodologies. It combines dynamic assessment principles with computer-assisted learning, enabling tailored learning experiences for each student.

C-DA also offers unparalleled scalability and accessibility compared to traditional assessments. Unlike face-to-face assessments requiring a trained evaluator, C-DA allows independent use, facilitating continuous learning outside the classroom realm. This flexibility ensures constant learner support, irrespective of time constraints or instructor availability. Additionally, C-DA enables monitoring of learners' progress over time, providing valuable insights into development and highlighting areas requiring improvement.

Particularly in grammar instruction, C-DA shows great promise. Traditional grammar education and assessment often lacks the personalized feedback necessary for mastering complex structures. C-DA, however, provides learners with a dynamic environment, offering immediate corrective feedback and suggestions. This approach reinforces understanding and application of grammatical rules. By using technology to create a more interactive and responsive learning environment, C-DA has the potential to revolutionize grammar instruction, rendering it more engaging, adaptive, and effective than traditional methodologies.

C-DA can further enhance writing skills by providing targeted support in grammar and its appropriate use within written discourse. Unlike static assessments, C-DA actively supports learning, helping learners recognize and correct errors immediately. By addressing individual needs, C-DA fosters effective writing practice and promotes long-term improvements in grammar and coherence.

To conclude, C-DA holds significant promise for transforming language learning, particularly in grammar instruction, which has been less explored. This approach addresses the shortcomings of conventional grammar instruction, which often lacks immediate intervention and meaningful feedback in complex grammar acquisition. The primary objective of this research is to investigate how C-DA can enhance learners' grasp of grammatical structures and their application across varied contexts, especially in writing, by offering them guidance.

This study focuses on the interventionist approach of computerized dynamic assessment since it emphasizes the active role of the assessor in providing targeted support and guidance, which is particularly valuable in the context of grammar instruction. The interactionist model also offers continuous feedback and scaffolding, enabling learners to make real-time corrections while writing, improving their understanding of grammatical errors and sentence structure. However, since the interactionist model is based entirely on flexible and individual intervention, it may be more difficult to achieve the level of rich linguistic support provided by human instructors with a computer program. Conversely, the interventionist model provides tailored prompts for targeted grammar development. Its structured and measurable approach to improving grammar in writing. Unlike the interactionist model, which focuses on open-ended mediation, the interventionist model uses standardized prompts, scoring, and step-by-step guidance to target specific grammatical issues. This model ensures that learners receive systematic feedback on grammar use, helping them internalize correct structures more effectively. This makes it easier to track progress, assess grammatical development, and ensure that intervention

leads to measurable improvements for English as a Foreign Language (EFL) learners to enhance grammar learning and use in contexts such as writing.

1.1 Statement of the Problem

Exams used to evaluate students in education systems vary from country to country. In countries like China (Yu, 2023) and Iran (ShayesteFar & Fazlali, 2020), high-stakes exams are regarded as the primary tools that determine students' academic and professional futures. In Iran, for example, university entrance exams play a big role in students' academic lives. However, these “high-stakes” exams contribute to social exclusion particularly among Iranian youth, and encourage creation a profitable industry from the situation that forces students and parents to spend money on private tutoring or exam books (Safari & Rashidi, 2018). Similar exam-focused Chinese education system makes it difficult to implement student-centered approaches by leading to a lack of understanding among teachers and students regarding the process and feedback (Yu, 2023). Such traditional examination formats, such as closed-book and time-constrained tests, offer limited pedagogical value and hinder effective learning. There is a need for a comprehensive approach to assessment that includes diverse methods to reduce stress, recommend “good teaching” (Poehner, Davin, & Lantolf, 2017, p. 251), and promote student well-being. The focus should be on fostering life-long learning and preparing students with a range of skills such as problem-solving and self-regulation, beyond simple fact recall (French, Dickerson & Mulder, 2024).

While high-stakes exams are common in many education systems, some countries prefer low-stakes assessments that focus more on continuous learning rather than one-time, high-pressure tests. In such countries, language assessment is often designed to support the learning process and incorporates diverse methods. For example, in Finland, methods such as self-assessment, peer assessment, and portfolios are used to develop students' language

skills. However, studies show that this diversity in assessment is not always perceived by students as beneficial for learning. Even in Finland's low-stakes exam culture, closed-book exams remain a dominant method, reflecting a continued reliance on traditional approaches to assessment (Nieminen, Atjonen & Tolvanen, 2024).

Similar to countries like Iran or China, high-stakes exams play a significant role in Türkiye's educational system as well, particularly in the field of English as a Foreign Language (EFL) education. High-stakes language proficiency tests are used as gatekeepers for EFL students, determining their language ability to undertake academic work in their fields (Güngör & Güngör, 2021). Standardized exams like the LGS (High School Entrance Exam), YDT (Foreign Language Test) and YDS (Foreign Language Proficiency Exam) can be considered as examples of those tests.

LGS, administered by the Turkish Ministry of National Education (MoNE), is the initial high-stake test to evaluate secondary school students' language skills. It is crucial for 8th-grade students aiming for high school admission. The English section tests grammar, vocabulary, and comprehension skills with text-based questions. Similarly, YDT is a yearly exam in Türkiye run by the Student Selection and Placement Centre (ÖSYM) as a part of YKS (Higher Education Institutions Exam) to apply to programs needing foreign language skills, such as English Language Teaching (ELT) department. It tests vocabulary, grammar, and reading through text-based questions, but not speaking, writing, or listening. YDS is again conducted by ÖSYM. It is a language proficiency test for graduates and professionals, focusing on reading, grammar, vocabulary, and translation skills, important for higher education and job opportunities.

Other than these high-stakes exams, schools regularly assess students' language abilities through written tests, quizzes, midterms, and oral evaluations. The Ministry of National Education outlines its K-12 English curriculum in alignment with the Common European Framework of Reference for Languages (CEFR), emphasizing communicative

competence, process-oriented learning, and formative assessment practices. MoNE's curriculum offers some testing techniques for every skill, and some of these suggestions are:

1. Reading: Matching information, finding specific details and titles, identifying main ideas, intensive reading, completing actions, solving puzzles, understanding text mechanics, and answering questions
2. Listening: Matching sentences with paragraphs/pictures, discriminating phonemes, identifying intentions/implicatures, listening and performing actions (e.g. drawing, matching, putting in order), and recognizing specific information with questions.
3. Speaking: Collaborative or solo acting, debates, discussions, storytelling, short presentations, visual analysis.
4. Writing: Summarizing various forms of writing and organizing information includes describing visuals, filling out forms, taking notes, creating outlines and lists, reporting tables/charts, rephrasing, rewriting, writing short notes/emails/journal entries, and composing paragraphs/theses (the Ministry of National Education, 2018).

The MoNE's English curriculum emphasizes formative and communicative approaches to language teaching and suggests using alternative assessment techniques such as portfolios or drama tasks (MoNE, 2018). However, while these guidelines encourage communicative skills and formative assessment approaches in language teaching, it is observed that these goals are often contradicted by static and summative assessment methods in classroom practices (Tokur Üner & Aşılıoğlu, 2022). In particular, written exams, quizzes and standardized assessment tools focus on determining students' current knowledge levels rather than dynamically improving their language skills. This situation reveals that the process-oriented and communicative assessment emphasized in the curriculum cannot be adequately implemented in the classroom.

The inadequate implementation of process-oriented and communicative assessment in classrooms can be attributed to several factors. First of all, inflexible exam systems and administrative demands compel teachers to adopt traditional assessment techniques, prioritizing summative evaluations (Arekkuzhiyil, 2021; Ektem, Keçici & Pilten, 2016). Arekkuzhiyil (2021) highlights that the current system can be overwhelming for teachers, with the overall structure of the education system influencing assessments and increasing teachers' workloads. Practical issues like time limitations (Arekkuzhiyil, 2021; Ektem, Keçici & Pilten, 2016; Hargreaves, Earl & Schmidt, 2002) and large class sizes (Ektem, Keçici & Pilten, 2016; Korkmaz, 2006) complicate the implementation of process-oriented assessment. Teachers are occasionally unable to devote enough time to individualized assessments, particularly when faced with high student numbers. Moreover, while teachers can assess whether a student meets or exceeds specific outcomes, matching that with a numerical grade and explaining this to parents might be challenging (Hargreaves, Earl & Schmidt, 2002). Another reason is that many teachers lack adequate training in these assessment methods, hindering their integration into teaching practices. Teachers can overcome challenges in applying formative assessment techniques with professional development and institutional support (Wylie, Lyon, & Goe, 2009). However, when the support and training are limited, teachers may revert to traditional methods that are easier to administer and more familiar.

Additionally, dynamic assessment is notably missing from the English Language Teaching (ELT) curriculum, which results in assessors and teachers to concentrate primarily on present language skills, overlooking learners' potential. Moreover, even when pre-service English language teachers are introduced to alternative assessment methods, there are often challenges in effectively implementing them. Güngör and Güngör (2024) state that pre-service teachers do not have opportunities to observe or implement the types of assessments they were taught in their programs. This results in a gap between theory and practice, creating a challenge for pre-service teachers to apply what they have learned in a

more authentic context. This also might be a reason why teachers still tend to use traditional assessment methods rather than applying the assessment methods stated in the MoNE curriculum.

As a result, present exam systems affect the choice of assessment methods that teachers use (Swaie & Algazo, 2023), and teachers' tendency towards traditional measurement methods limits students to an exam-oriented system instead of enriching their learning processes. These conventional assessment methods hinder learning by being exam-focused, lacking feedback, and creating stress and anxiety, rather than enhancing the overall learning experience (Huerta-Macías, 2002; Hughes, 2003; Bailey, 1998, as cited in Moqbel, 2017). Traditional assessments overlook deeper learning skills while alternative assessments evaluate knowledge application, improve logical reasoning, critical analysis, and problem-solving (Aitbayevna & Bayronovna, 2021). To address this discrepancy, this study focuses on a computerized dynamic assessment approach, which offers a method that not only measures students' current knowledge levels and potential of learning but also supports their learning processes and provides feedback according to their individual needs.

As high-stakes exams are prioritized in those educational settings, focus is always on static assessment methods, which suggests that students in such systems may uniquely face unique difficulties when adapting to new learning environments. Yet, the COVID-19 pandemic presented similar challenges for countries with high-stakes exams and those with low-stakes exams, forcing both to implement significant changes in their education systems. During the COVID-19 pandemic, EFL testing and assessment faced significant challenges globally due to the sudden closure of educational institutions (Güngör & Güngör, 2021). This resulted in a need for a rapid shift to remote learning and digital assessment methods.

The COVID-19 Pandemic caused major disruptions to international language tests, pushing them to adapt to online formats. Exams like IELTS and TOEFL introduced options such as the IELTS Indicator and TOEFL iBT Home Edition to keep testing available during test center closures. However, this transition created challenges in implementation. Security measures like video monitoring and computer tracking were used to prevent cheating, but these raised concerns about privacy. Many test-takers also faced technical issues like connection problems or limited access to technology, making it harder for them to participate. There were also doubts about whether online tests could match the reliability and fairness of in-person exams (Isbell & Kremmel, 2020; Ockey, 2021). Other than implementation issues, challenges like reduced interaction and the inability to provide immediate feedback also emerged as significant barriers to traditional assessment models (Doyle et al., 2024). Despite these problems, the pandemic encouraged faster innovation in language testing, which may shape future assessments (Isbell & Kremmel, 2020; Ockey, 2021). The shift revealed the need for more flexible and secure future EFL assessment methods.

Assessment practices in classrooms across different countries required a similar change during the COVID-19 pandemic. In China, universities shifted towards formative assessments, reducing the weight of summative exams. However, teachers faced difficulties adapting to digital tools and ensuring fair assessment conditions (Zhang, Yan & Wang, 2021). Similarly, in Indonesia, teachers faced challenges with the internet connectivity and student participation, which negatively affected the reliability of online assessments. (Yulianto & Mujtahid, 2021). In Türkiye, online testing faced challenges like security concerns, technical issues, and heightened workloads for teachers, compounded by limitations in question formats favoring fixed-response items (Gürbüz, Canlı, & Abi 2024). Conversely, Finland's distance education is believed to be successful due to strong digital infrastructure and teacher expertise, despite challenges such as unequal access to devices and lower student motivation. Importantly, digital competence among teachers and

students improved significantly, bolstered by supportive networks (Finnish National Agency for Education, 2020). Meanwhile, in Saudi Arabia, the integration of virtual tools was found to enhance student performance, particularly in grammar courses, suggesting that digital learning platforms can be effective alternatives to traditional instruction when properly implemented (Elbashir & Hamza, 2022). Despite various adaptations, concerns regarding technological accessibility and student motivation persisted across different educational contexts, and all cases stress the need for infrastructure growth, teacher training, and security improvements for effective online testing. The pandemic increased the need for computer assisted evaluation, enabling assessments that are more flexible, scalable, and equitable. Technologies like video-enhanced dialogic assessments (VEDA) and e-portfolios emerged as critical tools in fostering deeper reflection and professional identity formation (Doyle et al., 2024). They had both advantages and disadvantages in terms of appliances, but one thing the pandemic clearly showed is that there is a need for technology to be used in educational settings.

Taking everything into account, within the field of language assessment, a significant concern persists regarding the ongoing reliance on traditional summative testing, especially in high-stakes environments such as Turkiye. These evaluations only show a student's capabilities at a specific time, ignoring their potential for learning and development. In comparison, dynamic assessment methods, particularly C-DA, offer a valuable option, providing ongoing feedback and interactive assistance that improve language learning.

This problem is further compounded by the gap between the formative assessment objectives established by educational authorities (such as the Ministry of National Education) and the summative methods used in the classroom. The misalignment means that while policy may advocate for assessments that inform teaching and promote learning, the actual practices remain entrenched in high-stakes, summative evaluations. Moreover, the challenges experienced during the COVID-19 Pandemic in both high- and low-stakes assessment environments have exposed these limitations even more, emphasizing the

necessity for flexible evaluation methods. There is a growing need for new assessment methods that not only measure students' current knowledge but also support their learning. These methods should provide a more complete evaluation and be flexible enough to work in different settings, including online education.

Current issues are particularly evident in the teaching of grammar and writing, since traditional assessments often fail to capture the complexities of language use and development. Static tests typically evaluate grammatical knowledge in isolation, neglecting a student's ability to utilize these rules in writing contexts. This disconnect undermines the dynamic nature of language learning and the vital integration of grammar with writing practice. Dynamic assessment has a potential to fill in this gap in current teaching practices, however, its nature of providing personalized support during assessment makes it harder to embrace by teachers. DA requires more and more time for each learner and teachers may not always have the opportunity to guide each learner during the exam. However, computerized dynamic assessment has a potential to overcome that limitation, especially with the latest developments of technology. Hence, this type of assessment needs more attention to reveal its potential benefits on different areas of language learning.

1.2 Significance of the Study

Traditional assessment methods, especially in high-stakes contexts (Dawadi, 2021; French, Dickerson & Mulder, 2024; Solórzano, 2008), face criticism as they pose challenges for learners. They are viewed as restricted, especially since they rely on the idea that cognitive abilities are fixed and can be evaluated through standardized tests (Poehner, 2005). They provide only a description of a learner's current knowledge, often neglecting their potential for growth and responsiveness to instruction. This approach can lead to an incomplete understanding of a learner's capabilities and may not effectively inform instructional practices. Poehner (2005) states that dynamic assessment, on the contrary, recognizes that

abilities can change, as it incorporates mediation into assessments, enabling teachers to understand students' cognitive potential more deeply. It shifts focus from static measurement to individual responses to support, highlighting future learning capacity (Poehner, 2005). The transition from static assessment to dynamic assessment impacts educational practice as traditional assessments serve for large-scale comparisons, but do not inform instruction, while DA provides useful information about student learning, allowing teachers to adapt their interventions. Also, DA suggests effective assessment leads to effective instruction, with the understanding of assessment towards future rather than past (Poehner, Zhang & Lu, 2017).

While formative assessment is often seen as a more flexible and instructional-friendly alternative to summative testing, its implementation is frequently inconsistent and lacks a solid theoretical foundation. Poehner (2005) notes that many formative assessment practices are not systematically applied, leading to a "hit-and-miss" approach in promoting students' development. Similarly, Ellis (2003) argues that some formative assessments primarily contribute to the immediate completion of tasks rather than fostering long-term language development. DA provides a solution by inserting structured mediation within the assessment process, ensuring that learners receive targeted support that directly contributes to their development. Unlike many formative assessment methods that offer feedback after the assessment, DA incorporates feedback in real-time, allowing for immediate instructional adjustments. According to Poehner and Lantolf (2005), DA enables teachers to systematically track students' responsiveness to intervention, offering a more reliable method of diagnosing learning needs and guiding instruction.

This study aims to address the shortcomings of traditional static assessment by exploring the implementation of Computerized Dynamic Assessment as an alternative evaluation method. By providing immediate, tailored feedback and interactive scaffolding, C-DA not only assesses current knowledge but also facilitates ongoing learning. This approach aligns

with contemporary educational paradigms that emphasize alternative assessment and the continuous development of skills.

In terms of language education, traditional methods often fall short in supporting a student's ability to apply grammatical rules in authentic contexts, since grammar instruction and writing practice are separated (Jaeger, 2011). Separating grammar from writing practice can result in an inaccurate assessment of a student's language proficiency. Traditional pencil-and-paper assessments may fail to accurately reflect learners' language abilities, as some excel in tests but struggle in real-world usage (Phongsirikul, 2018). This disconnect can result in a superficial understanding of a student's writing proficiency and may not effectively guide instructional interventions. This study explores how C-DA enhances writing proficiency by integrating grammar instruction within dynamic assessment. Utilizing technology for real-time feedback, C-DA fosters engagement with grammar in writing tasks, improving accuracy in usage.

Specifically, in Türkiye, grammar accuracy in writing remains a persistent challenge for learners as they often struggle with applying grammatical structures correctly in production (Çelik & Bayraktar Çepni, 2020; Demirel, 2017). Demirel (2017) highlights that especially writing is a challenge for Turkish EFL learners, as their focus before higher education is mainly on reading and grammar, rather than on developing writing skills. Çelik and Bayraktar Çepni (2020) attribute this challenge to traditional methods that emphasize grammar, and some of the participants in their study who were university level students also stated the impact of grammar-based instruction on their failure. Traditional language teaching prioritizes grammatical competence, emphasizing explicit instruction and a deductive approach with rules and mechanical practice exercises (Özsevik, 2010). Assessment practices are primarily based on grammar-focused exams, offering students limited opportunities to receive individualized feedback or engage in meaningful grammar practice. Çelik and Bayraktar Çepni (2020) also highlight that insufficient individualized feedback and limited practice opportunities restrict students' English application beyond

the classroom, hindering their progress. Consequently, the dominance of traditional grammar instruction and the limitations of assessment systems negatively impact students' ability to apply grammatical structures accurately in writing.

Accordingly, this study aims to address these limitations by investigating how C-DA can offer more interactive and responsive grammar support. By providing real-time feedback and adaptive mediation, C-DA can better support both grammar instruction and the development of written fluency in online and face-to-face settings. This approach presents a promising alternative to traditional methods, helping students to internalize grammatical rules and apply them effectively in academic writing.

Moreover, a gap often exists between the educational policies that stress formative assessment practices to enhance instruction and student learning, and the summative assessments commonly used in classrooms, especially in high-stakes testing circumstances. Although communicative language teaching is emphasized in curricula, teachers primarily focus on vocabulary and grammar instruction (Uztosun, 2013). Some of the reasons of this misalignment is time related (Areekkuzhiyil, 2021; Ektem, Keçici & Pilten, 2016; Hargreaves, Earl & Schmidt, 2002) or class size related (Ektem, Keçici & Pilten, 2016; Korkmaz, 2006) limitations which can obstruct effective formative assessment implementation and restrict meaningful learning opportunities for learners. This study addresses this issue by presenting evidence on the effectiveness of C-DA as a formative assessment tool that can support learning by enabling personalized feedback for large groups of students in a short time, which aligns easier with policy goals.

Additionally, the need for innovative assessment methods became particularly evident during the COVID-19 pandemic (Shahriar, 2023). Traditional paper-based, or in-person assessment methods were no longer feasible, and teachers had to quickly adapt to new forms of assessment that could function effectively in digital spaces. The rapid and global shift to online learning posed unique challenges for both teachers and students, particularly

in maintaining effective and meaningful assessment practices in a virtual environment. These challenges included infrastructure deficiencies, misalignment of teaching methods, and a decline in motivation (Ghanbari & Nowroozi, 2021; Hijazi & AlNatour, 2021). Teachers, particularly those who were accustomed to face-to-face instruction, struggled to effectively manage student engagement and assessment in an online environment (Çalışkan, 2023). They struggled with higher workloads, time-intensive planning, and challenges in assessment and feedback (Puspasari, Utami, & Budiarta, 2021). As a result, concerns about the quality of online education during the pandemic became a major issue. The study conducted by Hijazi and AlNatour (2021) specifically underlined that students faced challenges in assessment since it only measures the knowledge level. In this context, C-DA becomes a viable solution by providing a framework for assessments that are both flexible and supportive of ongoing learning and that measures the potential of learning rather than focusing solely on current knowledge.

The integration of technology in education enhances assessment through C-DA which offers immediate, personalized feedback. By utilizing C-DA in language education, assessments become efficient while gathering detailed learner performance data, informing instructional choices. Its adaptability makes C-DA effective across various educational settings, including online and blended environments. As we move beyond the pandemic, the importance of C-DA remains clear. In the post-pandemic era, hybrid and online learning models remain prevalent, increasing the demand for adaptive assessment tools like C-DA. C-DA offers an assessment method that can assist transition between in-person and online learning formats, allowing teachers to maintain a consistent and meaningful assessment process for student support and success in uncertain educational environments.

To summarize the key points so far, Dynamic Assessment is an alternative method of assessing learners, focusing on their potential for learning rather than simply their current level of achievement (Cotrus & Stanciu, 2014; Haywood & Tzuriel, 2002; Poehner, 2008). Unlike traditional assessments, which often fail to account for individual learning

trajectories, computerized version of dynamic assessment allows for real-time feedback, adapting to the learner's responses and providing personalized guidance. This was particularly important in online learning environments such as COVID-19 pandemic which highlighted the flaws of traditional assessment methods in remote learning, since the learners often faced isolation and the challenge of staying motivated without the structure of a physical classroom. Even in classroom contexts, standardised tests may not accurately measure a learner's problem-solving skills and ability to engage with complex tasks, similar to online and hybrid settings. Formative assessment practices, which is viewed as a solution to this limitation, also sometimes fall short in being useful with challenges such as limited time. However, C-DA focuses on the learning process, offering feedback to help learners enhance their performance and skills gradually, and it makes the progress easier for teachers or learners as it is applied via technological tools.

While the effectiveness of DA in language teaching, particularly in EFL settings, has been widely explored (Ebadi & Saeedian, 2015; Haez & Delfani, 2022; Sherkuzyeva et al., 2023) the focus has primarily been on the relationship between DA and language skill development rather than grammar. Studies on Turkish EFL learners have similarly concentrated on this relationship (Kır, 2019; Özturan, 2022; Yakışık & Çakır, 2017; Yılmaz, 2021). Existing literature on grammar assessment within a DA framework remains limited, often relying on static grammar tests that fail to capture how grammar is used in real communicative contexts. Furthermore, there is a notable lack of studies exploring the relationship between DA and grammar in use—examining how learners apply grammatical structures in productive skills. This study aims to fill this gap by investigating how DA can support the integration and use of grammar in writing focusing specifically on university-level learners in higher education.

The number of studies on C-DA is even more limited than those on conventional DA. Although dynamic assessment itself is not a novel concept, its computerized version remains a relatively new area of research and is still being explored. Current C-DA

research primarily explores reading comprehension, with very little focus on grammar. More importantly, there are virtually no studies examining how C-DA can enhance the correct use of grammar in writing. This study extends the C-DA literature by exploring its effectiveness in developing grammatical accuracy and fluency in higher education writing classrooms. By integrating technology-driven mediation and interactive feedback, this research demonstrates how C-DA can enhance not only grammatical knowledge but also its application in academic writing.

Previous studies on DA and C-DA reveal the potential to support learners and the process of learning a language. Detecting the benefits of computerized dynamic assessment is crucial to understand how it can be implemented in language teaching and testing, and to see how it can be included in curriculum or teacher training program. However, the existing literature is dominated by studies on non-computerized versions of DA, which has led to a significant gap in research on C-DA. This gap is particularly evident in the Turkish context as well, where C-DA has not yet been widely implemented or studied in detail within EFL settings.

While DA has been widely studied in international research, applications of DA in Türkiye remain largely unexplored (Bayram, 2021), especially in higher education. Existing studies primarily focus on general language proficiency or skill-based assessments, with limited attention to grammar-focused DA in academic writing contexts. This research contributes to a growing body of DA studies in Turkish higher education. Moreover, by considering the misalignment between formative assessment goals in national education policies and the summative practices, this study provides practical insights into alternative assessment approaches tailored to the higher education sector.

While most assessment research focuses on evaluating learners, this study explores C-DA not only as an assessment tool but also as a means of supporting grammar instruction in higher education writing classrooms. Unlike static assessments that merely measure what

learners already know, C-DA integrates interactive scaffolding and real-time feedback, fostering a more learning-oriented approach (Poehner & Lantolf, 2014). In this study, C-DA functions as a teaching-supportive tool that helps students internalize grammar rules and improve their ability to apply them in writing. By demonstrating how assessment and instruction can be meaningfully integrated through C-DA, this research contributes to both language assessment and pedagogy, offering insights for teachers seeking more adaptive, student-centered approaches to teaching grammar in university settings. The research will provide valuable insights into using C-DA as a reliable teaching tool in dynamic learning environments as educational systems prepare for future uncertainties.

1.3 Aim of the Study

This study aims to investigate the effectiveness of computerized dynamic assessment on Turkish EFL learners' grammar use. To fill in the gap in current literature in that matter, this study aims to answer the following questions:

1. Does the Computerized Dynamic Assessment (C-DA) have an impact on EFL learners' grammar-in-use performance?
2. If yes, how does the C-DA contribute to EFL learners' grammar-in-use in written production?
3. What are EFL learners' reflections of the C-DA process in terms of grammar in use?

1.4 Definitions of Key Terms

Dynamic Assessment: Dynamic assessment is a methodological approach in which the assessor interacts with the individual being evaluated, using instructional interventions to promote their learning and development. (Haywood & Tzuriel, 2002)

Computerized Dynamic Assessment: Computerized dynamic assessment is an assessment approach that incorporates mediation and transfer tasks to track learner development in a second language. (Poehner & Lantolf, 2013)

Zone of Proximal Development: Zone of Proximal Development (ZPD) is a concept developed by Lev Vygotsky, a Russian psychologist, in his sociocultural theory of cognitive development. It refers to the gap between a learner's current level of ability and their potential level of development with assistance.

High-stakes exam: High-stakes exam is an exam with significant consequences for the test-taker, such as determining graduation, certification, university admission, or employment opportunities.

Low-stakes exam: Low-stakes exam is an exam with minimal or no significant consequences for the test-taker, often used to gauge progress, provide practice, or inform instruction without impacting final grades or major decisions.

Static assessment: The assessment approach where the evaluator measures a learner's knowledge or skills at a single point in time without providing feedback or interaction to support learning during the assessment process.

Grammar-in-use: An assessment or instructional approach focusing on how grammar is applied in practical, communicative contexts, rather than in isolated, rule-based exercises.

Formative assessment: Ongoing, informal assessments conducted during the learning process to provide feedback and guide instruction, helping students improve their performance.

Summative Assessment: A formal evaluation conducted at the end of a learning period to measure overall achievement or mastery of content, typically with a grade or score.

AfL: Assessment for Learning is an assessment approach designed to actively involve students in the learning process by providing feedback that helps them understand their progress and how to improve.

AoL: Assessment of Learning is an assessment approach aimed at determining what students have learned, typically for the purpose of assigning grades or evaluating overall achievement. It is often used for accountability and reporting purposes.



CHAPTER II

LITERATURE REVIEW

2.1 Language Assessment

Assessment refers to the systematic process of collecting, analysing, and interpreting data to evaluate performance or outcomes. It plays an important role across various fields, including psychology, healthcare, business, and education. In educational contexts, the term "language assessment" specifically pertains to evaluating individuals' abilities in speaking, listening, reading, and writing. Language assessment is significant in applied linguistics, shaping research methodologies, language teaching practices, and public policy. Before exploring language assessment in detail, it is essential to clarify the concept of "assessment" and distinguish it from related terms such as "test" and "measurement."

First of all, a test is a structured method designed to gather data about an individual's skills, intelligence, strengths, or areas for improvement (Hughes, 1989; Brown, 2004). It serves as a focused tool within the broader framework of assessment. It is specific, involving structured tasks with a set time limit, where responses are scored formally (Green, 2013). Teachers evaluate whether learning objectives have been met, identify areas for improvement, and provide feedback to both students and teachers. While testing is a useful tool, its narrow scope makes it a subset of assessment. Thus, it can be regarded as limited in scope compared to broader evaluative processes.

Measurement, in contrast, involves quantifying specific characteristics by assigning numerical values (Bachman, 1990). Testing might provide initial data about a student's abilities, while measurement translates this data into a numerical form to indicate the extent of a particular trait or skill (Mani, 2016). Therefore, measurement complements testing by providing a standardised framework for interpretation.

Assessment, the broadest term among the three, encompasses a diverse range of tools and methods. Green (2013) notes that it includes all activities aimed at evaluating language knowledge or ability, such as informal classroom activities and portfolios. Therefore, assessment occurs whenever teachers observe students engaging with questions or applying their knowledge (Brown, 2004). The clear differentiation of these three terms in the context of education shows that testing provides the raw data for measurement, measurement quantifies performance and contributes to the broader assessment process. Hence, assessment uses testing and measurement along with other tools to understand and support student learning.

When such data is specifically used to evaluate an individual's proficiency and comprehension in a language, it is termed "language assessment" (Chapelle, Kremmel & Brindley, 2020).

Language assessment evaluates language abilities for various purposes, involving theoretical, practical, and ethical aspects, making it a complex field. This complexity requires teachers to understand how to create, administer, and interpret assessments effectively to ensure they align with teaching objectives and student needs. This skill is called assessment literacy, which is essential to provide an effective assessment environment. Assessment literacy plays a fundamental role in teacher professionalism because it combines the knowledge and skills needed to design, implement, and interpret assessments effectively (Xu & Brown, 2016). However, many teachers are required to

make important assessment-related decisions without adequate training, which leads to what Stiggins (2010, as cited in Xu & Brown, 2016) describes as "assessment illiteracy."

To address this, various models have been proposed to define what teachers need to know about assessment. One widely recognized framework, the Standards for Teacher Competence in Educational Assessment, outlines seven competencies: choosing methods, developing assessments, scoring and interpreting, using results, valid grading, communicating results, and recognizing unethical practices (Xu & Brown, 2016). Despite these efforts, existing models often fail to connect assessment literacy with teacher education in a way that supports long-term growth. Xu and Brown (2016) argue that a more comprehensive framework is that integrates assessment literacy into both pre-service and in-service teacher education needed to ensure that teachers continue developing their skills throughout their careers.

Problems in assessment practices, including tests mismatched to student levels, misalignment with the curriculum, and inaccurate evaluations by untrained teachers, weakens genuine learning and mastery (Green, 2013); therefore, understanding assessment literacy is vital for teachers, particularly in language assessment. This requires an awareness of critical distinctions such as assessment, measurement, and testing, alongside specific teacher literacy needs. Key principles, which are practicality, reliability, validity, and washback, significantly influence assessment design and its effects on teaching and learning. Analysing these principles is essential to comprehend their implications and the choices teachers face in language assessment practices in their classrooms.

Incorporating these principles into assessment design ensures that tests are not only fair and effective but also contribute to students' overall language development. Brown (2004) highlights that a practical test should be cost-effective, time-efficient, easy to administer, and straightforward to score. Reliability is another crucial factor, referring to the consistency of test results over repeated administrations. Several factors, such as student

conditions and unclear test items can affect reliability. Equally important is validity which ensures that the test measures its intended purpose. (Brown, 2004). Additionally, washback reflects the impact of testing on teaching and learning. Positive washback occurs when tests promote meaningful learning, while negative washback can lead to extreme focus on test-taking strategies rather than genuine language acquisition (Brown, 2004). By balancing practicality, ensuring reliability and validity, and fostering positive washback, educators can create assessments that truly support learning rather than merely measuring it.

First of these terms, practicality is defined by Bachman and Palmer (2010) as the difference between the resources required for an assessment and those available. It is the feasibility of an assessment in terms of time, resources, and administration. A test should be cost-effective, easy to implement, and not overly time-consuming for either students or teachers. Without sufficient resources, even a well-designed assessment cannot function or be maintained in the long term. For example, a speaking test that requires one-on-one interviews with each student may be ideal for measuring oral proficiency, but if a teacher has sixty students and limited time, it may not be a practical option. Instead, a structured group discussion or a recorded speaking task could offer a more efficient alternative while still achieving the intended goal.

Green (2013) defines the other term, reliability, as the degree to which an assessment consistently measures what it is intended to measure. Reliability ensures that an assessment produces consistent results in different occasions and test-takers. It is crucial in assessment because it ensures that the results of a test are consistent and trustworthy. If a student takes the same test twice under similar conditions, their scores should be comparable. However, various factors can affect reliability, such as inconsistent grading by different raters or unclear test instructions leading to varied interpretations. Nonetheless, reliable assessments provide stable results regardless of who takes the test, minimizing the impact of individual differences. Just like test takers, raters are also an important part of assessment, and a

reliable assessment must ensure that different raters or even the same rater on different occasions score performances consistently (Green, 2013). For instance, if one teacher scores essays based on grammar while another focuses more on coherence, the results would lack reliability. To enhance reliability, clear rubrics and standardized grading criteria should be used.

However, creating a practical and reliable evaluation tool does not mean that the assessment is going to be effective. An effective assessment tool must have validity because a test or assessment needs to accurately measure what it is supposed to measure in order to be meaningful. McNamara (2000) argues that validation in language assessment guarantees the justifiability and equity of interpretations derived from test outcomes. In other words, it reflects whether the test or tool is truly assessing the intended construct and not something else. Therefore, ensuring the validity of an assessment tool is essential for making fair and meaningful interpretations of test results, ultimately determining its effectiveness in evaluating the intended construct.

One of the key terms is content validity, which refers to how well a test aligns with the subject matter it aims to assess. A test achieves strong content validity when it requires learners to perform tasks that directly reflect instructional objectives (Brown, 2004). For example, a test designed to assess conversational skills should include role-play activities rather than multiple-choice grammar questions.

Another term, criterion-related validity ensures that test results correspond with an outside standard. It involves concurrent validity, which refers to a test's results aligning with other performance indicators at the same time, and predictive validity, evaluating how effectively a test anticipates future performance, as observed in placement and admissions tests (Brown, 2004). For instance, if a university placement test accurately predicts which students will succeed in advanced language courses, it demonstrates predictive validity. In

a classroom setting, an example could be using a diagnostic quiz at the start of a semester to predict which students may need extra support.

Another critical aspect is construct validity, which evaluates whether a test accurately reflects the theoretical concept it aims to measure. This is particularly important in large-scale standardized testing, where assessments must align with constructs like communicative competence (Brown, 2004). If a test claims to assess reading comprehension, it should include passages that require students to infer meaning, not just identify isolated vocabulary words.

Face validity, a more subjective term, influences how students perceive a test's relevance and fairness. If a test format appears logical and familiar, students are more likely to view it as credible (Brown, 2004). For example, a writing test that asks students to write an email rather than an academic essay might be seen as more valid for learners studying English for business.

Lastly, consequential validity considers the broader effects of a test, including its influence on students' motivation, study habits, and access to educational opportunities (Brown, 2004). A high-stakes English proficiency test that determines university admission is an example of a test with significant consequential validity. If students begin focusing only on test-taking strategies rather than actual language learning, negative washback may occur. In a classroom setting, teachers can promote positive consequential validity by designing assessments that encourage meaningful learning rather than rote memorization.

To ensure overall validity, assessments should align with learning objectives and include tasks that mirror real-world language use, such as writing essays, engaging in discussions, or responding to authentic reading passages. A test is valid if it accurately measures what it claims to measure, that is to say it is one of the most important aspects in assessment. Hence, validity is typically seen as the cornerstone of a good test; however, reliability is

still crucial for making sure the results are consistent, and practicality is needed to be able to apply the tests.

Washback describes the impact of testing on teaching and learning (Alderson & Wall, 1993), which can be either positive or negative (Brown & Hudson, 1998). Positive washback encourages meaningful learning aligned with instructional goals. Well-designed tests promote real-world language skills and motivate teachers to employ effective teaching strategies. For instance, a speaking exam featuring role-plays allows students to engage in authentic communication, leading teachers to emphasize fluency over rote memorization. To foster positive washback, assessments should reflect genuine language use, provide detailed feedback, and align with course objectives. Conversely, negative washback arises when testing promotes superficial learning, forcing a "teaching to the test" mentality. An example is a high-stakes grammar test that emphasizes multiple-choice questions, leading to a focus on grammar drills instead of communicative competence. To maximize positive washback, educators should integrate performance-based assessments, offer formative evaluations, and balance test preparation with authentic skill development. Thoughtfully crafted assessments can lead to motivation and real-world language application, while poorly designed tests may encourage memorization and hinder true comprehension (Alderson & Wall, 1993).

In conclusion, teachers must practice practicality, reliability, validity, and washback as these aspects impact assessment effectiveness and fairness. Practicality ensures assessments are feasible under constraints, reliability guarantees consistent results, and validity ensures tests measure intended skills accurately, providing meaningful data on students' abilities. Understanding these concepts is also crucial when choosing the appropriate assessment types to use in the classroom. Different assessment types serve distinct purposes and require careful consideration of these principles to ensure they are effective in measuring student progress and learning outcomes. With this in mind, it is

crucial to consider the various forms of assessment and their effectiveness in different teaching contexts.

2.1.1 Assessment Types

Assessment plays a crucial role in language learning, offering important insights into students' development, strengths, and areas that need enhancement. In the absence of efficient assessment techniques, measuring learning outcomes or adapting teaching strategies to meet students' needs would be challenging. Different types of assessment serve distinct purposes, helping both educators and learners track development and refine learning approaches. Educational assessment is broadly classified into three major categories: assessment for learning (formative), assessment as learning (self-regulated learning), and assessment of learning (summative) (Earl & Katz, 2006). Among these, summative and formative assessments are central concepts in language assessment, with a strong connection to the distinction between static and dynamic assessment, which highlights the different approaches to evaluating language learning and development.

2.1.1.1 Summative Assessment

Summative assessment, also referred to as “assessment of learning” (AoL), evaluates students' achievements at the conclusion of a course or instructional period. It is used to measure student achievement at the end of an instructional unit, often through standardized tests or final projects. The primary function of this type of assessment is to certify learning and provide a benchmark for educational success (Earl & Katz, 2006). In an EFL classroom, a summative assessment may take the form of a writing exam where students compose an opinion essay on a given topic at the end of the term, demonstrating their grasp of grammar, vocabulary, and coherence. Alternatively, a standardized English proficiency test such as the TOEFL or IELTS serves as a high-stakes summative

assessment that evaluates a learner's overall competence in reading, writing, listening, and speaking.

2.1.1.2 Formative Assessment

In contrast, formative assessment, namely assessment for learning (AfL), monitors students' progress during the learning process, offering constructive feedback to foster continued development (Brown & Abeywickrama, 2004). It is utilized to provide real-time feedback that allows educators to modify instructional strategies and cater to individual student needs (Earl & Katz, 2006). This approach enables a more adaptive and responsive learning environment. By continuously assessing students during the learning process, teachers can identify misunderstandings and adjust their teaching accordingly. In an EFL classroom, for instance, a teacher may conduct informal speaking activities where students describe their weekend plans using the future tense. As the students speak, the teacher takes notes on common grammatical errors and later designs a lesson to address these specific issues. This ensures that assessment directly informs instruction, helping students develop their language proficiency in a targeted manner; therefore, formative assessment focuses not only on evaluating performance but also on supporting learners' growth by providing actionable insights.

Closely related to formative assessment, "assessment as learning" emphasizes student self-monitoring and metacognition (Earl & Katz, 2006). This method promotes self-assessment and reflection in EFL learners. To illustrate, students might record their spoken responses to prompts and then analyze their pronunciation and fluency, allowing them to track progress and adjust learning strategies accordingly. This type of assessment fosters independent learning and critical thinking skills, which are essential for lifelong education. This reflective process helps students become more aware of their strengths and weaknesses, ultimately improving their speaking and listening skills.

Historically, education systems prioritized summative assessment to evaluate student performance. However, contemporary approaches highlight the importance of formative and self-regulated assessments in fostering deeper learning (Earl & Katz, 2006). The emphasis is now on using assessment as a tool for learning. To demonstrate, rather than relying solely on multiple-choice grammar tests, teachers incorporate interactive assessment methods such as peer reviews of written work or oral presentations where students receive constructive feedback from classmates. These approaches encourage active engagement with the language and emphasize progress over mere correctness.

2.1.1.3 Static Assessment and Dynamic Assessment

Static assessment is a traditional form of evaluation that measures a learner's knowledge and skills without intervention. According to Haywood and Lidz (2007), "Static assessment is based on the measurement of an individual's independent performance without any intervention or assistance from the examiner" (p. 6). This approach aligns with summative assessment, since it reveals students' current abilities without considering their capacity for growth.

Dynamic Assessment (DA), on the other hand, shifts the focus from what the learner knows to their potential for learning. Dynamic Assessment (DA) is rooted in Vygotsky's Sociocultural Theory (SCT), which views cognitive development as a socially mediated process, and Vygotsky's concept of the Zone of Proximal Development (ZPD) laid the foundation for DA by emphasizing that assessment should not only measure what a learner can do independently but also reveal their potential development through guided interaction (Vygotsky, 1978). Unlike traditional assessments that capture only the results of past learning, DA emerged as a response to the need for a more dynamic approach that integrates assessment and instruction (Derakhshan & Kordjazi, 2015; Poehner, 2008). The introduction of Vygotsky's ideas to Western psychology, particularly through A.R. Luria

in the 1960s, led to the further development of DA as a formalized approach (Luria, 1961, as cited in Poehner, 2008).

Unlike static assessment, DA follows a test–intervene–retest approach to determine how students respond to instructional support (Haywood & Lidz, 2007). While static assessment views the learner as a passive participant, with the examiner identifying deficits through standardized methods, dynamic assessment encourages active learner participation. In this approach, the examiner works collaboratively with the learner to assess their potential for improvement, offering a more interactive perspective (Cotrus & Stanciu, 2014). It is particularly useful in EFL learning, where students may struggle due to limited exposure rather than lack of ability. For instance, in a speaking assessment, instead of merely scoring a student's initial response, the teacher provides scaffolded prompts to guide the student toward a more accurate answer. This interactive approach helps identify learning barriers and informs instructional strategies.

The limitations of traditional summative and static assessments have led to an increasing emphasis on formative and dynamic assessments. Research suggests that DA offers deeper insights into students' learning potential, while formative assessment promotes active student engagement (Earl & Katz, 2006; Haywood & Lidz, 2007). In EFL contexts, integrating DA with formative approaches allows for personalized instruction, helping students develop language proficiency more effectively than traditional methods alone.

In conclusion, assessment is evolving from a strict, performance-based model to a more interactive and developmental approach. While static and summative assessments remain necessary for certification and setting standards, formative and dynamic assessments provide valuable insights into students' learning processes and potential. In EFL education, combining these assessment types enables more effective instruction, ensuring that students not only demonstrate knowledge but also develop the skills necessary for long-term success.

2.1.2 Historical Evolution of Language Assessment

The evolution of language teaching methods reflects a dynamic interaction between educational philosophies, linguistic theories, and societal needs, leading to significant transformations in both instruction and assessment. Over time, various approaches have emerged, each presenting unique perspectives on how languages should be taught, learned, and assessed. These approaches align with different views of language (Structural, Functional, and Interactional), each influenced by distinct learning theories, including behaviorism, cognitivism, and constructivism.

2.1.2.1 Structural View and Behaviorism

The Structural View perceives language as a system of interconnected elements, where mastering grammatical structures and vocabulary is key to language proficiency (Richards & Rodgers, 2014). The structural view sees language as interconnected elements, and prioritizes accuracy and correctness in language learning, leading to assessment methods that focus on measuring grammatical competence and controlled language production. This view is closely tied to behaviorism, which emphasizes habit formation through repetition and reinforcement.

In behaviorism, learning was seen as a process of habit formation through stimulus, response, and reinforcement. A stimulus triggers a reaction, the response is the resulting behavior, and reinforcement encourages that behavior by providing a reward or positive outcome. From a teaching perspective, this approach emphasizes practice through imitation and repetition to enhance learning. Teachers should focus on structures differing between first and second languages, particularly challenging ones. Effective teaching involves drilling exercises targeting these differences, leading researchers to compare languages to identify areas of difficulty for better pedagogical strategies (Mitchell, Myles & Marsden, 2019). Therefore, assessment is centered around observable, measurable behaviors. The

primary goal is to reinforce correct language responses and to track how well students can produce specific forms or structures. This involves repetition, drills, and immediate feedback to ensure the correct behaviors are learned and retained.

Behaviorism is closely related to the structural view, particularly through the way language learning is conceptualized and the methods used for teaching. It emphasizes observable behaviors in language learning through habit formation, focusing on repetition, reinforcement, and accuracy. Similarly, the structural view prioritizes mastery of language elements through drills, reinforcing correct forms with positive feedback, ensuring learners develop strong habits of accurate language use.

One of the first methods, the Grammar-Translation Method (GTM), is a form of structural approach since it focuses on a structured method of language assessment, placing more importance on written competence and grammatical correctness than on practical communication abilities. Assessments concentrate on tasks related to translation, practicing grammar, memorizing vocabulary, and writing compositions, with the goal of evaluating students' proficiency in translating accurately and utilizing grammatical rules effectively. Nevertheless, this approach mostly ignores abilities in speaking, listening, and pronunciation since they are not considered important in the assessment criteria. GTM assessment's effectiveness in promoting overall language proficiency, especially in practical communication, is restricted by its heavy emphasis on written and grammatical skills methods (Larsen-Freeman & Anderson, 2013).

Another key approach under the structural view is the Audio-Lingual Method (ALM), which is deeply rooted in behaviorist principles. It is one of the methods that involves discrete-point testing. Evaluations are connected to drills and pattern practice, gauging students' ability to respond accurately and automatically. Error correction is essential during lessons to prevent bad habits, with teachers correcting mistakes immediately, because this approach views errors as barriers to language mastery. The assessment in

ALM supports habit formation and accuracy through repetitive exercises and drills, emphasizing the importance of error correction for students to develop correct language habits and maintain accuracy in language production (Larsen-Freeman & Anderson, 2013).

Behaviorist and structural assessments have their advantages and disadvantages. On the positive side, they are straightforward, focusing on observable behavior and correct responses, making grading simple and transparent. They also provide immediate feedback, supporting well-timed correction of mistakes and measurable progress tracking for teachers. However, they often overlook students' ability to use language creatively and communicatively, emphasizing correctness over practical use. This approach can lead to challenges in real-world communication and may result in demotivating repetitive tasks, as students miss out on more meaningful, context-based learning experiences. To address these limitations, alternative theoretical perspectives, such as cognitivism and constructivism, emerged to provide a more comprehensive approach to language learning and assessment.

2.1.2.2 Functional View, Cognitivism, and Constructivism

Behaviourism's evolution highlighted cognition's role in conditioning, leading to 1960s cognitivism's focus on learning and memory. Key advancements included understanding intelligence dimensions, prior knowledge's impact, and metacognition, influencing diverse teaching strategies and memory enhancement techniques (Gráf, 2012). In cognitivism, learning involves mental processes, understanding, and conscious rule learning. This perspective encourages active engagement, allowing learners to utilize prior knowledge to process new linguistic input and form mental frameworks (Anderson, 1983). This perspective aligns with The Functional View, which regards language as a tool for expressing meaning rather than merely a system of rules.

A notable example of this perspective is the Cognitive Code Approach, which prioritizes understanding linguistic structures over rote memorization (Chastain, 1976). In this framework, assessment focuses on learners' comprehension and ability to apply grammatical rules in meaningful contexts. Tasks such as cloze tests and paraphrasing exercises evaluate cognitive engagement with language structures.

Similarly, The Silent Way, developed by Caleb Gattegno, emphasizes discovery learning, problem-solving, and the conscious processing of language rules, which are core principles of cognitivism. Opposite to assessment in behaviouristic methods, evaluation in the Silent Way involves continuous evaluation through observation and interaction, rather than formal tests. Teachers adjust their teaching based on real-time assessments of student needs, emphasizing the transfer of learning to new contexts. Teachers do not immediately correct errors, instead allowing students to self-correct and develop their own criteria for correctness. Peer correction is encouraged to create a cooperative learning atmosphere. The goal is meaningful development in independent language use; therefore, the assessment focuses on progress (Larsen-Freeman & Anderson, 2013).

Constructivist approaches further expand the Functional View by advocating for learner-centered instruction. Constructivism, as described by Von Glasersfeld (2012), promotes active engagement, social interaction, and scaffolded learning. Assessments in this paradigm are process-oriented, emphasizing self-reflection, collaboration, and real-world applications. Thus, assessment in constructivism is process-oriented, authentic, and interactive. It encourages ongoing feedback, collaboration, self-reflection, and the application of knowledge in real-world contexts. By aligning assessments with the learning process and focusing on meaningful tasks, constructivist assessment aims to foster deeper understanding and active engagement with learning.

2.1.2.3 Interactional View

The Interactional View sees language primarily as a means of communication and social interaction. This perspective aligns with humanistic approaches and communicative theories, which emphasize authentic language use and meaningful interaction.

The Natural Approach, developed by Krashen and Terrell (1983), is a key example of this view. It draws on behaviorism, cognitivism, and constructivism to foster language acquisition through meaningful interactions rather than rote learning or strict grammar rules. This approach emphasizes the process of natural language acquisition parallel to how children learn their first language, distinguishing between acquisition (the unconscious intake through meaningful communication) and learning (the conscious study of grammar). It prioritizes understanding spoken or written language, reducing explicit reinforcement typical of behaviorism. Emphasizing contextual engagement, the Natural Approach relies on social interactions instead of isolated drills. Accordingly, assessment is transformed from formal testing to evaluating genuine communication and language comprehension via low-pressure methods like group observations. Progress is measured by fluency and growth, acknowledging that mistakes are an essential part of learning. Techniques such as self and peer assessments increase motivation and awareness, aligning closely with Krashen's perspective on natural language acquisition and promoting holistic evaluations focused on context rather than isolated grammar mastery.

Richards and Rodgers (2001) note that the natural approach builds on the legacy of earlier methods like the Direct Method by promoting language learning in real communicative settings. In the Direct Method, assessment focuses on students' communication skills in the target language, instead of memorization. Both oral and written abilities are evaluated through practical tasks rather than traditional exams. Activities like forming full sentences, completing tasks with appropriate words, and dictation assess the application of language in real situations. Since Direct Method values communicative competence, where students

use language effectively for real communication, assessments prioritize practical application and active language use over passive information recall, encouraging students to learn through using the language actively (Larsen-Freeman & Anderson, 2013).

Krashen (1982) acknowledges Total Physical Response (TPR) as a method that complements the Natural Approach, especially in its use of comprehensible input for beginners. Assessment in TPR is primarily done through observing students' actions in response to commands. Teachers can provide immediate feedback on students' understanding by watching their physical responses. Evaluation in TPR is informal and ongoing, with the option for more formal assessment through individual commands. Advanced learners can display their understanding through skits and creative activities. The focus of assessment is on comprehension rather than accuracy or perfection, with errors corrected discreetly. This approach aims to reduce language learning anxiety and create a stress-free environment for assessment (Larsen-Freeman & Anderson, 2013).

Similarly, in Desuggestopedia, language learning is based on the emotional and personal needs of the learner. This method is considered to be based on humanistic approach, rather than natural approach. Evaluation in Desuggestopedia is conducted based on students' normal in-class performance, rather than through formal tests. This approach aligns with the method's goal of reducing psychological barriers and maintaining a relaxed atmosphere. Formal testing is avoided because it might create stress or anxiety, which could hinder the learning process. Instead, evaluation focuses on students' engagement and performance in natural, communicative activities during the class. The emphasis is on creating a stress-free environment where students are not pressured to perform but can demonstrate their learning through participation and interaction in the classroom (Larsen-Freeman & Anderson, 2013).

The evolution of learning theories and language teaching has increasingly emphasized communication skills. Theories such as behaviorism, cognitivism, constructivism, and the

natural approach have informed various teaching methods, underscoring language as a communication tool built through real-life interactions. This shift is evident in Communicative Language Teaching (CLT), which fosters student engagement, real-life language exploration, and communication skill development. CLT blends cognitive and natural approaches, prioritizing content over form and focusing on fluency and authentic activities to achieve communicative competence across proficiency levels (Gráf, 2012).

The communicative approach, with its emphasis on "language use" and practical competence, shifted the focus of assessment towards more holistic and meaningful evaluations (Brown, 2004). In contrast, Community Language Learning (CLL) emphasized assessments that support emotional well-being and personal growth, providing individualized feedback and encouraging reflective practices that help students internalize progress. Assessment in CLL focuses on individual progress, offering personalized feedback to boost confidence. Reflection on personal learning experiences is a key component, encouraging students to internalize their growth and adapt their strategies. By integrating emotional and cognitive dimensions, CLL ensures that assessments support both linguistic development and overall personal growth (Larsen-Freeman & Anderson, 2013).

Community Language Learning and Communicative Language Teaching share some similarities, such as emphasizing communication, being tolerant of errors, and focusing on student-centered approaches. Both prioritize real-world communication, with CLL adding a personal and emotional dimension. They also promote error tolerance, recognizing mistakes as part of the learning journey. However, they differ in assessment and teaching goals. CLL emphasizes holistic assessment, prioritizing emotional support and personal growth, while CLT focuses on communicative competence through task-based assessments like role-plays. Additionally, CLL aims to foster emotional well-being and individual development, whereas CLT centres on enhancing language proficiency for effective communication in social contexts.

2.1.3 Communicative Language Assessment

Assessment in the Communicative Language Teaching (CLT) approach prioritizes developing communicative competence and practical language use. Unlike traditional methods that focus on grammatical accuracy, CLT emphasizes effective communication through integrated tasks such as role-plays, problem-solving, and the use of authentic materials like newspaper articles. Errors are tolerated to encourage fluency, while self-assessment, peer assessment, and constructive feedback promote autonomy and improve communication. Continuous assessment through classroom observations ensures ongoing skill development. By focusing on real-world application, CLT assessment prepares learners for successful communication in the target language (Larsen-Freeman & Anderson, 2013).

Harding (2014) highlights that Morrow's (1979) paper was one of the key studies that shaped the field of communicative language testing in its early years. Although Morrow's work did not mark the beginning of this approach, it played a significant role in its development. He argued that language tests should be linked to real, practical tasks, should be based on the specific skills they aim to measure, and should not overly prioritize numerical scores (Harding, 2014). Emphasizing the human aspect of language testing, Morrow stressed the importance of face validity, the extent to which a test appears acceptable and relevant to test-takers, over purely statistical measures of reliability. However, early communicative tests in the UK did not sufficiently consider trustworthiness, relying instead on content coverage and perceived validity as indicators of test effectiveness (Ellis, 2003). These insights laid the foundation for a more holistic approach to communicative language testing, balancing statistical rigor with test-taker experience.

Although Morrow's work was highly influential, it was soon overshadowed by the publication of Canale and Swain's framework. Canale and Swain (1980) introduced the

concept of communicative competence, which highlights that language proficiency extends beyond grammatical knowledge. Their work provided a crucial theoretical foundation for communicative language teaching (CLT), emphasizing the importance of sociolinguistic and strategic competence alongside grammatical competence. This development marked a significant step forward in establishing a solid theoretical base for CLT (Harding, 2014).

Building on previous models, Bachman (1990) made significant contributions to the field of communicative language testing. He distinguished between two types of authenticity in testing: real-life authenticity, which involves tasks that closely mimic real-world language use, and interactional authenticity, which focuses on how language is used in testing and its relevance to scoring (Harding, 2014). Additionally, Bachman introduced the concept of strategic competence, referring to the higher-level cognitive processes that facilitate effective language use. Recognizing the importance of reliability, he also highlighted how psychometric methods could minimize errors in language assessment (Ellis, 2003). His model refined the understanding of communicative testing by emphasizing the need to assess both real-world tasks and the underlying cognitive and linguistic skills essential for effective communication (Harding, 2014).

While Bachman (1990) developed a theoretical framework that emphasized both linguistic competence and the context of language use in testing, Fulcher (2010) critiqued existing frameworks, such as the Common European Framework of Reference for Languages (CEFR), for being overly focused on observable behavior and task performance without adequately addressing the deeper theoretical aspects of language (Harding, 2014). In response, Fulcher (2010) outlined three key characteristics of communicative tests. First, tests should assess real-world language performance as accurately as possible, with tasks that closely reflect authentic situations. For example, a communicative language test for professionals might require candidates to write emails, participate in meetings, or give presentations, ensuring that the assessment aligns with real-life language use in the workplace. Second, test-takers should understand the purpose of the task and be able to

respond appropriately, with input that is not overly simplified. Finally, success in a communicative test should depend on whether the test-taker can complete the task effectively, mirroring real-life language use and outcomes (Ellis, 2003). For instance, in a speaking assessment for airline staff, a candidate might be required to handle a passenger's complaint or provide safety instructions, with success determined by their ability to communicate the necessary information clearly and appropriately in a realistic scenario. By emphasizing these principles, Fulcher contributed to a more practical and contextually grounded approach to communicative language testing.

Contemporary language testing largely integrates both real-life tasks and theoretical models, ensuring that assessments not only evaluate practical language use but also consider the underlying skills being measured and their influence on performance (Harding, 2014). The evolution of communicative language testing has been shaped by key scholars who emphasized the importance of aligning assessments with authentic communication. Morrow underscored the need for relevance in testing, while Canale and Swain introduced the foundational concept of communicative competence. Bachman further refined the notion of authenticity, distinguishing between real-life and interactional authenticity. Although some scholars have critiqued task-based frameworks for being overly focused on observable performance, the field has progressively moved towards a balanced integration of practical application and theoretical depth. As a result, modern communicative language tests strive to assess both real-world language use and the cognitive and linguistic skills essential for proficiency.

2.2 Teaching and Assessing Grammar

Grammar, as defined by Thornbury (1999), is the study of language structures, particularly focused on syntax (word order rules) and morphology (word formation rules). This system serves both a representational function, which describes the world, and an interpersonal

function, which facilitates communication. Grammar provides precise meanings that vocabulary alone cannot convey, such as how verb tense not only indicates timing but also expresses duration and completeness of actions. Similarly, Brown (2007) describes grammar as the system of rules governing the conventional arrangement and relationships of words in a sentence. These definitions underscore the importance of grammar instruction, which aims to teach students the rules and frameworks that regulate a language's syntax, morphology, and semantics. In the context of language teaching, the goal is to help students achieve a deep understanding of these rules to enable accurate and effective communication in the target language. However, effective grammar teaching is not only about instruction; it also requires appropriate assessment methods to evaluate students' grasp of these complex systems. Therefore, both teaching and assessing grammar are integral components of a comprehensive approach to language acquisition.

The matter of "how" to teach grammar has long been a subject of debate, resulting in the development of various methods over time. The evolution of teaching and assessing grammar has closely followed the changes in language teaching methodologies. As language education has moved from memorization and rule-based instruction to more communicative, the emphasis on grammar teaching and evaluation has shifted. This change reflects broader developments in second language acquisition, where the focus is no longer solely on mastering grammatical rules but on developing communicative competence. Consequently, grammar teaching and assessment practices have adapted to prioritize practical language use in real-world contexts.

2.2.1 Teaching Grammar

Teaching grammar has gone through various phases, with each approach offering a different way to understand and convey language structure. Purpura (2004) examines language through the lens of syntax and communication, highlighting the significant role

sentence structure plays in meaning-making. He explains how analyzing word placement can help learners grasp grammatical principles more clearly. One of the earliest methods, traditional grammar, focused on explicitly teaching form, meaning, and usage within sentences. It offered prescriptive rules, sometimes with exceptions, like how “I am” becomes “aren’t I” in negative tag questions. Unlike some syntactic theories that focus only on structure, traditional grammar also placed importance on understanding the meanings behind these forms and how they should be used correctly. Another approach, structural grammar, looks at language through morphology and syntax, categorizing words based on their function. Though it identifies language patterns, structural grammar doesn’t rely on rigid rules and emphasizes form over meaning (Purpura, 2004). These different methods highlight the range of approaches to grammar teaching, each contributing to our understanding of how to teach grammar effectively today.

Language learning theories present varied methods for teaching and assessing grammar while sharing similarities. Behaviorism focuses on repetition and drills (Skinner, 1957), while Cognitivism emphasizes understanding grammar rules as information processing (Anderson, 1983). In contrast, Constructivism, especially within Communicative Language Teaching, prioritizes interaction and practical tasks over rote learning (Richards & Rodgers, 2014). Sociocultural Theory also values social interaction but highlights the importance of teacher scaffolding for guided support (Vygotsky, 1978). While both Constructivism and Sociocultural Theory emphasize interaction, they differ in their focus on collaboration versus guided learning. These theories collectively offer a spectrum ranging from structured reinforcement to interactive learning approaches.

2.2.1.1 Key Concepts of Grammar Teaching

Grammar is a vital aspect of language which provides the rules and structures needed to communicate clearly and effectively. It involves the study of how words are formed

(morphology), how they are organized into sentences (syntax), how meaning is conveyed (semantics), and understanding how language is used appropriately in different contexts (pragmatics). These key concepts go hand in hand to create meaningful and accurate expressions. A strong understanding of grammar and grammar teaching not only improves communication but also supports the development of critical language skills. With that reason, it is crucial to explain and comprehend the key concepts of grammar teaching.

2.2.1.1.1 Prescriptive and Descriptive Perspectives of Grammar

Prescriptive and descriptive grammar represent two distinct approaches to understanding and teaching grammar. Prescriptive grammar focuses on rules and correctness, emphasizing the raw teaching of grammatical structures and error correction. It is often associated with teaching methods where grammar and writing are taught separately. In contrast, descriptive grammar centers on how language is used in real contexts, highlighting grammatical choices as a resource for meaning (Locke, 2009; Xavier, 2023).

In teaching, prescriptive and descriptive grammar have distinct roles and applications. Prescriptive grammar is often used in traditional language instruction. The focus is on teaching rules, correcting errors, and promoting accuracy. It is commonly applied through drills, exercises, and direct grammar instruction. On the other hand, descriptive grammar takes a contextualized approach. This emphasizes how grammar is used in real-life contexts. This approach integrates grammar with writing, encouraging learners to explore grammatical choices as tools for constructing meaning. By treating grammar as a resource to form meaning, descriptive grammar supports literacy development and helps students connect grammatical structures to purposeful expression in writing (Xavier, 2023).

Teaching methods are closely linked to the distinction between prescriptive and descriptive grammar. Traditional approaches, such as the Grammar-Translation Method, emphasize prescriptive grammar by focusing on strict rules and accuracy in language use. In contrast,

modern approaches like Communicative Language Teaching align more with descriptive grammar, prioritizing real-life communication and accepting natural variations in speech. In practice, many teachers adopt an eclectic approach, utilizing prescriptive grammar to establish foundational rules while incorporating descriptive grammar to enhance students' ability to use language effectively in authentic contexts. This balanced integration allows for both structural accuracy and communicative competence in language learning.

Overall, rather than viewing prescriptive and descriptive grammar as opposing forces, a balanced approach that integrates both perspectives can be more effective in language teaching. While prescriptive grammar provides learners with a strong foundation in accuracy and rule application, descriptive grammar allows them to explore language as a tool for meaningful communication. To enhance this balance, modern approaches increasingly focus on assessing and supporting learners dynamically, ensuring that grammar instruction is both structured and adaptive to individual needs.

2.2.1.1.2 Deductive and Inductive Teaching

Deductive and inductive teaching are two distinct approaches to grammar instruction, each with its own methodology and advantages. Deductive teaching is a structured, teacher-centered method that explicitly teaches grammar rules before practice. Aligned with traditional approaches, it emphasizes rule memorization, as seen in the grammar-translation method (Han, 2023). In a deductive teaching approach, the teacher first presents rules or general principles, then provides examples or allows for practice. For instance, a teacher might introduce the present perfect tense and then ask students to create their own sentences. This approach ensures efficiency, clarity, and structure, especially for beginners, but also may involve a lack of engagement or depth in understanding. As Han (2023) notes, it often fails to develop proficiency for practical language use.

Conversely, inductive teaching focuses on a learner-centered approach, promoting grammar rule inference through exposure and practice. It values immersion and interaction, fostering natural language use (Han, 2023). This teaching approach focuses on students discovering rules through examples, with the teacher guiding the process. Teachers present text or problems, allowing students to analyze and infer the underlying concepts. This method encourages critical thinking and active learning, and curiosity. However, it can be time-consuming and potentially confusing without proper guidance and may not effectively teach complex concepts directly. Also, challenges include difficulties in internalizing complex rules or correcting errors without sufficient direct guidance (Han, 2023). Purely inductive instruction can sometimes lead to inefficiencies, as learners may struggle to identify key grammatical rules without sufficient guidance. To address this limitation, Guided Discovery emerges as a structured alternative that balances inductive exploration with teacher facilitation.

Guided discovery is a learner-centered instructional approach that integrates elements of both inductive and deductive teaching methods. Rooted in Jerome Bruner's (1960s) theory of discovery learning, this approach emphasizes the active role of learners in constructing grammatical knowledge with the guidance of a teacher (Alcaraz Cárceles, 2018). Unlike traditional deductive methods, where rules are explicitly provided, or purely inductive methods, where learners infer rules without direct instruction, Guided Discovery balances these extremes by providing structured exposure to linguistic data, allowing learners to analyze and derive grammatical rules themselves (Caprario, 2013). This methodology enhances student engagement, fosters autonomy, and improves long-term retention of language structures (Alcaraz Cárceles, 2018).

By involving learners in the process of pattern recognition and hypothesis testing, this approach promotes critical thinking and problem-solving skills alongside language learning (Caprario, 2013). Moreover, Guided Discovery has been found to increase learner motivation by creating a cooperative and interactive learning environment, reducing the

passivity often associated with traditional grammar instruction (Alcaraz Cárceles, 2018). However, it also presents challenges, such as the time required for rule discovery and the risk of learners forming incorrect generalizations if not properly guided by the instructor (Alcaraz Cárceles, 2018).

Both deductive and inductive teaching methods and the guided discovery method have their own strengths, depending on the context. Deductive teaching works well when students need clear rules or facts quickly, while inductive teaching helps them develop a deeper understanding and critical thinking skills. Deductive methods provide structure and clarity, whereas inductive approaches make learning more engaging and practical. Despite these challenges, Guided discovery also remains a valuable approach when carefully implemented with well-designed instructional materials. An effective teacher strategically integrates those methods, considering factors such as the topic, students' proficiency level, and learning objectives. This balanced approach ensures that diverse learner needs are met, fostering both conceptual understanding and skill development.

2.2.1.1.3 Implicit and Explicit Teaching

While deductive and inductive teaching refers to how a concept or rule is introduced, explicit and implicit teaching refers to how directly or indirectly knowledge is taught. Both concepts deal with how students learn rules or concepts, but they are distinct. The first deals with the question of whether the student is taught the rule or discovers it. Teacher gives rules/examples (deductive) or facilitates discovery (inductive). In the latter one, the main focus is on whether the teaching is direct or indirect. The teacher either facilitates discovery (inductive) or guides directly (explicit) or creates exposure (implicit) (DeKeyser, 2003).

Building on this distinction, explicit grammar teaching involves a direct approach where grammatical structures and rules are openly explained to students. Teachers often use

deductive methods, starting with a clear presentation of rules followed by examples and guided practice. This method helps students understand and apply grammar systematically. Notably, explicit instruction is particularly effective when teaching complex linguistic structures, as it ensures clarity and precision in grammatical understanding (Spada & Tomita, 2010). It also plays a key role in contexts like writing, where structured explanations help students recognize and correct errors (Petraki & Hill, 2011). Han (2023) adds that the importance of directly teaching grammar rules is emphasized in traditional methods like the grammar-translation method, where students are explicitly taught grammatical rules and apply them through exercises and translations. He also criticizes approaches that eliminate direct grammar instruction, highlighting that grammar is essential for developing accurate communication skills.

Implicit grammar teaching, on the other hand, emphasizes learning grammar through natural exposure to language in meaningful contexts, rather than through direct instruction (Ellis, 2003; Han, 2023; Petraki & Hill, 2011). Teachers employing this approach often use inductive methods, encouraging students to deduce rules from examples and engage in activities like discussions, games, and pair work to internalize grammar. For instance, teachers might guide students to notice grammatical patterns in authentic texts or during conversational activities, which helps connect grammar to real-world communication. Implicit methods are valued for making grammar learning less intimidating and more engaging, particularly when students can see how grammar functions in everyday language use. By linking grammar with practical applications, teachers foster an environment where students learn through exploration and usage, rather than memorization alone (Petraki & Hill, 2011).

Implicit knowledge is the unconscious understanding of language that develops through exposure and experience, without focusing on rules. It involves automatic, unconscious processes. In contrast, explicit knowledge is consciously aware of language structures and requires active processing of rules. While explicit learning can help notice language forms,

it doesn't automatically become implicit knowledge. Through consistent practice and exposure, implicit knowledge develops over time, illustrating the importance of experience in language acquisition (Ellis, 2003).

The effectiveness of implicit learning has been explored in various experimental studies. For example, Reber's (1967, 1976, as cited in DeKeyser, 2003) artificial grammar experiments demonstrated that learners could acquire complex linguistic patterns without explicit awareness. Similarly, Levin's (1969, as cited in DeKeyser, 2003) study in the Swedish GUME project initially found no difference between implicit and explicit treatments for teaching ESL structures, though later studies suggested that explicit instruction may have had an advantage (DeKeyser, 2003)

Given these perspectives, it is also essential to consider the broader relationship between implicit and explicit knowledge. While implicit knowledge develops unconsciously through experience, explicit knowledge involves conscious awareness and active processing of rules (Ellis, 2003) The relationship between implicit and explicit knowledge has been widely debated, with different theories offering varying views on how the two types of knowledge interact. Some scholars, such as Krashen, Zobl, and Hulstijn, argue that explicit knowledge cannot become implicit, suggesting that the two remain separate. On the other hand, DeKeyser and Sharwood Smith support the idea of a strong connection, where explicit knowledge can transform into implicit knowledge over time (Ellis, 2003). Ellis (1994), however, proposes a weaker connection, arguing that while explicit knowledge doesn't directly become implicit, it can still help in implicit learning by focusing attention on important language features. This ongoing debate shows that the relationship between implicit and explicit knowledge is complex and not fully understood (Ellis, 2003).

The relationship between implicit and explicit teaching lies in how information or skills are transmitted to students, with each approach offering unique strengths and serving different

purposes in the learning process. Both methods are important in education, and when used together, they can enhance students' learning experiences. These methods can complement each other in the classroom. Explicit teaching provides clarity and structure, while implicit teaching supports deeper understanding and retention by engaging students in real-world contexts. Often, teachers use a combination of both to enhance learning, moving from explicit instruction to opportunities for students to practice and internalize skills implicitly.

In second language (L2) contexts, implicit learning is often facilitated through communicative tasks that provide opportunities for authentic language use (Ellis, 2003). As Prabhu (1987) states, acquiring proficiency in a second language requires implementing situations in which learners can actively participate in communication, rather than solely relying on structured lessons or repetition. Thus, implicit grammar instruction is deeply intertwined with task-based language teaching methodologies, prioritizing natural exposure over explicit rule instruction (Ellis, 2003). Explicit grammar teaching involves a conscious focus on language rules, allowing learners to verbalize their knowledge. This approach, based on the idea that explicit knowledge supports learning processes like noticing and comparing linguistic features, helps adult learners understand grammar structures. While explicit knowledge does not directly lead to implicit knowledge, it complements implicit learning by increasing awareness and providing structured practice. Overall, explicit instruction serves as an essential component in language learning for adults (Ellis, 2003).

Research on explicit and implicit grammar teaching has diverse findings, highlighting the strengths and limitations of both approaches. Studies such as Akakura (2012, 2012, cited in Şahinkaya, 2024) and Ebadi, Saad, and Abedalaziz (2014) emphasize the advantages of explicit instruction in fostering grammatical knowledge, while others, including Soleimani, Jahangiri, and Gohar (2015), suggest that explicit and implicit teaching can be equally effective, particularly in developing fluency. Ling (2015) further supports this perspective, indicating that while explicit instruction enhances grammatical accuracy, implicit methods contribute to more interactive and communicative proficiency. Consequently, these

findings suggest that grammar instruction should not rely solely on one method but rather integrate explicit and implicit approaches based on learners' needs and linguistic objectives (Şahinkaya, 2024).

While explicit and implicit teaching are distinct approaches, they complement each other in a balanced and effective learning environment. A blend of both methods allows students to gain deep, lasting knowledge while also providing structure and clarity in the learning process. To illustrate, the teacher explains the grammar rule for the present continuous tense and gives students examples to understand the structure, which is the explicit part. Later, students listen to or read a passage where they encounter the tense in context, and they internalize how the tense works through real usage. Explicit teaching is critical for clarity and structure, ensuring that students have a solid understanding of the core content. In contrast, implicit teaching fosters deeper, more intuitive learning through application and experience, which often leads to better retention and practical skill development. Combining both approaches effectively enhances the learning experience, providing students with a well-rounded and engaging education.

Comprehending implicit and explicit instruction is crucial. Similarly, understanding the relationship between deductive/inductive teaching and explicit/implicit teaching and differentiating them is also necessary. While they share similarities, they are not identical concepts. To clarify, deductive teaching follows a rule-driven approach where the teacher provides the rule or concept upfront, making it inherently explicit (Jean & Simard, 2013). In deductive teaching, the teacher explicitly states the rule or principle before providing examples or practice, ensuring a direct and structured learning process (Jean & Simard, 2013). Since the rule is clearly stated at the beginning, deductive teaching is both deductive and explicit. Conversely, inductive teaching can be either explicit or implicit, depending on the level of guidance provided by the teacher. If the teacher offers structured examples and actively guides students in discovering the rule, this approach is both explicit and inductive (Jean & Simard, 2013). However, if students are exposed to examples without direct

guidance and infer the rule on their own through repeated exposure and contextual understanding, the approach becomes implicit and inductive (Tammenga-Helmantel, Arends, & Canrinus, 2014).

This discussion has significant implications for instructional approaches that seek to bridge explicit and implicit learning. In educational settings that prioritize adaptive and individualized learning, innovative methodologies leverage both explicit instruction and opportunities for guided discovery. By incorporating real-time feedback and scaffolded support, such approaches foster deeper engagement while ensuring conceptual clarity. These strategies illustrate the evolving nature of language instruction, where dynamic assessment and mediated learning experiences play an increasing role in shaping effective pedagogical frameworks.

2.2.1.2 Teaching Grammar in Diverse Language Methods

Grammar instruction has evolved significantly over time, reflecting different language teaching methodologies. Canale and Swain (1980) classify second language teaching into two primary approaches: grammatical and communicative. Before the rise of communicative language teaching, earlier methods placed a strong emphasis on grammar, aligning with behaviourist and structuralist perspectives. In traditional methods, grammar is the primary focus, and students are assessed mainly on their ability to apply rules in controlled exercises. Hence, some of the earliest methods followed the idea of prioritizing grammar.

In the GTM, grammar is taught deductively, which means that learners are first presented with the rules of grammar before they engage in producing sentences (Larsen-Freeman, 2000). Students are expected to master grammatical rules through deductive learning, and assessment is typically based on written tasks such as translations and grammatical

exercises. The method prioritizes written language and accuracy over communication, with little to no emphasis on speaking or listening skills.

Direct Method, on the other hand, expects students to focus on oral communication and use grammar as a tool for that, which means there is no deductive teaching. As Larsen-Freeman and Anderson (2013) emphasized, in Direct Method, students learn grammar structures by being exposed to them in context. Through repetition, drills, and the use of visual aids, learners acquire grammatical forms naturally, similar to how they would learn their first language. The emphasis is on speaking and listening, with grammar being absorbed through usage rather than memorized rules.

Conversely, the Audio-Lingual Method employs an inductive approach to teaching grammar. This is the exact opposite of GTM; however, grammar is still viewed as an important part of language learning in both of these methods unlike Direct Method. ALM places greater emphasis on habit formation and pattern drilling for reinforcement. Grammar is taught through repetition and practice, aiming for automatic language use. However, little focus is placed on communication function (Larsen-Freeman & Anderson, 2013), which shows a small shift away from earliest methods' perception on language learning.

The same as ALM, students discover grammar rules on their own instead of being taught explicitly in the Silent Way. This method emphasizes learner-centered language acquisition, with minimal teacher intervention and a focus on self-discovery, problem-solving, and self-correction. Tools are used to help learners connect forms and meanings. The approach emphasizes autonomy and learner-centered learning, with a focus on creativity and accuracy in language use (Richards & Rodgers, 2001). Unlike the Grammar Translation Method's focus on translation and grammar rules, the Direct Method's emphasis on immersive conversation, and the Audio-Lingual Method's habit-forming

drills, the Silent Way centres on learner autonomy, problem-solving, and self-correction to internalize language.

Similarly, in Desuggestopedia, grammar is learned through indirect exposure, where students are not explicitly taught rules. The teacher uses a variety of techniques such as music, relaxation, and dramatic readings to create a positive learning atmosphere that encourages passive language intake (Larsen-Freeman & Anderson, 2013).

In Total Physical Response, grammar is learned through physical activity and commands. The method uses students' physical responses to language as a means of reinforcing grammatical structures. Grammar is learned inductively through association with physical actions, and errors are not heavily corrected. The method emphasizes listening and comprehension, and assessment is based on how well students follow and perform tasks in the target language (Larsen-Freeman & Anderson, 2013). The TPR method contrasts with earlier methods like the Grammar Translation Method, Direct Method, and Audio-Lingual Method in its unique emphasis on physical activity as a medium for language learning. Unlike the GTM, which focuses on translating written texts and understanding rules, TPR relies on kinaesthetic learning and comprehension through movement. Compared to the Direct Method, which prioritizes immersive conversation, TPR emphasizes listening and action rather than speaking from the start. While the Audio-Lingual Method uses repetitive drills to form habits, TPR employs physical responses to commands to inductively reinforce grammar. TPR minimizes error correction and builds comprehension before production, creating a stress-free learning environment distinct from the rigid structures of earlier approaches.

In short, Grammar teaching has changed a lot over time, with different methods used before communicative language teaching became common. Earlier methods focused on teaching grammar rules clearly and practicing them step by step to help students learn. A popular method was the present-practice-produce (PPP) model, where students first

learned the rules, practiced them, and then used them in real-life situations. This framework focuses on presenting grammatical features, practicing them in controlled settings, and encouraging their application in freer production (Larsen-Freeman, 2001; Ellis, 2003). To begin with, the teacher provides an explanation of the grammar structure. Next, students engage in activities like drills to practice these structures. Lastly, students are asked to utilize that grammar structure for communication (Larsen-Freeman, 2009). ALM is a significant example where PPP took place, in this method grammar and structures are presented, practiced through repetitive drills (practice), and then applied in controlled dialogues or scripted interactions (production). The PPP framework is particularly suited for methods prioritizing clear progression, such as when teaching beginner or lower-intermediate learners. It is less prominent in methods like Total Physical Response or the Silent Way, which focus on inductive learning and student-driven discovery of rules.

Despite its popularity, the PPP model has been critiqued for several aspects of it. Larsen-Freeman (2009) states that even though there were many learners that were taught this way, students have difficulties when it comes to producing in PPP procedure. First issue was its assumption that language is acquired sequentially as discrete products rather than through dynamic processes like interlanguage development (Ellis, 2003). Accordingly, while PPP emphasizes grammar, it neglects fluency, causing struggles in real-world interaction. Grammar is often taught in isolation, failing to reflect real-life usage, hindering meaningful application. Then, it fosters teacher-centered instruction, making learning passive and limiting student exploration. This inflexible framework might not be appropriate for every student or language concept, so the method fails to be an adequate way to teach grammar.

In the 1970s, there was a shift away from traditional language teaching methods. The importance of knowing how to use language in different situations was emphasized. While traditional approaches focus on grammatical competence, which is solely about using the

correct form, new “communicative approach” embraced communicative competence to use grammar as a tool, not the primary goal (Richards, 2006). This shift led to a transformation in both language teaching methodologies and the approach to grammar instruction.

Before the rise of the Communicative Approach, grammar teaching was shaped by structural and cognitive paradigms. Noam Chomsky's *Syntactic Structures* (1957) introduced Transformational-Generative Grammar, emphasizing rule-based systems for sentence generation and shifting focus from pattern recognition to cognitive processes. His critique of behaviorism, particularly in his 1959 review of Skinner's *Verbal Behaviour*, highlighted the role of cognition in language use. Chomsky's distinction between competence (linguistic knowledge) and performance (language use in context), elaborated in *Aspects of the Theory of Syntax* (1965), reflected a formalist approach. These ideas, influenced by Saussure's *langue* and *parole*, prioritized structural descriptions over communicative functionality, setting the stage for later shifts toward meaning and interaction in language teaching (Howatt, 1984).

2.2.1.3 Teaching Grammar Communicatively

The teaching of grammar has traditionally focused on the structural and rule-based aspects of language, emphasizing how sentences are composed and their linguistic cohesion. However, this approach often overlooks the practical use of grammar in authentic communicative contexts. In contrast, communicative language teaching shifts the focus toward the use of language as a tool for real-world communication, prioritizing learners' ability to function effectively in specific contexts (Howatt, 1984).

Communicative Language Teaching (CLT) views grammar as a useful tool for effective communication within real-life situations, focusing on integrating it into contexts and improving communicative skills. Grammar is taught through communicative tasks, focusing on fluency over accuracy, by reflecting on authentic language use in an inductive

way. Mistakes are accepted as long as they don't hinder communication, and evaluation focuses on using language effectively in different situations, not just on grammatical understanding. Engaging in activities like role-playing and problem-solving provides authentic chances for assessment (Larsen-Freeman & Anderson, 2013).

Teaching grammar communicatively addresses this need by linking grammatical knowledge to its functional application in meaningful discourse (Howatt, 1984). According to Ettaleb (2021), the communicative approach to language teaching is based on two important theories: Piaget's Cognitive Constructionism Theory and Vygotsky's Sociocultural Theory. Cognitive Constructionism Theory explains that people learn by thinking and solving problems, building their knowledge step by step. It focuses on how learners make sense of things on their own. Sociocultural Theory, on the other hand, shows how learning happens through social interactions and cultural influences. It emphasizes the importance of talking, working with others, and learning from shared experiences. These two ideas shape the way grammar is taught in the communicative approach, making it more about real conversations and meaningful communication instead of just memorizing rules.

Although CLT shares a similar goal with earlier methods like the audiolingual approach, it differs significantly in its theoretical foundation. Unlike those earlier methods, which focused on language as a collection of linguistic systems such as grammar, vocabulary, and phonology, CLT is rooted in a functional view of language and the concept of communicative competence (Ellis, 2003).

Widdowson's development of syllabuses based on rhetorical acts, such as definition and classification, highlights how grammar can serve specific communicative purposes. This approach aligns with the 'strong' version of communicative language teaching, which posits that language acquisition occurs through communication itself. Activities such as role-plays, information-gap tasks, and simulations exemplify this method by embedding

grammar instruction in interactive and authentic language use. This dual emphasis on structure and function ensures that learners not only learn grammar but also develop the ability to apply it effectively in real-life communication (Howatt, 1984).

Moreover, CLT moves away from solely studying grammatical rules to comprehending language use in communication, advancing from easier to more intricate expressions over time. Real materials and exercises such as jumbled sentences are used to highlight the connection and flow of ideas, improving students' ability to communicate effectively (Larsen-Freeman, 2000). This method highlights how crucial it is for students to use language in real-life situations, allowing them to apply grammar effectively in practical conversations.

However, challenges arise in ensuring learners' focus on target structures during communicative tasks without returning to form-driven exercises. To address this, integrated task cycles—comprising pre-task, task, and language focus phases—offer opportunities to balance attention to form and meaning. This aligns with research emphasizing that meaningful interaction, coupled with a strategic focus on grammar, facilitates both fluency and accuracy in language use (Ellis, 2023).

Traditionally, the Communicative Approach (CA) in language teaching has prioritized meaning-focused activities, often at the expense of explicit grammar instruction (Spada, 2008). Early implementations of this approach largely neglected form-focused instruction (FFI), assuming that grammatical accuracy would emerge naturally through exposure and communication. However, certain grammatical structures fail to emerge without explicit instruction, necessitating a more balanced approach that integrates both meaning-based and form-focused activities (Spada, 2008). Nassaji (2000) similarly critiques early communicative approaches for undervaluing grammar teaching, arguing that integrating FFI within communicative contexts is essential for fostering both fluency and accuracy. While some educators maintain a strict separation between grammar-focused and

communicative activities, research increasingly supports the effectiveness of combining these elements to optimize language learning outcomes (Nassaji, 2000).

The integration of FFI within the Communicative Language Teaching (CLT) framework has been shown to enhance students' grammatical competence, communicative abilities, and overall engagement in language learning. Woymo, Bachore & Jobo (2024) found that incorporating FFI with communicative grammar activities, such as information-gap, opinion-gap, and reasoning-gap tasks, significantly improved students' speaking fluency while fostering positive cognitive and behavioural attitudes toward speaking lessons. Similarly, Tianli et al. (2021) reported that CLT-based instruction increased students' confidence, participation, and comprehension of grammatical structures through interactive oral activities. Comparative studies further suggest that CLT is more effective than traditional grammar-focused instruction, as it not only raises students' awareness of grammatical forms but also integrates meaningful language use, resulting in more dynamic classroom interactions (Kong, 2016, as cited in Tianli et al., 2021). These findings align with Ellis's (2006) assertion that grammar instruction should direct learners' attention to specific linguistic forms in ways that facilitate both comprehension and production, ensuring that students develop accuracy without sacrificing fluency.

Empirical research further supports the effectiveness of the communicative approach in fostering linguistic accuracy and fluency. Tsulaia (2021) conducted an experimental study demonstrating that students taught using a communicative approach exhibited substantial improvements in both grammatical accuracy and oral fluency, with statistical analyses confirming the method's effectiveness. Additionally, students reported positive attitudes toward this instructional approach, emphasizing its motivational impact and its role in reducing anxiety through interactive and cooperative learning activities. Given Tsulaia's (2021) empirical results, the communicative approach emerges as a promising alternative to traditional grammar teaching, offering a pedagogical framework that fosters both linguistic accuracy and fluency in English as a Foreign Language (EFL) classrooms.

In summary, the communicative approach to grammar instruction bridges traditional grammar teaching methods with communicative strategies, fostering linguistic competence that is both correct and contextually appropriate. By integrating form-focused instruction within meaningful communicative contexts, this approach accommodates the developmental needs of second language learners while ensuring that grammatical structures are effectively internalized. Furthermore, empirical studies affirm that a balanced approach, which strategically incorporates explicit grammar instruction within interactive, communicative tasks, leads to improved language learning outcomes. Ultimately, aligning grammar instruction with communicative principles offers a more comprehensive and practical framework for second language acquisition, supporting learners in achieving both fluency and accuracy.

2.2.1.3.1 Focus on Forms, Focus on Meaning, Focus on Form

Grammar instruction in second language acquisition has been a widely discussed topic, giving rise to three major approaches that reflect how attention is directed toward language use and learning: Focus on Forms (FonFS), Focus on Meaning (FonM), and Focus on Form (FonF) are three different approaches. These approaches differ in their emphasis on linguistic structures, meaning, and the integration of form within communication. Understanding their theoretical foundations, pedagogical implications, and empirical support is crucial for determining their effectiveness in language instruction.

The focus-on-forms approach is rooted in traditional grammar-based instruction, where language is taught through discrete linguistic elements presented in a sequential manner, emphasizing explicit teaching of grammatical structures, vocabulary, and linguistic elements. This method typically follows a structured syllabus and a presentation-practice-production (PPP) framework, where learners are introduced to rules, engage in controlled exercises, and eventually attempt production (Ellis, 2016). By providing clear and

systematic exposure to grammar, FonFS enhances learners' metalinguistic awareness and benefits beginners who require explicit instruction (Long, 1998). However, this approach has been widely criticized for its lack of communicative engagement. Research suggests that while FonFS supports accuracy, it does not effectively promote fluency or spontaneous language use (Uysal & Bardakçı, 2014). While it enhances metalinguistic awareness and is beneficial for beginners, it often overlooks communicative language skills and may limit practical application in real-world contexts.

Long (1998) highlights six primary concerns regarding FonFS. Firstly, there is a deficiency in customized assessments, leading to unengaging content that does not meet learners' needs. Then, relying on linguistic grading leads to artificial materials that hinder authentic language use, while outdated teaching models also reduce effectiveness. Moreover, failing to consider input from learners during curriculum development can lead to discrepancies between teaching methods and the natural process of acquiring knowledge. These problems lead to boring lessons, decreasing student motivation and involvement. In addition, there is frequently too much focus on particular techniques, failing to recognize that successful language learning can happen through a variety of methods, irrespective of the method chosen.

Long (1988) later introduces the second alternative, the focus-on-meaning approach, which values learners and their learning processes. FonM shifts attention away from explicit grammar instruction and emphasizes language acquisition through exposure to comprehensible input. Inspired by Krashen and Terrell's (1983) Natural Approach, FonM assumes that learners develop grammatical competence naturally when they are immersed in meaningful communication (Ellis, 2015). FonM focuses on communication and meaning over grammar, and the activities in FonM promote message understanding and natural language use, prioritizing fluency and communicative competence by encouraging interaction without an emphasis on correctness.

However, while FonM is effective in promoting natural language use, research has shown that it may lead to the fossilization of incorrect linguistic forms (Doughty & Williams, 1998, as cited in Uysal & Bardakci, 2014). Overemphasis on communication with zero weight on accuracy may lead to persistent errors and a lack of accuracy if not addressed. Long (1998) further critiques FonM for its inefficiency in helping learners develop native-like proficiency, as exposure alone is not always sufficient for acquiring complex grammatical structures. Additionally, the lack of explicit instruction can make it difficult for learners to notice and correct persistent errors, leading to gaps in linguistic accuracy. This suggests that while FonM plays a crucial role in SLA, it may not be sufficient on its own. Despite its benefits, challenges include lack of personalized curriculum guidance, potential maturational constraints on language learning, difficulty achieving native-like proficiency, challenges in learning certain language contrasts solely from exposure, and inefficiency compared to approaches addressing language structure.

As a middle ground between FonFS and FonM, the focus-on-form approach integrates grammar instruction within communicative contexts, emphasizing noticing language forms like grammar, vocabulary, and pronunciation during meaningful communication or content study (Larsen-Freeman, 2009). FonF involves briefly directing students' attention to linguistic elements in context as they arise incidentally during lessons primarily focused on meaning or communication, therefore it allows for a flexible and responsive teaching style. Unlike FonFS, it does not follow a strict syllabus; instead, grammar instruction emerges naturally as learners engage in communication (Ellis, 2016). Grammar focus arises naturally during activities, with minimal teacher intervention for corrections that enhance understanding. The aim is to merge accuracy and fluency. For instance, in a role-play, a teacher may gently remind a student to use "goes" instead of "go." This approach prevents error fossilization while prioritizing communication.

Empirical evidence supports the effectiveness of FonF. Studies have shown that FonF enhances both accuracy and fluency by prompting learners to notice and process

grammatical structures in meaningful contexts (Norris & Ortega, 2000, as cited in Gu, 2007). Techniques such as corrective feedback, and pre-emptive form-focused instruction help learners refine their interlanguage, preventing fossilization while maintaining communicative engagement (Ellis, 2015). Larsen-Freeman (2009) highlights how FonF encourages learners to become more conscious of linguistic forms without disrupting the flow of conversation. For example, a teacher might gently correct a student's verb conjugation error during a role-play activity, reinforcing grammar without detracting from the communicative purpose. This dynamic approach makes FonF highly adaptable to different classroom contexts and learner needs, offering a practical solution to the accuracy-fluency dilemma. Given its ability to balance form and meaning, FonF is widely acknowledged as an effective approach in SLA (Spada & Lightbown, 2008, as cited in Uysal & Bardakci, 2014).

The integration of form-focused instruction within a communicative context is considered to be beneficial for language learning. Drawing attention to linguistic forms during communicative tasks, facilitating form-meaning mapping and incidental learning enhances learning outcomes and aligns with natural language acquisition processes. Additionally, this approach is adaptable to various teaching methods and learner needs. Overall, the integration of form-focused instruction within communicative language teaching is essential, as it combines the strengths of FonFS and FonM for more effective language acquisition (Ellis, 2016; Long, 1998).

These three approaches differ in their primary goals, teaching styles, and potential limitations. Focus on Forms emphasizes accuracy through explicit, structured instruction, often relying on drills and exercises. In contrast, Focus on Meaning prioritizes fluency and communication, encouraging learners to use language naturally without explicit attention to grammatical correctness. FonF blends the two, integrating accuracy and fluency by drawing attention to linguistic forms during meaningful communication, often through context-sensitive corrections. While FonFS can neglect communication, FonM may lead to

fossilized errors. FonF aims to balance the strengths of both approaches, though achieving this balance can be challenging. These three approaches are important in language and grammar teaching because they reflect different ways of balancing the two key aspects of language learning: accuracy (the correct use of grammar) and fluency (the ability to use language effectively in communication).

Recent research has extensively examined the differential effects of FonF, FonFs, and FonM instruction in second language acquisition. Empirical findings suggest that FonF instruction, which integrates learners' attention to linguistic features within meaningful communication, is significantly more effective than both FonFs and FonM in fostering productive knowledge of target grammatical structures (Oyama, 2017). Specifically, explicit FonF instruction has been shown to enhance accuracy in written tasks, with learners outperforming those in FonFs and FonM conditions (Oyama, 2017). Although FonFs instruction, which entails decontextualized grammar practice, contributes to grammatical accuracy, its effects are less pronounced compared to FonF, particularly in terms of long-term retention (Gümüş, 2021).

Additionally, learners exposed to FonF instruction reported superior retention of grammatical structures due to its contextualized nature, while those receiving Focus on Forms instruction encountered difficulties in applying learned forms in meaningful contexts (Gümüş, 2021). Meanwhile, Focus on Meaning, which prioritizes meaning-based communication without explicit focus on form, resulted in the least improvement, with no significant difference observed between immediate and delayed post-tests (Oyama, 2017). These findings highlight the pedagogical advantages of Focus on Form instruction, particularly in achieving both grammatical accuracy and long-term retention in second language learning.

Several studies have investigated the impact of FonF, FonFs, and FonM on second language acquisition, providing further insights into their effectiveness. Saito (2012)

compared FonF and FonFs, and the research reported that FonF led to significant improvements in both controlled and spontaneous speech, whereas FonFs only facilitated gains in controlled contexts. In contrast, the FonM group exhibited no measurable progress. Furthermore, Ellis, Loewen, and Erlam (2006) examined the role of corrective feedback and found that metalinguistic explanations were more effective than implicit recasts in fostering long-term grammatical development. Collectively, these findings indicate that while meaning-focused instruction alone is insufficient for linguistic development, integrating with focus on form, particularly through explicit feedback and metalinguistic explanations, can enhance second language acquisition outcomes.

2.2.1.3.2 The Three-Dimensional Grammar Framework

The Three-Dimensional Grammar Framework (TDGF), introduced by Diane Larsen-Freeman in the late 20th century, provides a holistic perspective on grammar by integrating three core dimensions (Zhang & Tang, 2025). Traditional approaches often view grammar as a set of rules to be learned, whereas modern approaches consider grammar to be a more dynamic and multidimensional phenomenon. Until the 1970s, structuralism emphasized form-based instruction, neglecting meaning and communicative functions. With the rise of communicative language teaching, the focus shifted to meaning, though the exclusion of form-based teaching led to inaccuracies in language use. Larsen-Freeman's three-dimensional grammar theory integrates form, meaning, and use, offering a holistic and student-centered approach that significantly enhances language proficiency (Zhang & Tang, 2025).

Form involves language structure, including morphemes and syntax, while *meaning* pertains to lexical and grammatical aspects. And *use* addresses language appropriateness in social contexts and communicative intentions. (Zhang & Tang, 2025). Unlike traditional grammar teaching methods that isolate these components, TDGF emphasizes their

interconnectedness, advocating for an integrated instructional approach (Larsen-Freeman, 2015). Consequently, this theory shifts the perception of grammar from a static system of rules to a dynamic structure that evolves with use and context.

Form relates to accurately shaping the language unit (Larsen-Freeman, 2001), and it consists of visible or audible elements such as sounds, written symbols, words, and grammatical structures. Linguistic analysis has traditionally placed a strong emphasis on form as the core of grammar, focusing on how words and sentence structures are organized according to specific rules (Larsen-Freeman, 2003). This approach aligns with structuralist and generative grammar frameworks, where form is seen as a set of syntactic and morphological patterns that exist independently of meaning and use. However, more contemporary perspectives, such as cognitive and functional linguistics, suggest that forms are not just abstract patterns but are deeply influenced by meaning and social interaction (Bourdieu, 1991, as cited in Larsen-Freeman, 2003). Despite these shifts in understanding, form continues to play a critical role in grammar instruction. It offers learners the necessary structure to produce grammatically correct sentences. Although focusing too much on rules can sometimes impede fluency and communicative competence, having a solid grasp of form remains vital for achieving linguistic accuracy and control.

On the other hand, *meaning* refers to what the unit represents (Larsen-Freeman, 2001). This dimension deals with the dictionary meanings of words or language units. Larsen-Freeman (2003) argues that language functions as a tool for conveying meaning and messages, highlighting its integrated nature in discourse rather than as a collection of isolated structures. However, meaning is not just the dictionary definition of a word, it can change according to context and usage. It is a dynamic potential realized through interaction. Meaning is not fixed; it is shaped by the context in which it is used and the pragmatic choices of speakers, as the intended meaning often differs from the literal interpretation of words (Larsen-Freeman, 2003).

The last one, *use*, is about the situation in which the unit is necessary (Larsen-Freeman, 2001). The concept of "use" in grammar goes beyond structural accuracy, encompassing both semantic and pragmatic appropriateness. It examines the social functions of language and what it means in context. Unlike approaches that rely on frequency-based exposure or rote memorization, effective use of grammar requires learners to make informed linguistic choices based on the context in which they are communicating (Larsen-Freeman, 2003). To build this skill, students must engage in activities that involve selecting between different grammatical structures and receiving feedback on their appropriateness in specific contexts (Larsen-Freeman, 2003). Incorrect pragmatic usage can lead to a misunderstanding of language learners' intentions (Larsen-Freeman, 2003); therefore, integrating grammatical use into language instruction is crucial, as it helps bridge the gap between knowing grammatical forms and effectively using them to communicate in real-life interactions.

TDGF is closely linked to various teaching theories, aiming to bridge gaps found in traditional methods while aligning with contemporary educational practices. To begin with, the Grammar Translation Method emphasized form by teaching grammar rules and vocabulary through direct instruction and translation exercises. Students were expected to memorize structures and apply them in written translations. However, it avoids meaning and use, which makes learners proficient in rules but ineffective communicators. The audio-lingual method also prioritized form through repetition and drills. Students practiced language patterns repeatedly to achieve automaticity, and overemphasis on mimicry and drilling overlooked learners' understanding of meaning and their ability to apply knowledge dynamically in real-world contexts (use). By integrating meaning and use, the Three-Dimensional Grammar Framework ensures grammar is taught not as isolated structures but as tools for communication. While TDGF values practice, it enriches this with contextualized exercises that emphasize semantics and pragmatics (Zhang & Tang, 2025).

Later approaches, such as Communicative Language Teaching, shift the focus from form. CLT revolutionized language teaching by emphasizing use, the ability to communicate effectively in real-life situations. Task-Based Language Teaching emphasizes completing real-world tasks to learn a language naturally, focusing on use and, to a minor extent, meaning. Nonetheless, they often neglect form, leading to inaccuracies in grammar. The Three-Dimensional Grammar Framework complements these approaches by ensuring tasks include attention to form, as well as its connection to meaning and use (Zhang & Tang, 2025). It combines form-focused methods with communication-oriented approaches, ensuring accuracy, understanding, and practicality, thereby addressing previous limitations and promoting an effective grammar teaching approach for academic and real-world communication.

TDGF's holistic nature makes it inherently eclectic. By integrating form, meaning, and use, it aligns with various methodologies, providing flexibility to address different teaching goals and learner profiles. These three dimensions are interconnected like parts of a whole; therefore, a change in one dimension affects the others. In order to fully understand a language unit, these three dimensions must be considered together (Larsen-Freeman, 2003). This framework helps teachers teach grammar more effectively. By analysing these three dimensions before teaching a structure, the teacher can decide which points to teach (Larsen-Freeman, 2001).

Language teaching methods generally focus on one of these three dimensions and may neglect the others. Teachers should consider these dimensions in a balanced way and be selective by focusing on the point where students will have the most difficulty (Larsen-Freeman, 2003). By following this approach, grammar teaching can move away from being purely rule-based and instead become more communicative and relevant (Larsen-Freeman, 2001).

Larsen-Freeman (2001) stresses the importance of meaningful practice when teaching form, as it helps students use what they learn in the classroom in real-life situations. Similarly, DeKeyser (1998) explains that meaningful practice is essential for turning knowledge into practical skills. For teaching meaning, Larsen-Freeman (2001) suggests using visuals, real objects, and actions (like in the Total Physical Response method) to help students understand the meaning of language. Celce-Murcia and Hilles (1988) recommend similar strategies, and Ellis (1998) supports methods that link form to meaning. For teaching use, Larsen-Freeman (2001) proposes role-play activities, allowing students to practice language in social settings by considering factors like social distance. Together, these approaches address the three key aspects of grammar teaching: form, meaning, and use (Yılmaz, 2018).

Among the three dimensions, use plays a crucial role in ensuring that learners can apply grammatical structures effectively in authentic contexts. Pragmatic competence, which involves understanding how and when to use specific linguistic forms, is essential for achieving communicative success (Zhang & Tang, 2025). This approach not only improves grammatical fluency but also fosters learners' ability to navigate diverse linguistic environments with confidence. Consequently, the inclusion of use within grammar instruction enhances both communicative effectiveness and overall language proficiency.

"Grammar in use" refers to the practical use of grammar rules in everyday communication, such as correctly applying verb tenses, sentence structures, and other language patterns while speaking or writing (Larsen-Freeman, 2003). It focuses on helping learners use grammar naturally and effectively in real-life situations rather than just memorizing rules or completing exercises. This approach encourages active practice and application, making grammar a tool for clear and meaningful communication instead of just a set of abstract concepts.

The concept of "grammar in use" aligns closely with the use dimension of the three-dimensional framework, emphasizing grammar as a tool for effective communication rather than as an abstract set of rules. It emphasizes practicality by focusing on how grammar operates in everyday language, connecting rules and meanings for real-world application (Celce-Murcia & Larsen-Freeman, 2015; Larsen-Freeman, 2003). Therefore, grammar in use balances form and meaning to enhance communication effectiveness. For example, it clarifies the difference between "I work" (habitual action) and "I am working" (ongoing action) in terms of their grammatical forms and appropriate contexts. The three-dimensional grammar framework supports teaching methods like "grammar in use," enabling teachers to help students relate grammatical structures to real-life usage and meanings.

Recent research underscores the importance of integrating grammatical accuracy with pragmatic competence in second language acquisition, aligning closely with the "grammar in use" perspective, which emphasizes the practical application of grammar for effective communication. Schauer (2006), in a mixed-methods study involving 53 ESL and EFL learners, investigated the interaction between grammatical and pragmatic awareness through questionnaires and follow-up interviews. The study revealed that ESL learners, benefitting from immersive environments, demonstrated greater sensitivity to pragmatic errors, whereas EFL learners, whose learning was largely classroom-based, showed stronger awareness of grammatical violations.

Similarly, Bardovi-Harlig and Dörnyei (1998) examined the perceptions of 543 ESL and EFL learners, asking them to evaluate grammatical and pragmatic errors presented in video-based scenarios. Consistent with Schauer's (2006) findings, ESL learners with greater real-world exposure were more sensitive to pragmatic violations, while EFL learners, accustomed to grammar-focused instruction, placed greater emphasis on grammatical accuracy. In line with this, Celaya and Barón (2015) analyzed open role-play performances of 144 EFL learners and found that as learners' grammatical competence

improved, their requests became both more elaborate and pragmatically appropriate, despite the absence of explicit pragmatics instruction.

Building on these insights, Choraih, Loutfi and Mansoor (2016) conducted a theoretical analysis of pragmatic competence within EFL programs, synthesizing findings from prior studies. They argued that an extreme focus on grammatical accuracy, isolated from real-life communicative practice, risks learners' overall communicative competence, as pragmatic competence is essential for effective language use in authentic contexts. Youn (2014) further explored this relationship by analysing the written responses of 40 ESL learners to pragmatic assessment tasks. The findings indicated that learners who demonstrated higher pragmatic performance also produced more syntactically complex language, illustrating how grammar knowledge and use directly support pragmatic expression in communicative tasks.

Taken together, these studies highlight the mutual relationship between grammar and pragmatics, demonstrating that effective grammar instruction, particularly one that reflects the principles of "grammar in use", can foster not only grammatical competence but also pragmatic awareness. This body of research points to the need for pedagogical approaches that bridge the gap between grammatical form and communicative function, ensuring that learners acquire both linguistic accuracy and the ability to use language appropriately in context.

2.2.1.3.3 Grammaring

The concept of grammaring represents a shift from viewing grammar as a static set of rules to understanding it as a dynamic and skill-based process (Thornbury, 2001). Defined as the capacity to apply grammatical structures with precision, relevance, and contextual appropriateness, grammaring emphasizes the integration of form, meaning, and use rather than mere memorization of prescriptive rules (Larsen-Freeman, 2003). This perspective

challenges conventional rule-based instruction and encourages teachers to create learning environments where grammatical competence emerges naturally through meaningful use (Larsen-Freeman, 2003; Thornbury, 2001).

Larsen-Freeman (2003) argues that traditional grammar instruction often leads to a "passive knowledge problem," where learners can recall rules but struggle to apply them in real communication. To address this issue, she conceptualizes grammar as the fifth skill alongside speaking, writing, reading, and listening, emphasizing that grammar learning requires practice and contextual engagement. Similarly, Thornbury (2001) critiques traditional approaches that treat grammar as a collection of discrete structures to be memorized. Instead, he posits that grammar operates dynamically, enabling speakers to encode nuanced meanings onto basic ideas.

By treating grammar as an evolving and fluid component of language rather than a fixed system, grammaring aligns with discourse-based and communicative methodologies. This approach reframes grammar instruction as an active, emergent process rather than a finished product, shifting the focus from rote memorization to fostering conditions that support the natural development of grammatical competence (Larsen-Freeman, 2003; Thornbury, 2001). For example, in a traditional grammar lesson, students might be taught the past perfect tense with rules and example sentences like "I had finished my homework before dinner." However, in a grammaring-based approach, students would engage in a storytelling activity where they naturally use the past perfect to describe past events in relation to each other, such as "By the time I arrived at the party, my friends had already started dancing." This way, grammar is not just learned in isolation but emerges as part of authentic communication.

Grammaring is essential in communicative grammar teaching because it moves beyond rote memorization of rules and encourages learners to develop grammar as a practical skill for real communication. Instead of treating grammar as a set of isolated structures to be

learned separately, this approach emphasizes using grammar naturally and meaningfully in context. By integrating form, meaning, and use, grammaring helps learners internalize grammatical structures so they can apply them effortlessly in conversation. Rather than focusing solely on accuracy, it also supports fluency, allowing learners to communicate more effectively. In this way, grammaring aligns with the core principles of communicative language teaching, ensuring that grammar is not just studied but actively used in meaningful interactions.

2.2.2 Assessing Grammar

Grammar assessment provides insights into learners' grammatical competence and usage. By assessing grammatical skills, educators can evaluate learners' proficiency, identify areas for improvement, and tailor teaching methods to address individual and group needs better. Furthermore, it is essential for measuring progress, monitoring development, and ensuring that language learners are acquiring the necessary skills for effective communication. Although grammar testing does not directly measure communicative competence, it provides insight into linguistic proficiency and serves as a foundation for broader language assessment. Various methods have been developed to test grammar, each with distinct advantages and limitations. Understanding grammar assessment practices allows for more accurate and effective evaluations, offering a deeper understanding of how learners acquire and apply grammatical structures over time.

2.2.2.1 Traditional and Contemporary Approaches to Grammar Assessment

Grammar assessment has long been an essential component of language assessment, evolving alongside pedagogical shifts in language teaching. Traditional approaches to

grammar assessment primarily focus on explicit rule-based evaluations, emphasizing accuracy through structured tests (Larsen-Freeman & Anderson, 2013). These assessments are rooted in methodologies such as the Grammar-Translation Method and the Audiolingual Method, both of which prioritize grammatical accuracy over communicative competence (Richards & Rodgers, 2001). GTM employs translation exercises and written grammar analysis and reinforces memorization, while ALM utilizes pattern drills to promote automaticity in grammatical structures. Despite their structured nature, these methods have been criticized for their inability to assess spontaneous language use effectively (Larsen-Freeman & Anderson, 2013).

In contrast, other approaches emphasize implicit assessment strategies, shifting the focus from isolated grammatical accuracy to practical language use. The Direct Method and Total Physical Response exemplify this shift by prioritizing natural language acquisition. DM requires students to learn grammatical structures inductively, which encourages cognitive engagement (Larsen-Freeman & Anderson, 2013). Similarly, TPR evaluates students' comprehension of commands rather than their ability to articulate grammatical rules explicitly, highlighting an alternative way of measuring grammatical understanding (Richards & Rodgers, 2001). These approaches underscore the increasing recognition that grammar assessment should go beyond rote memorization and incorporate real-world linguistic application.

Hybrid methodologies have emerged as a response to the limitations of those approaches. The Silent Way and Community Language Learning (CLL) blend explicit and implicit assessments, allowing learners to discover grammatical rules autonomously while engaging in communicative tasks (Larsen-Freeman & Anderson, 2013). Additionally, Suggestopedia and the Lexical Approach redefine grammar assessment by integrating grammar into holistic language exposure, focusing on contextualized learning rather than isolated rule application (Richards & Rodgers, 2001).

The shift from structural to communicative assessment is further exemplified by Competency-Based Language Teaching (CBLT) and Communicative Language Teaching (CLT). These approaches favour performance-based evaluations, where learners are assessed on their ability to use grammar functionally within real-world tasks (Richards & Rodgers, 2001). Unlike traditional methods, which prioritize accuracy through discrete-point testing, CBLT and CLT advocate for dynamic assessment models, such as portfolios, discourse analysis, and observational evaluations. This transition highlights the need for alignment between instructional philosophy and assessment strategies, ensuring that grammar evaluation reflects both accuracy and communicative competence.

2.2.2.2 Balancing Accuracy and Communicative Competence in Grammar Assessment

While grammar testing is vital for language assessment, its effectiveness in measuring overall language proficiency remains a subject of debate. Traditional grammar tests, such as multiple-choice exams and error correction tasks, efficiently evaluate learners' knowledge of grammatical rules (Kitao & Kitao, 1996). However, these assessments often fail to capture the ability to apply grammatical structures meaningfully in communication (Roever & McNamara, 2006). Research in second language acquisition (SLA) suggests that grammar learning is not a linear process but rather a dynamic restructuring of interlanguage (Ellis, 2003). This perspective highlights the importance of assessing not only grammatical accuracy but also the contextual application of grammar in diverse communicative scenarios (Bachman & Palmer, 1996).

To address the limitations of traditional grammar assessments, various methodologies have been proposed. Transformation exercises, where students convert sentences between different grammatical structures, provide insight into their syntactic flexibility (Kitao & Kitao, 1996). To illustrate, a student is given the sentence "He is playing soccer" and asked

to convert it into the past tense, demonstrating their ability to manipulate grammatical structures. Similarly, sentence-combining tasks test learners' ability to construct complex structures, offering a more interactive means of evaluating grammatical competence (Kitao & Kitao, 1996). Learners receive two simple sentences like "He bought a book. The book was expensive." and asked to merge them into a single complex sentence to assess their syntactic flexibility. These methods, while more reflective of productive language skills, require careful implementation to maintain scoring reliability and consistency.

Completion tasks, another widely used grammar assessment format, requires learners to supply missing words in given sentences (Kitao & Kitao, 1996). Although these tasks offer a more open-ended approach compared to multiple-choice tests, they present challenges related to scoring subjectivity and variability in acceptable responses. Likewise, word-changing exercises, which assess morphological knowledge, provide insights into learners' grasp of tense, aspect, and derivational morphology but may not directly measure communicative competence (Kitao & Kitao, 1996). Therefore, a balanced approach that integrates both recognition-based and production-based assessments is essential for a comprehensive evaluation of grammatical proficiency.

Despite advancements in grammar assessment, a challenge is the integration of communicative elements without compromising test validity and reliability. McNamara and Roever (2006) argue that traditional tests emphasize grammatical accuracy at the expense of pragmatic competence, limiting their ability to measure real-world language use. Larsen-Freeman (2009) further critiques traditional assessments for neglecting the social dimensions of language, advocating for dynamic testing models that reflect authentic communication. This necessitates a reconsideration of assessment strategies to bridge the gap between rule-based knowledge and practical language application.

In conclusion, effective grammar assessment requires an approach that balances accuracy with communicative competence. While structured grammar tests provide valuable insights

into linguistic proficiency, they should be complemented by performance-based evaluations that reflect authentic language use. As language assessment continues to evolve, adopting hybrid assessment models that integrate both explicit rule-based evaluation and communicative task-based assessment will enhance the reliability and applicability of grammar testing in language education.

2.3 Sociocultural Theory in Language Teaching and Assessment

Sociocultural theory, as proposed by Lev Vygotsky, provides a framework for understanding how human development and learning are shaped by social interactions, cultural tools, and the broader societal environment. Vygotsky (1978) argued that traditional psychological experiments, which often follow a stimulus-response (S-R) approach, fall short when it comes to explaining more complex human behaviors. In the S-R model, individuals are exposed to a stimulus, which elicits a specific response, allowing psychologists to measure behavior in a controlled manner. While this approach is useful for studying simpler psychological processes, Vygotsky emphasized that it fails to capture the nuanced, social nature of higher-level cognitive functions. Therefore, he advocated for a more dynamic understanding of human psychology that incorporates social context and cultural influences, suggesting that these factors are critical in shaping how individuals think, learn, and develop.

Vygotsky (1978) emphasized the crucial role of language and symbols in cognitive development, arguing that these tools are essential for higher mental functions. According to his perspective, complex mental processes, such as the understanding of language and the use of symbols, emerge over time through social interaction. Children learn complex mental processes through interactions with their social environment, and these processes develop not individually but within a social context. In experiments conducted under Vygotsky's supervision by A. N. Leontiev, researchers examined how children and adults

organize their memory and attention. The findings indicated that children's ability to organize their memory improves over time, aided by external cues. This supports Vygotsky's statement that socio-cultural factors play a significant role in shaping a child's mind. His work highlights how individuals' interactions with signs, symbols, and tools within their social and cultural environments contribute to their cognitive and social development.

To adequately analyze higher psychological functions, Vygotsky (1978) introduces his new approach and its three initial principles. First, he argues that psychology should focus on analysing processes rather than static objects. In this context, developmental psychology is emphasized because the new method aims to study processes as a whole and to dynamically show the history and evolution of these processes. The second principle involves going beyond mere description. Vygotsky critiques traditional psychological approaches for being predominantly descriptive and asserts that true scientific analysis should aim to uncover the relationships that underlie psychological phenomena rather than just documenting them. The third principle, which he terms "fossilized behavior," stresses the importance of understanding psychological processes through their historical development. By conducting a developmental analysis, the goal must be to trace back to the source of behavior and reconstruct all the stages of development. Consequently, Vygotsky's sociocultural theory seeks to understand individuals' developmental processes not through external factors but within historical, social, and cultural contexts.

Despite being overlooked initially due to conflict with the government's psychological approach, Vygotsky's theory gained popularity as the field moved towards theories emphasizing the impact of the social environment on mental processes. Vygotsky's unique concepts, influenced by a variety of sources, including Marxist philosophy, continue to be relevant today as they focus on the social and cultural influences on human cognitive functions (Poehner, 2008).

Sociocultural theory is crucial because it revolutionized our understanding of learning and development by highlighting the importance of social interaction, culture, and context. It provided a broader, more dynamic perspective compared to earlier theories, focusing on the interconnectedness between individuals and their environments. Prior to sociocultural theory, many theories focused primarily on the individual learner. Vygotsky introduced the idea that learning is deeply rooted in social relationships and cultural contexts, highlighting how interaction with others shapes thought processes. The theory emphasizes the importance of collaboration with "more knowledgeable others" and shows that effective learning often involves dialogue, guidance, and shared problem-solving.

Vygotsky's theory links mental functions to social interaction and cultural context. He believes that our thinking is influenced by symbols and our surroundings, shaping our cognitive development. Learning occurs through social interactions using cultural tools like language and signs. He stresses the role of social and cultural factors in developing higher mental abilities. Cultural knowledge is internalized through social interaction and becomes part of our cognitive processes (Lantolf, 2000). All in all, Vygotsky (1978) defends that combining practice with oral production is the key for intellectual development.

Applying Vygotsky's sociocultural theory in education enables students to not only acquire knowledge but also gain insight into their own learning processes. This perspective has profoundly influenced modern educational practices by emphasizing the importance of collaboration, context, and the role of culture in shaping learners' abilities. By considering students' developmental stages, social interactions, and cultural backgrounds, teachers can provide a more effective and enriching learning experience. This approach fosters a deeper understanding of how students learn and supports the development of critical thinking, problem-solving, and social skills in a meaningful and contextually relevant way.

Thus, sociocultural theory plays a crucial role in language acquisition by highlighting the importance of social and cultural contexts in learning (Castanelli, 2023; Kurt, 2022). SCT has had a profound influence on contemporary approaches to language learning and assessment. Unlike cognitive theories that emphasize individual mental processes, SCT suggests that learning occurs through social interaction within a cultural context (Johnson, 2006). It stresses the significance of authentic practice and interaction with others to facilitate language learning, emphasizing meaningful interactions and exposure to diverse linguistic and cultural experiences within specific contexts (Castanelli, 2023). A fundamental aspect of language acquisition, as highlighted by Vygotsky, is social interaction. Language skills develop through collaborative activities that include peer interactions, discussions with teachers, and group projects. Such socially mediated learning facilitates the clarification of misunderstandings, negotiation of meanings, and real-time refinement of language use. This perspective has significant implications for how languages are taught and learned, offering insights into how learners interact with their environment and with others to develop language skills.

Thorne and Tasker (2011) also state that humans acquire higher cognitive abilities such as planning, categorization, interpretation, and rationality through informal social interactions, formal education, and exposure to languages and digital literacies. This process, called internalization, allows people to carry out complex tasks with less need for external help. This developmental process involves progressing from relying on external objects for guidance to seeking help from others and finally regulating one's own actions. By internalizing external forms of mediation, individuals gain greater voluntary control over their thoughts and behaviors, either by improving their use of mediational resources or by reducing their dependence on external aids.

According to SCT, language serves not only as a communication system but also as a cognitive tool for thinking, problem-solving, and making sense of the world. In the domain of language education, this perspective underscores the importance of learners engaging in

real social contexts, allowing them to negotiate meaning and partake in shared cultural practices rather than solely memorizing vocabulary and grammar.

This theoretical perspective underscores the importance of mediation, scaffolding, and the Zone of Proximal Development (ZPD) in shaping language acquisition (Shooshtari & Mir, 2014). The ZPD represents the distance between what learners can achieve independently and what they can accomplish with guidance from knowledgeable peers or teachers (Vygotsky, 1978). Scaffolding, another core concept in SCT, involves providing structured support to students, which is gradually removed as they become more skilled. In the context of language learning, this could mean initially guiding students to use language accurately and then granting them greater freedom as their confidence and competence grow. According to Brooks and Donato (1994), scaffolding occurs when learners receive tailored support that helps them bridge the gap between their current level of linguistic competence and their potential development. This aligns with the notion of the ZPD, which suggests that learners can perform beyond their independent capabilities with appropriate assistance (Lantolf & Thorne, 2007). Lastly, mediation refers to the process by which learners acquire knowledge and develop skills through interaction with tools, language, or more knowledgeable individuals. Vygotsky (1978) emphasized that learning is not a direct transmission of knowledge but rather a socially mediated process in which learners are guided and supported to construct understanding. By integrating these concepts into language teaching and testing, educators can create more dynamic and meaningful learning experiences.

In language teaching, SCT-informed pedagogy prioritizes interaction, scaffolding, and dialogic engagement. Research suggests that instructional strategies such as collaborative writing, teacher feedback, and peer-assisted learning enhance learners' linguistic capabilities (Allami, Najari, & Tajeddin, 2025). Additionally, SCT-based approaches encourage educators to tailor learning activities to students' individual needs. These

strategies not only support language development but also promote metacognitive awareness as learners reflect on their progress and internalize new linguistic structures.

The application of SCT goes beyond teaching to language assessment, particularly in dynamic assessment (DA), another concept derived from SCT. Unlike traditional testing methods that focus on static measures of proficiency, DA aligns with SCT by evaluating learners' potential through interactive, scaffolded assessment (Swain, Kinnear, & Steinman, 2015; van Compernelle & Williams, 2013). This approach acknowledges the role of mediation in language learning, providing timely feedback that promotes advancement and focusing on potential growth rather than merely assessing static performance. As a result, DA provides a more comprehensive and developmental view of language proficiency.

Despite its advantages, implementing SCT-based methods in language teaching and testing presents challenges. One limitation is the need for trained educators who can effectively scaffold learning within the ZPD (Johnson, 2006). Additionally, while DA offers a richer understanding of learners' abilities, it requires more time and resources compared to standardized assessments (van Compernelle & Williams, 2013). Nevertheless, research supports the effectiveness of SCT in fostering communicative competence and long-term language development, making it a valuable framework for language education.

In conclusion, Sociocultural Theory provides a robust foundation for language teaching and testing by emphasizing social interaction, scaffolding, and dynamic assessment. By integrating SCT principles, educators can create more engaging and contextually meaningful learning experiences that support both linguistic and cognitive development. As the field continues to evolve, further research is needed to explore best practices for implementing SCT in diverse educational settings and to address the practical challenges associated with its application.

2.3.1 The Zone of Proximal Development

Vygotsky (1978) explores the complex relationship between learning and development, emphasizing its significance in psychology. He discusses three main theoretical perspectives on this relationship. The first perspective argues that development occurs independently of education, suggesting that growth follows pre-established developmental stages rather than being influenced by learning. In contrast, the second perspective posits that learning and development are deeply interconnected and cannot be separated. According to this view, learning extends beyond the acquisition of knowledge and skills, encompassing personal growth as well. The third perspective maintains that while learning and development are distinct processes, they still interact with each other. This view acknowledges that learning influences development, though the two remain separate. Overall, Vygotsky's examination of these perspectives highlights the ongoing debate on the role of learning in human development.

Vygotsky (1978) critiques these three perspectives, arguing that the relationship between learning and development is far more complex and dynamic than they suggest. Rather than viewing learning and development as separate or rigidly connected processes, he emphasizes the need for a broader and more interactive understanding of their interplay. Rejecting these limited views, Vygotsky introduces the concept of the Zone of Proximal Development (ZPD) within the framework of Sociocultural Theory. This concept emphasizes the role of social interaction in cognitive development, suggesting that learners benefit most when instructional support is gradually adjusted to their evolving competencies (Khaliliaqdam, 2014). Understanding the role of ZPD in language education and assessment can lead to more effective teaching methodologies and fairer evaluation systems. Through ZPD, Vygotsky offers a more comprehensive perspective on the learning process, challenging traditional notions of development.

Vygotsky (1978) rejects the idea that children's true developmental level can be determined solely by what they can achieve independently. What they can accomplish with the assistance of a knowledgeable other is also a part of their actual development level. A child who is able to complete a task on their own may have achieved an age-appropriate level of development. However, when supported by others, the activity can be elevated to a higher complexity, demonstrating the child's possible developmental stage. Vygotsky defines this difference as the zone of proximal development; that is, the potential developmental area where the child can solve a task with help, beyond the level they can solve alone.

In language teaching, ZPD plays a crucial role in scaffolding learners' development by providing structured assistance that gradually decreases as learners gain proficiency. According to Khaliliaqdam (2014), the effective implementation of ZPD involves interactive tasks where teachers or peers guide learners through progressively more complex linguistic structures. For example, a teacher might initially provide key vocabulary and sentence structures before asking students to construct their own sentences. Over time, as learners become more confident, the scaffolding is reduced, enabling them to communicate independently (Shabani, Khatib & Ebadi, 2010). This approach aligns with communicative language teaching, where meaningful interaction fosters linguistic competence. Thus, ZPD-informed teaching encourages students to move beyond their current capabilities and develop their language skills in a supportive environment.

ZPD highlights scaffolding and guided learning to challenge learners just beyond their current abilities, helping them progress and develop new skills. It represents functions that are not yet fully developed but are in the process of maturation, and helps to understand a child's upcoming development, including what is currently being achieved and what is still maturing (Vygotsky, 1978). Sociocultural highlights social mediation, support within the ZPD, and cultural relevance, offering a comprehensive framework for effective and meaningful language education. Central to SCT, ZPD is a critical concept in language

education because it helps identify the optimal level at which a learner can successfully acquire new language skills with appropriate support.

Furthermore, classroom-based studies demonstrate that ZPD-oriented instruction improves student engagement and language proficiency. Brooks and Donato (1994) found that learners working within their ZPD during communicative tasks exhibited higher levels of language use and self-regulation. By promoting interactive learning environments where students co-construct knowledge, educators can leverage the ZPD to maximize second language acquisition outcomes. Therefore, integrating ZPD into teaching and assessment practices allows for a more responsive and learner-centered approach in language education.

In addition to its instructional applications, ZPD has significant implications for language assessment, particularly through the concept of Dynamic Assessment (DA). Traditional assessments often measure only a learner's current ability, disregarding their potential for development (Allal & Ducrey, 2000). In contrast, DA, which is rooted in ZPD, evaluates both actual performance and the level of support required to reach a higher level of competence (Shabani, Khatib & Ebadi, 2010). This assessment method provides a more comprehensive picture of a learner's abilities by integrating intervention within the testing process (Allal & Ducrey, 2000). As a result, DA not only assesses what learners know but also predicts their capacity for future improvement, making it particularly beneficial in language learning contexts where progress occurs gradually.

Despite its advantages, the application of ZPD in language education presents certain challenges, particularly in standardizing scaffolding techniques and ensuring consistent assessment criteria. Roosevelt (2008, as cited in Quintero Dorado, 2006) argues that maintaining an optimal balance between support and independent learning is difficult, as different learners require varying degrees of assistance. Additionally, teachers must be trained to effectively identify each student's ZPD and adjust their instructional strategies

accordingly (Shabani, Khatib & Ebadi, 2010). In assessment, the challenge lies in integrating DA into standardized testing frameworks without compromising reliability and validity (Allal & Ducrey, 2000). Addressing these challenges requires further research and professional development programs for educators.

In conclusion, the Zone of Proximal Development provides a powerful framework for enhancing both language teaching and testing by emphasizing guided learning and potential development. Its application in scaffolding language instruction allows learners to progressively build competence, while its integration into assessment ensures a more dynamic and learner-centered evaluation process. However, effective implementation requires careful consideration of individual learner needs and methodological consistency. As research continues to explore the potential of ZPD, it remains a cornerstone of innovative and equitable language education.

2.4 Dynamic Assessment

Dynamic assessment is an interactive approach that aims to evaluate an individual's learning potential and cognitive abilities, emphasizing the process rather than the outcome. Unlike traditional static assessments, which measure what a person already knows or can do at a specific moment, dynamic assessment focuses on how learning unfolds over time. It involves guided interaction and feedback, allowing the assessor to observe how the individual approaches problem-solving tasks and adapts to challenges. This method provides a deeper understanding of a person's learning capabilities, offering valuable insights into their potential for future development. Thus, dynamic assessment offers a more comprehensive and process-oriented evaluation of cognitive abilities.

Vygotsky and his colleagues state that traditional testing methods may not fully capture an individual's capabilities; hence, integrating mediation techniques into assessment started to be recognized by teachers and psychologists in time (Abdolrezapour & Ghanbari, 2021).

Vygotsky (1978) clearly states that their approach is more "experimental-developmental" and uses experiments to actively stimulate and provoke behavior. He even adds that the approach is similarly suitable for the fundamental objective of "dynamic analysis", emphasizing the importance of studying how psychological processes develop and change over time, rather than just examining them at a single point in their fully developed form.

However, he never uses the term "dynamic assessment" himself. His colleague Luria (1961, as cited in Orhon & Mirici, 2023) was the one who introduced "dynamic assessment" by defining the differences between 'static' and 'dynamic' assessment. In the field of L2, the theory gained recognition in 1985 through Frawley and Lantolf, influencing L2 development and practice-based approaches in education (Poehner & van Compernelle, 2020). Dynamic assessment is linked to sociocultural theory because it is based on Vygotsky's sociocultural principles. Social interactions and cultural contexts have an impact on learning and development, according to Vygotsky (1978), so dynamic assessment acknowledges the significance of combining teaching with evaluation, highlighting the influence of social interaction on cognitive changes.

As Haywood and Tzuriel (2002) define it, dynamic assessment is a type of interactive assessment used to understand the student's learning process. Cotrus and Stanciu (2014) explain the term 'dynamic assessment' as an evaluation technique used to determine both a child's current skills and their capacity for learning. Unlike traditional assessments that focus on current knowledge or skills, dynamic assessment mostly emphasizes a learner's ability to learn and adapt. It considers the learner's interaction with the assessor and the learning setting, giving a more thorough understanding of their capabilities and potential for improvement (Lidz, 1987). Considering all definitions, Haywood and Lidz (2007) highlight the importance of active intervention and examinees response to intervention in the dynamic assessment process. During dynamic assessment, the teacher interacts with students, using different mediation strategies to both teach and assess. The students react to

the teacher's mediational moves, showing their zone of proximal development. (Özturan & Gürdal, 2023)

To perform an evaluation with DA, it is important to understand its strengths and weaknesses. In their work on dynamic assessment, Haywood and Lidz (2007) present a comparison between traditional and dynamic assessment approaches, and they highlight the key differences between these two assessment methods. The first difference is focus. Traditional standardised assessment classifies individuals based on current functioning, while dynamic assessment evaluates learning potential and identifies strengths for improvement and growth opportunities. Hence, the nature of data is also different. Standardised assessment ranks individuals using a fixed score; on the contrary, dynamic assessment examines potential growth through a flexible process without fixed classifications. To analyze the results, standardised assessment uses fixed norms for comparison, while dynamic assessment emphasizes examiner skill and individual strengths. As a result, standardised assessments are consistent results for comparison.

However, dynamic assessments lack established reliability due to varying examiner conclusions. With a table adapted from Feuerstein, Haywood, Rand, Hoffman, and Jensen (1982, 1986), and from Haywood and Bransford (1984), Haywood and Lidz (2007) summarize these points and add another difference. Assessors are neutral in standardised tests, while they play an active role in dynamic assessment by instructing and encouraging metacognitive transformation strategies. Overall, standardized assessments evaluate students' current knowledge and skills consistently, using fixed tests and objective scoring for comparison purposes. In contrast, dynamic assessments measure potential for growth through interactive, flexible activities, emphasizing learning processes and continual feedback, allowing for adaptations based on individual learner needs and responses.

DA distinguishes itself from traditional assessment by emphasizing the dynamic and developmental nature of learning, particularly through the principles of mediation,

intentionality, self-regulation, and transcendence. At the heart of DA lies mediation, a process in which the assessor actively guides and supports the learner during assessment, selecting and interpreting tasks to scaffold understanding and promote development (Antón, 2012). This process is purposeful, the mediator aims to reveal and foster the learner's emerging cognitive abilities rather than only measuring existing knowledge (Lantolf & Thorne, 2006, as cited in Antón, 2012). Intentionality in dynamic assessment refers to the assessor's purposeful effort to guide the learner toward development. It involves using mediation strategically to reveal and support the learner's potential within their Zone of Proximal Development. Through ongoing, responsive interaction, learners gradually control their own learning processes, reflecting the development of self-regulation, a core goal of DA that highlights learners' ability to manage and monitor their own performance independently (Antón, 2012). Finally, transcendence refers to the learner's capacity to transfer acquired knowledge and skills to novel tasks and contexts, marking a deeper, more sustainable form of learning that extends beyond the immediate assessment (Feuerstein et al., 2002, as cited in Antón, 2012). Collectively, these features underscore DA's commitment to fostering learner growth through socially mediated, forward-looking assessment practices.

Haywood and Lidz (2007) outline a comprehensive process for evaluators creating dynamic assessment tools, emphasizing the importance of systematic preparation and ongoing evaluation. The process begins with gathering existing information about test takers, including their past language learning experiences, strengths, and weaknesses. At this stage, it is crucial to observe how individuals apply their knowledge in real-life contexts. Based on this initial data, evaluators then develop assessment instruments, incorporating both normative and curriculum-based methods to measure the individual's current developmental stages. Once the evaluation tool is designed, it is used dynamically to identify the individual's zone of proximal development. The information gathered from this dynamic testing is then used to formulate targeted intervention strategies aimed at

addressing specific areas of improvement. Finally, the effectiveness of these interventions is evaluated. This process, from design to application, can vary depending on the setting, objectives, and learner characteristics. Overall, this approach highlights the flexibility and adaptability of dynamic assessment models to meet diverse educational needs.

To illustrate the dynamic assessment process, consider a language test where the learner is initially asked to complete a sentence with missing words. If the learner encounters difficulty, the examiner offers hints related to grammar or vocabulary. The learner then has the opportunity to attempt the task again, potentially demonstrating improved performance due to the provided support. This process allows the examiner to assess how well the learner integrates the feedback, revealing their capacity for learning and cognitive growth. Ultimately, such an approach underscores the importance of interaction and feedback in evaluating a learner's true potential.

Dynamic tests are specifically designed to assess not only what a learner currently knows but also their ability to improve with appropriate support. The process is interactive and flexible, aiming to foster learning through feedback that aids in skill development. Unlike traditional assessments that measure static levels of competence, dynamic tests focus on the learner's potential for growth, emphasizing their capacity for future development. This approach highlights the value of support and adaptability in the learning process, offering a more comprehensive view of the learner's abilities.

2.4.1 Mediation

Mediation in dynamic assessment is a core component of dynamic assessment, aiming to identify how a learner can progress and demonstrate their learning potential when given appropriate assistance. Kozulin (2003) states that the traditional "acquisition" model views the learner as a passive receiver of information and that when this model is viewed insufficiently, alternative learning models such as mediation emerge. As one of these

alternatives, Vygotsky's theory claims that the development of a child's higher mental processes depends on the presence of mediating elements in their interactions with their environment. In other words, the child is no longer seen as a passive recipient of information but as an active participant in learning through social interactions and tools (Kozulin, 2003). The concept of mediation offers a new perspective on how learning is structured within the context of sociocultural theory.

As Poehner and Lantolf (2010) describe, mediation provides appropriate assistance to promote independent performance, enabling individuals to transfer skills to future situations effectively. L.S. Vygotsky highlights mediation in his theories, where signs evolve actions into cultural behaviors. He connects speech development to complex language interactions, emphasizing community and communication's role in education and culture (Troitsky, Maksimova, & Albul, 2023). Mediation, alongside reception, production, and interaction, enhances communication by integrating these skills. It facilitates idea evolution and comprehension through active participation with language, thereby improving meaning and aiding understanding (the Council of Europe, 2020).

Kozulin (2003) explores the concept of mediation, particularly in the context of child development and learning, and outlines two main aspects: human mediation and symbolic mediation. Human mediation emphasizes the adult's role in directing and assisting the child's growth. Symbolic mediation examines how symbolic resources (e.g., language, cultural items) can affect and modify the child's thinking and performance. As an example of human mediation, Wertsch and Stone (1985) observed a child working on a puzzle with her mother. The child gradually took on the task of solving the puzzle independently as the mother's involvement decreased, highlighting how adult mediation supports the child's development. Kozulin (2003) expresses that different types of human mediation are present, including creating a safe learning space, offering feedback, demonstrating behaviors, and giving support. Nevertheless, these variations rely on the situation and the type of task. Within this line, teacher mediation can include modelling, feedback, cognitive

structuring, and contingency management (praise/criticism). These strategies vary in complexity and the level of cognitive involvement required. Evidently, distinguishing between types of mediation and specific techniques used in these types is needed for further understanding (Kozulin, 2003).

Mediation involves assisting learners who face challenges during tasks through hints, explanations, or prompts. This support is provided within the learner's ZPD, bridging the gap between independent capability and achievable goals with help. Types of mediation include verbal prompts for critical thinking, non-verbal cues like gestures or visual aids, and modelling the problem-solving process. Mediation serves as a marker of learning potential, revealing a learner's capacity for growth through their responses to support. The process is collaborative and responsive, adapting based on the learner's needs. Dynamic assessments reflect this by tracking performance and improvement, ultimately emphasizing the importance of providing suitable support to help learners demonstrate and enhance their learning potential.

The significance of mediation in language learning has been explored within the framework of SCT in several studies. Ebadi and Hatami (2018) conducted a qualitative study investigating a teacher's oral mediation in an advanced EFL classroom. The study involved six female advanced EFL learners and their teacher, with data collected through classroom observations, semi-structured interviews, and stimulated recall protocols. The findings revealed that students' signals, such as long pauses and lack of peer mediation, indicated appropriate moments for teacher intervention. Additionally, mediation shifted from implicit to explicit forms as students required more support. The study highlights the teacher's crucial role in scaffolding learners' language development through dynamic mediation.

Expanding on the impact of mediation, Sarmiento-Campos et al. (2022) conducted a quasi-experimental study to explore the effects of scaffolding-based mediation on Iranian EFL

learners' speaking achievement. The study involved 61 participants, divided into an experimental and a control group. The experimental group received structured mediation through scaffolding techniques, while the control group followed conventional speaking instruction. Pre- and post-tests revealed that the experimental group significantly outperformed the control group, demonstrating the effectiveness of mediation in enhancing speaking skills. The findings suggest that integrating the mediation into instructional design can lead to measurable improvements in learners' oral proficiency.

Similarly, Rivera and Barboza (2016) examined the effect of mediation on Iranian EFL learners' willingness to communicate (WTC) using a multiple case study design. The study included 15 learners and employed SCT-oriented tasks, classroom observations, reflective journals, and stimulated recall interviews. The results demonstrated that teacher mediation, particularly proactive implicit mediation, significantly increased learners' motivation and engagement in communication. The study concluded that structured mediation fosters a supportive learning environment and enhances communicative competence.

In terms of grammar, Mohammadimoghadam (2015) conducted a case study investigating the effects of mediation within dynamic assessment (DA) on an Iranian EFL learner's grammar development, specifically focusing on English tag questions. The participant, a 25-year-old beginner-level English learner, first attempted a set of tag questions and if incorrect, received progressively explicit mediation. The results indicated a significant improvement in the learner's ability to correctly use tag questions, demonstrating the efficacy of mediation in fostering grammatical development. The study highlights the importance of DA in assessing not only a learner's current knowledge but also their potential for further development, offering insights for EFL practitioners in designing more effective assessments.

Overall, the reviewed studies collectively highlight the transformative role of mediation in language learning. Whether through scaffolding, structured intervention, or dynamic

assessment, mediation has been shown to enhance learners' linguistic capabilities, communication skills, and overall engagement. By tailoring support to individual needs and adjusting intervention strategies dynamically, educators can facilitate meaningful learning experiences.

2.4.2 Interactionist and Interventionist Dynamic Assessment

Lantolf and Poehner (2004) introduce interventionist and interactionist perspectives on dynamic assessment as the two main approaches. Interactionist dynamic assessment mainly focuses on qualitative assessment of psychological processes and their developmental dynamics, in line with Vygotsky's perspective, while interventionist approaches rely on quantitative measures. In other words, Interventionist DA uses standardised assistance forms to assess learners' needs in reaching specified goals, focusing on the speed and efficiency of learning. In contrast, Interactionist DA emphasizes the assessor-learner interaction within the learner's Zone of Proximal Development (ZPD), prioritizing individual growth over quick outcomes. This approach aligns with Vygotsky's view, promoting creativity and transformation through the ongoing development of learners' goals (Lantolf & Poehner, 2004).

The interactionist DA model emphasizes dialogue-based, responsive mediation between the learner and the mediator. This model is deeply grounded in Vygotsky's concept of the Zone of Proximal Development (ZPD), where learners engage in co-constructed activities to bridge the gap between current and potential abilities (Sarabi Asl, Rashtchi, & Rezaie, 2024). It utilizes the ZPD to understand a child's potential psychological processes for upcoming development stages and determine the needed instruction or assistance. (Minick, 1987; cited in Lantolf & Poehner, 2004). Interactionist dynamic assessment does not involve measuring but rather focuses on qualitatively assessing a person's learning

potential. The goal is to help the individual understand assessment items better and find ways to overcome them (Tuluk, 2019; Sarabi Asl, Rashtchi, & Rezaie, 2024).

In contrast, the interventionist DA model employs structured, pre-planned interventions. Mediation in this model progresses systematically from implicit to explicit prompts, aiming for quantifiable outcomes (Ritonga et al., 2022). It is particularly useful for generating measurable data that compares learners' performances before and after mediation, making it suitable for larger groups or institutional contexts (Khanifar, Rahimi Esfahani, & Riahipour, 2024). Poehner and Lantolf (2005) present the concept of "Interventionist Dynamic Assessment" as a technique rooted in Vygotsky's numerical understanding of the ZPD, viewing it as a 'difference score.'. This method prioritizes numerical evaluations and actions to evaluate a person's ability to learn. According to Lantolf and Poehner (2004), the interventionist aspect of DA studies the speed and effectiveness of learning. The interventionist approach to DA includes giving clear instruction and assistance to learners, where the teacher is essential in guiding their grasp and progress in pragmatic comprehension skills (Malmir, 2020).

Several studies have investigated the effectiveness of dynamic assessment (DA) models in various language skills and educational settings. Khanifar, Rahimi Esfahani, and Riahipour (2024) studied the impact of interactionist and interventionist DA on Iranian EFL learners' reading comprehension (RC) and reading motivation (RM), involving 99 participants divided into experimental and control groups. Both DA models significantly enhanced RC and RM, with interactionist DA providing tailored interactions and interventionist DA offering structured mediation. Ritonga et al. (2022) examined DA effects on speaking accuracy and fluency (SAF) and found both models improved SAF and motivation; however, the interactionist approach more effectively reduced foreign language classroom anxiety (FLCA) by fostering a supportive environment. Sarabi Asl, Rashtchi, and Rezaie (2024) explored DA's effects on speaking sub-skills among 30 EFL learners, revealing interactionist DA's superiority in grammatical accuracy, pronunciation, and vocabulary

depth, while interventionist DA excelled in fluency and vocabulary breadth. These studies illustrate the distinct advantages of both DA models in catering to varied instructional needs.

The distinct features of interactionist and interventionist DA make them suitable for different educational contexts. Interactionist DA is particularly effective in one-on-one or small-group settings, where individualized mediation can address learners' unique needs. It is ideal for developing higher-order language skills, such as critical thinking and nuanced grammar, and for reducing anxiety through collaborative interactions (Sarabi Asl, Rashtchi, & Rezaie, 2024).

Interventionist DA, with its structured approach, is better suited for larger classrooms and standardized assessments. It provides a systematic framework for monitoring progress and predicting learners' future performance. This model is beneficial for tasks requiring consistent evaluation, such as vocabulary acquisition or reading comprehension exercises (Ritonga et al., 2022).

In professional training contexts, interactionist DA can be used to enhance problem-solving and interpersonal communication skills, while interventionist DA is effective for preparing learners for standardized certifications. Moreover, in special needs education, interactionist DA supports individualized learning plans, and interventionist DA provides structured guidance for progress monitoring (Khanifar, Rahimi Esfahani, & Riahipour, 2024).

The examined studies highlight the combined advantages of interactionist and interventionist DA in language teaching. Interactionist DA promotes profound, adaptable learning experiences, whereas interventionist DA guarantees quantifiable and scalable results. By aligning DA models with targeted educational objectives and learner requirements, teachers can enhance their teaching methods to promote well-rounded language growth.

2.4.3 Cake and Sandwich Format

Sternberg and Grigorenko (2001) demonstrate two formats of DA and name them as cake format and sandwich format. The sandwich method aligns with classic experimental designs, with a pretest, mediation, and post-test. The mediation phase is statically. The comparison of pre-test and post-test performance measures improvement from mediation (Poehner, 2008). This format of dynamic assessment involves giving a traditional pretest to learners before they receive instruction, followed by learning the material individually or in groups, and then taking a post-test (Sternberg & Grigorenko, 2001). Mohammad et al. (2020) conducted a mixed-methods study to explore the efficacy of the cake format in developing grammatical English tenses among EFL learners. In this study, learners received mediation through computer-based hints embedded within a grammar test. The hints provided progressively explicit guidance to address errors, culminating in direct explanations if earlier hints failed to elicit correct responses. The findings indicated that the cake format significantly enhanced learners' grammatical accuracy compared to a non-dynamic control group. However, while the cake format group outperformed the control, no statistically significant difference was found between the cake and sandwich format groups (Mohammad et al., 2020).

The sandwich format separates mediation from the assessment process, adding an instructional phase between a pretest and a post-test. This approach enables structured learning before the learners' knowledge is reassessed. Majdedin, Nabizadeh, and Taghinejad, (2015) investigated the effectiveness of the sandwich format in an interactionist DA model focused on grammatical English relative pronouns. In this study, learners completed a pretest, engaged in mediation through interactive feedback and hints, and then took a post-test to measure their progress. The results demonstrated significant improvements in learners' post-test scores, highlighting the sandwich format's ability to foster deeper understanding through targeted instruction. Notably, teenagers exhibited

greater improvement than adults, suggesting age-related differences in responsiveness to mediation (Majdedin, Nabizadeh & Taghinejad, 2015).

The sandwich format's structured approach to separating instruction and assessment provides learners with the opportunity to reflect and consolidate their understanding. This is particularly valuable in classroom settings, where explicit instruction can address shared knowledge gaps before reassessment.

The cake format involves giving the instruction based on responses to each assessment item, allowing mediators to concentrate on assisting learners with correcting mistakes after each task. Therefore, each learner is assessed individually. In interventionist DA's cake format, assistance is given through a set of standardised cues, progressing from indirect to direct. If a learner answers incorrectly, they are given clues to help find the answer. This method provides instructional support until the item is answered correctly, similar to adding layers to a cake for a deeper understanding. The clues' content is typically constant across all learners, while the personalized aspect is the quantity of clues required by each individual (Poehner, 2008; Sternberg and Grigorenko, 2001). Poehner (2008) adds that the examiner evaluates the learner's needs by the amount and kind of cues needed for each task. In this framework, variations among learners are identified by the quantity of standardised cues offered.

Both formats demonstrate distinct advantages in specific contexts. Mohammad et al. (2020) compared the two formats in a controlled study, revealing that while both formats significantly outperformed the non-dynamic control group, there was no statistically significant difference in their effectiveness for grammatical development. This suggests that the choice of format should align with the instructional goals and the specific needs of learners.

The cake format is particularly suitable for contexts requiring immediate feedback, such as real-time language assessments or computer-adaptive tests. Its ability to provide dynamic

and personalized guidance makes it ideal for addressing individual learner needs in grammar-focused exercises (Mohammad et al., 2020). Conversely, the sandwich format is better suited for structured instructional settings, such as standardized test preparation or iterative writing skill development, where learners benefit from a clear delineation between instruction and assessment phases (Majdedin, Nabizadeh & Taghinejad, 2015).

2.4.4 Learner Potential Score (LPS)

The Learner Potential Score (LPS) in dynamic assessment is a measure used to evaluate a learner's capacity to improve and learn when provided with guidance or assistance during the assessment process. It is important for several reasons, particularly in education, psychology, and developmental fields. Its value lies in the way it shifts focus from static evaluations of current abilities to a deeper understanding of learning potential and responsiveness to instruction. The LPS helps identify what a learner can achieve with appropriate support, not just what they currently know or can do independently. It aligns with a growth mindset approach, emphasizing the capacity for improvement rather than labeling learners based solely on existing skills. By measuring how a learner responds to intervention during the assessment, teachers and psychologists can design targeted, individualized support that matches the learner's needs. It highlights areas where the learner benefits most from scaffolding and guidance, enabling more efficient teaching strategies. The concept of LPS is rooted in Vygotsky's Zone of Proximal Development, which identifies the difference between what a learner can do independently and what they can achieve with help. This perspective fosters a dynamic understanding of development.

Budoff and Friedman (1964) investigated the use of DA in education by assessing learning potential as an alternative to conventional IQ tests, which disadvantaged some children. They employed a pretest-intervention-posttest method to evaluate individuals' reactions to

the intervention. Enhanced scores demonstrated significant learning potential, underscoring the relevance of context in assessing capabilities (Abdolrezapour & Ghanbari, 2021).

Later, Kozulin and Garb (2002) designed a formula that quantifies the difference between independent and mediated performance, thus categorizing learners by their learning potential. This formula calculates the difference between a learner's post-mediation score and their initial independent score, allowing teachers to identify high, mid-level, or low potential learners. Notably, low initial performers can demonstrate greater potential than high achievers, showcasing that learning ability is not fixed but can improve with appropriate support. LPS categories include high (≥ 1.0), mid-range (0.79-0.88), and low (≤ 0.71) scorers.

Reflecting on learner potential score, Poehner and Lantolf (2013) state that it shows how much mediation is needed for individuals or groups to progress. They also add that learner potential should not be seen as a fixed trait hidden within a person. Instead, it reflects a learner's openness to mediation and their ability to internalize assistance, thereby enhancing their own learning process.

The significance of the LPS is rooted in its capacity to offer a comprehensive and dynamic insight into a learner's capabilities. It redirects attention from fixed labels to growth opportunities, ensuring assessment guides both diagnosis and effective intervention. This renders it a potent instrument in promoting fairness, flexibility, and efficiency in educational and psychological methods.

2.4.5 Dynamic Assessment of Writing

Dynamic Assessment (DA) is increasingly being used in writing, presenting an alternative to traditional assessments by incorporating real-time mediation and personalized feedback. In contrast to static assessments that evaluate final products, DA engages learners during the writing process, identifying their Zone of Proximal Development (ZPD) and offering

scaffolding for improvement. As a result, this approach enhances linguistic accuracy and rhetorical organization, enabling learners to progress in proficiency. Moreover, by diagnosing weaknesses and providing tailored support, DA fosters self-regulated learning and refines awareness of writing strategies while also helping teachers differentiate between current competence and future potential for improvement.

A case study by Xiaoxiao and Yan (2010) explored how DA influenced EFL learners' process writing. The study focused on scaffolding techniques and the mediation process rather than formal assessment. Interestingly, results showed that DA enhanced learners' interest in writing and improved their overall writing competence. However, no explicit assessment was carried out to determine learners' ZPD, making it difficult to quantify the effects of DA on writing performance.

Expanding on the role of mediation in DA, Alavi and Taghizadeh (2014) explored the effects of implicit and explicit mediation within DA on L2 learners' internalization of writing skills and strategies. Their study involved 32 undergraduate students from two Iranian universities, implementing DA procedures tailored to learners' ZPD. Participants received varying levels of mediation, from implicit hints to explicit feedback. The findings demonstrated that DA significantly improved students' writing performance in terms of content and organization, with explicit mediation proving the most effective. Furthermore, results suggested a hierarchical internalization of writing skills, where learners progressively advanced from reliance on external mediation to self-regulated writing. Thus, the study highlights the effectiveness of DA in fostering writing development through scaffolded intervention and underscores the importance of tailored mediation in supporting L2 learners' writing processes.

Similarly, Rashidi and Bahadori Nejad (2018) examined the effect of DA on Iranian EFL learners' writing ability using a pretest-treatment-posttest design. Seventeen participants were divided into control and experimental groups, with the latter receiving DA-based

mediation during writing activities. Consistent with previous findings, the study found that the experimental group outperformed the control group, demonstrating significant improvement in writing scores. Additionally, interviews revealed that learners viewed DA as beneficial for writing confidence and motivation.

Moving beyond general EFL contexts, Mauludin et al. (2021) investigated the role of DA in enhancing genre-based writing skills in an English for Specific Purposes (ESP) class. Using a mixed-methods approach, they studied 70 students in an Indonesian university's Library Technician Program. The intervention group received DA-mediated instruction, while the control group followed a traditional approach. Notably, DA was applied using a combination of group and individual mediation, focusing on writing descriptive texts. Statistical analysis revealed that the experimental group showed a significant improvement in post-test scores ($p < .001$), highlighting the effectiveness of DA in developing students' writing abilities. Moreover, qualitative findings indicated that students perceived DA positively, as it helped them identify weaknesses, expand vocabulary, and reduce anxiety. Thus, the study underscores DA's potential in ESP contexts, where targeted mediation can improve both writing proficiency and learner confidence.

More recently, Tang and Ma (2023) investigated the effectiveness of an interventionist DA approach in college English writing in China. The study involved 60 students divided into a DA group and a control group. The DA group received standardized mediation using a construct-descriptor-based rating checklist over an eight-week instructional period, while the control group received traditional feedback. Through ANOVA and MANCOVA analyses, results revealed that the DA group significantly improved in writing performance, particularly in specific constructs such as coherence and cohesion. Therefore, the findings underscore the potential of interventionist DA to systematically diagnose and enhance learners' writing abilities.

In summary, the reviewed studies collectively demonstrate the effectiveness of DA in improving L2 writing performance across various contexts. While some research (e.g., Xiaoxiao & Yan, 2010) emphasized DA's role in increasing engagement, subsequent studies (e.g., Alavi & Taghizadeh, 2014; Rashidi & Bahadori Nejad, 2018) provided empirical evidence of its impact on writing competence. Moreover, research on DA in specialized settings (e.g., Mauludin et al., 2021) and structured interventionist approaches (e.g., Tang & Ma, 2023) further emphasized its applicability and effectiveness. However, despite these promising findings, challenges remain, particularly in systematically assessing ZPD and optimizing mediation strategies. Future research should, therefore, explore more standardized yet flexible DA frameworks to maximize its benefits for L2 writing development.

2.4.6 Dynamic Assessment of Grammar

The role of DA in grammar instruction has been extensively explored in second language acquisition research. DA integrates assessment with instruction, offering scaffolded support tailored to learners' needs. Unlike traditional assessment methods that merely measure proficiency, DA actively engages learners in the learning process, facilitating their grammatical development through interaction and mediation. Studies have consistently shown that DA can enhance grammatical accuracy and awareness by fostering individualized learning experiences.

To begin with, Estaji and Ameri (2020) investigated the impact of DA on the grammar achievement of pre-intermediate and high-intermediate Iranian EFL learners. The study involved 58 participants, divided into quasi-experimental and control groups, with DA implemented through a pre-test, mediation, and post-test design over eight sessions. The findings indicated that DA had a significant effect on grammar achievement, particularly for pre-intermediate learners, who benefited more from mediation techniques such as

discussion, teacher feedback, and self- and peer correction. Thus, the study concluded that DA is a valuable tool for enhancing grammar learning, especially among lower-proficiency learners.

Similarly, Daneshfar and Aliasin (2018) examined the effect of DA on the grammar achievement of Iranian third-grade secondary school EFL learners. The study included 86 participants (43 males and 43 females) divided into experimental and control groups, who underwent six sessions of mediation between a pre-test and post-test. The results demonstrated that DA significantly improved the grammar achievement of both male and female learners compared to the control group. In particular, the study emphasized the potential of DA to provide individualized mediation based on learners' ZPD, enhancing their ability to internalize grammatical structures.

At the elementary level, Sharafi and Sardareh (2016) explored the impact of DA on learners' acquisition of prepositions of time and place. The study involved 46 male adult learners divided into experimental and control groups, with the former receiving DA-based instruction over ten sessions. The results of a pre-test and post-test analysis revealed a significant improvement in the experimental group's grammar learning. Therefore, the findings support the integration of DA into elementary-level grammar instruction, particularly in areas where learners typically struggle.

In the Turkish context, Çalış (2018) investigated the role of DA in improving students' metasyntactic awareness within a preparatory English language program at Mersin University in Türkiye. Metasyntactic awareness, a component of metalinguistic awareness, enables learners to analyze and reflect on syntactic structures, aiding in error correction and the effective application of grammatical rules. The research demonstrated that DA enhances cognitive insights and self-regulation through interactive feedback. Nevertheless, while the findings highlight DA's potential to address students' linguistic challenges, the study is limited in fully understanding DA's effect on grammar as it focuses solely on

metasyntactic awareness. This is important because grammar encompasses broader elements like phonology, morphology, semantics, and pragmatics, which were not addressed in this research.

Likewise, Şentürk's study (2019) aimed to demonstrate how DA can help students become more aware of their grammatical choices. Conducted with three sixth-grade students in Istanbul, the research specifically examines secondary school students' preferences for using either the simple past or past progressive tenses in writing activities. By the end of the study, the study showed significant improvements in students' linguistic awareness and ability to identify and correct tense-related errors, along with positive feedback from both participants and the researcher about the DA process.

Furthermore, Orhon (2022) focused on DA in the context of grammar achievement, particularly on improving the use of narrative tenses by B1-level EFL learners. This study demonstrated that Group Dynamic Assessment (G-DA) was a more effective method for teaching narrative tenses compared to traditional instruction. Seventy-two students were divided into experimental and control groups. The experimental group, which received gradual and interactive feedback, improved more in their grammar tests and used narrative tenses more accurately and variably in writing tasks. Moreover, they became more independent in correcting their mistakes. Thus, the study highlights that providing tailored support to learners can help them improve their grammar skills and become more self-sufficient in using the language.

In conclusion, the reviewed studies collectively underscore the effectiveness of DA in enhancing grammar achievement across different proficiency levels and learning contexts. While research conducted in Iran has primarily focused on pre-intermediate and secondary school learners, Turkish studies have provided insights into metasyntactic awareness and grammatical choices. Overall, the findings suggest that DA is a valuable pedagogical tool, offering individualized feedback and fostering self-regulation in grammar learning. Future

research could further explore its long-term impact and applicability across diverse linguistic backgrounds.

2.5 Computerized Dynamic Assessment

Computerized Dynamic Assessment (C-DA) is an innovative approach that integrates technology with dynamic assessment principles. Unlike static assessments, C-DA incorporates real-time mediation and feedback, allowing for a more individualized and responsive evaluation of learners' abilities. Poehner (2008) highlights that C-DA is beneficial in educational settings as it enables large-scale implementation while providing detailed diagnostic insights into learners' strengths and areas for improvement. By utilizing computer-based platforms, C-DA offers an efficient way to assess learners' zone of proximal development and provide necessary scaffolding during the assessment process.

Poehner, Zhang, and Lu (2015) emphasize that C-DA generates comprehensive learner profiles through different scoring mechanisms, enabling teachers to design more targeted instructional strategies. The system allows students to receive immediate feedback and mediation tailored to their individual learning needs. Additionally, the anonymity and automated nature of C-DA can reduce test anxiety, making it a more comfortable assessment method for students (Tzuriel, 2021). However, some limitations exist, such as the lack of emotional connection between the learner and the assessor, which may affect motivation in certain students (Tzuriel, 2021).

The effectiveness and applicability of C-DA have been examined in multiple studies. Malmir and Mazloom (2021) compared Group Dynamic Assessment (GDA) and C-DA and found parallel results. They investigated how different dynamic assessment models affect pragmatic comprehension in second-language learners. A sample of 52 upper-intermediate Iranian EFL learners participated, divided into three groups: GDA, C-DA, and a control group receiving conventional instruction. Over 14 sessions, learners engaged with

pragmatic comprehension tasks focusing on speech acts like requests, apologies, greetings, and refusals. Findings revealed that both GDA and C-DA significantly improved pragmatic comprehension accuracy, with C-DA showing a greater reduction in comprehension speed compared to other groups. The study shows that dynamic assessment methods, especially C-DA, are more effective than traditional non-dynamic assessment (N-DA) in helping students understand English speech acts like requests and apologies.

Research findings suggest that C-DA not only helps measure language proficiency but also enhances learners' potential for growth by providing insights into their learning trajectory. Kamrood et al. (2021) found that C-DA improves second-language acquisition by offering mediation during the test and analysing students' responses dynamically. Tzuriel and Shamir (2002) developed a C-DA system to assess kindergarten students' seriation thinking skills, which refer to their ability to arrange objects based on specific attributes such as size, length, or weight. Their study demonstrated that children who received both human and computer-based mediation performed better than those who received only human support. Jacobs (1998, 2001) investigated the use of KIDTALK, a computerized system that assessed language aptitude by requiring children to learn an artificial language. Similarly, Guthke and Beckman (2000) developed a computerized version of the Leipzig Lerntest to provide detailed reports on children's language aptitude. These studies collectively highlight the transformative potential of C-DA in language education.

2.5.1 Computerized Dynamic Assessment for Receptive Skills

Research on computerized dynamic assessment has extensively focused on receptive skills, particularly listening and reading comprehension. These studies provide critical insights into how C-DA fosters learners' ability to process and understand input effectively, demonstrating its potential in language acquisition.

A study by Teo (2012) showed that the C-DA program is an effective tool for improving students' reading skills and helping them think about their own learning processes. The study included 68 Taiwanese EFL students from a university. By combining teaching and testing, the C-DA program provided students with personalized support based on their needs. The results indicated that students performed better after using the program and became more aware of how to use effective reading strategies. Although the study had some limitations, like focusing on just one group of students, it proved that the C-DA program can be a valuable way to both teach and assess students in a flexible and supportive way.

Bakhoda and Shabani (2019) also explored the role of C-DA in reading comprehension, involving 183 Iranian EFL learners who chose visual, auditory, or written mediation while working on reading tasks. Findings suggested that mediation choices significantly influenced learners' ability to understand texts over time, emphasizing the importance of adaptive, personalized electronic support in education.

Similarly, Poehner, Zhang, and Lu (2017) investigated the effects of C-DA on listening and reading comprehension among university-level intermediate learners of Chinese. Participants received increasingly explicit prompts for incorrect responses, and transfer items measured their ability to apply mediated learning to new tasks. Results showed that C-DA provides valuable diagnostic insights and enhances learners' independent performance and responsiveness to mediation.

Regarding listening skills, Kamrood, Davoudi, Ghaniabadi, and Amirian (2021) examined the effectiveness of online C-DA in diagnosing and improving English listening skills among Iranian EFL learners. The study used software adapted from TOEFL iBT listening tests, offering dynamic feedback to aid comprehension. Results demonstrated significant differences between learners' actual and mediated scores, highlighting the limitations of traditional static assessments in capturing developmental potential. Additionally, the LPS

distinguished learners with identical initial scores but varying capacities for improvement, emphasizing the value of individualized diagnostic insights. This research confirms that C-DA can better evaluate and improve students' skills compared to traditional tests. By offering help during the test (mediation) and analysing detailed scoring profiles, teachers can see both what students already know (ZAD) and what they are close to learning (ZPD). LPS helps to identify differences between students who may seem similar based on regular test scores, allowing for personalized teaching. While there are some issues, like the limits of multiple-choice questions and how help is given, the study shows that C-DA can give teachers useful information to create tailored learning plans and help students improve more effectively.

C-DA has demonstrated encouraging results in evaluating learners' cognitive abilities and ZPD as well, according to a study by Qin and Zhang (2019.) Their study examines the application of Computerized Dynamic Assessment (C-DA) to support second language (L2) learning by integrating pre-programmed mediation during online testing procedures. They focused on C-DA to assess university-level learners' performance in L2 contexts, specifically in reading and listening comprehension and pragmatic comprehension. The research highlights two recent projects: one assessing listening and reading comprehension in Chinese, French, and Russian, and another evaluating L2 Chinese learners' pragmatic comprehension.

Both studies employed standardized mediation and generated learner profiles through LPS. Findings reveal that C-DA fosters learner development, provides diagnostic insights for personalized instruction, and facilitates the transfer of emerging skills to novel tasks, though its individualized mediation design requires further refinement.

Ebadi, Karimi, and Vakili (2023) further explored the experiences of Iranian EFL learners using a web-based C-DA platform for listening comprehension. Conducted with 94 participants using a web-based C-DA platform, the study found that learners generally

viewed the software positively, appreciating its novelty, stress-relieving features, and convenience in terms of time and cost. Participants found the test engaging, stress-relieving, and beneficial for deepening their understanding of the material. They liked the automated feedback, which made the test less stressful compared to traditional exams. While some learners questioned its effectiveness compared to human mediation, the overall feedback emphasized C-DA's potential as an effective language assessment tool.

Ünal (2021) investigated C-DA's effectiveness in a Turkish EFL context, focusing on reading comprehension. Conducted at Kocaeli University, the study involved 92 participants from preparatory to fourth-year ELT students. Using an interventionist "cake" format of dynamic assessment, the study applied computerized TOEFL reading comprehension tests, providing automated mediations for incorrect answers. The study revealed significant improvements in students' scores after mediation. The findings emphasize C-DA's effectiveness in supporting reading comprehension development and its potential for scalable applications in large student groups, highlighting its advantages over traditional assessment methods. The research found that students who received more help during the test, especially those with lower initial scores, showed greater improvement.

Similarly, Bayram (2021) examined how working memory influences L2 reading comprehension using C-DA. The research involved 59 students learning English, using tools to measure their reading comprehension and WM. The findings showed that the C-DA process helped improve their reading through guided support (mediation). Students benefited differently based on how much they used this support, highlighting the personalized benefits of C-DA. The results suggest that mediation helped lower-achieving students the most. This means that some students can improve more with the right support, even if they have the same current abilities.

Kırtız (2021) also explored C-DA's impact on university students' reading comprehension. Conducted with 130 university students, this study employs an explanatory sequential

mixed-methods design. Quantitative data, gathered via pretests and posttests, show improved reading comprehension in the experimental group compared to the control group. Qualitative data from interviews highlight students' positive perceptions of C-DA, emphasizing the utility of hints in identifying details and correcting errors. The study concludes that C-DA effectively enhances reading. By offering support through hints and guidance, C-DA helps students perform better and develop a positive attitude toward learning English. The study found that students who received this extra help showed significant improvement compared to those who did not.

The reviewed studies collectively highlight the significant role of Computerized Dynamic Assessment (C-DA) in enhancing receptive skills, particularly listening and reading, among L2 learners. C-DA's integration of mediation and tailored feedback has proven effective in diagnosing learners' developmental potential and improving their abilities in these areas. These findings collectively affirm that C-DA is a transformative tool for advancing receptive skills by combining assessment with targeted, adaptive support, enabling both skill development and the transfer of learning to novel tasks.

2.5.2 Computerized Dynamic Assessment for Productive Skills

C-DA has also been applied to productive skills, such as writing and speaking, yielding promising results. Research in this area highlights its effectiveness in enhancing learners' abilities to generate language output. In particular, several studies have explored the impact of C-DA on writing proficiency, demonstrating improvements across various aspects of academic writing.

For instance, Davoudi and Ataie-Tabar (2015) investigated the effect of a Computerized Dynamic Test of Writing (CDTW) on Iranian EFL learners. Their study involved 60 upper-intermediate EFL students, who were divided into control and experimental groups. The experimental group, which received helpful hints during the writing process through

CDTW, outperformed the control group. Notably, this improvement was especially pronounced among students with lower initial writing scores. The results indicated that CDTW significantly enhanced learners' writing performance, particularly in sub-skills such as organization, content development, coherence, and style. Moreover, participants expressed positive attitudes toward CDTW, viewing it as a supportive and motivating tool. These findings suggest that CDTW not only aids in the development of writing proficiency but also fosters confidence and motivation by providing continuous support.

Similarly, Ebadi and Rahimi (2019) examined the effects of online DA using Google Docs on the academic writing skills of three EFL learners preparing for the IELTS exam. Employing a sequential exploratory mixed-methods design, they conducted individual synchronous DA sessions and tracked learners' microgenetic development through mediation and reciprocity typologies. IELTS-based assessments revealed improvements in key areas such as task achievement, coherence and cohesion, lexical resource, and grammatical accuracy. However, in transcendence tasks, some participants struggled to transfer their learning to more complex writing contexts. Additionally, a qualitative thematic analysis of interviews highlighted learners' positive perceptions of online DA, emphasizing its role in fostering academic writing development.

Building on these insights, Ebadi and Bashir (2021) explored mobile-based DA (MDA) in EFL writing instruction, with a particular focus on the impact of different mediation types—text-based and voice-based—on learners' performance. The study involved 30 intermediate EFL learners in Iran who were divided into two experimental groups and one control group. Writing tasks were completed via Google Docs, with text-based mediation provided through the app and voice-based mediation via WhatsApp. Interestingly, while both experimental groups showed improvement, the voice-based mediation group significantly outperformed the text-based group. Furthermore, thematic analysis of interviews indicated learners' preference for voice-based mediation, citing its efficiency and reduced social pressure.

In addition to these studies, Nicholas et al. (2024) investigated a C-DA system designed to improve the pragmatic competence of Japanese learners of English in email writing. Conducted with 17 students at a Japanese university, the study adopted a quasi-experimental design in which assessments were administered twice with a two-week interval. Results demonstrated clear reductions in both the number and severity of communication mistakes, indicating that students improved their ability to write emails independently. Importantly, these findings underscore the value of automated feedback tailored to individual learning needs in enhancing English communication skills.

Further evidence of the benefits of DA in writing instruction comes from Özturan (2022), who examined the combined effects of DA and Corrective Feedback (CF) on EFL learners' writing skills. This study, which involved 50 preparatory class students in an ELT department, specifically focused on rhetorical features (organization, cohesion) and linguistic features (grammar, vocabulary, punctuation). The findings suggest that DA positively influenced both rhetorical and linguistic aspects of writing, with improvements persisting even after the intervention ended. Moreover, students reported increased motivation and a better understanding of their learning progress through the DA process.

In conclusion, existing research consistently demonstrates the effectiveness of C-DA in enhancing writing skills among EFL learners. Studies highlight its role in improving various writing sub-skills, fostering learner autonomy, and increasing motivation. While different mediation types, including text-based, voice-based, and computerized feedback, have been explored, findings suggest that interactive and personalized support is particularly beneficial. Nevertheless, challenges such as the transferability of learning to new contexts remain. Thus, future research should further investigate the long-term effects of C-DA and explore strategies to enhance its applicability across different writing tasks and proficiency levels.

2.5.3 Computerized Dynamic Assessment for Grammar

Although DA has been widely studied in second language learning, research specifically investigating its computerized form in grammar acquisition remains relatively limited. While C-DA has been applied to assess various language skills, its role in grammar instruction and testing has not been extensively explored. The existing studies, however, provide valuable insights into its effectiveness in enhancing learners' grammatical competence.

First and foremost, Modarresi and Alavi (2014) developed a Computerized Dynamic Grammar Test (CDGT) to assess EFL learners' grammar skills. Their study, conducted with 122 university students, demonstrated that C-DA significantly enhances grammar performance, particularly benefiting lower-achieving students. Furthermore, the results emphasize the usefulness of C-DA in both classroom and high-stakes testing environments, advocating its role in fostering self-directed learning and providing diagnostic insights for teachers.

Similarly, Ahmadi and Barabadi (2014) explored C-DA in adaptive grammar assessment using graduated hints with 83 university students. Notably, their findings indicate that C-DA not only improves grammar skills but also reveals individual learning potential by distinguishing actual development from assisted capacity. Thus, this study reinforces the argument that C-DA enables personalized learning and supports more informed educational decision-making.

More recently, Behbahani, Namaziandost, and Shakibaei (2024) examined the role of working memory in C-DA's effectiveness for grammar acquisition. Their study, which involved 60 male Iranian EFL learners, compared an experimental group receiving C-DA interventions through Google Meet with a control group that received traditional instruction. Crucially, the results showed that C-DA significantly improved learners' understanding of the past perfect tense in English. By providing personalized support,

interactive activities, and timely feedback, C-DA facilitated notable progress in both explicit and implicit grammar knowledge. This suggests that C-DA can enhance not only conscious grammatical understanding but also the internalization of grammar structures.

Expanding on the integration of technology in grammar instruction, Karimpour, Namaziandost, and Behbahani (2024) explored the combined effects of C-DA and Digitalized Feedback (DF) on grammar acquisition. Their quasi-experimental study, conducted at an Iranian language institute, involved a control group and an experimental group, each with 30 participants. Significantly, the experimental group, which received C-DA-based mediation alongside personalized DF, outperformed the control group in both comprehension and production of conditional type 1 structures. These findings highlight the potential of combining C-DA with digitalized feedback to foster individualized learning and improve grammar acquisition.

Finally, Behbahani and Karimpour (2024) further investigated C-DA's impact on explicit and implicit grammar knowledge, focusing on the past perfect tense. Their interventionist C-DA study, conducted with 27 experimental and 25 control group participants, revealed that C-DA significantly enhanced both types of knowledge. Therefore, this study provides additional evidence for C-DA's role in bridging the gap between explicit and implicit grammar learning.

In conclusion, although research on C-DA and grammar acquisition is still relatively scarce, the available studies indicate its effectiveness in improving grammatical competence. Across different studies, C-DA has been shown to support individualized learning, enhance both explicit and implicit knowledge, and promote long-term retention of grammatical structures. Moreover, integrating technology-driven dynamic assessments with digitalized feedback appears to strengthen grammar learning outcomes. Given the limited number of studies in this area, future research should explore the applicability of C-

DA in different linguistic contexts and its potential for optimizing grammar instruction in diverse educational settings.

2.5.4 Computerized Dynamic Assessment for Pragmatic Competence

Although the concept of "use" in language learning goes beyond grammar to include meaningful and appropriate communication (Larsen-Freeman, 2001), its relationship with C-DA has received limited attention in the literature. Pragmatic ability, a key component of language use, refers to the capacity to employ language appropriately in social interactions, encompassing speech acts, implicatures, and politeness strategies. While pragmatic ability is an essential aspect of communicative competence, research on its dynamic assessment remains relatively scarce.

Given the lack of studies explicitly examining "use" and C-DA, this review draws on existing research on the dynamic assessment of pragmatic ability to explore their potential connections. The studies reviewed focus on how various forms of dynamic assessment, including computerized, web-based, and mobile-mediated approaches, contribute to the development of pragmatic ability in EFL learners. By examining these findings, this section aims to highlight the role of dynamic assessment in fostering pragmatic ability as a fundamental aspect of language use while also underscoring the need for further research directly addressing the broader concept of use in relation to C-DA.

Zangoei et al. (2019) investigated the impact of C-DA on Iranian EFL learners' interlanguage pragmatic development. Their study, which included 137 upper-intermediate and advanced learners (aged 16–36) from high schools and universities in Iran, utilized a web-based software called C-DASRI. Participants completed a multiple-choice discourse completion test assessing their comprehension of speech acts, routines, and implicatures. Notably, the C-DA approach provided graduated hints, and learners received three types of scores: actual, mediated, and learning potential. Furthermore, the results indicated that

learners significantly improved their pragmatic comprehension with mediation, underscoring the role of C-DA in diagnosing and fostering pragmatic competence beyond traditional assessment methods.

Building on this, Alavi, Shahsavar, and Norouzi (2020) designed and implemented a C-DA tool to diagnose and enhance EFL learners' pragmatic competence, specifically in the speech acts of apology and request. Their study involved 60 BSc engineering students aged 18–24, with proficiency levels ranging from pre-intermediate to upper-intermediate. Participants engaged in a C-DA process that included 30 multiple-choice discourse completion tests, supplemented by pre-established mediational hints arranged from implicit to explicit. Importantly, the analysis revealed significant improvements in learners' mediated scores, affirming the effectiveness of C-DA in facilitating pragmatic development. Additionally, results suggested that the mediation process benefited learners across different proficiency levels, further reinforcing the potential of C-DA as a viable tool for diagnosing and enhancing pragmatic competence in EFL contexts.

In addition to computerized approaches, Ghorbanian, Ahangari, and Saeidi (2024) explored Iranian EFL learners' perceptions of Web-Based Dynamic Assessment (WDA) in developing pragmatic competence. Using a qualitative design, they conducted semi-structured interviews with 10 female intermediate learners. Their findings revealed several benefits of WDA, including improved verbal skills, increased willingness to learn pragmatics, reduced anxiety, accelerated learning, and enhanced learner autonomy and motivation. Moreover, participants reported stronger peer relationships and greater enjoyment of learning. These results emphasize WDA's ability to foster both cognitive and affective aspects of pragmatic competence in EFL contexts.

Extending the scope of dynamic assessment to mobile platforms, Rahmani, Ghonsooly, and Ghanizadeh (2025) examined the impact of Mobile-Mediated Dynamic Assessment (MDA) on EFL learners' pragmatic competence in expressing disagreement. Employing a

mixed-methods design, they studied 54 intermediate Iranian EFL learners divided into three groups: Dynamic Assessment (DAG), Explicit Feedback (EFG), and Control (CG). Over eight sessions conducted via Telegram, the DAG received graduated mediation, the EFG received direct feedback, and the CG had no intervention. Notably, the DAG significantly outperformed the other groups in post- and delayed post-tests. Furthermore, a thematic analysis of semi-structured interviews highlighted that the learners in the DAG perceived MDA as beneficial in enhancing their ability to express disagreement appropriately while reducing anxiety and fostering engagement. These findings further support the potential of MDA as a pedagogical tool for developing pragmatic competence in EFL learners.

In conclusion, the reviewed studies demonstrate the effectiveness of dynamic assessment approaches, whether computerized, web-based, or mobile-mediated, in fostering pragmatic competence among EFL learners. While each method offers unique advantages, all share the common feature of providing mediation that enhances learners' comprehension and production of speech acts. Given the promising results, further research is needed to refine dynamic assessment frameworks and ensure their efficacy in developing pragmatic competence in EFL contexts.

CHAPTER III

METHODOLOGY

3.1. Research Design

This study adopts a convergent mixed-methods design to explore the impact of computerized dynamic assessment on EFL learners' grammar in use in written production. As Creswell (2012) explains, a convergent mixed-methods approach enables researchers to collect and analyze both qualitative and quantitative data simultaneously, leading to a more comprehensive understanding of the research problem. In this design, these two datasets are examined separately, their findings are compared, and interpretations are drawn based on whether the results align or diverge (Creswell, 2012). By integrating these two forms of data, this study aims to gain deeper insights into how C-DA influences learners' grammatical progress, both in measurable performance and in their personal learning experiences.

Cohen, Manion, and Morrison (2007) highlight that mixed-methods research benefits from a well-structured data collection strategy that enhances validity through multiple perspectives. By using pre-tests, post-tests, dynamic assessment tasks, learner reflection diaries, semi-structured interviews, and a final writing task, this study follows triangulation principles, ensuring that multiple data sources contribute to a holistic and credible analysis by cross-validating findings from different perspectives. According to Cohen, Manion, and

Morrison (2007), triangulation strengthens research by reducing bias and increasing reliability through the integration of various data sources. In this study, the combination of quantitative (pre/post-tests, dynamic assessment scores) and qualitative (interviews, diaries) methods ensures a more comprehensive understanding of the impact of C-DA on grammatical development. The quantitative component of the study offers concrete evidence of learners' grammatical development through pre-test and post-test assessments, as well as weekly dynamic assessment scores and the grammar accuracy rates from the essay. Meanwhile, the qualitative component provides a broader perspective, capturing learners' thoughts and reflections through diaries and semi-structured interviews. A key feature of the convergent mixed-methods approach is that both types of data are gathered independently but analyzed collectively (Creswell, 2012). The integration of these datasets took place during the interpretation phase, ensuring that both numerical findings and personal experiences contributed to the overall conclusions.

3.2. The Research Context

This study took place in the College of Foreign Languages at a large state university in Türkiye, where preparatory students were enrolled in general English courses. In Türkiye, an English preparatory program is designed to enhance students' language proficiency before they begin their academic studies in a university department where English is the primary language of instruction.

University preparatory programs in Türkiye typically offer one-year intensive courses that focus on developing students' reading, writing, listening, and speaking skills necessary for English for Academic Purposes (EAP). Two main approaches are implemented: General Academic English (EGAP) and Specific Academic English (ESAP), with the latter being tailored to discipline-specific language needs. These programs adopt a student-centered approach, integrating technology and communication-based learning methods to prepare

students for academic and social interactions in English. Assessment includes a placement test at the beginning of the academic year, continuous evaluations through written exams, quizzes, and group projects, and a final proficiency assessment at the end of the program (British Council & TEPAV, 2015).

The College of Foreign Languages at this state university is accredited by the Evaluation and Accreditation of Quality in Language Services (EAQUALS), ensuring that it meets international standards in language education. The institution is committed to supporting students in achieving a B2 level of English proficiency, with an emphasis on reading, writing, listening, and speaking. The program starts with a placement test to assess students' language levels and assign them to appropriate classes. The administrative structure of the college includes several key units, each playing a critical role in curriculum design, assessment, and faculty development. Among these, the Measurement and Evaluation Unit is responsible for designing, implementing, and reviewing all assessments.

Measurement and Evaluation Unit ensures that assessments are standardized and aligned with international language proficiency benchmarks. The unit prepares midterms, final exams, quizzes, and portfolio assignments, ensuring that they effectively measure students' language development. Additionally, it provides rubrics and grading criteria for writing and speaking exams to ensure objectivity and consistency in evaluation. Instructors play a crucial role in both teaching and assessment. They monitor students' progress, provide formative feedback, and evaluate performance based on structured assessment criteria. Instructors are also actively involved in the grading process, particularly for writing and speaking tasks, using detailed rubrics prepared by the Measurement and Evaluation Unit.

Students participate in 25 hours of English instruction per week, focusing on skill-based lessons that enhance their overall language proficiency. The assessment framework is designed to be comprehensive and multi-dimensional, incorporating various evaluation methods. Midterms and the final exam assess all four language skills while quizzes, both

scheduled and "pop-up," focus on grammar, vocabulary, and language usage. In addition to traditional exams, students are required to complete portfolio assignments, which include writing tasks, speaking presentations, and digital projects aimed at fostering active learning and self-assessment. Moreover, online and mobile-based tasks are integrated into the curriculum to reinforce classroom instruction and provide students with additional opportunities for language practice.

3.3. Sampling and Participants

Sampling is a crucial aspect of research methodology, ensuring that the selected participants represent the target population effectively. Cohen, Manion, and Morrison (2007) emphasize that the quality of a research study depends not only on the appropriateness of its methodology and instruments but also on the suitability of the sampling strategy employed. In convergent mixed-methods research, selecting an appropriate sample is vital to capture both quantitative performance data and qualitative insights.

This study employs purposive sampling, in which researchers deliberately select participants based on their relevance to the research focus rather than aiming for generalizability. Purposive sampling allows researchers to select the cases that best align with the goals of the study, thus ensuring that the sample is appropriate for the research needs (Cohen, Manion, & Morrison, 2007). In this study, twelve EFL learners enrolled in a university preparatory program were selected based on specific criteria. The criteria included the following: (1) enrolment in the same preparatory program, (2) a B1 proficiency level, although their initial levels ranged from A1 to A2, (3) representation from different academic disciplines (e.g., ELT, architecture, engineering), (4) having been taught by the researcher in the previous term (to ensure that the DA tasks were appropriately designed with knowledge of the participants), and (5) no prior experience

with dynamic assessment. These factors demonstrate that the sampling strategy was not random but intentionally structured to explore the impact of C-DA on grammatical development within a specific learning context.

The participants were students enrolled in the College of Foreign Languages. All were in their second term at the college's preparatory school and ranged in age from 17 to 20. They shared a common demographic background as native Turkish speakers learning English as a foreign language. However, they also represented diverse academic backgrounds, which is particularly relevant in dynamic assessment, as it is a methodology known for benefiting students with varied educational experiences. In Türkiye, the university entrance exam, categorizes students into four main tracks based on their focus areas: Science Track, which includes students who specialize in mathematics, physics, chemistry, and biology, typically aiming for fields like engineering and natural sciences; Verbal Track, which encompasses students who focus on subjects like Turkish language, literature, history, and social sciences, usually pursuing degrees in humanities or law; Equal Weight (Turkish-Mathematics) Track, which combines both quantitative and verbal subjects, and includes students preparing for programs in economics, business administration, and other fields requiring both types of skills; and Foreign Language Track, which focuses on foreign languages, especially English, and includes students aiming for careers in translation, language teaching, and international relations. The participants in this study come from the Science Track and Foreign Language Track backgrounds, each of which brings distinct academic strengths, making dynamic assessment particularly relevant for addressing their diverse educational experiences.

Of the 12 participants, 4 were male and 8 were female. According to the college's standard assessment system, all participants were classified as B1-level English learners. However, upon entering the preparatory program, their initial proficiency levels varied, with some starting at A1 and others at A2. Their level classification was determined by the college,

and the reliability of these assessment tests is ensured by the institution's accreditation from EAQUALS.

As per the Turkish education system, students typically start learning English in the second grade of primary school, meaning that all participants had at least 10 years of prior English learning experience before enrolling in the preparatory program. Despite this extensive exposure, none of the participants had previous experience with dynamic assessment.

The participants came from different academic backgrounds, including 4 English Language Teaching (ELT) students, 6 architecture students, and 2 engineering students. However, since they were in their preparatory year, they had not yet begun coursework specific to their fields of study and were exclusively focused on English language training. This academic diversity is particularly significant in a dynamic assessment context, as it allows for an exploration of how students from different disciplinary backgrounds respond to mediated learning. A summary of participant demographics is provided in Table 1.

Table 1
Participant Demographics

Participant	Age	Gender	Field of Study	Current Proficiency Level	Initial Proficiency Level	Educational Level
P1	17	Male	Architecture	B1	A1	Preparatory
P2	19	Male	ELT	B1	A2	Preparatory
P3	18	Female	ELT	B1	A1	Preparatory
P4	19	Male	Architecture	B1	A1	Preparatory
P5	18	Female	ELT	B1	A2	Preparatory
P6	18	Female	Engineering	B1	A2	Preparatory
P7	18	Female	ELT	B1	A2	Preparatory
P8	19	Female	Architecture	B1	A1	Preparatory
P9	18	Female	Architecture	B1	A1	Preparatory
P10	20	Male	Architecture	B1	A1	Preparatory

P11	17 Female	Architecture	B1	A1	Preparatory
P12	18 Female	Engineering	B1	A1	Preparatory

A key aspect of dynamic assessment is understanding students' prior learning experiences, as "knowing the student" is essential for effective mediation. In this study, all participants had been taught by the researcher in the previous term, allowing for a deeper understanding of their learning histories, strengths, and areas of difficulty. This familiarity enabled the researcher to tailor the assessment process more effectively, aligning with one of the core principles of dynamic assessment, which is adapting mediation to students' needs based on prior knowledge of their learning trajectories.

Beyond the role of an observer, the researcher also actively participated in the study by designing the assessment tasks, formulating the mediation strategies, and analyzing student responses. The researcher holds a degree in ELT and has approximately three years of experience in the field, working with diverse age groups and Common European Framework of Reference for Languages (CEFR) proficiency levels. This background in language teaching and assessment provided valuable insights into the specific challenges that learners encounter in grammatical development and facilitated the implementation of dynamic assessment principles. The dual role of the researcher, as both an instructor and an assessor, enhanced the study's ability to capture the learning processes and individualized support mechanisms, further contributing to the depth of the findings.

3.4. Data Collection Instruments

This study employs multiple data collection instruments to measure the effects of computerized dynamic assessment on learners' grammatical development. The instruments include pre-test and post-test assessments, weekly dynamic assessment tasks, learner reflection diaries, semi-structured interviews, and a final writing task. Each of these tools serves a distinct purpose in capturing different aspects of the learning process.

3.4.1 Pre-test and Post-test

The pre-test scores were obtained from the institution's unannounced quizzes, which are administered by the Measurement and Evaluation Unit as part of the regular evaluation process. These quizzes assess students' grammar and/or vocabulary knowledge. The Measurement and Evaluation Unit ensures that the assessments align with the CEFR and maintain high validity and reliability. For this study, only the grammar-related scores from these quizzes were considered as the pre-test data. Since these quizzes were conducted as part of the standard curriculum without prior notification, they provided a natural measure of participants' initial grammar proficiency, minimizing test-induced learning effects.

The pre-test comprised a total of 25 grammar-related questions, selected from two institutional quizzes to address a variety of grammatical topics, which were discourse markers, conditionals, simple past tense, past perfect tense, past modals, relative clause, and noun clause. The questions covered a range of difficulty levels, from basic to more advanced structures, providing a comprehensive measure of participants' grammar knowledge. Participants' scores were calculated on a scale of 100. Due to confidentiality reasons, the original quiz questions from the institution could not be shared.

The post-test was developed by the researcher to align closely with the structure and standards of the institution's quizzes while ensuring alignment with the pre-test in terms of question type, difficulty, and scope. It also contained 25 questions covering the same grammar topics to maintain comparability (see Appendix A). To ensure content validity, the test was reviewed by an experienced instructor with prior experience in the Measurement and Evaluation Unit, who had more than five years of experience in ELT, and another instructor working in that university who had three years of experience. This review process verified that the post-test was equivalent to the pre-test in terms of scope and difficulty level.

Furthermore, internal validity was enhanced through multiple measures. The test was constructed following the institution's established assessment criteria to maintain consistency. Participants were explicitly instructed not to engage in additional grammar studies throughout the intervention period to prevent external influences on their performance. Additionally, the specific grammar topics addressed in the dynamic assessment tasks were deliberately not disclosed to participants in advance, ensuring that their performance reflected their actual linguistic development rather than prior preparation. The post-test was administered after the two-month intervention period to assess participants' progress in grammatical competence.

Since the pre-test was derived from the institution's standard assessments, its reliability analysis was not conducted by the researcher. These institutional assessments are specifically designed to ensure high levels of validity and reliability, adhering to the standards set by the Common European Framework of Reference for Languages (CEFR). Conversely, the post-test, which was developed by the researcher, underwent a reliability analysis using Cronbach's Alpha. Cronbach's Alpha is a widely used statistical coefficient that measures the internal consistency of a test, indicating how closely related a set of items are as a group. A higher Cronbach's Alpha value suggests greater reliability of the test items. According to Taber (2018), values above 0.70 are generally considered acceptable, indicating a moderate to high level of internal consistency. In this study, the reliability of the post-test was assessed through Cronbach's Alpha, computed using Python programming tools. The resulting coefficient was 0.748, demonstrating an acceptable level of internal consistency.

3.4.2 Computerized Dynamic Assessment Tasks

The C-DA tasks were designed to assess grammar and were implemented over two months, with one C-DA task administered each week (see Appendix B). The study was

conducted in the college, where each participant completed the assessment individually on a separate computer. A specialized educational software was purchased for the implementation of the assessment. With funding provided by the University's Scientific Research Projects (BAP) unit, iSpring Suite 11 was selected for its dynamic assessment-friendly structure, offering tools for interactive content creation, learner monitoring, and personalized feedback. In this software, each question appeared sequentially (see Appendix C). If a participant answered correctly, the system automatically moved on to the next question. However, if the response was incorrect, the system directed the participant to the first hint. This fully automated process ensured consistency in the assessment procedure.

The weekly dynamic assessments followed the cake format of dynamic assessment, where learners received standardized, progressively structured cues from indirect to direct until they reached the correct answer (Sternberg & Grigorenko, 2001). For each test item, if a participant selected an incorrect response, the system displayed a hint on the screen to assist them. The first hint was broad, prompting the learner to reconsider their choice. If the second attempt was also incorrect, the system provided a more detailed hint to further guide the learner. This process of providing hints continued for a maximum of four attempts, following the scoring framework developed by Poehner and Lantolf (2013). If the final response was still incorrect, the correct answer was displayed, and the learner proceeded to the next question.

No explicit grammar instruction was provided during the study, as all participants had previously received standardized grammar instruction on these topics either in the previous academic term or at the beginning of the current term. The grammar topics covered in the dynamic assessment tasks were as follows:

- Discourse markers
- If clauses
- Simple past tense

- Past perfect tense
- Past modals
- Relative clause
- Noun clause

These topics were randomly selected from the college curriculum. Each C-DA task incorporated at least two topics from the list, and participants were not informed in advance about which grammar structures would appear in the assessment. The tasks were intentionally structured in a non-sequential manner, deviating from the curriculum order to prevent participants from anticipating specific topics.

The test items were developed by the researcher, ensuring consistency with the pre-test and post-test formats. To maintain validity and reliability, the researcher carefully examined grammar explanation materials and exercise worksheets prepared by the Material Development Unit, as well as pop-up quizzes created by the Measurement and Evaluation Unit. Additionally, to further enhance the reliability of the assessments, another instructor from the institution independently reviewed and validated the test items to ensure their appropriateness and alignment with institutional standards. These institutional resources and expert evaluations helped ensure that the test questions accurately measured participants' grammatical knowledge. Each weekly dynamic assessment test consisted of ten questions, a number determined based on practical time constraints, ensuring a balance between comprehensive evaluation and feasibility within the study framework.

The hints were specifically designed to address common challenges that students were likely to encounter during the assessment, ensuring that they received targeted support tailored to their specific difficulties. These hints were carefully structured to progressively guide learners toward the correct answer while promoting independent problem-solving and deeper grammatical understanding. There were four types of hints provided within the system: categorization, which helped students classify grammatical structures; keyword

provision, which highlighted crucial words or phrases in the sentence; exemplification, which offered sample sentences to illustrate correct usage; and grammar rule reminders, which reinforced relevant grammatical rules.

3.4.2.1 Observation Notes

Throughout this process, participants' responses to the guided assessment were observed, and their interactions, along with thinking-aloud protocols, were recorded in observation notes each week. According to Creswell (2012), think-aloud protocols involve participants verbalizing their thought processes while completing a task. This method provides insights into how learners approach problems, make decisions, and what challenges they encounter. By recording these verbalized thoughts, researchers can better understand the strategies participants use, their areas of difficulty, and the types of support they require. This approach is valuable for examining language learning processes and assessing the effectiveness of instructional interventions. This data provided a valuable resource for understanding how learners engaged with the dynamic assessment framework.

Cohen, Manion, and Morrison (2007) suggest that observational notes should be divided into descriptive and reflective categories. Descriptive notes are focused on recording what is directly observed, such as the physical setting, human interactions, or specific behaviors. These notes should capture the chronological sequence of events and portray a detailed record of what happens during the observation. Reflective notes, on the other hand, include the observer's thoughts, feelings, and interpretations during the observation process, providing insights into the meaning or implications of what is being observed (Cohen, Manion, & Morrison, 2007). In this study, semi-structured observation was employed, where the researcher recorded both descriptive and reflective notes to gather authentic and comprehensive data on participants' responses during the assessment process.

These notes were crucial for understanding the nuances of participants' interactions, challenges, and learning behaviors, as Cohen, Manion, and Morrison (2007) emphasize the importance of capturing real-time, unfiltered data in natural settings. By blending descriptive and reflective observations, the researcher was able to gain a deeper insight into the participants' learning experiences and the effectiveness of the hints provided during the assessment.

3.4.3 Learner Reflection Diaries

Learner reflection diaries were used as a qualitative data collection tool to gain insights into participants' experiences with the C-DA process. As Cohen, Manion, and Morrison (2007) highlight, reflective diaries serve as valuable instruments for capturing learners' cognitive and emotional responses to assessment tasks, providing a deeper understanding of their perceptions of learning.

In this study, participants were asked to write about their experiences at the end of each C-DA task, focusing on specific prompts such as their impressions of the assessment process, any surprising aspects of the concepts tested, the differences between dynamic and traditional assessments, and their overall perception of the experience (see Appendix D). The structured prompts in the diaries encouraged participants to critically analyze their assessment experiences, allowing learners to critically engage with their own learning processes while offering researchers valuable qualitative data on the effectiveness of dynamic assessment. The use of open-ended questions allowed for a balance between structured guidance and participant autonomy.

These diaries, along with the observation notes, provided valuable insights into how computerized dynamic assessment supported learners' understanding of grammatical structures and their perceptions of the learning process. This data helped identify patterns

in how learners engaged with the tasks, how they perceived the effectiveness of the hints, and how the dynamic assessment method influenced their overall grammar proficiency.

3.4.4 The Final Writing Task

At the end of the two-month dynamic assessment period, participants were required to complete a final writing task in the form of an argumentative essay. This task was designed to evaluate their ability to integrate grammatical forms with their functional use in written discourse. More than just assessing grammatical accuracy, the objective was to determine whether learners could effectively apply these structures in a coherent and structured manner within an academic writing context.

Participants were given two essay topics to choose from and were expected to follow a well-defined structure, consisting of an introduction with a clear thesis statement, two body paragraphs presenting supporting arguments, a refutation paragraph addressing counterarguments, and a conclusion that reinforced their stance (see Appendix E). In addition to content organization, they were required to incorporate at least three of the following grammatical structures: if clauses, relative clauses, noun clauses, past simple tense, past perfect tense, and past modals. The use of discourse markers was also encouraged to enhance cohesion and clarity in their arguments. The essays had to be between 250 and 300 words in length and the time limit was 60 minutes. This final writing task served as a means to assess learners' progress and the impact of dynamic assessment on their writing skills. It provided insight into their ability to effectively utilize complex grammatical structures within an academic framework.

3.4.5 Semi-structured Interviews

A semi-structured interview is a qualitative research method that combines structured and unstructured elements (Cohen, Manion, & Morrison, 2007). It involves a set of predetermined questions and also allows for flexibility in the conversation. Interviewees have the opportunity to elaborate on their responses, and the interviewer can ask follow-up questions based on the interviewees' answers (Cohen, Manion, & Morrison, 2007). This approach provides rich, detailed insights while maintaining a clear focus on the research objectives.

In this study, retrospective semi-structured interviews were conducted at the end of the research process. The questions were designed based on participants' learner reflection diaries to address topics that were either insufficiently explained or unexplored in the diaries. By allowing flexibility in follow-up questions, these interviews complemented the diary data, providing a deeper understanding of participants' experiences and perceptions. Furthermore, the questions were personalized for each participant and tailored to the specific content of their reflections, ensuring a context-sensitive approach (Cohen, Manion, & Morrison, 2007). Each interview lasted between 5 to 10 minutes, allowing for concise yet insightful discussions within a structured framework (see Appendix F).

3.5. Data Collection Procedure

The study's data collection process involved multiple stages to assess participants' language development using dynamic assessment. Over eight weeks, participants completed weekly tasks to track their grammar progress. Data was collected using both quantitative and qualitative methods, including pretest and post-test scores, observation notes, weekly diaries, an argumentative essay, and semi-structured interviews. These methods provided an accurate picture of participants' experiences and progress. The study timeline is shown in Figure 1.

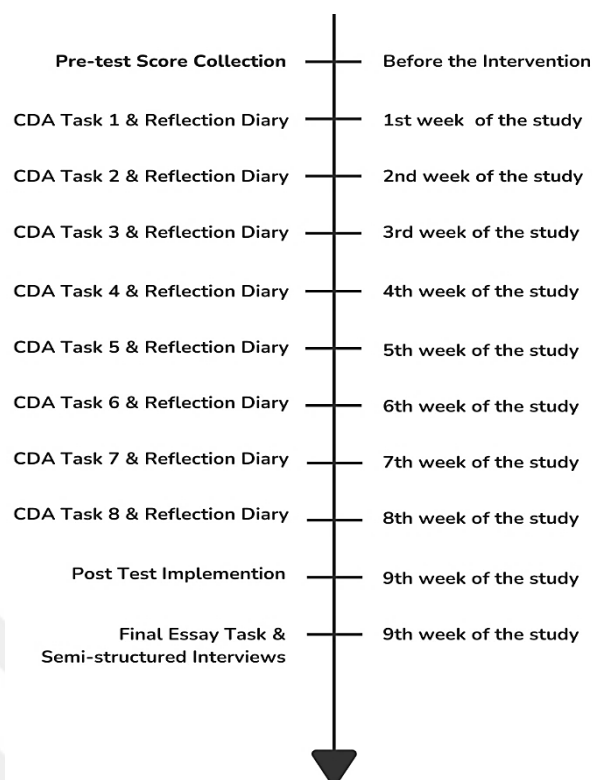


Figure 1. Timeline of the data collection procedure

Before any mediation, participants' grammar quiz scores from the spring term were used as pre-test data. Over the following two months, dynamic assessment activities were conducted. Each participant attended one individual session per week for eight weeks, held in a quiet classroom at the university's preparatory school. A controlled, distraction-free environment was provided to maintain assessment validity. In each session, participants completed tasks that assessed their grammar. For each weekly C-DA task, two scores were recorded: the actual score, representing the participant's initial response before any intervention, and the mediated score, showing their response after receiving guidance. Both scores were calculated for every task, enabling a detailed analysis of progress over time. To ensure the security of the data, all collected information was stored in encrypted files, which were only accessible to the researcher.

The researcher closely observed how each participant responded to the mediations provided during the task. Observations included participants' responses to interventions,

the pace of their work, think-aloud protocols, the number of hints requested, and any physical or verbal reactions. These observations were recorded in notes. After each weekly C-DA task, participants wrote a reflection on their experience. The weekly reflection diaries supported the researcher's observation notes and helped track progress over time. This test-observation-reflection process was repeated weekly for eight weeks. After eight weeks, participants completed a final writing task to measure their language development. The task was to write an argumentative essay and to use the structures they practised with C-DA tasks. This final task aimed to assess their progress in applying the targeted grammatical structures in a more integrated and coherent manner. The data collection process ended with semi-structured interviews, where participants shared their experiences and reflected on the assessment process in more depth. Peer debriefing was used as an effective method to mitigate researcher bias and contribute to maintaining objectivity throughout the research process. Table 2 summarizes the data collection procedure.

Table 2
Data Collection Procedure

Stage	Duration	Activities	Data Collected
Pre-test	Before the intervention	Collection of participants' grammar quiz grades	Quiz scores (pretest)
Dynamic Assessment	Week 1 - 8	C-DA tasks administered; observation notes completed	C-DA test scores, observation notes
Reflection Diary	Week 1 - 8	Participants submit weekly written reflections	Reflection diaries
Post-test	End of the study	Non-dynamic post-test administered	Post-test scores
Essay Writing	End of the study	Participants write an argumentative essay	Argumentative essays
Semi-structured Interviews	End of the study	Participants are interviewed regarding the process and their reflection diaries	Audio recordings

3.6. Data Analysis

Due to the mixed-methods approach used in this study, both quantitative and qualitative analyses were conducted. The quantitative analysis focused on comparing pre-test and post-test results, weekly C-DA performance data, and statistical evaluations to assess the effectiveness of the intervention. The qualitative analysis included learner reflection diaries, semi-structured interviews, and observation notes to explore participants' views and engagement with C-DA. To ensure the validity and reliability of the analysis, expert consultation was sought from a professor specializing in test and measurement in education, ensuring that the chosen methods were in line with best practices in applied linguistics research. Furthermore, triangulation was achieved by gathering data from multiple sources, including test scores, observation notes, and learner reflections, to confirm the findings.

3.6.1. Quantitative Data Analysis

Quantitative data in this study were collected through a pretest, a post-test, weekly computerized dynamic assessment tasks, and a final essay task. The data consisted of five main numerical measures: (1) pretest scores, (2) post-test scores, (3) actual scores from the computerized dynamic test (recorded weekly), (4) mediated scores from the computerized dynamic test (recorded weekly), and (5) grammar accuracy rates from the essays. These numerical data were analyzed using statistical methods to determine changes over time and evaluate the impact of mediation on students' grammar accuracy.

To ensure the integrity of the data analysis process, several reliability and validity measures were applied. According to Creswell (2012), ensuring data reliability involves intra-rater and interrater checks, while validity should be assessed through multiple forms of evidence. This study incorporated intra-rater reliability by having the same researcher analyze the data at different points in time to ensure consistency. Expert consultation was

sought to refine the analytical approach, ensuring both construct validity and content validity of the assessment instruments.

3.6.1.1 Analysis of Pre-test and Post-test Results

To analyze the data, both descriptive and inferential statistical methods were employed. Descriptive statistics, including mean, standard deviation, minimum, maximum, median, and range, were calculated to summarize the distribution of pre-test and post-test scores.

Since many parametric statistical tests (e.g., t-tests, ANOVA) require normality assumptions, normality tests such as the Shapiro-Wilk and Kolmogorov-Smirnov tests are commonly used to determine data distribution (Field, 2018). However, when the sample size is small, these tests often lack sufficient statistical power, meaning they may fail to detect deviations from normality. Razali and Wah (2011) define that small sample size as being less than 30, while Mendes and Pala (2003) suggest that that sample size below 20 is considered small. Given that this study had a sample size of $N = 12$, a normality test was not conducted. Instead, the Wilcoxon signed-rank test, a non-parametric alternative, was applied. Statistical analyses were conducted using SPSS (version 29), with a significance level set at 0.05 to determine statistically significant differences between pretest and post-test scores.

3.6.1.2 Analysis of the Data from C-DA

In dynamic assessment, evaluation is typically based on the learning potential score, which reflects a learner's ability to improve with mediation. The LPS is designed to assess not only what a learner currently knows but also their capacity to learn when provided with structured assistance. However, since this study does not primarily aim to evaluate students' potential, identify their ZPD, or assess their learning capacity through DA, LPS

scores were not included in the analysis. Instead, two types of scores were calculated for each test administered during the study: the Actual Score and the Mediated Score.

Actual Score represents the raw test performance without any mediation. It is calculated by summing the points from correct answers on the first attempt, without considering whether a participant later benefited from assistance. This score provides a measure of a participant's immediate, unassisted knowledge.

Mediated Score, on the other hand, considers how participants responded to structured mediation during the test. This score reflects not only whether the answer was ultimately correct but also the level of support required to reach it. To determine the Mediated Score, the scoring framework developed by Poehner and Lantolf (2013) was applied (Figure 2). In this system, each test question allows up to four attempts. If a participant answers correctly on the first attempt, they receive four points. If the first attempt is incorrect, they are provided with a clue, and if they answer correctly on the second attempt, they receive three points. With each additional clue, the awarded points decrease. The scoring process is summarized in Figure 2.

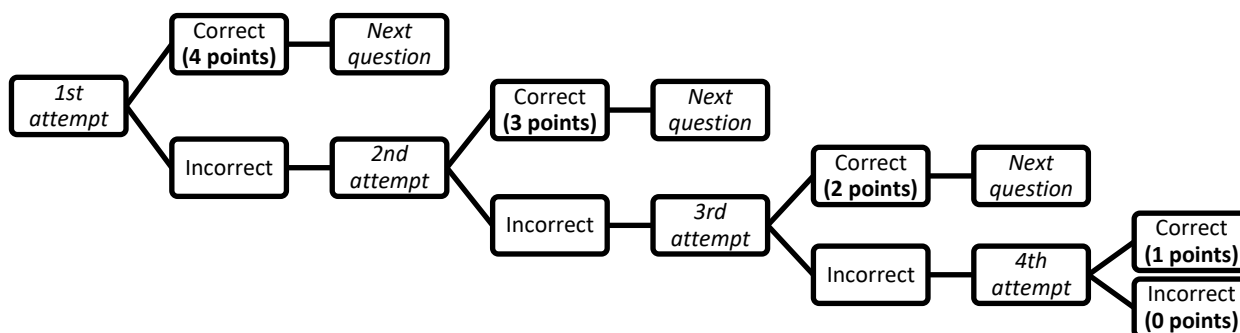


Figure 2. Process of awarding points in C-DA tasks

This scoring system provides insight into both the learner's independent knowledge and their responsiveness to instructional support. The Actual Score highlights what a student

knows without help, while the Mediated Score captures their ability to improve when guided, offering a more nuanced picture of their learning process.

To track performance trends over time, weekly averages of both Actual Scores and Mediated Scores were calculated. Instead of analysing individual students separately, the scores of all participants in a given week were averaged to determine the group's overall performance. For instance, in Week 1, the scores of all 12 participants were added together and divided by 12 to obtain the mean score for that week. This process was repeated for each of the 8 weeks, allowing for a comparative analysis of trends and changes over time. This approach helped identify whether students' performance improved with mediation and how their unassisted and assisted scores evolved throughout the study.

3.6.1.3 Analysis of Essay Tasks

Instead of assigning numerical scores to essay, the study focused on the grammatical accuracy of structures covered in C-DA sessions. This analysis does not involve holistic or analytic scoring, as it does not assign a single overall score or evaluate different aspects of the essay, such as organization or style. Instead, the focus is solely on the grammatical accuracy of specific structures. The analysis examined both the structural correctness and the contextual appropriateness of the target grammatical structures, following the principle of 'grammar in use.' The goal was to assess whether the structures were used correctly in form and, equally important, if they were used appropriately in context.

By calculating the frequency of correct uses, the study measures the accuracy rate based on the formula: $\text{Accuracy Rate} = (\text{Correct Uses} / \text{Total Attempts}) \times 100$. This approach provides a quantitative analysis of grammatical accuracy, rather than a holistic or analytic evaluation of the entire essay. Therefore, while the analysis involves a form of scoring, it is specific to the correct and contextually appropriate use of grammatical structures and does not represent a comprehensive assessment of the essay as a whole.

To ensure reliability, a second independent instructor from the same university also evaluated the essays. This instructor calculated the number of correct uses and total attempts for the target structures and reached the same conclusions as the primary researcher, confirming the consistency of the evaluation process. Appendix G provides an example of a participant essay.

3.6.2 Qualitative Data Analysis

The qualitative data comes from observation notes, weekly reflection diaries, and semi-structured interviews. In this study, thematic analysis was used to systematically identify and interpret recurring patterns within the data, allowing for a deeper understanding of participants' experiences and perspectives (Braun & Clarke, 2006), as the collected data from reflection diaries, and semi-structured interviews were open-ended and aimed at exploring participants' experiences, perceptions, and challenges.

The analysis followed Braun and Clarke's (2006) six-step framework, which includes data familiarization, initial coding, theme identification, theme review, theme definition, and final reporting. The analysis was conducted manually to allow for more in-depth engagement with the data. To ensure reliability in the manual coding process, multiple steps were taken. Although the coding was conducted by a single researcher, intra-coder reliability was ensured through multiple rounds of coding and comparison. After an initial round of coding, the data was revisited at a later stage to check for consistency in code application. Additionally, coding decisions were discussed with the academic supervisor to minimize subjectivity and validate the identified themes.

3.6.2.1 Analysis of Reflection Diaries

Thematic analysis of reflection diaries was conducted inductively, meaning that no pre-existing categories were imposed on the data. Patterns and themes emerged from the data rather than being predetermined, allowing for a more data-driven and exploratory approach to analysis (Braun & Clarke, 2006). The diaries were repeatedly examined to ensure deep familiarization, and initial codes were generated based on frequently mentioned concepts. These codes were then refined and categorized into broader themes aligned with the research objectives.

The reflection diaries were first read in their entirety to gain an overall understanding of participants' self-perceptions. Appendix H includes sample learner reflection along with its English translation. Next, text segments were identified and coded according to key themes, including perceptions of mediation, increased grammar awareness, and self-reported improvements in written production. Following Naeem et al.'s (2023) thematic analysis guidelines, codes were refined by eliminating redundancies and grouping them into higher-order themes. The final step involved collapsing the data into three overarching themes, ensuring a structured and systematic interpretation of participants' reflective accounts.

Key themes that emerged from the reflections include mediation and self-regulated learning, grammar structures awareness, and the impact on language production. These themes represent key areas of development during the learning process. Mediation and Self-Regulated Learning includes students' perceptions of teacher support, the use of guidance techniques, and how these helped them become more independent and motivated learners. Grammar Structures Awareness reflects students' growing ability to notice and understand grammar rules and patterns in the language. Production Impact focuses on how these developments affected students' actual language use, such as improved grammar

accuracy, confidence, and variety in their writing and speaking. Table 3 shows the main themes and specific codes.

Table 3

Categories/Themes from the Thematic Analysis of Reflection Diaries

Category/Theme	Code
Mediation and Self-Regulated Learning	Perceived teacher support
	Use of scaffolding techniques
	Self-directed learning strategies
	Emotional impact of mediation
	Increased motivation through guidance
Grammar Structures Awareness	Noticing grammar patterns
	Increased awareness of language structure
	Use of grammar rules in production
	Confidence in grammatical accuracy
Production Impact	Increased confidence in grammar usage
	Improved application of grammar rules
	More frequent use of complex structures
	Higher grammatical accuracy in production
	Lexical and structural variety in writing

This method was selected as the primary analytical approach because reflection diaries provided direct insights into participants' thought processes and self-evaluations. Reflection diaries represent participants' self-constructed narratives, making them a rich source for understanding their cognitive and emotional engagement with the learning process.

3.6.2.2 Analysis of Observation Notes

The observation notes were analyzed using descriptive analysis (Yıldırım & Şimşek, 2013), following the thematic framework previously developed through the analysis of reflection diaries. In line with the four stages of descriptive analysis, which are creating a

thematic framework, processing data according to the framework, identifying findings, and interpreting them, the observation data were organized to support and enrich the findings from participant reflections. Rather than generating new codes, the analysis focused on categorizing observed behaviors under the pre-established themes, aiming to provide illustrative examples that enhance the credibility and interpretability of the qualitative findings.

A structured framework based on Creswell's (2012) qualitative observation method was used to ensure a systematic and objective approach. This method incorporated both descriptive elements (e.g., observed behaviors such as hesitation, response times, and reliance on hints) and reflective aspects (e.g., engagement shifts and responses to mediation), allowing for a comprehensive interpretation of participants' learning interactions.

The primary purpose of the observation notes was to validate and complement the self-reported data from the reflection diaries. As Naeem et al. (2023) emphasize, triangulating multiple data sources enhances analytical reliability by cross-referencing self-reported perceptions with observed behaviors. To achieve this, participants' verbal and non-verbal interactions with the learning system were systematically examined. For instance, instances where participants hesitated before responding or re-read hints multiple times were linked to self-reported struggles with understanding certain concepts, a reduction in response time and fewer incorrect attempts over time indicated an improvement in grammar awareness and increased confidence in self-correction, and increased engagement with dynamic assessment tools, such as verbalizing thought processes or actively using hints, was associated with participants' reflections on scaffolding and self-regulated learning.

By positioning the analysis of observation notes as a secondary and complementary process, this study acknowledges the potential limitations of self-reported data while reinforcing the insights gained from reflection diaries. The structured approach ensured

consistency and minimized subjective bias in interpreting participants' engagement in the learning process.

3.6.2.3 Analysis of Semi-Structured Interviews

The semi-structured interviews were transcribed and analyzed using inductive thematic analysis (Braun & Clarke, 2006). Appendix I includes sample semi-structured interview transcripts along with their English translations. The transcripts were thoroughly examined, and initial codes were generated based on recurring patterns across participants' responses. These codes were then refined, grouped into broader themes, and aligned with the research questions. The primary themes that emerged from the analysis included Traditional Assessment vs. Dynamic Testing, Mediation, and Production. Direct quotations were used to illustrate key insights and provide a nuanced understanding of learners' experiences with C-DA.

To ensure coding reliability, intra-coder reliability techniques were applied. The data were coded in two separate rounds with a time interval to check for consistency. Additionally, the thematic structure was reviewed and discussed with the academic supervisor to confirm that the final themes accurately reflected the participants' experiences.

The identified themes were further compared with those from the reflection diaries and observation notes to enhance the coherence and depth of the overall analysis. This triangulation process ensured that insights from different data sources aligned and provided a more holistic understanding of participants' engagement.

These themes highlight different aspects of the assessment and learning process. Traditional Assessment vs. Dynamic Testing explores how students experienced different types of assessment, especially in terms of feedback, learning benefits, confidence, and anxiety. Mediation Strategy focuses on the specific techniques used by the teacher during dynamic assessment, such as providing examples, using key words, or reminding students

of grammar rules, and how these helped learners understand and apply language more effectively. Production reflects the impact of these strategies on students' language use, particularly in their grammar accuracy, structural variety, and ability to produce more complex language during tasks.

Table 4

Categories/Themes from the Thematic Analysis of Semi-Structured Interviews

Category/Theme	Code
Traditional Assessment vs. Dynamic Testing	Feedback and Error Correction
	Learning-Oriented Assessment
	Retention and Transfer
	Confidence and Test Anxiety
Mediation Strategy	Use of Examples
	Use of Key Words
	Categorization
	Grammar Rule Reminders
	Combination/Topic Dependent
Production	Improved Grammar Use in Production
	Increased Grammar Awareness During Production
	Variety of Structures in Production
	Improvement in Complex Structures

CHAPTER IV

FINDINGS

The following section outlines the key findings obtained from the analysis of the data.

4.1 Findings from the Quantitative Data

This section features the quantitative findings of the study, which focus on the analysis of pre-test and post-test data. Descriptive statistics, the Wilcoxon Signed-Rank Test, and error analysis were used to analyze participants' performance before and after the intervention. Moreover, the accuracy of the essays was compared with the test results to see patterns of grammatical enhancement. Furthermore, actual and mediated scores were analyzed to assess the impact of mediation on participants' learning outcomes. The results are presented in tables and are explained briefly, without interpretation.

4.1.1. Descriptive Analysis of Pre-Test and Post-Test Scores

A total of 12 participants ($N = 12$) completed both pre-test and post-test assessments designed to evaluate their grammatical accuracy. Table 3 presents the descriptive statistics for these assessments. The mean pre-test score was 67.67 ($SD = 22.27$) and increased to 79.33 ($SD = 14.85$) in the post-test, indicating an improvement of approximately 11.67

points. The reduction in standard deviation from 22.27 to 14.85, along with a narrowing of the range from 68.00 to 48.00, suggests that score variability decreased following the intervention. Additionally, the minimum score improved from 28.00 to 52.00, while the maximum score increased from 96.00 to 100.00, indicating that even lower-performing participants showed notable gains and higher-performing participants reached full scores. These findings collectively demonstrate an overall upward trend in participants' performance.

Table 5
Descriptive Statistics of Pre-Test and Post-Test Scores

	Pre-test Score	Post-test Score
Mean	67.67	79.33
Standard Deviation	22.27	14.85
Minimum	28.00	52.00
Median	74.00	86.00
Maximum	96.00	100.00
Range	68.00	48.00

While these descriptive statistics indicate an improvement in grammatical accuracy, the statistical significance of these differences was subsequently assessed using the Wilcoxon Signed-Rank Test.

4.1.2. Wilcoxon Signed-Rank Test Results

A Wilcoxon Signed-Rank Test was conducted to compare the pre-test and post-test scores, assessing whether the observed improvement in grammatical accuracy was statistically significant. The Wilcoxon Signed-Rank Test is a non-parametric test used for comparing two related samples, particularly when the data do not meet the normality assumption

required for parametric tests. This test evaluates whether there is a consistent directional change in scores between two paired measurements.

The test results indicated a statistically significant improvement in participants' scores following the intervention ($Z = -2.25$, $p = .024$). Since the p-value is below the conventional threshold of .05, the difference in median scores between the pre-test and post-test is considered statistically significant. Table 6 presents the detailed test results.

Table 6
Inferential Analysis of Pre-Test and Post-Test Scores

Test	Z-Value	p-Value	Interpretation
Wilcoxon Signed-Rank Test	-2.25	.024	Significant difference in medians ($p < 0.05$).

The median score increased from 74.00 (pre-test) to 86.00 (post-test), indicating an overall improvement in participants' grammatical accuracy. The negative Z-value (-2.25) reflects the direction of change, suggesting that the post-test scores were generally higher than the pre-test scores. Since the Wilcoxon Signed-Rank Test accounts for both the magnitude and direction of changes in individual participants' scores, the results confirm that the observed increase is not due to random variation but represents a meaningful improvement.

4.1.3. Comparison of Accuracy Rates across Pre-Test, Post-Test, and Essay Writing

The pre-test accuracy rates represent participants' initial grammatical proficiency before the C-DA intervention. This assessment measured their baseline knowledge of the targeted structures in a controlled testing environment, without any feedback or scaffolding. Since the pre-test was administered before the instructional period, the accuracy rates reflect the participants' spontaneous use of grammatical rules. The post-test accuracy rates were recorded after participants completed eight weeks of C-DA tasks, which incorporated

dynamic assessment principles to provide mediated learning opportunities. The changes in accuracy rates between the pre-test and post-test highlight the effectiveness of the intervention in improving grammatical proficiency.

The essay accuracy rates provide an additional perspective by evaluating participants' ability to use these grammatical structures in spontaneous written production. Unlike the pre-test and post-test, which consisted of structured test items, the essay task required participants to integrate the targeted grammatical forms naturally in a writing context. This measure offers insights into not only accuracy but also participants' ability to transfer their grammatical knowledge to a more communicative and functional domain.

Table 7 displays the comparison of these three sets of accuracy rates, which allows for a comprehensive understanding of how well participants improved over time and how effectively they applied their grammatical knowledge in different linguistic contexts.

Table 7

Accuracy Rates Across Pre-Test, Post-Test, and Essay Writing Tasks

Grammar Structure	Pre-test Accuracy (%)	Post-test Accuracy (%)	Essay Accuracy (%)
Discourse Markers	81.7%	75.0%	97.8%
Conditionals	60.4%	80.0%	100%
Simple Past & Past Perfect	50.0%	72.2%	100%
Past Modals	61.1%	75.0%	100%
Relative Clause	65.0%	93.8%	94.1%
Noun Clause	75.0%	77.1%	97.0%

The pre-test accuracy rates ranged from 50.0% (Simple Past & Past Perfect) to 81.7% (Discourse Markers), indicating varying levels of grammatical proficiency among participants before the intervention.

Following eight weeks of C-DA tasks, post-test accuracy rates showed an increase in most grammatical structures, ranging from 72.2% (Simple Past & Past Perfect) to 93.8% (Relative Clause). Notably, Relative Clause exhibited the highest post-test accuracy (93.8%), indicating a strong improvement in this area. However, Discourse Markers, which initially had the highest pre-test accuracy (81.7%), showed a slight decrease in post-test accuracy (75.0%).

In the essay writing task, accuracy rates remained high across all grammatical structures. Conditionals, Simple Past & Past Perfect, and Past Modals were used with 100% accuracy, indicating no errors in their application within written production. Discourse Markers also demonstrated a high accuracy rate of 97.8%, while Noun Clause and Relative Clause were used correctly 97.0% and 94.1%, respectively.

These results suggest that while post-test accuracy generally improved across structures, participants demonstrated even greater accuracy when applying these grammatical rules in their written essays.

4.1.4. Comparison of Actual and Mediated Scores

This section presents a comparison between Actual Scores and Mediated Scores across eight computerized dynamic assessments conducted over an eight-week period. Each test consisted of 10 questions, with responses scored out of a maximum of 40 points. The Actual Score represents the number of correct responses provided on the first attempt, without any external assistance. In contrast, the Mediated Score reflects participants' performance on the same test, not through a retake, but by also scoring the answers they provided after receiving structured hints.

The mediation process was designed to provide graded levels of support, where each hint resulted in a reduction of the possible score for that question. If a participant answered correctly without any hints, they received four points. If one hint was required, the

maximum score for that question was three points, while two hints resulted in a final score of two points. If a participant was unable to provide a correct response even after the third mediation, they received zero points.

By comparing these two sets of scores, we can observe differences between participants' independent performance and their performance with external scaffolding. Figure 3 illustrates the trends in Actual and Mediated Scores across the eight weeks.

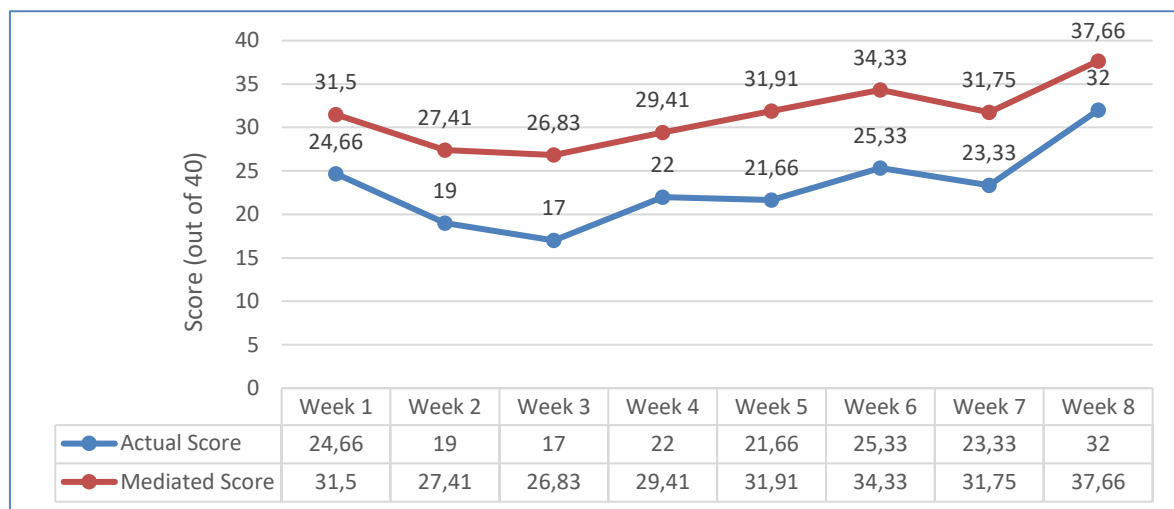


Figure 3. Comparison of actual and mediated scores across eight weeks

The Actual Scores, representing participants' independent performance, fluctuated over the eight-week period. In Week 1, the mean Actual Score was 24.66. A decline was observed in Week 2 (19) and Week 3 (17), marking the lowest score recorded in the study. The most significant drop occurred between Week 1 and Week 3, with a decrease of 7.66 points. However, from Week 3 onwards, a gradual improvement was noted. Week 4 showed a slight increase to 22, followed by a minor decline to 21.66 in Week 5. The upward trend continued in Week 6 (25.33), slightly declined in Week 7 (23.33), and reached the highest Actual Score in Week 8 (32). Despite fluctuations, the final score in Week 8 exceeded the initial score in Week 1 by 7.34 points.

The Mediated Scores, which reflect participants' performance after receiving structured hints, exhibited a more stable upward trend compared to the Actual Scores. The highest Mediated Score was recorded in Week 8 (37.66), while the lowest occurred in Week 3 (26.83). The mean score in Week 1 was 31.5. A slight decrease was noted in Week 2 (27.41) and Week 3 (26.83), but from Week 4 (29.41) onward, a general upward trend was observed. Week 5 recorded a score of 31.91, followed by 34.33 in Week 6. However, a slight drop occurred in Week 7 (31.75) before reaching the highest peak in Week 8 (37.66). The largest increase in mediated scores occurred between Week 7 and Week 8, with a rise of 5.91 points. While minor fluctuations were observed in some weeks, the overall trend remained positive, with scores steadily increasing over time.

A comparison of the two score sets reveals key differences in performance with and without mediation. The Mediated Scores were consistently higher than the Actual Scores across all weeks, demonstrating the effect of mediation. The largest gap between the two scores occurred in Week 3, where the Mediated Score (26.83) exceeded the Actual Score (17) by 9.83 points. In contrast, the smallest gap was observed in Week 8, where the difference between the Mediated Score (37.66) and the Actual Score (32) was 5.66 points. Additionally, the highest increase in Actual Scores was observed between Week 7 and Week 8 (8.67 points), while the highest increase in Mediated Scores occurred in the same period (5.91 points).

4.2 Findings from the Qualitative Data

The qualitative data for this study was gathered from weekly reflection diaries, observation notes, and semi-structured interviews conducted with twelve participants. Following the data collection, a systematic analysis was carried out to identify key patterns in their experiences with C-DA, focusing on their engagement, self-regulation, and interaction

with adaptive feedback. This section presents a detailed analysis of the findings, highlighting recurring themes and variations in participant responses.

4.2.1. Weekly Reflection and Observation Notes

To analyze the data from weekly reflections and observation notes, the findings have been categorized into three primary themes: Mediation and Self-Regulated Learning, Grammar Structures Awareness, and Production Impact. Direct quotations from participants have been translated into English and appropriately referenced to preserve the authenticity of their responses. To ensure the clarity and accuracy of the language used, feedback was obtained from a language expert. Additionally, participants were consulted to verify that the translations preserved the intended meaning, a process known as member-checking.

Additionally, observational data have been incorporated to provide a more comprehensive view of participant engagement during the assessment process, including behavioural patterns and response strategies. By combining self-reported reflections with observed behaviors, the analysis offers a deep insight into how participants interacted with C-DA. The following sections summarize the key findings, highlighting notable patterns and comparisons across participants.

4.2.1.1 Mediation and Self-Regulated Learning

A fundamental aspect of C-DA is its ability to provide real-time feedback, allowing learners to recognize their errors and adjust their responses accordingly. Many participants found the hints valuable in identifying mistakes, since the immediate explanations helped them refine their understanding of grammatical rules. The dynamic nature of the test was generally perceived as beneficial, as it offered instant feedback and opportunities for self-correction through subtle guidance.

Participant responses and observed behaviors were categorized under five key codes: Use of Scaffolding Techniques, Perceived Teacher Support, Self-Directed Learning Strategies, Emotional Impact of Mediation, and Increased Motivation Through Guidance. These codes emerged from the thematic analysis of weekly reflections, showing the most frequently mentioned themes of the data. Among these, Use of Scaffolding Techniques was the most frequently mentioned, referenced by five participants. Perceived Teacher Support, Self-Directed Learning Strategies, Emotional Impact of Mediation, and Increased Motivation Through Guidance were each identified in the reflections of three participants. In addition to participant reflections, behavioral data observed during the C-DA sessions were documented and analyzed to support the thematic categories. Observation notes were analyzed based on the codes emerging from the reflections of participant to support the existing data.

The category Use of Scaffolding Techniques describes how the structure of the C-DA tests facilitated learning through graduated hints and adaptive feedback. Several participants reported that the test's design, which provided progressively specific hints after incorrect responses, helped them identify and correct their mistakes. For example, one participant stated that after reading the second hint, they “instantly realized [his] mistake” (P1, W3), and this was reflected in their immediate correction following the second-level prompt. Participant 2 also noted “I was able to learn correctly by making mistakes and reinforcing it with hints... I learned through the examples after my mistakes” (P2, W2), showing improved accuracy immediately after receiving hints. Furthermore, Participant 4 stated that the C-DA enabled him to connect previous errors to new concepts (P4, W3). These responses illustrate that the structured provision of hints made participants feel an improved ability to recognize and address their own misunderstandings, which contributed to enhanced performance within the testing process.

The second code, Perceived Teacher Support, captures participants' interpretations of the feedback system as teacher-like assistance. Hints were described as supportive, instructive,

and responsive. Participant 3 described it as “like having real-time support” (P3, W1), and Participant 5 similarly stated “It felt like I was asking someone for help whenever I needed it.” (P5, W7). The feedback was compared to interaction with a teacher, suggesting a sense of instructional presence. To illustrate, Participant 4 noted “it explained the questions I repeatedly got wrong and guided me like a teacher. ” (P4, W3), and he showed increased engagement with each hint and fewer repeated mistakes in the following test items. These self-reports demonstrate that participants perceived the system’s hints as a form of instructional presence.

Self-Directed Learning Strategies represent the third code. This code includes the participant statements suggesting increased autonomy, awareness of personal error patterns, and application of acquired knowledge beyond the immediate testing context. In the reflection paper from the first week, Participant 8 stated that she was able to answer the subsequent questions more easily because the hints helped her approach the questions more systematically. Supporting her point, faster response times and reduced hesitation were observed in the later test items. P9 explained a similar benefit by stating that the hints were helpful “in identifying the correct answers to [her] mistakes” (P9. W8), and she also showed increased ability to correct mistakes after hints without further support in later weeks. According to Participant 10, learning how to correct mistakes further led to easier application of the target structure. These reflections suggest that the ability to recognize and correct errors independently, along with evidence of applying learned structures in subsequent tasks, indicate the development of self-directed learning strategies over time.

The fourth code, Emotional Impact of Mediation, includes emotional responses related to the presence of real-time feedback. Participant 6 reported feeling more confident because the hints “acted like a safety net” (P6, W7). She displayed fewer signs of frustration after seeing the hints in later weeks' tests. Another emotional impact mentioned in some reflections was an increased sense of concentration with the assistance of hints. Participant 6 noted, “The hints helped me refocus and concentrate when I felt confused or distracted”

(P7, W6), and Participant 9 explained that the hints helped her “approach difficult questions more carefully,” stating that they allowed her “to think ahead instead of rushing” (P9, W1). Brief pauses before retrying after the first hint were observed in both participants, and their revised responses were accurate. Overall, reported emotional effects included increased confidence, reduced frustration, and enhanced concentration. Observable behaviors such as more deliberate pacing and improved accuracy following hints further align with these emotional responses.

Finally, the code of Increased Motivation Through Guidance includes participant comments on how the assessment process influenced their interest, persistence, and enjoyment. Some statements under this code suggest that the participants found the tasks engaging. Participant 12 noted that the C-DA test was “thought-provoking and educational”, and she added “I felt like I was learning throughout the test. It kept me engaged from start to finish.” (P12, W1). Participant 6 also mentioned continuing with tasks willingly, noting "Towards the end, I had gotten used to the system and it was clear what I needed to do. I was answering the questions more enjoyably." (P6, W8) These accounts imply that the guided nature of the assessment process contributed to sustained interest and engagement.

To conclude, these reflections and observed behaviors highlight various aspects of mediation and self-regulated learning in the context of C-DA. These include the use of scaffolded support for error correction, perceived instructional guidance through system feedback, the adoption of independent learning approaches, emotional regulation facilitated by real-time hints, and increased engagement and motivation influenced by adaptive feedback mechanisms.

4.2.1.2 Grammatical Structure Awareness

Grammatical structure awareness refers to learners' ability to internalize and accurately apply grammar rules. Participant reflections were analyzed and assigned specific codes based on emerging patterns in the development of grammatical competence. These codes reflect patterns of growth in recognizing grammatical structures, applying grammar rules in their own production, and gaining confidence in their grammatical accuracy.

Among the identified codes, "Noticing grammatical patterns" and "Increased awareness of structure" were the most frequently observed, each appearing within the reflections of 3 out of 12 participants. "Noticing grammatical patterns" reflects participants' ability to identify and recognize grammatical structures in context, representing an initial stage in the process of conscious grammar acquisition. Similarly, "Increased awareness of structure" refers to a deeper understanding of how grammatical elements are organized within sentences and how they interact to convey meaning. "Confidence in grammatical accuracy" and "Use of grammar rules in production" were each mentioned by two participants, indicating a developing ability to apply grammar rules with increasing self-assurance. Although not all participants explicitly reflected on this theme, the in-depth accounts of those who did suggest a meaningful trajectory of development in their understanding and use of grammatical structures.

Some participants demonstrated an increasing ability to recognize and understand grammatical structures. They described how guided prompts during the C-DA tasks helped them recognize previously unclear patterns and distinctions. Participant 8, for example, stated that she had been experiencing challenges with punctuation in discourse markers, because she lacked clarity on the rules. However, she noted that over time, she began to identify patterns in sentence structures as a result of the hints provided. A similar but in "use" level experience was mentioned by Participant 5:

I knew that I should use past perfect tense in if clauses when the other half of the sentence includes something like 'would have.' I had memorized this rule before, so I could pick the

correct answer in the test. However, I didn't really understand why we use the past perfect tense instead of the past simple in these cases. That was something I learned during the tests (C-DA tasks). (P5, W7)

Accompanied by increased awareness, increased confidence was also reported in some reflections and was related to the ability to use this structure in production. Alongside heightened awareness, several participants also reported increased confidence, particularly in their ability to use grammatical structures in production. For instance, Participant 6 stated that she “no longer ha[d] difficulty in combining sentences with relative clauses, because it [did] not feel intimidating at all.” (P6, W7). Similarly, Participant 12 shared her experience with conditionals:

For example, I could never do Type 3 Conditional questions from the If Clauses topic. I used to mix them all up when I saw them in questions, but now, thanks to C-DA, I understand them well enough. Instead of skipping them out of fear, I can confidently solve them. (P12, W5)

Taken together, the analysis of participant reflections demonstrated recurring instances of grammatical structure awareness, particularly through the identification of structural patterns, clarification of previously misunderstood rules, and the observable application of these rules during subsequent tasks within the C-DA process.

4.2.1.3 Production Impact

Building upon the participants' increased grammatical awareness, this section examines how such awareness was reflected in their actual language production. While noticing patterns and understanding grammatical distinctions form the foundation of language competence, the ability to actively and accurately apply these structures in written tasks indicates a more advanced level of internalization. To this end, participant reflections were analyzed to explore the impact of C-DA on their writing performance.

In analyzing the impact of C-DA on participants' writing production, five key codes were identified. Table 8 provides a comprehensive overview of all five production-related

improvement codes, including their definitions, and the participants who reported the impact.

Table 8

Production-Related Improvement Codes

Code	Description	Supporting Participants
Increased confidence in grammar usage	Feeling more secure and deliberate in applying grammar structures	P2, P3, P4, P6, P9, P11, P12
Improved application of grammar rules	Effective transfer of grammar knowledge into writing	P1, P2, P3, P6, P7
More frequent use of complex structures	Using relative clauses, conditionals, discourse markers more often	P1, P3, P4, P5, P6, P7, P8, P9, P10, P12
Higher grammatical accuracy in production	Using grammatical structures with fewer or no errors	P1, P3, P4, P5, P6, P7, P8, P9, P10, P12
Lexical and structural variety in writing	Employing a broader range of vocabulary and sentence patterns	P2, P4, P5, P6, P7, P8, P9

The code “Increased confidence in grammar usage” emerged in the reflections of seven participants, who reported feeling more secure and deliberate in their grammatical choices. Five participants demonstrated enhanced application of grammar rules, successfully integrating structures learned through C-DA into their writing. Likewise, the more frequent use of complex structures such as relative clauses, conditionals, and discourse markers was noted in ten participants' reflections. Notably, the same number of participants reported greater grammatical accuracy, often achieving near-perfect or perfect usage of targeted forms. Lastly, seven participants exhibited increased lexical and structural variety, employing a broader range of discourse markers and more complex sentence patterns in their essays.

Although five distinct codes were identified, they were grouped thematically into two overarching subcategories: (1) Increased Confidence in Grammar Usage and (2) More Frequent and Accurate Grammar Structure Usage. This thematic distinction allowed for a clearer representation of productive development, capturing both psychological readiness and linguistic performance.

The sub-theme “Increased Confidence in Grammar Usage” includes the code related to reduced hesitation and greater self-assurance when applying grammar knowledge. In contrast, the sub-theme “More Frequent and Accurate Grammar Structure Usage” comprises the remaining four codes (improved application of grammar rules, more frequent use of complex structures, higher grammatical accuracy in production, and lexical and structural variety in writing), each of which reflects concrete advancements in written output. This thematic grouping allows for a clearer presentation of findings, distinguishing between learners’ perceived confidence and their observable improvements in performance.

4.2.1.3.1 Increased Confidence in Grammar Usage

This sub-theme captures participants’ growing sense of confidence and reduced hesitation in using grammar structures, particularly in written production. Several participants explicitly stated that the C-DA experience helped them feel more confident in applying grammar knowledge, especially in areas they had previously found challenging.

For instance, Participant 2 stated, “I used the grammar I learned through C-DA in my essay and paragraph writing frequently, and I felt that I improved.” (P2, W8), while Participant 3 similarly reported, “C-DA increased my confidence in grammar, and I now apply what I have learned in essay writing.” (P3, W8). Likewise, Participant 6, who mentioned that specific patterns encountered in the test boosted her confidence: “I used some of the patterns I saw in the tests in my writing because they increased my confidence in the

subject.” (P6, W3). These reflections suggest a link between mediated feedback and participants’ willingness to transfer grammatical knowledge into real writing contexts.

Participant 9’s reflection highlighted a shift in affective perspective, stating that “The tests over the eight weeks helped me improve my grammar in school writing tasks because I feel I have learned it better. I am no longer hesitant to use it.” (P9, W6). This growing comfort and readiness to use grammar was also expressed by Participant 11, who reflected, “I feel like I gained more knowledge about grammar each week. I had the best experience with these tests; they helped me feel more positive about my ability to write.” (P11, W4).

Finally, Participant 12 provided a reflection that distinguishes between areas of competence and those still developing: “I am confident in using relative and noun clauses, but I still have some gaps in discourse markers. However, I no longer make mistakes when using these structures in writing, which shows that the tests were effective.” (P12, W8). This demonstrates a growing sense of control over previously problematic structures, reinforcing the role of C-DA in building both awareness and confidence.

Together, these reflections illustrate a psychological shift from uncertainty to self-confidence, as participants began to trust their grammatical knowledge and apply it with greater intention in academic writing contexts.

4.2.1.3.2 Increased and More Accurate Use of Grammar Structures

The remaining four codes were grouped under the sub-theme “More Frequent and Accurate Grammar Structure Usage” as they collectively reflect participants’ enhanced ability to use grammatical structures more effectively, accurately, and diversely in their writing. While each code captures a specific dimension of grammatical development, such as increased accuracy, complexity, or lexical variety, they all point toward a broader improvement in grammatical competence in productive tasks following the C-DA process.

Participants' reflections revealed a more frequent and accurate use of specific grammar structures following their engagement with C-DA tasks. These structures included relative clauses, conditionals, and discourse markers. Findings suggest that participants not only attempted to incorporate these features more often but also demonstrated a higher level of grammatical accuracy in doing so. These reflections were consistent with the findings from participants' essays, which also showed more frequent and accurate usage of these structures.

Four out of twelve participants reported an overall improvement in their grammar use. Their reflections mention increased use of various structures, particularly in paragraph and essay writing. Participant 2 stated "I learned various sentence structures...(W6) I frequently use the grammar (structures) I learned from C-DA tests in essay or paragraph writing, and I felt that I improved" (P2, W6 & W8). This reflection highlights not only the acquisition of structural variety, but also the perceived transfer of these structures into writing tasks. Participant 6 also mentioned active transfer and improved application of grammar structures in productive tasks: "I try to use the topics I've practiced in these (C-DA) tests in my writing and essay exams, and I was able to use most of them without any issues, receiving no negative feedback" (P6, W8). The absence of negative feedback here supports the perceived success in grammar application. Participant 7 reported a qualitative change in writing habits: "My writing has improved because I now use complex grammar structures more frequently, not just simple tenses" (P7, W5). This reflection indicates a broader shift in grammar use, showing progression beyond basic forms toward more advanced structures. The analysis of these participants' essays further confirmed that each participant used four to five different grammar structures with 100% accuracy.

Following the overall improvement in grammar usage, some participant reflections focused specifically on the use of relative clauses. These participants stated that they began incorporating relative clauses more frequently and/or accurately after gaining a clearer understanding of the rules, supported by C-DA tests and hints. Participant 6, for instance,

noted: “I now find it easy to use relative clauses, and I’ve started incorporating them more frequently in my writing tasks and essays” (P6, W6). This statement indicates not only increased usage but also reduced cognitive load when producing relative clauses.

Similarly, Participant 7 reflected on a specific learning moment during the C-DA tests:

I’m learning relative clauses better now. For example, I realized through the test that even if a word seems like a place, we don’t always use 'where.' If the word functions as an object rather than an actual location, we should use 'which' instead. I’ve started using relative clauses in class activities and, more importantly for me, in my writing portfolio. (P7, W6).

Participant 5 also reported a tangible shift in usage: “Now that I understand the rules, I can form clearer and more complex sentences. I’ve also started using relative clauses more in both speaking and writing, which has helped me become more fluent” (P5, W8). This reflection highlights not only accuracy but also fluency gains, suggesting a broader integration of this structure.

Collectively, these participants expressed that targeted feedback and scaffolding within the C-DA process helped them not only understand but also internalize and apply relative clauses in a variety of writing contexts. Essay evaluations of each of these participants confirmed that relative clauses were used correctly in their writing, with a 100% accuracy rate.

After relative clauses, some participants specifically mentioned improvements in their understanding and application of conditionals, particularly through C-DA tasks and example-based hints. Participant 3 described a gradual yet steady improvement: “After a few weeks, I feel more confident about if-clauses, and I believe I’ve really improved my understanding. I think my writing performance has been improving week by week” (P3, W4). This reflection highlights not only an increased sense of confidence but also a perception of progress over time. Participant 1 also stated: “My writing performance has actually improved thanks to the hints I got from the tests... I genuinely feel like I’m learning something. For instance, I was able to understand Type 3 conditionals through

these tests” (P1, W4). Taken together, these reflections suggest that targeted feedback and contextualized examples in the C-DA format supported the development of both the form and function of conditionals in participants’ writing. Essay evaluations showed that participants used conditionals two to three times with 100% accuracy, indicating that their self-reported progress was also evident in their written performance.

Some reflections revealed a notable improvement in the use of discourse markers by the participants, with many reporting increased confidence in their ability to apply a wider range of markers correctly. For example, Participant 1 reflected on the scope of his knowledge: “I knew the basic ones, but I could not remember the others. Now, after these (C-DA) tests, I think I know more than I did in the past, even though I still feel a little incompetent in that area” (P1, W8). He used eleven different discourse markers in his essay, with the accuracy of 82%. Participant 4 reported broader improvements, noting:

I realized that my vocabulary has expanded, and I’ve learned how to use new discourse markers properly when I come across them (W5). Dynamic assessment tests helped me learn because as I solved various types of questions, my mistake rate decreased, and I also started using more discourse markers as a result. (P4, W5 & W8).

Similarly, Participant 8 acknowledged improvements in both frequency and accuracy: “I can say that my use of discourse markers has increased, and I use them in the right places... I’ve also noticed that I use discourse markers more frequently and accurately in my writing assignments” (P8, W4 & W8). Participant 9 then offered a concrete example of lexical diversification: “(C-DA) helped me recall what I learned, enabling me to write my paragraphs with more accurate sentences. Moreover, by using connectors like ‘nonetheless’ and ‘in addition’ instead of simpler ones like ‘but’ and ‘and’, I managed to diversify them” (P9, W4).

Lastly, Participant 10 highlighted the shift from total avoidance to successful implementation:

I used to fail to use any discourse marker correctly. I am trying to enrich my writing by using discourse markers in paragraphs and essays now, and I am able to do this with no mistakes or fewer mistakes, unlike my previous experiences (P10, W8).

Together, these reflections suggest that C-DA tasks helped participants to recall and effectively use discourse markers in various contexts. Essay evaluations show that participants used between six and eleven different discourse markers, with accuracy rates ranging from 82% (P1) to 100% (P4, P8, P9, P10). The data indicates that learners' self-reported progress in using discourse markers was largely reflected in their written performance.

Past modals also emerged as a structure where participants reported clear progress.

Participant 5 noted:

It was a great test to learn past modals, and I had the opportunity to use them effectively in a writing exercise during the lesson. This test helped me understand the differences between must have + past participle, may/might have + past participle, and can have + past participle” (P5, W7).

This reflection points to both conceptual clarity and successful application in classroom writing. Similarly, Participant 8 reported: “Past modals were a structure I had never used before, but now I use them” (P8, W8). Although she initially found the topic “challenging and thought-provoking,” she emphasized the role of C-DA hints in helping them navigate the distinctions between modal choices (W7).

Participant 9 shared a similar experience: “Since I had practiced it in the test, using past modals in the writing activity during class felt easy. I could easily apply the modals by focusing on the meanings of the sentences” (P9, W8).

These reflections underline that C-DA not only contributed to raising awareness of advanced grammar structures such as past modals, but also supported their functional integration into written production, even among learners with no prior usage experience. While Participant 5 and 9, showed no usage of past modals in their essays, P8 was able to successfully incorporate them after receiving guidance. Overall, the reflections suggests

that while some learners struggled with past modals, the support from C-DA tasks helped them apply these structures with confidence, even though usage in the essays was limited.

Unlike the previous grammar structures, there were no specific reflections from participants regarding their use of the simple past tense, past perfect tense, or noun clauses. While improvements in other areas, such as conditionals, relative clauses, and discourse markers, were clearly articulated, these particular structures did not have detailed self-reports from learners.

4.2.2. Semi-Structured Interviews

This section presents the findings from the semi-structured interviews conducted at the end of the study. The interviews aimed to explore participants' perceptions of C-DA its impact on their grammar learning and written production. The responses were analyzed based on three emerging key themes: Traditional Assessment vs. Dynamic Testing, Mediation, and Production. These themes provide insights into how participants compared C-DA to traditional testing, their experiences with mediated learning, the grammar topics they found most challenging or beneficial, and the influence of C-DA on their written performance. The findings are supported by direct participant quotes for clarity.

4.2.2.1 Traditional Assessment vs Dynamic Assessment

Traditional static tests and dynamic tests function differently in terms of feedback, learning opportunities, and overall effectiveness. In the present study, participants engaged with both traditional and dynamic assessment tasks, which allowed them to compare these two approaches from a firsthand perspective. This section explores these participant perceptions on these two assessment methods. The responses were analyzed based on four

key themes: Feedback and Error Correction, Learning-Oriented Assessment, Retention and Transfer, and Confidence and Test Anxiety.

The code Feedback and Error Correction was developed based on participants' descriptions of how assessments responded to their mistakes. This category addresses the presence or absence of immediate input during the assessment process, particularly regarding recognizing and correcting errors.

Several participants noted that in dynamic assessments, they were able to see their mistakes and received hints that guided them toward the correct answer. For instance, Participant 4 stated, "The tests you applied (C-DA) were more useful because we could see our mistakes, and when we saw them, we were directed to the correct answer and could identify the missing points." Similarly, Participant 9 noted, "Dynamic tests were more beneficial because after making mistakes, they gave warnings and guided me to find the correct answer with hints."

Participant 3 described how the structure of the feedback contributed to her grammatical reasoning:

For example, when I made a mistake, the hints in the test said something like: "This is an unreal situation. Which type can be used here?" It made me think (to find the answer). Now, when I get confused, I remember these hints. I think whether I'm talking about a real situation or presenting a scientific fact, and based on that, I decide which type to use. I think about it not only for my writings, but also while I am speaking. (P3)

Participant 5 compared the two assessment types by focusing on the presence of correction: "When I made an error, the feedback pointed me to exactly where I went wrong and why. Without that, I would have been left guessing. Traditional tests do not correct my mistakes, I dislike that."

Participant 1 stated that in traditional tests, he was generally torn between two options, and he tends to choose the wrong one. Then, he described a moment of realizing an error and correcting it based on the feedback provided: "I was again torn between two options, chose

the incorrect one at first, saw that the other one was correct, and when I looked at the hint, I understood why my answer was incorrect. So, I learned.”

The second code, Learning-Oriented Assessment shows participants’ perceptions of how different types of assessments affect learning, specifically whether they only measure existing knowledge or also promote learning during the assessment. Some participants noted that dynamic assessment allowed them to engage more deeply with the material.

Participant 2 explained:

In the dynamic test, you see the topics you got wrong and try to find the correct answer by making your own inferences. You can't do this in a normal test because you answer based on your knowledge at that moment, but in the dynamic test, at least since you make your own inferences, it becomes more permanent. I had the opportunity to understand better and grasp the topics in detail... The dynamic learning method is more effective for topics you know little or nothing about, and for familiar topics, it mainly serves as reinforcement. (P2)

Participant 3 similarly emphasized the potential of dynamic assessment to promote learning:

In these tests (C-DA), whether you answer correctly or incorrectly, you still learn the topic. It doesn't just examine your current knowledge. That's why it was very good; I wish all tests were like this...When you are taking these traditional tests, if you don't know the structure (well enough), you fail. If you don't study beforehand, taking that kind of test is not beneficial. In contrast, the dynamic tests guide you toward the right answer even when you are unsure, making the process itself an opportunity for learning. (P3)

Participants also reflected on the deeper engagement required during dynamic assessment. As Participant 7 expressed, “In traditional tests, I just answer and move on, not really thinking about why something was wrong. But with the dynamic ones, it was like the test was teaching me, not just measuring me.” Similarly, Participant 8 stated, “Dynamic assessment didn't just test me; it made me think and figure things out during the process. It was as if learning and testing were happening at the same time, which I've never experienced in a regular test.”

The third code, Retention and Transfer, was based on participants’ accounts of how the feedback and strategies in dynamic assessments helped them retain and apply grammatical

knowledge in future tasks. For example, Participant 3 said “Now, when I get confused, I remember these hints. I think whether I’m talking about a real situation or presenting a scientific fact, and based on that, I decide which type to use... while I am speaking.” Stating that the hints she encountered during dynamic assessment stayed with her. Participant 9 echoed this experience: “Dynamic tests helped me remember the grammar rules later because the hints stayed in my mind. For example, in other writing tasks, I could recall the same hints and use them to apply the correct structures.”

The fourth code, Confidence and Test Anxiety, reflects how assessment types influenced learners' emotional states such as anxiety, confidence, and motivation. Participant 1 stated that dynamic assessment helped reduce his uncertainty: “In normal tests, I always get stuck between two options... that makes me nervous. But... when I looked at the hint, I understood why my answer was incorrect. So, I learned with composure.” Participant 6 described a similar feeling:

The feedback-based tests (C-DA) we solved during the research also helped me in my school exams. Being able to look at hints in the questions felt like we had our notebooks in front of us and were reviewing our lesson notes, which was very useful. Normal (traditional) tests were not as beneficial for me; they felt harder and worrying.

Participant 11 also commented on the relaxing nature of dynamic assessment compared to traditional formats: “I can say that I was more productive in the tests (C-DA) I solved during the research process. I would prefer this method; this is more relaxing.”

The findings indicate that participants favoured dynamic assessment over traditional assessment due to its interactive nature, built-in feedback, and positive impact on learning. While static tests were seen as necessary for summative evaluation, they were not perceived as beneficial for actual learning. In contrast, C-DA was viewed as both an assessment tool and a learning opportunity, reinforcing grammar knowledge through immediate feedback and self-correction. These insights are summarized in Table 9, which compares key features of static and dynamic assessment based on participant feedback.

Table 9

Comparison of Static and Dynamic Testing Based on Participant Reflections

Feature	Traditional Static Assessment	Dynamic Assessment	Participants Reporting the Benefit
Feedback and Error Correction	No immediate feedback: mistakes remain uncorrected.	Immediate hints guiding learners to identify and correct mistakes.	P1, P3, P4, P5, P9
Learning-Oriented Assessment	Measures knowledge at a fixed point; does not promote learning during the test.	Integrates learning and assessment by guiding students to the correct answer.	P2, P3, P7, P8
Retention and Transfer	Limited reinforcement of grammar rules unless reviewed separately.	Participants recall hints later and apply knowledge in writing and speaking.	P3, P9
Confidence and Test Anxiety	High anxiety due to lack of support and pressure to perform.	Hints reduce stress, support decision-making, and build confidence.	P1, P3, P6, P11

4.2.2.2 Mediation Strategies

Mediation is a key component of dynamic assessment, allowing learners to receive structured support as they navigate through grammar tasks. In this study, participants encountered four different types of mediation, which were categorizing, giving key words, exemplifying, grammar rule reminding, during the assessment process. Participants were asked to reflect on the types of support (mediation) they received during the computerized dynamic assessment (C-DA) process. Their responses were analyzed thematically and categorized into five types of mediation strategies: use of examples, use of key words, categorization, grammar rule reminders, and combination of strategies.

Among all strategies, the use of examples was the most commonly and consistently appreciated, cited by ten participants. Learners highlighted that the examples not only reinforced their understanding of grammar rules but also showed them how to apply these rules in context. As Participant 7 explained: “Giving examples was the most helpful because it made it easier to remember how to use the structure in real situations.” Similarly, Participant 4 stated: “Even if I know the rule, I don't know how to use it in a sentence, so the examples were very helpful.”

Participant 8 emphasized the dual function of examples: “Hinting with examples was the most useful because it contributed not just to learning the rule but also to learning how to use it.”

Six participants mentioned the effectiveness of the use of key words. While this strategy was not as highly rated as examples, some participants still considered it a helpful cue. For example, Participant 6 shared: “The most useful type for me was stating keywords. After that, it was giving examples. Because seeing a structure used in a sentence is much more helpful.”

However, others expressed that key words were less necessary when the semantic relationship was already apparent. As Participant 1 said: “Stating keywords didn't really help me that much since I could already establish the semantic relationship myself.”

Categorization, mentioned by five participants, was considered especially useful when differentiating between similar grammatical structures. Participant 3 explained: “The most useful thing for me was always categorization. It stayed in my mind longer and helped me find the correct answer by making inferences.” Participant 7 similarly noted: “Categorizing helped, especially when there were similar structures, because it made the differences clearer.”

Grammar rule reminders were cited as useful by only two participants, and even then, with reservations. Participant 6 stated: “Since we usually learn grammar structures as fixed patterns in class, reminding the rule was the least useful.”

Participant 2, on the other hand, suggested that rule reminders could still be beneficial in cases of incomplete understanding: “If you don't fully understand the topic, hints that remind you of the rules are also very helpful.”

Finally, a few participants emphasized that the usefulness of mediation strategies could vary depending on the grammatical content or task type. For example, Participant 11 remarked: “Giving examples is the most useful. But I think it can change from topic to topic. For me, for example, giving examples was the most useful in one topic, but categorizing was more useful in another.”

Overall, learners valued mediation that provided contextual, meaningful, and differentiating support, particularly in the form of examples and categorization. They demonstrated diverse preferences regarding mediation strategies, with examples, key words, and categorization emerging as the most effective forms of support. While individual differences played a role in which hints were found most useful, most participants reported that C-DA mediation strategies contributed to their learning by reinforcing grammar knowledge and guiding them toward self-correction.

4.2.2.3 Production

The theme of Production reflects participants' experiences regarding the influence of CDA-based tests on their ability to express themselves in written forms. This theme shows the participants' reflections on how their grammatical accuracy, structural variety, and complexity improved through engagement with the C-DA. The analysis of the data was conducted based on four main codes.

The first code, Improved Grammar Use in Production, refers to participants' increased ability to apply grammatical rules correctly in their productive language tasks, particularly in writing. Some participants reported that they became more accurate in forming sentences and more cautious about their grammatical choices. For instance, Participant 1 reflected: "If Clauses is a structure that I can now use correctly, thanks to these tests... I benefited the most from If Clauses. Relative Clause is also a structure I improved thanks to these tests." In a similar vein, Participant 4 shared a significant personal achievement:

For example, in one (C-DA) test, I had answered an if clauses question incorrectly. The hint page opened, and I saw why I had made the mistake. I realized I had used the structure incorrectly. I learned the correct way and used it in writing... My first writing exam score at school was 12 (out of 25). It has improved a lot since then, and I've been scoring over twenty since I started doing C-DA tests. I started getting higher scores because I corrected my mistakes.

This reflection exemplifies the participant's ability to improve accuracy in written production. Participant 5 also described a similar improvement: "I used to make grammatical mistakes when forming my sentences, but now I'm more careful when writing. I've started to notice which structures I need to use, and this has made my writing more accurate." These reflections suggest that the use of C-DA helped participants recognize their errors and provided the tools to correct them, resulting in more accurate and confident language production.

The second code, Increased Grammar Awareness During Production, emphasizes participants' growing sensitivity to the grammatical structures they used in written production. Rather than relying on instinct or habitual usage, a shift towards a more conscious and deliberate application of grammar was mentioned, with a specific focus on the structures the participants had learned through C-DA tasks. Participant 1 reflected on this shift:

Normally, I hesitate to use something I have just learned because I generally learn by memorizing the rules. But now, when I write, I take a step toward using If Clauses because I feel confident. Or when I speak, I try to use Relative Clauses more often because I trust myself and I am able to use them consciously.

This highlights not only a growing confidence in applying learned structures but also a deeper awareness of their intentional use. Similarly, Participant 6 noted an increase in metalinguistic awareness: “I’ve gained more awareness, especially in using relative clauses. Now I’m more conscious about using the correct connectors and constructing the sentence properly.”

Participant 12 also illustrated this development: “I can’t use them (discourse markers) much in speaking, but I have benefited from them a lot in writing exams, and they even improved my exam scores. I used to use them randomly, but now I write them consciously.” This reflection points to an increased awareness in the application of discourse markers, showing a deliberate effort to apply them appropriately in writing tasks.

The third code, Variety of Structures in Production, reflects participants' increased ability to incorporate a range of grammatical structures, particularly in academic writing. Several participants reported a noticeable shift in their writing as they moved beyond basic sentence structures and began using more varied and complex forms. Participant 4 summarized this change briefly: “I’m using more varied sentences now.”, while Participant 7 explained:

Recently, we have been writing a lot of essays at school. Since I need to write something longer than a paragraph, I have to use discourse markers to make my writing more fluent. They help me write more academically because now I use a greater variety of structures.

This reflection reveals how the C-DA tests not only improved grammatical understanding but also encouraged more academic language use. Participant 8 further elaborated on the diversification of structures, particularly with discourse markers: “I can use discourse markers in a more varied way because I can now distinguish their usage areas more easily. In speaking, I use the basic ones, but in writing, I can use a wider range.”

Finally, Participant 9 shared her improved use of discourse markers after engaging with C-DA: “I had difficulty using discourse markers when writing paragraphs. After C-DA, I started using them more and in more varied ways.” This reflection also reports the visible impact of C-DA on the ability to diversify language use and increase complexity in written tasks.

The final code, Improvement in Complex Structures, captures participants’ progress in using grammatically complex forms such as conditional sentences, relative clauses, and noun clauses. These reflections were particularly focused on how learners moved beyond basic usage and began to integrate these structures with greater accuracy and confidence. To illustrate, Participant 2 shared his experience of integrating complex structures with greater ease: “I started using discourse markers even more. I had reduced the use of if clauses in the second term because they felt too basic, but now I’ve started combining them with other structures.” This reflects the participant’s growth in moving beyond basic sentence structures and combining them with other more advanced forms.

Participant 3 highlighted the challenges she faced with conditionals but also noted significant improvement:

The most challenging part of the tests for me was conditionals, but I also think they helped me improve. In the past, I didn’t know how to use complex sentence types like if clauses. In the tests, I would get the answer wrong, and a hint would appear, saying, ‘This was an impossible situation.’ Now, when I use them, this way of questioning comes to my mind directly, and I analyze it myself.

This reflection demonstrates a shift from struggling with conditionals to developing the ability to analyze and apply them more confidently.

Participant 10 shared his journey with discourse markers: “I had a lot of trouble using discourse markers, they felt complicated, but now it’s resolved. The hints I saw in the tests were very helpful.” This highlights how the C-DA process helped the participant to use complex structures more effectively. Finally, Participant 11 also expressed her growing competence in complex structures: “I’ve started using many complex structures more

easily. For example, I've improved at correctly forming conditional structures or relative clauses, and I make fewer mistakes in my writing now." This demonstrates an overall increase in the ability to apply complex structures with greater accuracy and fewer errors in written production.

Participants' statements suggest that C-DA contributed to their ability to use grammatical structures more effectively in writing. They stated more frequent and confident use of grammar structures, a greater variety and more conscious use of discourse markers in academic writing, and improved awareness of grammatical structures, leading to better performance in writing tasks.

CHAPTER V

DISCUSSION

The previous section provided a detailed presentation and analysis of the study's findings. This section expands on those results by discussing them in relation to the research questions and relevant literature. The present study aimed to investigate whether C-DA has an impact on EFL learners' grammar-in-use performance. Drawing upon both quantitative and qualitative findings, the results offer compelling evidence that C-DA significantly enhances learners' grammatical competence and performance, particularly by fostering grammatical awareness, encouraging self-regulated learning, and promoting successful transfer to written production. All findings are analyzed to provide deeper insights and suggest possible explanations. Additionally, the results are interpreted in connection with existing literature to highlight their implications for EFL learning.

5.1. The Impact of Computerized Dynamic Assessment on EFL Learners' Grammar-in-Use Performance

The findings of this study provide strong evidence that C-DA has a significant and positive impact on EFL learners' grammar-in-use performance. This impact is visible not only in the statistical improvement of learners' test scores but also in their enhanced ability to

apply grammatical structures accurately in various linguistic contexts. The integrated analysis of pre- and post-tests, essay performances, and participant reflections demonstrates that C-DA contributed to both measurable grammatical accuracy and qualitative developmental gains.

As an answer to the first research question “Does computerized dynamic assessment have an impact on EFL learners' grammar-in-use performance?”, it is found that the C-DA has a positive impact. From a quantitative perspective, the comparison between pre-test and post-test scores showed an upward trend. The mean score rose from 67.67 to 79.33, and the median score increased from 74.00 to 86.00, indicating that learners as a group performed better after the intervention. The Wilcoxon Signed-Rank Test further confirmed the significance of this change ($Z = -2.25$, $p = .024$), validating that the observed improvement was not due to chance. Additionally, the reduced standard deviation and narrower range of scores in the post-test suggest increased consistency across learners, indicating that C-DA had a balancing effect on learner performance. Although statistical improvement was evident, it is important to acknowledge that part of this gain could potentially be attributed to increased familiarity with the test format over time. However, the parallel improvements in essay writing and qualitative reflections suggest that performance gains were not solely due to test practice but reflected broader language development. Through step-by-step mediation, learners received scaffolding that enabled them to build internalized control over grammar use.

These results suggest that C-DA not only improved performance overall but also helped reduce the performance gap between higher- and lower-performing learners. Instead of providing equal treatment to all, it appears to have offered support based on learners' individual needs. The results also affirm the value of C-DA as a formative assessment tool, offering immediate and personalized feedback that supports learning rather than merely evaluating it. This progress highlights learners' movement within their Zone of Proximal Development, as they achieved outcomes beyond their independent performance through

guided support. Still, it is possible that individual learner characteristics, such as cognitive style, motivation, or working memory capacity, may have interacted with the C-DA process in ways that influenced outcomes. Future studies could benefit from exploring how learners with different profiles respond to adaptive mediation and whether C-DA can be tailored to accommodate such differences more effectively.

The observed reduction in score variability suggests that the intervention may have effectively addressed disparities in learner performance, potentially supporting those who typically struggle in more static assessment contexts. This aligns with Vygotsky's notion of the ZPD, as DA offers scaffolded, responsive feedback tailored to learners' individual needs (Malmir, 2020). Furthermore, the balancing effect observed can be interpreted as an indicator of mediated learning experiences, where interaction with adaptive assessment tools facilitates not only performance gains but also cognitive development.

Complementing these quantitative improvements, gains across specific grammar categories revealed additional depth in learners' development. Most grammar structures showed notable gains. For example, conditionals rose from 60.4% to 80%, and relative clauses increased from 65% to 93.8% in post-test scores. Of particular significance is the finding that learners' accuracy in essay writing was even higher, often reaching 100% accuracy in structures such as conditionals, past tenses, and modals. This illustrates a successful transfer of grammatical knowledge from controlled assessments to productive writing tasks.

One possible reason why certain structures such as conditionals and modals showed more substantial improvement may relate to the nature and frequency of mediation provided during C-DA sessions. Furthermore, learners' prior exposure to these forms in previous learning contexts may have facilitated quicker recognition and internalization during feedback sequences. This suggests that the effectiveness of C-DA might be moderated by

both the cognitive complexity of the structure and the level of adaptive support provided during mediation.

Similarly, Orhon's (2022) study on the use of Group Dynamic Assessment (G-DA) to develop B1-level EFL learners' narrative tenses also demonstrated significant gains in grammatical accuracy. Her findings highlighted that learners who received scaffolded mediation outperformed their peers and displayed enhanced control and transfer of tense use in writing. While Orhon (2022) focused on narrative tenses in a group format, the present study expanded the scope to multiple grammatical categories and emphasized productive writing outcomes. Together with the present study, this supports the view that DA, whether computerized or group-based, can foster grammatical development through tailored support and responsive feedback.

These grammar-specific improvements offer a meaningful illustration of what DA aims to achieve. Beyond just improving scores, the learners' ability to apply these structures accurately in essay writing suggests that real learning has taken place. This aligns closely with the idea of transcendence, where knowledge is not just learned for a test but becomes transferable across tasks (Feuerstein et al., 2002, as cited in Antón, 2012). In this sense, the improvement in grammar performance, especially in more open-ended tasks like essays, is more than a surface-level achievement. It represents growth, and this is exactly what DA sets out to reveal. However, it is also important to consider that not all grammar structures demonstrated the same degree of improvement. This could be due to either the relative unfamiliarity of such structures prior to the intervention or the lower frequency and intensity of mediation sequences targeting them.

In parallel with the statistical findings, qualitative data clarified how C-DA facilitated these improvements. Learner reflections and observation notes suggest that the real-time feedback and mediated support provided during C-DA sessions played a crucial role in fostering learning. For instance, one participant remarked: "I didn't understand why my

answer was wrong, but after reading the second hint, I instantly realized my mistake. The progressive hints really helped.” (P1, W3) Such examples illustrate how graduated hints enabled learners to recognize errors, internalize rules, and apply this understanding in subsequent tasks. These findings support the argument made by Poehner and Lantolf (2005), and Lantolf and Poehner (2014) that dynamic assessment (DA) enhances language development by providing scaffolded support. It is also worth noting how this reflects a move toward self-regulation; learners seem to be taking more control over their language learning, showing a level of independence that DA explicitly tries to develop.

Moreover, learners frequently emphasized how engagement with grammar through C-DA sharpened their awareness of patterns and rules. One participant noted: "After 2-3 tests, I observed that I no longer had any problems with conditionals. The clues provided (before)... were helpful in this (last) test.” (P8, W8) This suggests a conceptual shift from passive knowledge to active grammatical reasoning, as learners moved from memorizing rules to consciously applying them. This shift can also be explained through the lens of intentionality, a core principle of dynamic assessment. The systematic provision of tailored prompts and feedback was not random but rather a deliberate effort by the assessor to mediate learning and foster independent grammatical reasoning. By strategically offering support, the assessor guided learners, helping them transition from reliance on external hints to autonomous application of grammatical structures.

Altogether, the integration of statistically significant score gains, increased essay accuracy, and positive learner reflections confirmed the effectiveness of C-DA in enhancing grammar-in-use. The present study's findings are supported by Behbahani, Namaziandost, and Shakibaei (2024), who examined the effects of computerized mediation on grammar learning among Iranian EFL learners. Their quasi-experimental design revealed that learners receiving C-DA significantly outperformed a non-dynamic control group on both explicit and implicit grammar tasks. Moreover, they highlighted the moderating role of working memory, suggesting that individuals with higher cognitive resources gained more

from the intervention. While their focus remained on test-based grammar tasks, the current study extends this by examining how C-DA facilitates the transfer of grammatical competence into productive writing. With both studies conducted in EFL contexts, the collective evidence points out C-DA's adaptability and effectiveness across diverse task types and learner profiles.

Building on this line of research, the results of this study also resonate with the findings of Estaji and Ameri (2020), who observed that DA significantly improved grammar achievement among Iranian EFL learners, particularly those at lower proficiency levels. Their study emphasized the role of mediation techniques, such as discussion, teacher feedback, and self- and peer correction, in fostering grammar development.

Likewise, Daneshfar and Aliasin (2018) highlighted the individualized support provided by DA, which enhanced learners' ability to internalize grammatical structures through personalized mediation. These studies further reinforce the idea that C-DA, by addressing learners' ZPD, can be particularly beneficial for those struggling with grammar acquisition.

Another key insight from the present study is that even the low-performing participants demonstrated noticeable improvement. This is particularly significant, as it reflects the equalizing potential of C-DA. Ahmadi and Barabadi (2014) similarly found that C-DA significantly enhanced grammatical comprehension and usage, particularly among learners with limited prior achievement. Modarresi and Alavi (2014) also emphasized the role of DA in supporting learners who struggle with complex grammar points by providing individualized mediation. In the current study, four participants explicitly mentioned their growing confidence and ability in using advanced structures such as conditionals and modals, which were the structures they had previously avoided. This suggests that beyond raising general proficiency, C-DA may enable less proficient learners to use higher-level grammatical constructs with greater accuracy and autonomy.

In line with these findings, Behbahani and Karimpour (2024) offer compelling evidence on how C-DA facilitates the integration of explicit and implicit grammar knowledge, particularly in mastering complex forms like the past perfect tense. Their quasi-experimental study, involving two groups of Iranian EFL learners, revealed that those exposed to C-DA not only improved on post-tests but also demonstrated greater implicit retention and automaticity in using past perfect structures. What makes their study particularly relevant to the present research is the shared emphasis on the transfer of grammatical knowledge to meaningful language use. However, while Behbahani and Karimpour focused narrowly on a single structure (past perfect) within controlled tasks, the current study explored multiple grammar categories and extended the analysis to productive tasks like essay writing. This broader scope allowed for the observation of structural gains in freer language use, highlighting C-DA's potential to support both accuracy and transfer across contexts.

Beyond grammatical competence, the broader pedagogical potential of C-DA is exemplified in the study by Alavi, Shahsavar, and Norouzi (2020), which investigated its effectiveness in diagnosing and enhancing pragmatic competence. Their results showed that dynamic, tailored mediation helped learners better understand and use these language functions appropriately. While their focus was on pragmatics, the underlying principle, providing support based on learners' emerging needs, closely mirrors what was observed in the present study. Taken together, these findings point to C-DA's flexibility, not only in fostering grammatical accuracy but also in promoting broader communicative abilities that matter in real-life language use.

Nevertheless, as with any educational intervention, there remains the possibility that external variables, such as exposure to supplementary materials, or peer collaboration, may have contributed to the observed improvement. However, specific measures were taken to minimize such effects. For instance, participants were not informed in advance about the grammatical structures that would be addressed during either the C-DA sessions or the

related assessments. This choice was intended to ensure that any observed improvements could be attributed more confidently to the mediation provided during the C-DA tasks, rather than to learners' prior exposure or external study.

Overall, the findings of this study contribute to the growing body of literature showing that C-DA is not just an assessment tool but also a meaningful pedagogical approach that supports deeper language learning. From grammar accuracy in controlled settings to effective use in free writing task, participants showed measurable and transferable progress. When considered alongside prior studies, it becomes clear that the strength of C-DA lies in its adaptability and responsiveness to learners' needs. Especially for those who tend to fall behind in traditional assessment contexts, C-DA offers a more inclusive and development-oriented alternative. As such, this study not only confirms the effectiveness of C-DA in grammar instruction but also highlights its potential as a bridge between testing and teaching.

5.2 The Contribution of Computerized Dynamic Assessment to EFL Learners'

Grammar-in-Use in Written Production

The second research question focused on how the C-DA contributes to EFL learners in transferring their grammatical knowledge into written production. The findings of the study strongly suggest that C-DA not only improves learners' understanding of grammatical structures but also enables them to apply these structures accurately and appropriately in extended writing tasks. This contribution was reflected both in the quantitative results, which is marked by high levels of accuracy in essay performances, and in qualitative data, which revealed learners' growing grammatical awareness, strategic use of forms, and increased confidence in writing.

Quantitatively, participants reached remarkably high levels of accuracy in essays, with some structures such as conditionals, relative clauses, and past tenses being used with

100% correctness. These outcomes are especially significant given that essay writing requires more than just recognition of rules; it also requires the integration of grammatical knowledge into coherent, communicative discourse. As illustrated in Figure 4, grammatical accuracy improved from the pre-test stage to the essay tasks, suggesting that participants successfully internalized and transferred their knowledge to authentic written output.

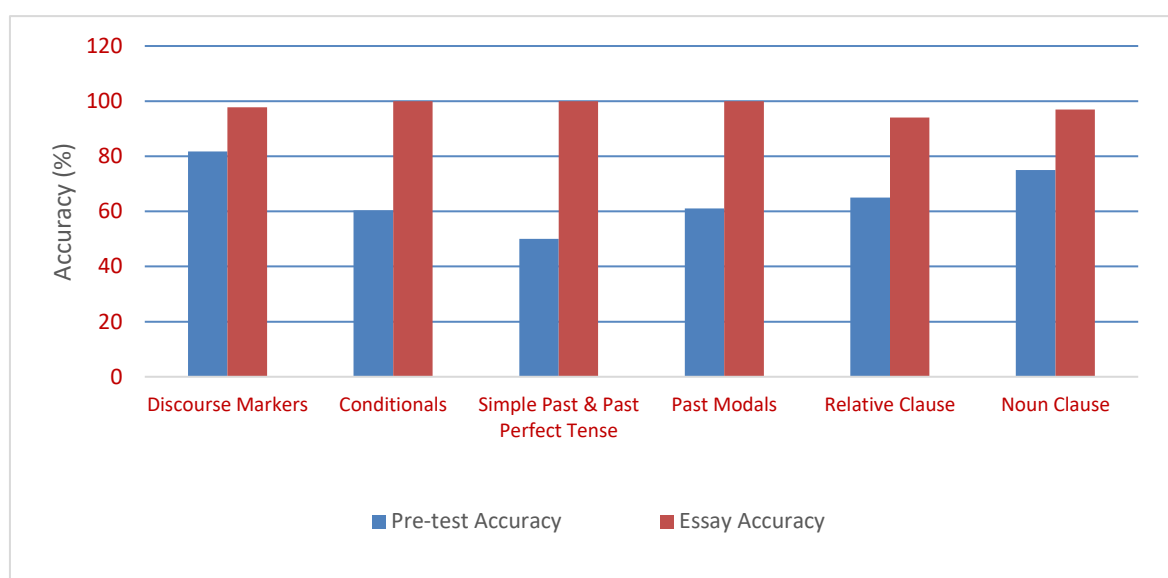


Figure 4. Accuracy rates for grammar structures in the pre-test and the essay

Essay analysis revealed that 75% of participants (9 out of 12) achieved complete grammatical accuracy in the structures they practiced through C-DA. One of the most striking improvements was seen in the use of simple past and past perfect tenses, where accuracy increased from 50% in the pre-test to 100% in the post-essay, marking a 50-point gain. Similarly, conditionals improved from 60.4% to full accuracy, while relative clauses and discourse markers saw substantial gains (from 65% to 94.1% and from 81.7% to 97.8%, respectively). Noun clauses also showed strong development, improving from 75% to 97%, and past modals reached 100% accuracy despite appearing less frequently in learners' writing.

These results highlight the impact of C-DA in supporting both the learning and productive use of complex grammatical structures. Rather than simply recalling rules, learners demonstrated an ability to transfer their knowledge to authentic writing tasks. The full accuracy observed in advanced tenses and conditionals suggests successful internalization, while the meaningful use of relative clauses and discourse markers points to deeper integration into learners' written expression. Although past modals were infrequently used in the written production, their accurate application in the instances where they did appear indicates that learners had internalized the structure to a basic extent. However, their ability to use these forms naturally and appropriately in different contexts remains a developing skill. These outcomes point to a positive washback effect, as the C-DA implementation not only improved grammatical performance in formal assessments but also enhanced learners' engagement with grammar during independent writing tasks. The reflective nature of the assessment and the targeted mediation appear to have encouraged learners to internalize grammatical knowledge, which subsequently influenced their learning behaviors beyond the assessment context. Altogether, the findings suggest that C-DA effectively promotes not only grammatical accuracy, but also the confident and contextually appropriate use of language, an essential outcome in language development. In this regard, the learners' ability to apply grammatical structures in context reflects what Larsen-Freeman (2003) conceptualizes as "grammaring," where grammar is viewed not as a static set of rules to be memorized but as a dynamic skill that involves shaping meaning through form.

These findings offer strong support for the effectiveness of C-DA in promoting the transfer of grammatical knowledge into productive language use. The marked improvement in learners' post-essay performances, particularly in complex structures such as the past perfect tense, conditionals, and noun clauses, reflects not only increased grammatical accuracy (aligned with Focus on Forms) but also a meaningful integration of these forms within authentic written production (Focus on Forms). The results suggest that C-DA

played a significant role in enhancing both accuracy and fluency in the learners' language use. Unlike Focus on Forms, which traditionally emphasizes isolated grammar instruction, the C-DA approach allowed learners to develop a more nuanced understanding of grammatical structures in real writing contexts. This shift from simple rule application to contextually appropriate use demonstrates the potential of C-DA to bridge the gap between explicit grammatical knowledge and its productive use, suggesting that it supports both FoNF and FoNFS. Thus, the results indicate that its application did contribute to meaningful language use that incorporated grammatical accuracy, bridging the gap between fluency and structure in language learning, as suggested by previous research on FoNF and its efficacy (Ellis, 2015; Norris & Ortega, 2000).

While the findings clearly show that learners were able to transfer their grammatical knowledge into written production, it is important to consider how lasting this transfer might be. Since the current study did not include delayed post-tests or follow-up tasks, we cannot determine whether the improvements observed would persist over time without continued support. This raises an important question about the durability of transfer, which future studies should investigate more closely. In addition, although some grammatical structures such as conditionals and past tenses were used with complete accuracy, others like discourse markers or noun clauses showed slightly lower gains. The study did not specifically investigate why certain forms transferred more successfully than others, but this variation might relate to factors such as how often those forms are practiced, their complexity, or learners' prior familiarity with them.

Current findings align with previous research that emphasize the effectiveness of C-DA in facilitating grammatical development. For instance, Behbahani, Namaziandost, and Shakibaei (2024) found that C-DA significantly enhanced learners' understanding of the past perfect tense through personalized and interactive mediation. Similarly, Karimpour, Namaziandost, and Behbahani (2024) showed that integrating C-DA with digital feedback tools improved both the comprehension and production of conditional structures. These

studies support the present findings, particularly in light of participants' complete accuracy in using past perfect and conditional forms. However, the current study extends previous work by focusing not only on comprehension, but also on the transfer of grammatical knowledge into independent written production.

Learner reflections further support the quantitative findings, particularly in relation to the transfer of grammatical knowledge to written production. All participants highlighted in their reflection diaries that the C-DA sessions positively influenced their writing performance. They consistently noted that the scaffolded feedback and gradual hints significantly enhanced their understanding and use of grammatical structures in essay writing.

Notably, four participants (P2, P5, P6, P7) described a general improvement in grammar application, suggesting a broad influence of C-DA on their overall language awareness. More specifically, four learners (P5, P6, P7, P10) highlighted progress in using relative clauses, while three (P1, P3, P12) pointed to increased confidence and accuracy with conditionals. Discourse markers were another area of growth, mentioned by five learners (P1, P4, P8, P9, P10), and three participants (P5, P8, P9) noted improved control over past modals.

Taken together, these findings point to the effectiveness of C-DA not only in supporting learners' grammatical accuracy but also in enabling them to transfer this knowledge into meaningful written communication. This pattern of development is observed in previous research. Nicholas et al. (2024) observed that C-DA significantly reduced both syntactic and lexical errors in learners' email writing, suggesting that mediated feedback not only promotes grammatical accuracy but also supports communicative effectiveness in real-world tasks. These findings align with the present study, where participants achieved high levels of accuracy in complex grammatical forms such as conditionals, past tenses, and noun clauses. This indicates a successful transfer of knowledge from assessment sessions to written production.

Similarly, Davoudi and Ataie-Tabar (2015) reported that learners receiving C-DA mediation outperformed their peers in both grammatical precision and textual organization. Their use of structured prompts and personalized feedback echoes the mediational strategies employed in the current study, which also provided tailored support aligned with each learner's ZPD. As a result, learners not only improved in form-based accuracy but also demonstrated greater fluency and coherence, reinforcing the value of C-DA as a tool for integrated language development.

Participants of the present study also expressed that they gained confidence in applying grammar structures, which further enhanced their performance. The emotional impact of C-DA, especially its ability to reduce anxiety and support learners in real time, was frequently reported. As one learner shared: "The hints helped me refocus and concentrate when I felt confused or distracted. They acted like a safety net" (P7, W6). Such emotional scaffolding not only promoted task engagement but also reduced the cognitive load.

Similarly, Rashidi and Bahadori Nejad (2018) found that learners who received dynamic assessment outperformed their peers in process writing tasks, attributing this success to the structured mediation offered during key writing stages such as topic selection, idea generation, and macro-revision. Their study emphasized that DA not only improved learners' writing performance but also enhanced their motivation and confidence, where participants showed marked gains in both grammatical accuracy and the ability to organize their ideas effectively. Unlike Rashidi and Bahadori Nejad's classroom-based group DA approach, however, the present study applied C-DA in a more individualized format, allowing for highly personalized scaffolding tailored to each learner's ZPD. This approach may have contributed to the observed application of learned knowledge in learners' independent writing. In a similar vein, Xiaoxiao and Yan (2010) also observed that dynamic assessment fostered learner engagement and contributed to overall improvements in writing competence, further supporting the idea that interactive and responsive feedback mechanisms are key to successful writing development.

The learner-reported gains in this study closely mirror the improvements observed in their essays, indicating that the progress was also effectively transferred to real writing tasks. The combination of qualitative insights and quantitative outcomes supports the pedagogical value of C-DA in supporting learners' transition from grammatical knowledge to active, accurate use. This alignment is consistent with Vygotsky's sociocultural theory, particularly the concept of the ZPD, which emphasizes the role of mediated support in helping learners move beyond their current level of independent performance (Shabani, Khatib & Ebadi, 2010). Within the C-DA framework, scaffolded feedback and graduated prompts served as forms of mediation that enabled learners to internalize grammatical forms and apply them independently in their writing. In this way, dynamic assessment not only fosters immediate learning gains but also supports the long-term development of communicative competence by bridging the gap between form-focused instruction and real-world language use.

The findings of this study are in line with the previous research that has demonstrated the positive impact of dynamic assessment on learners' writing development. For example, Ebadi and Rahimi (2019) examined the use of online DA through Google Docs and reported improvements in grammatical accuracy, coherence, and task achievement in academic writing. Similarly, the present study found marked gains in grammatical accuracy, in the use of conditionals and past tenses, as well as overall writing performance. A common thread in both studies is the way learners improved gradually over time, supported by ongoing feedback and interactive guidance. However, while Ebadi and Rahimi (2019) focused on online collaborative platforms, the current study employed C-DA in an individual instructional setting. This personalized mediation not only enhanced learners' grammatical knowledge but also facilitated its transfer into written production.

Lastly, Özturan (2022) explored the impact of combining dynamic assessment with corrective feedback and found that this approach enhanced both the rhetorical and linguistic aspects of EFL learners' writing. Learners in her study demonstrated long-term

improvements in grammar, vocabulary use, and overall text organization, which were attributed to personalized mediation and learners' active engagement. These findings resonate with the present study, where C-DA was similarly effective in promoting both grammatical accuracy and broader communicative competence. While Özturan (2022) worked with larger group sessions, the present study employed individual sessions of C-DA to allow for more individualized scaffolding. This focused mediation appears to have supported not just accurate language use but also fluency and coherence in learners' essays.

In conclusion, the findings of this study provide evidence for the effectiveness of C-DA in fostering both correct and contextual use in written production. Participants improved their use of complex structures like conditionals and noun clauses, applying them effectively in writing tasks. The combination of quantitative data and learners' reflections indicates that C-DA promotes meaningful internalization and knowledge transfer. These findings support previous research but also highlight the role of individualized mediation in promoting independent writing development. The study underscores the importance of C-DA in grammar instruction, suggesting further exploration of its impact on other writing aspects across diverse contexts.

5.3 EFL Learners' Reflections of the Computerized Dynamic Assessment Process in terms of Grammar-In-Use

The third research question aimed at exploring EFL learners' reflections on the C-DA process with a specific focus on grammar in use. Participants' reflections throughout and at the end of the C-DA process reveal a rich demonstration of cognitive, emotional, and metalinguistic responses that offer insight into how they experienced grammar learning through dynamic assessment. Their comments illustrate that C-DA was not simply evaluative but, for many participants, also instructive, offering learners new ways to

understand and apply grammar meaningfully. The findings of the present study indicate that the implementation of C-DA contributed to learners' grammar-in-use development, not only through explicit mediation but also by supporting internalization and productive application.

Most participants' reflections indicated a perceived increase in meaningful engagement with grammar tasks, resulting in increased grammatical awareness, self-regulated learning, and more confident language production. A majority of participants (10 out of 12 participants) highlighted the usefulness of example-based hints, describing them as the most practical and memorable. These examples enabled learners to see how grammar functioned in context instead of memorizing the rule. One participant noted, "Even if I know the rule, I don't know how to use it in a sentence, so the examples were very helpful" (P4), while another (P7) stated "Giving examples was the most helpful because it made it easier to remember how to use the structure in real situations." This preference connects well with what Ellis (2016) described as focus on form: drawing attention to grammar not in isolation, but as it comes up naturally in meaningful use. In that way, the examples not only explained the rules but also showed the rules in action, which helped learners remember and apply them more confidently when they needed to write.

A noticeable outcome for several participants was the perceived instructional value of C-DA's mediated feedback. Rather than being seen only as a corrective tool, the graduated hints were viewed as scaffolding that guided learners. In their reflection diaries, five participants (P1, P2, P3, P4, P7) specifically noted that the adaptive hints supported them in identifying and correcting their own mistakes. The reflections suggest that mediation allowed participants to engage in metalinguistic reasoning and arrive at the correct form independently, often after one or two levels of hinting.

In this context, many participants appeared to actively engage in self-regulated learning rather than merely reacting to feedback; they were actively engaging in self-regulated learning by determining how and when to apply it, when to attempt again, and how to

reshape their language based on internalized knowledge. This ability to monitor, assess, and adjust one's own learning closely aligns with Zimmerman's (2002) concept of self-regulated learners, who set goals, use strategies, and reflect on their outcomes to guide future actions. Developing these skills is key to becoming an independent and effective language user.

Furthermore, three participants (P8, P9, P10) reflected on how C-DA encouraged the development of self-directed learning strategies. P9 noted that the process helped them "become more aware of recurring errors," while P8 stated that they learned to "approach problems more systematically." These insights indicate that learners internalized feedback over time and began to apply it independently in future tasks. Similarly, three participants (P3, P4, P5) described the hints as serving a guiding or instructive role, likening the support to real-time teacher intervention. A participant (P4) emphasized this by stating that the system guided him "like a teacher," suggesting that mediation provided both cognitive and emotional reassurance. These results also affirm the value of C-DA as a formative assessment tool, offering immediate and personalized feedback that supports learning rather than merely evaluating it.

Emotional factors also emerged as relevant in some participants' experience with mediation. Three learners (P7, P9, P11) reported that the mediated hints helped them manage confusion and maintain focus. For example, P7 described the hints as a "safety net" during moments of uncertainty, noting, "The hints helped me refocus and concentrate when I felt confused or distracted." Two participants (P6, P12) highlighted the motivational benefits of mediation. The structure and interactivity of the C-DA tasks appeared to sustain engagement and enhance the perceived value of the learning process. P12 stated, "The (C-DA) test was more thought-provoking and educational. I felt like I was learning throughout the test. It kept me engaged from start to finish." While the reflections show increased motivation and emotional engagement during and shortly after the C-DA

process, further longitudinal data would be needed to determine the persistence of these effects.

Reflections from many learners indicated a perceived increase in grammatical awareness and growing confidence, especially regarding complex structures. For example, P5 stated, "I had memorized this rule before... However, I didn't really understand why we use the past perfect tense instead of the past simple in these cases. That was something I learned during the tests (C-DA tasks)." Remarkably, seven participants (P2, P3, P4, P6, P9, P11, P12) explicitly mentioned that they had gained greater confidence in using grammar in their writing. One recurring theme was the sense of control they felt while constructing sentences, knowing that the forms they chose were not only accurate but purposeful. This emerging confidence was frequently associated with learners' improved ability to apply grammar more effectively in communicative contexts. However, it is important to note that these reflections are based on self-reports and thus represent learners' perceived gains rather than objective performance measures.

The study also revealed that several participants preferred C-DA over traditional static assessment methods. Participants described traditional tests as limited in their ability to support learning, primarily due to their lack of feedback and emphasis on final outcomes rather than the learning process itself. In contrast, C-DA was perceived as interactive and informative, offering opportunities not only to identify errors but also to understand the reasoning behind them. This distinction reflects Zangoei et al. (2019), who demonstrated that C-DA plays a crucial role in diagnosing and fostering linguistic competence beyond conventional assessment practices. P11 stated the experience was "more relaxing" and led to better productivity. Emotional responses were also notably different across assessment types: while traditional tests were associated with confusion and test anxiety, C-DA was often described as calming and motivating.

These findings are in line with previous research suggesting that C-DA may support learners by integrating assessment with instruction, thus promoting active engagement and deeper processing of linguistic structures (Kozulin, 2003; Poehner, Zhang, & Lu, 2015). Similar benefits were reported by Ghorbanian, Ahangari, and Saeidi (2024), where Web-Based DA promoted learner autonomy, motivation, and reduced anxiety among Iranian EFL learners.

Findings from Alavi and Taghizadeh (2014) also highlighted the role of mediation in enhancing writing skills, showing that explicit mediation helped learners internalize writing strategies more effectively. While their work focused primarily on strategic development, our data reveal that C-DA also contributed to learners' emotional regulation and sustained motivation. The present findings suggest that targeted, scaffolded support through C-DA plays a crucial role in facilitating grammar internalization and its accurate application in writing.

This observation resonates with previous studies emphasizing DA's role in increasing metasyntactic awareness and writing confidence (Çalış, 2018; Şentürk, 2019). Yet our study provides evidence that such awareness also translated into real-time corrective behaviors and increased learner autonomy during the assessment tasks themselves. Rizelioğlu (2024) also found greater learner confidence after DA, while Davoudi and Ataie-Tabar (2015), and Rahmani, Ghonsooly, and Ghanizadeh (2025) reported motivational and anxiety-reducing effects of DA.

Likewise, participants in Özturan's (2022) research also reported increased motivation and improved rhetorical control. However, while Özturan's study focused more on the development of students' overall writing structure and idea organization, the current study highlights the importance of grammatical support, particularly in helping learners use complex sentence structures correctly and confidently.

Nevertheless, a few limitations and varied responses should be acknowledged to maintain a critical perspective. First, not all learners may have equally benefited from mediation; the C-DA tasks, while supportive, could still be perceived as directive rather than autonomy-promoting by some participants. Second, learners who are highly dependent on feedback might risk developing a reliance on external cues rather than fully internalizing rules, particularly if not sufficiently challenged to operate beyond mediated zones. Future studies might explore whether the intensity and frequency of hints could be tailored to prevent over-scaffolding.

In conclusion, the findings of this study suggest that C-DA may enhance grammatical accuracy, learner engagement, and self-regulated learning. While the insights are based on self-reported reflections and thus not generalizable, they offer valuable perspectives on participants' perceived cognitive and emotional gains. By integrating assessment with instruction, C-DA appeared to foster a more interactive and supportive learning environment, reducing test anxiety and promoting deeper engagement with grammar. These findings align with previous research and highlight C-DA's potential role in supporting both the cognitive and affective dimensions of language learning.

CHAPTER VI

CONCLUSION

This study aimed to investigate the effectiveness of C-DA on the grammar-in-use performance of EFL learners, particularly in their written production. To achieve this objective, the study was conducted at a large state university with twelve B1-level students enrolled in the College of Foreign Languages. A mixed-methods research design was employed, incorporating both quantitative and qualitative data collection tools. Pre-tests and post-tests were administered before and after the eight-week C-DA implementation. During the implementation period, participants were observed by the researcher and wrote weekly reflection diaries. At the end of the study, semi-structured interviews were conducted, and participants submitted a final written essay. The data were analyzed to address three research questions regarding the impact, contribution, and learners' perceptions of C-DA.

In relation to the first research question, the analysis of pre-test and post-test scores, supported by participants' reflections and interviews, demonstrated a clear improvement in learners' grammatical accuracy, both in controlled test settings and in productive writing tasks. C-DA not only enhanced test performance but also promoted structural transfer and grammatical self-awareness, as evidenced by learners' reflections and essay outputs. These results confirm the pedagogical potential impact of C-DA beyond its role as an assessment

tool. Aligned with Vygotsky's concept of the ZPD, the dynamic mediation provided scaffolded, individualized feedback that addressed learners' specific needs. In doing so, it reduced performance variability, empowered lower-achieving learners, and fostered deeper, more transferable learning, particularly in production-based tasks.

The second research question explored how the C-DA contributed to learners' use of grammar in written production. Findings provide compelling evidence that C-DA enhances learners' understanding and application of complex grammatical structures, especially in extended writing. Significant improvement was observed in the use of structures such as conditionals, past tenses, and noun clauses, which were applied with greater accuracy and growing confidence. Additionally, learners' active engagement with the C-DA process and increased strategic awareness of grammar use in writing were notable. Scaffolded prompts and individualized mediation were key in helping learners internalize grammar rules and apply them in communicative contexts. While short-term transfer of grammatical knowledge was achieved, questions remain regarding the long-term durability and the factors influencing variability in structure use.

The third research question addressed learners' reflections of the C-DA process in terms of grammar-in-use. Analysis of learners' reflections indicated that C-DA had a multifaceted impact on cognitive, emotional, and metalinguistic development. Its scaffolded and interactive nature fostered grammatical awareness, encouraged self-regulated learning, and supported more confident grammar use in writing. Unlike traditional static assessment, C-DA was perceived as an engaging, meaningful process that blended assessment with instruction—providing both corrective feedback and learning opportunities. Learners also reported reduced anxiety and increased motivation, emphasizing the holistic benefits of the approach. These findings are consistent with existing literature and suggest that C-DA can significantly support grammar development in more personalized and reflective ways. However, as the findings are based on self-reported data from a small sample, future

research should consider longitudinal designs and performance-based assessments to examine the durability and broader applicability of C-DA's effects.

Overall, this study has demonstrated the pedagogical value of C-DA in enhancing EFL learners' grammar-in-use, particularly in productive writing tasks. Through a dynamic and individualized approach, C-DA bridged assessment and instruction, fostering both cognitive and emotional aspects of learning. These findings contribute to the growing body of research advocating for more responsive and formative assessment practices in foreign language education.

6.1 Pedagogical and Practical Implications

The findings of this study have several implications for both EFL teaching and assessment practices. Firstly, the positive impact of Computerized Dynamic Assessment (C-DA) on grammar-in-use suggests that integrating digital mediation tools into language instruction can enhance learners' written production. This highlights the potential of C-DA as an effective pedagogical tool, particularly in settings where individualized feedback is essential but difficult to implement due to large class sizes. Teachers and curriculum designers may consider incorporating C-DA into their instructional practices to provide continuous, adaptive support tailored to learners' needs.

In terms of teaching grammar, the findings offer valuable insights into how C-DA can complement both focus on form and focus on forms approaches in classroom settings. Through scaffolded mediation, learners are encouraged to notice and internalize grammatical structures as they arise in meaningful contexts (focus on form), while also receiving explicit feedback and support on discrete grammar points (focus on forms). This dual support structure enables teachers to adopt a more flexible, context-sensitive approach to grammar instruction, balancing accuracy-focused activities with communicative language use. Integrating C-DA into classroom routines can thus help bridge the gap

between form-oriented instruction and fluency-oriented tasks by promoting learner awareness and self-regulation in grammar use.

Additionally, the development of user-friendly C-DA platforms with automated feedback mechanisms can help simplify its implementation, making it more accessible to teachers and learners alike. Future advancements in artificial intelligence and machine learning could further enhance C-DA systems by offering more personalized and adaptive feedback based on individual learner performance. Given the positive reception from participants, educational institutions may explore ways to integrate C-DA within standardized language programs, ensuring that students have access to dynamic, responsive feedback mechanisms. Additionally, this study provides evidence that C-DA can bridge the gap between assessment and instruction, making grammar-in-use learning more interactive and meaningful.

From an assessment perspective, the findings indicate that C-DA offers an innovative alternative to traditional grammar testing methods by integrating diagnostic, formative, and summative elements. Rather than relying purely on static assessments that measure grammatical knowledge at a single point in time, C-DA captures learners' potential for development through mediation. This approach allows teachers to assess not only what learners know, but also how they respond to assistance and how close they are to independent performance. As such, C-DA aligns well with principles of dynamic and process-oriented assessment and may inform more equitable, learner-centered evaluation practices in grammar instruction.

To fully integrate C-DA into language teaching, it is crucial to develop teacher education programs that familiarize pre-service teachers with the principles and applications of dynamic assessment. Educating these teachers in C-DA methodologies will enable them to effectively implement digital mediation strategies, observe learner progress, and tailor feedback accordingly. Institutions should consider incorporating C-DA training into pre-

service and in-service teacher education programs to enhance its adoption and maximize its benefits.

6.2 Limitations of the Study

This study, while providing important findings regarding the use of C-DA in developing grammar-in-use in EFL learners' written production, has several limitations that should be taken into account when interpreting the results.

First, the study was conducted with a relatively small sample of twelve B1-level students from a single university context. Although the findings are promising, the limited sample size and homogeneity of the participant group reduce the generalizability of the results to broader EFL populations or different educational settings.

Second, the duration of the study was limited to an eight-week instructional period. While this was sufficient to observe initial changes in learners' grammatical accuracy and awareness, it does not provide evidence regarding the long-term effects of C-DA. Longitudinal research is required to determine whether the observed improvements are sustained over time.

Third, some of the data collection tools, such as reflection diaries and semi-structured interviews, relied on self-reported information. Although these tools generated valuable qualitative insights into learners' experiences, they are subject to potential biases such as selective memory, social desirability, or misinterpretation of the assessment process.

Furthermore, this study focused solely on the written production aspect of language use. Other language skills such as speaking, listening, and reading were not included in the scope of the investigation. As language learning is a multifaceted process, excluding other modalities limits the comprehensiveness of the findings.

Lastly, the design and implementation of the C-DA process were developed by the researcher and tailored to the specific needs of the participant group. As such, the outcomes may have been influenced by contextual factors including the digital platform used, the form of mediation provided, and the researcher-learner interaction.

6.2 Future Research Implications

While this study provides valuable insights into the effectiveness of C-DA for EFL learners, several areas need further investigation. Firstly, future research could explore the long-term impact of C-DA beyond the eight-week implementation period to assess the sustainability of grammar-in-use improvements. Longitudinal studies tracking learners' writing performance over extended periods would provide deeper insights into the lasting effects of C-DA interventions.

Secondly, this study focused on B1-level learners at higher education level. However, the effectiveness of C-DA may vary across different proficiency levels and age groups. Further research should explore how C-DA influences learners at different stages of language development, including beginner (A1-A2) and advanced (B2-C1) proficiency levels, or different age groups. Such studies would help refine C-DA interventions to meet diverse learner needs (special education students, learners with learning disabilities) more effectively. Additionally, future studies could explore the impact of C-DA on different language skills (e.g., speaking and listening), investigate its applicability across diverse contexts such as online learning environments, and conduct experimental research on the integration of C-DA with other technological tools.

6.3 Conclusion

In conclusion, this study demonstrates that C-DA can effectively enhance EFL learners' grammar-in-use in written production. The improvements observed in participants' performance, alongside their positive perceptions of the process, underline the potential of C-DA as both an assessment and instructional tool. However, to fully explore its benefits, further research is needed to refine its implementation across diverse contexts, proficiency levels, and language skills. These efforts will contribute to the continued evolution of C-DA as a dynamic and personalized approach to language education.



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APPENDICES



Appendix A. The Post-test

ENGLISH GRAMMAR TEST

Part 1: Read the text and fill in the blanks with the correct grammatical forms.

Last summer, Sarah faced a crucial moment in her academic career. She needed to pass her final exams. Her friend Jane advised her, "If I (1) _____ (be) you, I _____ (take) regular breaks to avoid burnout." Because Sarah seemed to be stressing way too much about it. Reflecting on her past mistakes, Sarah said, "I don't have time to take a break. If (2) I _____ (start) revising earlier, I _____ (cover) all the topics. But there is still so much I need to study. " Jane knew that it was not too late. She said, "If you (3) _____ (manage) your time well, you _____ (cover) all the topics before the exam. You still have time, but you should relax and be organized. (4) If you _____ (stay) organized, you _____ (achieve) your goals."

Part 2: Choose the correct option to complete the sentence.

5. The committee hasn't decided yet _____ the event will be held indoors or outdoors.

- a) that
- b) whether
- c) if
- d) whether or not
- e) if or not

6. There was a time _____ there were beaches along the coast from Kadıköy to Kartal in Istanbul.

- a) how
- b) which
- c) where
- d) when
- e) what

7. He will tell us _____ his opinion is after he has had a look at our project.

- a) who
- b) which
- c) that
- d) when
- e) what

8. When our car broke down on the way to Ankara, the mechanic _____ helped us knew exactly _____ the problem was.

- a) whom / Ø
- b) that / how
- c) which / where
- d) Ø / why
- e) who / what

9. *My brother is really scared of large dogs and panics _____ he sees one.*

- a) although
- b) whenever
- c) because
- d) while
- e) wherever

10. *I will call my friend _____ husband works in the management office. He can help us.*

- a) who
- b) whose
- c) which
- d) that
- e) whom

11. *After I _____ the report, I _____ that it was too late.*

- a) had finished / had seen
- b) have finished / have seen
- c) had finished / saw
- d) have finished / saw
- e) finished / saw

12. *What surprised me the most was ____.*

- a) how calmly she handled the crisis
- b) how did she handle the crisis
- c) that she handled calmly the crisis
- d) how she handled the crisis calmly
- e) how calm did she handle the crisis

Part 3.A: Read the text and choose the correct option to complete the sentences.

New York is an extremely exciting city. It has so much to offer visitors. There are many famous sights, such as the Statue of Liberty and Times Square. __ (13) __ historical buildings, there are also lots of great museums and art galleries. __ (14) __, the shopping is amazing, with lots of big department stores and designer shops.

__ (15) __, there are some things that I don't like about New York. The traffic is terrible, and the subway is always crowded. It's not a very green city either - there are hardly any parks or open spaces. __ (16) __, you can go for a walk in Central Park. __ (17) __ it's always full of people, especially at weekends, it is nice to walk around and have some fresh air.

New York can be overwhelming at times, especially for first-time visitors. __ (18) __, you would have discovered some lesser-known but incredible places. It is also worth talking to people __ (19) __ knowledge of the city helps uncover hidden gems and avoid tourist traps.

- 13. A) Also B) Nevertheless C) As well as D) Furthermore E) Owing to
- 14. A) Besides B) However C) As well as D) Otherwise E) Because
- 15. A) Besides B) Nonetheless C) As well as D) Since E) Despite

16. A) Moreover B) Overall C) To conclude D) Whereas E) As well as
17. A) Besides B) In spite of C) Although D) Since E) On the other hand
18. A) If you take more time to research the city beforehand
 B) If you have taken more time to research the city beforehand
 C) If you took more time to research the city beforehand
 D) If you had taken more time to research the city beforehand
 E) If you would have taken more time to research the city beforehand
19. A) who B) whom C) whose D) which E) that

Part 3.B: Read the text and choose the correct option to complete the sentences.

I was walking in the park when I saw a man lying on the ground. He looked dead, but he __(20)__ alive because I saw him breathing. A woman was standing next to him. She __(21)__ his wife, or a nurse. She was holding a small bottle. It __(22)__ medicine, but the situation was suspicious. She looked nervous, as if she __(23)__ something bad. I hoped __(24)__ poison. There were two other people in the park, but they didn't look up. Then, I went over to the man on the ground. I looked at his face and suddenly I __(25)__ what _____. He wasn't dead - he was sleeping!

20. A) can't have been B) must have been C) might have been D) can be E) might be
21. A) can't have been B) must have been C) might have been D) can be E) might be
22. A) can't have been B) must have been C) might have been D) can be E) might be
23. A) had done B) did C) was doing D) would do E) has done
24. A) that it wasn't B) if it wasn't C) was not that D) that wasn't E) which wasn't
25. A) understand/happens B) understood/have happened C) understood/had happened
 D) had understood/had happened E) had understood/happened

Appendix B. Sample C-DA Test Items And Hints

This appendix presents samples from the eight tests implemented during the C-DA intervention. The first test is provided in full to illustrate the design, structure, and mediation in detail. For the remaining tests, selected representative items of certain tests are included to demonstrate the range of grammatical targets and test items or hint formats used throughout the study.

C-DA TEST ITEMS AND HINTS OF WEEK 1

Choose the correct option to fill in the blanks.

1. If I _____ free time in the evening, I usually _____ books to relax and unwind after a busy day.

- A. had / would read B. have / will read C. have / read D. will have / read E. had / will read

Hint 1: (*categorization*) — What type of conditional describes habitual actions?

Hint 2: (*keyword provision*) — Pay attention to the word "usually."

Hint 3: (*rule reminder*) — Think about the tense we use in both clauses to express real-life routines and general truths.

2. If you _____ this button on the remote control, the machine _____, initiating its operation according to the programmed commands.

- A. pressed / started B. have pressed / will start C. press / have started D. will press / starts E. press / starts

Hint 1: (*categorization*) — Is this a real-time instruction or a hypothetical scenario?

Hint 2: (*keyword provision*) — Focus on "the machine starts." Is it something that always happens?

Hint 3: (*rule reminder*) — In cause-effect instructions or factual conditions, we often keep both clauses in the present.

3. If we _____ rich, we _____ the world and explore different cultures, cuisines, and landscapes.

- A. were / would travel B. are / will travel C. can be / would travel
D. will be / will travel E. were / travelled

Hint 1: (*categorization*) — Is this situation real or hypothetical?

Hint 2: (*grammar rule reminder*) — Imaginary present situations often require a backshift in tense.

Hint 3: (*exemplification*) — Think of a sentence like: "If I were a bird, I would fly."

4. If she _____ more carefully, she wouldn't have made that mistake in the presentation.

- A. listens B. has listened C. had listened D. listened E. would have listened

Hint 1: (*categorization*) — Does this reflect a past mistake or a future plan?

Hint 2: (*keyword provision*) — Look at "wouldn't have made." What does that suggest about time?

Hint 3: (*rule reminder*) — What structure do we use in the "if" part of third conditionals?

5. You _____ have told me about the meeting! I missed it completely.

- A. should B. must C. could D. should have E. would

Hint 1: (*categorization*) — Is this obligation about now or the past?

Hint 2: (*grammar rule reminder*) — Regret about past actions requires a specific modal pattern.

Hint 3: (*exemplification*) — Think of this: “You didn’t call me? You ____ have called!”

6. She had already left the office when I _____ there.

- A. had arrived B. arrive C. arrived D. was arriving E. would arrive

Hint 1: (*categorization*) — How do we show which past action happened first?

Hint 2: (*keyword provision*) — Focus on “had already left.”

Hint 3: (*rule reminder*) — In a past-perfect + past-simple sequence, which tense shows the earlier action?

7. I studied hard for the test. _____, I didn’t get a good grade.

- A. However B. Because C. So D. Then E. Since

Hint 1: (*categorization*) — Are these ideas complementary or contrasting?

Hint 2: (*keyword provision*) — “Didn’t get a good grade” is unexpected.

Hint 3: (*rule reminder*) — Which connector do we use when something happens contrary to what we expect?

8. They didn’t go on a picnic _____ the weather was bad.

- A. although B. because C. however D. in spite of E. despite

Hint 1: (*categorization*) — What kind of relationship is this: contrast or cause?

Hint 2: (*keyword provision*) — “The weather was bad” explains the reason.

Hint 3: (*rule reminder*) — Which connector introduces a reason for an action?

9. If he _____ the instructions carefully, he wouldn't be having this issue now.

- A. followed B. had followed C. would follow D. follows E. would have followed

Hint 1: (*categorization*) — This is a mixed conditional. What's the time frame of cause and effect?

Hint 2: (*keyword provision*) — “Wouldn't be having” points to a present result.

Hint 3: (*rule reminder*) — For past cause and present result, what tense comes after “if”?

10. You _____ have eaten all the cake. Now there's nothing left for the guests!

- A. should B. must C. shouldn't D. shouldn't have E. wouldn't

Hint 1: (*categorization*) — Is this expressing advice, obligation, or criticism?

Hint 2: (*keyword provision*) — “Now there's nothing left” shows disapproval.

Hint 3: (*rule reminder*) — To criticize a completed action, which modal + structure is commonly used?

C-DA TEST ITEMS AND HINTS OF WEEK 2

(1) If I _____ (wake up) early, I always _____ (go) for a run in the park. (2) I _____ (feel) more energized if I _____ (exercise) in the mornings. Yesterday, I didn't have time for it. (3) If I _____ (have) time, I _____ (exercise). But I always walk to work, so I wasn't inactive at all. (4) If I _____ (work) in a company that is far away from home, I _____ (not walk). Maybe I would go to work by bus. Thankfully, I don't need that. My workplace is not far away. I can walk whenever I want to. I like physical activity and I like healthy life! (5) If I _____ (keep) up this routine, I _____ (see) improvements in my overall health in the long run.

1. Hint 1: (*categorization*) — Is this a regular habit or a one-time plan?
Hint 2: (*grammar rule reminder*) — For daily routines, what tense do we use in both clauses of the conditional?
Hint 3: (*exemplification*) — Consider: “If I sleep well, I feel better.”
2. Hint 1: (*keyword provision*) — Look at the red word* (*in the mornings*).
Hint 2: (*exemplification*) — Does this sentence have a similar pattern to the previous one?
Hint 3: (*grammar rule reminder*) — Think about the tense we use to express real-life routines.
3. Hint 1: (*categorization*) — Look at the previous sentence and the red word** (*yesterday*).
Hint 2: (*grammar rule reminder*) — I didn't exercise yesterday. I'm imagining a different result for something that didn't happen yesterday. Could this be type 3?
Hint 3: (*grammar rule reminder*) — For events that didn't happen in the past, we normally use “had + past participle” in the if-clause.
4. Hint 1: (*key word provision*) — Look at the statements written in red***. (*I always walk to work. My workplace is not far away. I can walk whenever I want to.*) Do I walk to work? Does “not walking” always happen?
Hint 2: (*categorisation*) — Is “not walking to work” a general routine (Type 0), or an imaginary condition (Type 2)?
Hint 3: (*exemplification*) — Which example is similar to this sentence? “If I am rich, I buy houses.”, “If I had been rich, I would have bought houses.” or “If I were rich, I would buy houses”?
5. Hint 1: (*categorization*) — Does this refer to a likely future scenario?
Hint 2: (*keyword provision*) — “In the long run” implies a future result.
Hint 3: (*rule reminder*) — What tenses are used in the first conditional?

* The word “in the mornings” is presented in red in the second attempt.

** The word “yesterday” is presented in red in the second attempt.

*** The statements “I always walk to work. My workplace is not far away. I can walk whenever I want to.” are presented in red in the second attempt.

C-DA TEST ITEMS AND HINTS OF WEEK 3

...

8. Which sentence shows a condition?

- A) Despite your invitation, I didn't go to the cinema.
- B) I finished my homework besides studying for my exams.
- C) She was tired since she worked until late.
- D) I feel depressed unless I listen to his podcasts.

Hint 1: (*categorization*) — These options include additional information, condition, contrast, and reasoning.

Which one could be the condition?

Hint 2: (*keyword provision*) — Look at the words in red (despite, besides, since, when).

Hint 3: (*exemplification*) — Think of a sentence like: “If I don’t exercise, I forget the rules.” Which option has a closer structure?

9. Which sentence adds extra information?

- A) He didn’t go to the party as he was feeling sick.
- B) She enjoys swimming although the water is cold.
- C) I cleaned the kitchen as well as doing the laundry.
- D) If you study now, you'll finish earlier.

Hint 1 (*categorization*): One of these options includes a second action that adds to the first without showing contrast or cause.

Hint 2 (*keyword provision*): Pay attention to phrases that suggest “this too” or “in addition.”

Hint 3 (*exemplification*): Consider: “I made dinner besides setting the table.” Which option feels similar?

10. Which sentence shows a generally positive attitude but also reveals some hesitation or concern?

- A) Even though she had little time, she completed the project on time.
- B) Despite the weather, we went out for a walk.
- C) Although he knew the answer, he didn’t respond.
- D) While he agreed with the plan, he wasn’t fully convinced.

Hint 1 (*categorization*): One of these options blends both agreement and mild uncertainty, but others show a full contradiction.

Hint 2 (*keyword provision*): Look for adverbs or verbs that can show hesitation.

Hint 3 (*exemplification*): Think: “I said yes to the trip, but I wasn’t sure about the plan.” Which sentence gives a similar vibe?

C-DA TEST ITEMS AND HINTS OF WEEK 6

...

Join the sentences using relative clauses.

7. I sent an invitation to my brother. (My brother lives in Italy.)

Hint 1 (*key word provision*): You're defining the brother. He lives in Italy. ("He" is written in red)

Hint 2 (*exemplification*): Check the example: "I like a house. It is blue. I like the house which is blue." Now choose the correct relative pronoun to form your own sentence.

Hint 3 (*rule reminder*): When there is a subject pronoun, it is replaced with "who". When there is a possessive pronoun, it is replaced with "whose." Which one fits better for you?"

8. We broke the computer. (The computer belongs to my father.)

Hint 1 (*key word provision*): Look at the word written in red (it). Which relative pronoun fits there?

Hint 2 (*exemplification*): Check the example: "I like a girl. (She is a student.) I like the girl who is a student. / I like the girl that is a student." Now choose the correct relative pronoun and re-write your sentence.

Hint 3 (*rule reminder*): When there is a possessive pronoun, it is replaced with "whose." In relative clauses. But I'm not talking about something that is computer owns. I'm talking about the computer itself. Here, the computer is an object and I'm defining it.

C-DA TEST ITEMS AND HINTS OF WEEK 8

...

Choose the correct discourse marker from the box to fill in the blanks.

since	even if	because	besides	thus	after	before
-------	---------	---------	---------	------	-------	--------

4. Joey acts so weird nowadays. _____, we don't want to invite him over.

Hint 1 (*keyword provision*): What is the relationship between "being weird" and "not being invited"?

Hint 2 (*categorization*): Is there an opposite (even if), similar (besides), time related (after, before) or cause-effect (thus, since, because) relationship?

Hint 3 (*exemplification*): He acts weird. As a result, we don't want to invite him. There is a cause-effect relationship. Which discourse marker is used to introduce the effect of a cause?

...

Choose the correct option to fill in the blanks.

8. Uncle David finally _____ to the doctor after he _____ ill for a month.

- A. went / was B. had gone / was C. went / had been
D. had gone / had been E. had gone / was being

Hint 1: (*keyword provision*) — Keywords here are “after” and “finally”. There are two actions in past, connected with “after.”.

Hint 2: (*categorization*) — Something happened after a longer situation. Can you tell which part lasted longer? Which action happened first and which one happened later?

Hint 3: (*exemplification*) — Think: “She left the party after she had talked to everyone.” What’s the structure there?

...

9. A: I think Jack and Sara are not dating anymore.

B: No way! I saw them together five days ago, they ____ up!

- A) shouldn’t break
- B) mustn’t break
- C) might not have broken
- D) can’t have broken

Hint 1: (*keyword provision*) — Focus on “No way!”, is it expressing doubt, possibility, or certainty?

Hint 2: (*categorization*) — Let’s categorize the options. “shouldn’t break” and “mustn’t break” are in the present form. “might not have broken” and “can’t have broken” are in the past form.

Hint 3: (*exemplification*) — Think of these examples:

“He needs money. He shouldn’t be fired.”

“To win the bet, he mustn’t be fired.”

“I am not sure, he might not have been fired.”

“He went to work this morning. He can’t have been fired.”

Which one shows that the speaker is almost certain something didn’t happen?

Appendix C. Reflection Diaries

HAFTA 2

Bu günlük, dinamik değerlendirme deneyiminiz hakkında düşünmeniz içindir. Düşünceleriniz araştırmacıların bu değerlendirme yönteminin nasıl çalıştığını ve öğrenme üzerindeki etkisini anlamalarına yardımcı olur. Deneyiminize dayanarak bir yansıma günlüğü yazın, özellikle şunlar hakkında konuşun:

- *Değerlendirme sürecine ilişkin izlenimleriniz nelerdi? Öğrenmenize katkısı hakkında ne düşünüyorsunuz?*
- *Bu testin size farklı gelen yönleri nelerdir?*
- *Dinamik değerlendirme testi deneyiminizi nasıl tanımlarsınız?*
- *Neleri beğendiniz? Zorlayıcı olan neydi?*
- *Mevcut testteki performansınızı nasıl tanımlarsınız?*



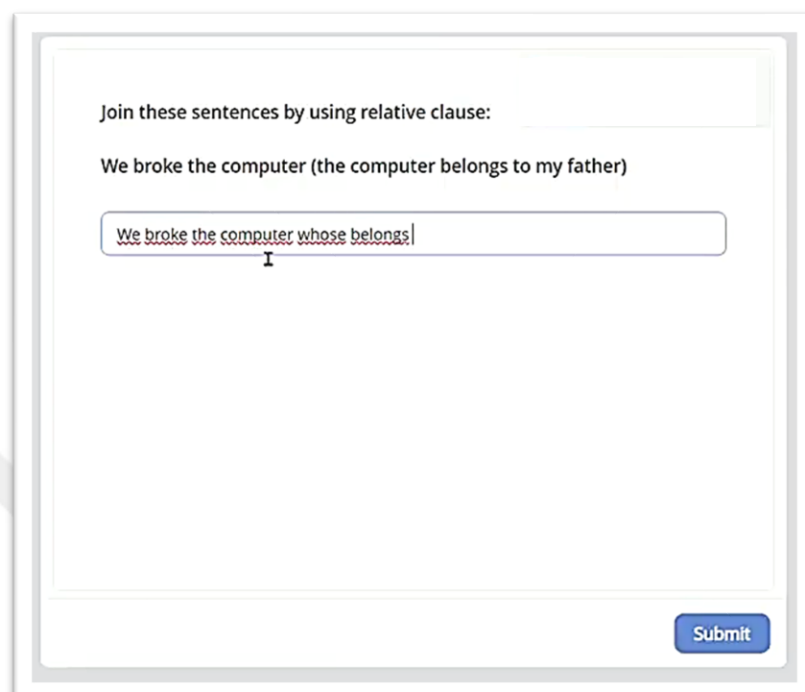
WEEK 2

This journal is for reflecting on your dynamic assessment experience. Your thoughts will help researchers understand how this type of assessment works and how it affects learning. Based on your experience, write a reflection journal, and be sure to talk about the following:

- *What were your impressions of the assessment process? What do you think about its contribution to your learning?*
- *What aspects of this test felt different to you?*
- *How would you describe your experience with the dynamic assessment test?*
- *What did you like? What did you find challenging?*
- *How would you describe your performance on the current test?*

Appendix D. Sample of a C-DA Question Display

Week 6, Question 8:



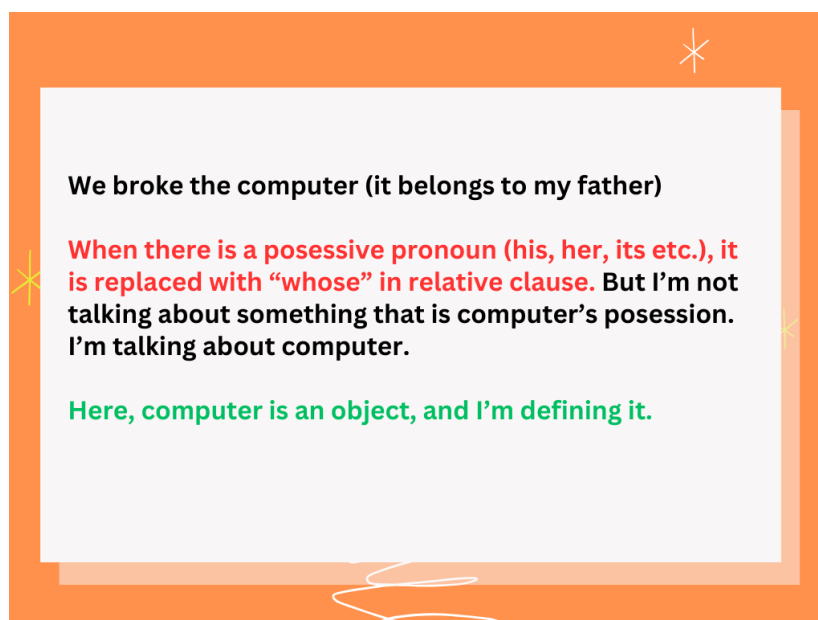
Join these sentences by using relative clause:

We broke the computer (the computer belongs to my father)

We broke the computer whose belongs

Submit

The hint is displayed after the incorrect attempt:



We broke the computer (it belongs to my father)

When there is a posessive pronoun (his, her, its etc.), it is replaced with "whose" in relative clause. But I'm not talking about something that is computer's posession. I'm talking about computer.

Here, computer is an object, and I'm defining it.

Appendix E. The Final Writing Task

TASK: WRITING AN ARGUMENTATIVE ESSAY

Choose **one** of the topics given below and write a well-organized argumentative essay.

While writing your essays, consider the following points:

- Organization: **the introduction, the body (two), refutation, and the conclusion.**
- Use at least **3** of these sentence structures: **if clauses, relative clauses, noun clauses, past perfect tense, past modals.**
- **Use discourse markers.**
- Please pay special attention to **your punctuation, spelling, organization of your paragraphs, formal language and word count.**
- Your essay should include 200-300 words.

TOPIC 1: Discuss whether using technology makes learning English easier or it causes students to rely too much on it.

TOPIC 2: Discuss how technology will change education in the future and whether it should play a key role in education.

Appendix F. Semi-Structured Interview Questions

Merhaba, öncelikle bu çalışmaya katıldığınız için teşekkür ederim ve hoş geldiniz.

Daha önce de belirttiğim üzere, bu araştırma bilgisayar destekli dinamik değerlendirmenin öğrencilerin gramer kullanımı üzerindeki etkisini incelemeyi amaçlamaktadır. Bu kapsamda, sekiz hafta boyunca düzenli olarak dinamik değerlendirme testlerine katıldınız ve yansıma günlükleri oluşturdunuz. Şimdi, bu süreçle ilişkin deneyimlerinizi daha ayrıntılı biçimde anlamak amacıyla size bazı sorular yönelteceğim.

Görüşmemiz sesli olarak kaydedilecektir; ancak bu kayıt yalnızca bilimsel amaçlarla kullanılacak ve gizliliğiniz tarafımdan titizlikle korunacaktır.

Görüşmeye başlamadan önce sormak istediğiniz herhangi bir şey var mı?

Örnek Sorular

- 1) Araştırmaya başlamadan önce ve araştırma bittikten sonra, dinamik olmayan geleneksel birer test çözdün. Bunun dışında da 8 hafta boyunca dinamik test çözmüştün. Bu iki test türü hakkında ne söylemek istersin?
- 2) Dinamik değerlendirme sırasında aldığın ipuçlarından bahsedeceğim. Ekranda DÖRT ipucu çeşidi göreceksin. Bunların hangisi ya da hangilerini faydalı buldun?
- 3) Beşinci haftada yazdığın yansıma günlüğünde “...” şeklinde bir ifaden var, bunu biraz açar mısın? Ne açıdan geliştiğini düşünüyorsun?
- 4) ...

Hello, and first of all, thank you for participating in this study. Welcome.

As I previously mentioned, this research aims to examine the effect of computer-assisted dynamic assessment on students' use of grammar. Within this scope, you participated in regular dynamic assessment tests over the course of eight weeks and maintained reflective journals. I will now ask you a series of questions to gain a more detailed understanding of your experiences throughout this process.

This interview will be audio-recorded; however, the recording will be used solely for academic purposes, and your confidentiality will be strictly protected by me.

Before we begin, do you have any questions?

Sample Questions

1. Before the study began and after it concluded, you completed two traditional (non-dynamic) grammar tests. In addition to this, you completed dynamic tests over the course of eight weeks. What are your thoughts on the differences between these two types of tests?
2. I'd like to talk about the prompts you received during the dynamic assessments. You will see four different types of prompts displayed on the screen. Which of these did you find helpful, and why?
3. In the reflection journal you wrote during the fifth week, you mentioned: "..."
Could you elaborate on that a bit? In what ways do you think you improved?
4. ...

Appendix G. A Sample of Participant Essays

ARGUMENTATIVE ESSAY

PARTICIPANT 1

Word Count: 271

Does Technology Make Learning English Easier?

Nowadays, many students use technology when they study English. Some people think it is very helpful, while others believe it makes students lazy. In this essay, I will argue that technology really makes learning English easier, but students must also be careful not to depend on it too much.

First of all, technology gives us many different resources. For example, we can use applications that teach us grammar or vocabulary. We can also watch movies or videos with subtitles, and this help us understand real English. In addition, online dictionaries are fast and useful. If students didn't have these tools, it would be more difficult for them to study alone. So technology makes learning more accessible.

Secondly, technology can make learning more interesting. There are many websites which explain grammar rules clearly, and also some games that help us remember new words easily. What I believe is that students feel more motivated when they enjoy learning. Students can also join online speaking clubs or chat with foreigners who speak English fluently. This gives them a chance to practice in real life situations.

On the other hand, some students rely on technology too much. They always use translator and they don't try to write or think in English. They could have learned better if they had practiced more without apps. Also, some students forget grammar rules because the technology do everything for them. This is not good for long-term learning.

To sum up, technology really helps students learn English faster and in fun way, but it is important that they use it wisely. Without practicing by themselves, technology alone is not enough.

Appendix H. A Sample of Participant Reflections

KATILIMCI: 7

HAFTA: 5

Bu hafta yine dinamik değerlendirme sürecine katılmak baya faydalı oldu çünkü önceki deneyimlerimle kıyaslama yapma şansı buldum. Artık sisteme daha çok alıştım diyebilirim, bu da kendimi daha rahat hissetmemi sağlıyor. İlk başta biraz garip gelmişti ama her hafta bu yöntemin ne kadar etkili olduğunu daha net fark ediyorum. Test sırasında verilen yönlendirmeler sayesinde olay sadece neyi bilip bilmediğimle ilgili değil aynı zamanda nasıl öğrendiğimi de ortaya koyuyor. Bu da kendimi daha iyi tanımama yardımcı oluyor. Özellikle yazma becerilerimde bariz bir gelişim fark ettim. Artık daha karmaşık dil bilgisi yapıları kullanıyorum, sadece basit zamanlarla takılmıyorum. Önceden bu tarz yapıları kullanmaktan kaçınırdım ama artık daha özgüvenli kullanıyorum. Geçen hafta testte “despite” ile “despite of” arasındaki farkı öğrendim. Bu hafta sınıfta yazı yazarken, “Despite the challenges, the solution was implemented successfully.” gibi bir cümle kurdum. Hem doğru kullandım hem de geçiş ifadesini doğru yere koyduğumu hissettim. Bu tarz bağlaçlarda eskiden çekinirdim ama artık daha bilinçli davranıyorum. Bu testte en sevdiğim şey, bir şeyi sadece “hatalı” olarak işaretlemek yerine, neden yapamadığımı gösteriyor olması. Bu da stresimi ciddi anlamda azaltıyor çünkü sürekli değerlendirilmek yerine destekleniyor gibi hissediyorum. Tabii ki bazı kısımlar hâlâ zorluydu. Özellikle ipuçlarını hızlıca anlayıp uygulamam gerektiğinde bazen zorlandım. Ama bunun öğrenme sürecinin bir parçası olduğunu kabullenmeye başladım ve ne kadar çok pratik yaparsam o kadar kolaylaştığını görüyorum. Şimdiden her seferinde daha hızlı adapte olduğumu fark ediyorum. Genel performansıma baktığımda artık sadece doğru cevap sayısına göre değil, süreç içindeki gelişimime göre de değerlendiriyorum kendimi. Bu da beni daha çok motive ediyor çünkü artık hatalarımı gelişimin bir parçası olarak görüyorum.

PARTICIPANT: 7

WEEK: 5

Participating in the dynamic assessment process again this week was quite helpful, as it allowed me to compare it with my previous experiences. I can say that I've gotten more used to the system now, which helps me feel more comfortable. At first, it felt a bit different, but each week I realize more clearly how effective this method actually is. Thanks to the prompts given during the test, it's not just about what I know or don't know—it also shows how I learn. This gives me a chance to understand myself better. I've especially noticed a clear improvement in my writing skills. My writing has improved because I now use complex grammar structures more frequently, not just simple tenses. I used to avoid those kinds of structures, but now I use them with more confidence. Last week, I learned the difference between "despite" and "despite of" in the test. This week, while writing in class, I used a sentence like "Despite the challenges, the solution was implemented successfully." I felt that I not only used it correctly but also placed the transition expression properly. I used to hesitate with these kinds of linkers, but now I act more consciously. What I like about this test is that instead of just marking something as "wrong," it helps me see why I couldn't do it. That really reduces my stress because I feel supported rather than constantly evaluated. Of course, some parts were still challenging. Especially when I had to understand and apply the hints quickly, it sometimes took effort. But I've started to accept that this is part of the learning process, and the more I practice, the easier it gets. I can already see that I'm adapting more quickly each time. When I look at my overall performance, I've started to evaluate it not just based on how many correct answers I get but also based on my progress throughout the process. This motivates me more, because now I see my mistakes as part of my development.

Appendix I. A Sample of Semi-Structured Interviews

Araştırmacı (S1): Merhaba, öncelikle hoş geldin. Daha önce de konuştuğumuz gibi, bu çalışma bilgisayar destekli dinamik değerlendirmenin öğrencilerin gramer kullanımı üzerindeki etkilerini incelemeyi amaçlıyor. Görüşmemiz sesli olarak kaydedilecek fakat yalnızca bilimsel amaçlarla kullanılacak ve tüm bilgileri gizli tutulacak. Başlamadan önce sormak istediğin bir şey var mı?

Katılımcı (S2): Yok hocam, sorun yok. Hazırım, başlayabiliriz.

S1: Araştırmaya başlamadan önce ve araştırma tamamlandıktan sonra klasik yani dinamik olmayan iki test çözdün. Bunun dışında da 8 hafta boyunca dinamik testlere katıldın. Bu iki test türünü karşılaştıracak olsan, neler söylersin?

S2: Yani şöyle hocam... Klasik testlerde aslında direkt cevabı verip geçiyorsun. Doğru muydu, yanlış mıydı; çok da üzerinde durmuyorsun açıkçası. Ama dinamik testlerde yanlış yaptığın anda sistem sana “bak burada hata yaptın” diyor, sonra o an, “ha evet burayı yanlış anlamışım” diyorsun. O yüzden eksik olduğum yerleri net fark ettim ve üzerine çalıştım. Bence çok daha öğretici oldu.

S1: Anladım. Peki dinamik testlerdeki ipuçları hakkında ne söylemek istersin? Hatırlarsan sana dört farklı ipucu türü gösterdim: anahtar kelime, örneklendirme, kural hatırlatma ve kategorilendirme. Hangisini daha faydalı buldun?

S2: Hmm... benim için en faydalı olan kesinlikle örneklendirme oldu. Çünkü neyin nasıl kullanılacağını örnek üstünden görünce kafamda çok daha iyi oturuyordu. Sonra anahtar kelimeler geliyor bence, bazı cümlelerde o kelimeler direkt yönlendiriyordu zaten. Üçüncü sıraya kural hatırlatmayı koyarım ama o da biraz ezber gibi geldi bana. O yüzden çok bir şey katmadı açıkçası.

S1: Günlüklerini incelediğimde özellikle 4. haftada şöyle bir cümle dikkatimi çekti: “Yeni yapılar öğreniyorum, yeni kelimeler öğreniyorum ve bunları yazılarımda kullanmaya başladım.” Bunlardan aklında kalanlar oldu mu?

S2: Evet oldu. Mesela test çözerken bazen bilmediğim fiiller ya da sıfatlar çıkıyordu. Onları direkt sözlükten bakıyordum testten sonra. Sonra “hmm, bu kelimeyi yazımda kullanabilir miyim?” diye düşünüyordum. Eğer anlamı uygunsa, yazarken ekliyordum. Böyle böyle kelimeler kafamda kalmaya başladı zaten. Hatta bazılarını günlük hayatta da kullanmaya başladım.

S1: Peki, “yeni yapıları kullanmak konusunda daha rahat hissediyorum” demişsin. Aklına gelen net bir örnek var mı?

S2: Evet aslında bir tane var. Mesela bir testte yanlış yaptığım bir yapı vardı—sanırım past modals ile ilgiliydi. Sonra sistem bana düzeltme ekranı açtı, orada doğrusunu gördüm. Meğer o yapıyı hep

yanlış kullanıyormuşum. O an “aa tamam, böyle oluyormuş” dedim. Sonra bir portfolyo yazısında aynı yapı denk geldi ve bu sefer doğru kullandım. O hissi hatırlıyorum, baya tatmin ediciydi.

S1: Dönem başındaki yazılarla şu an yazdıkların arasında ne gibi farklar görüyorsun?

S2: Çok fark var hocam, hem de olumlu anlamda. Mesela dönem başında yazdıklarım daha basitti, sürekli aynı kalıpları tekrar ediyordum. Yazıya başlarken hep aynı cümlelerle giriyordum. Şimdi daha farklı bağlaçlar kullanabiliyorum, cümle yapılarım çeşitlendi. Ayrıca gramer hatalarım da baya azaldı. İlk yazımda 12 ya da 14 almıştım, şimdi 20’lerin üzerine çıktım. Bu da motive edici bir şey tabii.

S1: Bir önerinde, “Her haftanın sonunda, o haftanın konusu ile ilgili kısa bir yazı yazılabilir” demişsin. Bunu biraz açabilir misin?

S2: Tabii. Şöyle düşündüm hocam: Mesela o hafta if clauses işlendiyse, hafta bitmeden o konuyu içeren küçük bir paragraf yazsak çok iyi olurdu. Ve sistem de bu kısa yazıyı değerlendirip, geri bildirim verseydi... Hem konuyu pekiştirirdik hem de hataları erkenden görürdük. Finalde yazdığımız essay gibi uzun değil de daha minik alıştırımlar ama her hafta olmalı bence.

S1: Teşekkür ederim. Son olarak eklemek istediğin bir şey var mı?

S2: Ben teşekkür ederim hocam. Bu sistem bence çok etkiliydi. Yani sadece test çözmek değil, gerçekten öğrenmemize yardımcı oldu. O yüzden katkınız büyük, sağ olun.

Researcher (S1): Hello, first of all, welcome. As we discussed earlier, this study aims to examine the effects of computer-assisted dynamic assessment on students' grammar use. Our interview will be audio-recorded, but it will be used solely for scientific purposes, and all information will be kept confidential. Do you have any questions before we begin?

Participant (S2): No, teacher, no problem. I'm ready, we can start.

S1: Before starting the study and after it ended, you took two traditional, that is, non-dynamic tests. In addition, you participated in dynamic tests for eight weeks. If you were to compare these two types of tests, what would you say?

S2: Well, it's like this... In traditional tests, you just give the answer and move on. Whether it was right or wrong, you don't really dwell on it. But in dynamic tests, the system immediately tells you, "Look, you made a mistake here," and then you realize, "Ah, I misunderstood this part." That way, I could clearly see where I was lacking and worked on those areas. I think it was much more instructive.

S1: I see. What would you say about the prompts in the dynamic tests? If you remember, I showed you four types of prompts: keyword, exemplification, rule reminder, and categorization. Which one did you find most useful?

S2: Hmm... the most useful for me was definitely exemplification. Because when I saw how something was used in an example, it made much more sense in my head. Then come the keywords, I think—in some sentences, those words directly guided me. I'd put rule reminders in third place, but they felt a bit like rote memorization to me. So honestly, they didn't add much.

S1: When I looked at your journal entries, one sentence from week 4 stood out: "I'm learning new structures, new words, and I've started using them in my writing." Do any of those still stick in your mind?

S2: Yes, some do. For example, sometimes during a test, I'd come across verbs or adjectives I didn't know. I'd look them up in the dictionary right after the test. Then I'd think, "Hmm, can I use this word in my writing?" If the meaning was appropriate, I would include it while writing. Little by little, the words started to stick in my mind. I even started using some of them in daily life.

S1: You also said, "I feel more comfortable using new structures." Do you have a specific example that comes to mind?

S2: Yes, I actually have one. In one test, I made a mistake with a structure—I think it was about past modals. Then the system opened the correction screen and I saw the correct form. Turns out, I had been using it wrong the whole time. At that moment, I thought, "Oh, so that's how it works."

Then in one of the portfolio writings, the same structure came up and this time I used it correctly. I remember that feeling, it was very satisfying.

S1: What differences do you see between your writings at the beginning of the term and now?

S2: There are a lot of differences, in a good way. For example, my early writings were simpler, I kept repeating the same patterns. I always started with the same sentences. Now I can use different connectors, and my sentence structures are more varied. Also, my grammar mistakes have decreased significantly. I got around 12 or 14 on my first writing, but now I score over 20. That's really motivating.

S1: In one of your suggestions, you said, "At the end of each week, a short writing task related to that week's topic could be included." Could you elaborate on that?

S2: Sure, teacher. I thought like this: for example, if we studied "if clauses" that week, it would be really helpful to write a short paragraph using that topic before the week ended. And if the system could evaluate that short writing and give feedback... We would reinforce the topic and also notice our mistakes earlier. Not a long essay like in the final, but small exercises every week, I think that would help a lot.

S1: Thank you. Lastly, is there anything else you'd like to add?

S2: Thank you, teacher. I think this system was really effective. It wasn't just about taking tests, it really helped us learn. So your contribution was huge, thank you.



GAZİLİ OLMAK AYRICALIKTIR...