

# Teaching and Assessing L2 Listening Comprehension with Computerized Dynamic Assessment (CDA): Theoretical Foundations, CDA Models, and Future Directions

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**Abstract:** *Computerized Dynamic Assessment (henceforth CDA) represents a paradigm shift in second language (L2) assessment, integrating instruction with assessment to reflect learners' developed abilities and potentials (responsiveness to mediation). CDA has been gradually adopted in L2 teaching and assessing. Results show that its application to L2 education has positive impact on learners' language abilities. However, study on its impact to L2 listening remains relatively under-explored. The review introduces its research framework, summarizes findings from key studies, identifies CDA models and discusses its application value and challenges. The article provides suggestion for future research, including longitudinal designs, mixed-methods approaches, and the incorporation of advanced technologies to enhance the validity and practicality of CDA in L2 listening.*

**Keywords:** *Computerized Dynamic Assessment, L2 listening, Zone of Proximal Development*

## 1. Introduction

Listening comprehension is a fundamental yet challenging skill in L2 acquisition, requiring real-time processing of multiple linguistic cues under time constraints<sup>[1]</sup>. Traditional assessments focus on product-oriented, quantitative measures<sup>[2]</sup>, which are useful for placement but offer little insight into learners' development or support needs.

Dynamic Assessment (DA), rooted in Vygotsky's Sociocultural Theory, integrates graduated mediation into assessment. Central to DA is the Zone of Proximal Development (ZPD), defined as the gap between independent performance and guided potential<sup>[3]</sup>. DA thus serves both to diagnose and to promote development. Two main approaches exist: interventionist DA, which standardizes procedures for comparability, and interactionist DA, which emphasizes flexible, contextualized mediation<sup>[4]</sup>. Although DA is well established in psychology and general education, its use in L2 listening remains limited. Computerized Dynamic Assessment (CDA), following the interventionist approach, uses pre-scripted, graduated prompts, making DA scalable<sup>[5]</sup>. CDA studies typically combine both approaches, designing prompts through one-on-one interactionist DA before implementing them in computerized procedures. By tracking responsiveness, CDA generates profiles of learner modifiability beyond what traditional tests capture.

Most current online listening programs incorporate advanced technologies such as artificial intelligence (AI) but rely on traditional assessment, analyzing errors and surveys to recommend exercises<sup>[6]</sup>. While effective for proficiency assessment, they fail to foster growth. In contrast, CDA measures developed ability through independent performance (actual score) and learning potential through mediated prompts (mediated score). Despite its promise, the validity and effectiveness of CDA in L2 listening remain debated. This article reviews existing literature, identifies CDA models and findings, and outlines future directions. Section 2 covers theoretical foundations; Section 3 reviews empirical studies; Section 4 discusses limitations; Section 5 proposes future research; Section 6 concludes with implications.

## 2. Theoretical Foundations

### 2.1 Sociocultural Theory (SCT)

Dynamic assessment (DA) is grounded in L. S. Vygotsky and his colleagues' work on sociocultural theory (SCT), which offers a framework for understanding human mental functioning and development.

#### 2.1.1 Development of higher forms of consciousness

What distinguishes humans from other species is their capacity for higher forms of consciousness—such as perception, attention, and memory—shaped through physical and cultural interaction with the environment<sup>[7]</sup>. As Luria<sup>[8]</sup> states, “the social nature of people comes to be their psychological nature as well.” For example, while a dog can only use its legs to dig a buried bone, humans invent and use tools like a shovel to plant a tree. This ability to conceptualize and deploy tools reflects the cognitive products of human-environment interaction<sup>[3]</sup>. According to SCT, consciousness involves self-regulatory mechanisms unique to humans<sup>[9]</sup>. Thus, cognitive abilities are dynamic and mediated by physical and symbolic artifacts through social interaction. To understand learner development, one must assess both independent performance and responsiveness to assistance—termed mediation—provided gradually from implicit to explicit. This process, known as dynamic assessment (DA), diagnoses and promotes learning potential<sup>[10]</sup>, offering a comprehensive evaluation grounded in Vygotsky's theory.

#### 2.1.2 Dynamic assessment

Unlike traditional assessments that assess learners based on their independent development, DA seeks to capture emerging abilities by offering mediation and observing responsiveness.

#### 2.1.3 Mediation

According to Wertsch<sup>[11]</sup>, tool-mediated and intention-driven behavior is the basic unit of consciousness. In dynamic assessment (DA), mediation allows teachers to offer hints to improve task performance, with results shown either as pretest–post-test differences or post-test scores alone<sup>[12]</sup>. In contrast, non-dynamic assessment (NDA) provides no tester assistance and fails to capture learners' Zone of Proximal Development (ZPD). Mediation can be physical (tangible tools) or symbolic (e.g., graphs, verbal records, action plans). As Lantolf<sup>[13]</sup> notes, planning enables mental action without physical execution. Two DA approaches have been developed<sup>[4]</sup>. Interventionist DA uses standardized, scripted prompts arranged from implicit to explicit, prioritizing consistency and quantitative methods, suitable for large classrooms. Interactionist DA allows flexible, dialogic interaction tailored to learners' immediate needs, typically requiring a human mediator and using qualitative methods. By merging assessment and instruction, DA challenges traditional paradigms<sup>[14]</sup>. However, it is time- and energy-intensive, limiting its use in large-scale teaching. To address this, researchers have developed Computerized Dynamic Assessment (CDA) for large-scale online settings.

### 2.2 Computerized Dynamic Assessment (CDA)

CDA was developed to address practical limitations of DA, such as the time-intensive nature of one-on-one mediation and the need for trained mediators<sup>[5]</sup>. By automating mediation, CDA enables consistent delivery to large groups of learners. Pioneering contributions to L2 CDA research include the work of Tzuriel and Shamir<sup>[15]</sup>, Guthke and Beckmann<sup>[16]</sup>, and Jacobs<sup>[17]</sup>.

Jacobs<sup>[17]</sup> created KIDTALK, a computerized aptitude program for school-aged children. It presents tasks based on an invented language, starting with a cartoon of a doll speaking that language. Learners deduce linguistic rules and answer questions. Incorrect responses trigger replay of relevant cartoon segments, with up to two replays per item. The program records both a binary score (correct/incorrect) and the number of attempts per item, laying the groundwork for interventionist CDA. Unlike KIDTALK, the computerized Leipzeigh Learning Test (LLT) by Guthke and Beckmann<sup>[16]</sup> offers multidimensional, individualized mediation. When errors occur, the program identifies a relevant dimension and provides training tasks if errors persist. Though mediation sequences are preset, delivery is individualized, aligning with interactionist DA. The LLT unifies teaching and assessment, building on Budoff's pretest-intervention-post-test model and standardizing hints to support interventionist CDA. Tzuriel and Shamir<sup>[15]</sup> developed a CDA program with mediation ranging from implicit to explicit, aiming to assess its impact on young children's logical thinking and compare it with human-delivered

DA. Hints escalate after each incorrect response. Building on prior work, Poehner and Lantolf<sup>[5]</sup> refined CDA procedures. Their pilot study used interactionist DA in a pretest-intervention-post-test-transfer design, with one-on-one mediation preceding the CDA to identify effective prompts. Enrichment Programs (EPs) addressed performance gaps between tests, supporting learners' Zone of Proximal Development (ZPD). Based on pilot results, a four-tier prompting system was implemented, increasing in explicitness: (1) implicit hint indicating an incorrect response; (2) explicit hint to match text sections; (3) clarification of difficult vocabulary; (4) revelation of the correct answer after four attempts. A link button allowed students to check explanations regardless of answer correctness. Scoring reflected help level: 4 points (no help), 3 points (one hint), 2 points (two hints), 0 points (incorrect after four attempts). Student profiles included actual score (initial independent performance), mediated score (actual plus post-prompt score), and Learning Potential Score (LPS) based on Kozulin and Garb (2002). Transfer tasks—more challenging but similar items—were introduced as a novel contribution. LPS was identified as a promising predictor of future learning, as comparing non-transfer and transfer scores cautioned against assuming direct correlations across scoring groups.

Inspired by Poehner and Lantolf's CDA framework, a growing body of research has examined the effectiveness of various CDA procedures in diagnosing learning difficulties and L2 proficiency. The key features of research designs and CDA models are summarized as follows. (1) Research design sequence. Most CDA research follows a pretest-intervention-post-test design, where one-on-one interactionist DA is first administered to verify the effectiveness of mediation. An Enrichment Program (EP) is typically inserted between tests, offering mediation tailored to learners' ZPD based on prior performance. A transfer test is included as a developmental indicator, based on the principle that genuine development is shown by learners' ability to apply mediated knowledge independently<sup>[10]</sup>. Transfer thus goes beyond rote recall, reflecting internalization of strategies and knowledge—and applying learning to more complex contexts signals higher development. Findings on transfer in DA are mixed: some studies report strong effects, while others find limited transfer, especially with complex skills or brief interventions<sup>[18]</sup>. Key factors include intervention duration, mediation quality, and learner traits. In L2 listening, transfer is especially crucial, as instruction ultimately aims to enable comprehension of authentic, unsupported input. Without transfer, CDA's pedagogical value remains limited. Yet most CDA listening studies use one-group pretest-post-test or quasi-experimental designs with non-CDA controls. Although these have shown CDA's feasibility, they face limitations: lack of random assignment weakens causal claims, and few studies include delayed post-tests or transfer tasks differing substantially from training. To improve causal inference, more rigorous designs—such as cluster-randomized controlled trials—are needed. Mixed-methods approaches, combining quantitative outcomes with qualitative data, can better illuminate how learners internalize and use mediation. (2) Features of CDA program/model in L2 listening. Research has demonstrated that CDA significantly improve learners' listening comprehension<sup>[18][19][20][21]</sup> and speaking performance<sup>[22]</sup>. Most studies combine interventionist and interactionist DA. Interventionist DA offers graduated hints—from implicit to explicit—while tracking learners' responses. Key features include: (1) Graduated mediation: Based on Aljaafreh and Lantolf<sup>[23]</sup>, prompts become increasingly explicit. Less explicit prompts are believed to foster autonomy, though optimal prompt types depend on proficiency, task difficulty, and listening sub-skills (e.g., word recognition vs. inferencing). Adaptive, real-time prompt selection remains under-researched. (2) Dual-score tracking: Records both support type and amount, yielding actual scores (unaided performance) and mediated scores (reflecting hint use). The gap between them captures microgenetic change. The Learning Potential Score (LPS)<sup>[24]</sup> predicts future support needs<sup>[25]</sup>. Teo<sup>[26]</sup> notes that CDA reduces teachers' mediation burden in large classrooms and outperforms traditional methods. For L2 listening—where input is transient—CDA enables real-time scaffolding via immediate mediation, audio replay, or strategy cues.

### **3. CDA studies in L2 Listening**

Although adopting the interventionist DA and interactionist DA to CDA procedure can address the practicality and flexibility demands of real-world L2 context, the empirical studies on mixed approach CDA in listening are still emerging, particularly in EFL listening. The following part reviews key studies, organized by their primary focus.

#### **3.1 The feasibility of DA/CDA in enhancing listening comprehension**

Ableeva<sup>[27]</sup> found that dynamic assessment (DA) improved French listening comprehension by offering individualized mediation and tracking learner responsiveness. Unlike non-dynamic methods,

DA revealed qualitative differences in learner difficulties, helping identify specific breakdowns (e.g., phonological, lexical, syntactic) for targeted instruction. Building on this, Pishghadam et al.<sup>[28]</sup> developed a computerized DA (CDA) for EFL listening that provided graduated prompts. Results showed greater gains in the CDA group than in a non-dynamic computerized group. Moreover, the amount of mediation needed negatively predicted posttest performance, confirming modifiability as a valid learning indicator.

Hidri and Roud<sup>[29]</sup> found that a CDA program significantly improved Iranian EFL learners' performance on the TOEFL iBT listening test across all question types, including both monologue and dialogue tasks. Similarly, Kao and Kuo<sup>[30]</sup> developed a computer-assisted dynamic assessment using iSpring Quiz Maker for Taiwanese junior high students, providing mediation prompts in the first language from implicit to explicit, consistent with prior CDA studies. A unique feature was a listening difficulty checklist attached to each item, enabling students to self-identify errors.

Barabadi et al.<sup>[31]</sup> introduced a human-mediated CDA prompt as a third level of mediation in their procedure. The prompts were standardized and progressively delivered in a multimodal format: the first hint provided a partial transcription; the second included related pictorial information with Persian annotations; and the third allowed test-takers to request teacher mediation. Before the listening test, participants received an orientation on the CDA program. Results indicated a significant improvement in learner performance due to mediation. However, the content and quality of CDA mediations require further investigation and refinement, as the standardized prompts may lack sufficient targeting. In addition, limited software access—teachers needed to install the program—hindered flexible teaching and learning.

Parisa and Nasim<sup>[32]</sup> proposed a hybrid SR-DA model combining self-regulation and dynamic assessment, which enhanced EFL listening comprehension. Ebadi et al.<sup>[33]</sup> used a web-based hybrid CDA program to examine inferential listening skills, employing DIALANG as a pretest for proficiency grouping and comprehension-checking items to reduce guessing. Their results showed notable gains in Iranian EFL university students' responsiveness to mediation across five inference types.

### ***3.2 Transfer test in CDA studies***

The concept of the transfer test originates from Feuerstein et al.'s<sup>[34]</sup> notion of transcendence within Mediated Learning Experience (MLE) theory. Feuerstein et al. [34] identified twelve MLE attributes, divided into universal parameters (three essential components) and situation-specific parameters (nine components, including mediation of meaning, transcendence, and intentionality-reciprocity). Intentionality refers to the mediator's deliberate efforts to help a child complete challenging tasks, distinguishing it from independent learning. Reciprocity reflects the child's responsiveness to the mediator's guidance, allowing the mediator to adjust support accordingly. Transcendence extends interaction beyond immediate goals to more remote ones, indicating whether the child has internalized skills to tackle complex tasks. Feuerstein emphasized that enhancing learners' abilities is MLE's ultimate goal, aligning with Dynamic Assessment (DA). These three attributes work together, with mediation of meaning integrating intentionality and transcendence to foster cognitive development<sup>[7]</sup>. A key inquiry is whether CDA listening gains transfer to independent performance. Ebadi and Saedian<sup>[35]</sup> provided positive evidence from an eight-week CDA listening intervention, showing that the CDA group significantly outperformed a control group on an independent listening post-test, indicating knowledge and skills transferred to more complex contexts. However, not all studies report strong transfer. Some find that while learners improve on mediated tasks, independent gains are smaller or non-significant, especially with short interventions or substantial differences between mediated and independent tasks (e.g., topics, speakers, or task types). These results echo Poehner and Lantolf's<sup>[5]</sup> LPS findings with French learners, who cautioned against assuming direct correlations across scoring groups. Notably, significant transfer score differences between high- and mid-LPS groups in reading and listening tests suggest LPS predicts future learning potential. Overall, transfer likely requires sufficient mediation and alignment between training and assessment conditions.

### ***3.3 Summary of CDA listening studies***

Across studies, several consistent patterns emerge: (1) CDA consistently improves L2 listening performance under mediated conditions. (2) formats of mediational prompts vary. (3) Transfer of learning to independent listening is often observed, though effect sizes are typically smaller than those for mediated gains. Learners' responsiveness to mediation is a unique predictor of learning outcomes

beyond traditional pretest scores. (4) Learner characteristics (e.g., proficiency, working memory, anxiety) moderate the effectiveness of CDA, suggesting that one-size-fits-all mediation may not be optimal. Despite these insights, the literature remains limited in several respects. Most studies are short-term (under 12 weeks), use small sample sizes, and lack delayed post-tests to assess retention. Moreover, few studies have directly compared CDA to other instructional approaches (e.g., strategy instruction, extensive listening) or examined implementation in authentic classroom contexts.

#### **4. Challenges and Limitations**

##### ***4.1 Pedagogical application***

Even when technology is highly advanced, integrating it into real-world language classrooms can be challenging. Teachers need to be familiar with the principles of dynamic assessment (DA) and, in particular, understand the core concept of DA - the Zone of Proximal Development (ZPD). In educational settings where traditional teaching and assessing methods are still dominant, providing mediation during task completion becomes especially challenging. Furthermore, the time required for CDA activities may conflict with other instructional priorities. For successful integration, it is essential to provide professional development for instructors, align CDA with clear learning objectives, and a clear articulation of how CDA complements rather than replaces human teaching.

##### ***4.2 Technical concerns***

Implementing CDA for listening comprehension involves several technical difficulties. Automated speech recognition (ASR) technology could be adopted, but it is not yet sufficiently reliable enough for scoring open-ended listening responses, especially in L2 contexts with diverse accents. As a result, most studies still rely on multiple-choice questions or true/false items, which may limit the depth of comprehension assessed. In addition, developing a robust and user-friendly CDA system requires expertise in programming, interface design, corpus construction, and language pedagogy- skills and resources that may be beyond the reach of many researchers.

Scalability is another concern. Although CDA is more scalable than one-on-one interactionist DA, it still requires considerable upfront investment in content development and system testing. For large-scale implementation, issues of server capacity, data security, and technical support must be addressed.

##### ***4.3 Generalizability Concerns***

Most research on CDA listening research has been conducted in specific contexts - for example, with Iranian or Turkish EFL university students - and often involves limited sample sizes. Consequently, it is unclear whether the findings can be generalized to other populations (such as K-12 learners, vocational students, or heritage language learners), different proficiency levels, or other languages. Cross-contextual replication studies are urgently needed to address this gap.

#### **5. Future Directions**

Given the current state of research, several promising avenues for future investigation can be identified.

##### ***5.1 Longitudinal and Transfer Studies***

Future research should consider extending intervention periods (e.g., an entire semester) and including delayed post-tests administered three to six months after the intervention. This would allow researchers to assess how long the effects of CDA last. Additionally, studies should examine whether the acquired knowledge and skills could be transferred to more challenging tasks—such as listening in different contexts, for different purposes, or with different types of input—to determine whether CDA promotes flexible, generalizable listening ability.

### **5.2 Mixed-Methods Research**

As discussed previously, diagnosing listening difficulties and enhancing listening comprehension abilities are crucial for facilitating learners' progression to higher language proficiency levels. Studies on mixed approach CDA research design (with both interactionist and interventionist DA) have demonstrated its effectiveness as both a teaching and assessment tool in large classroom settings and as a diagnostic instrument for identifying learners' difficulties and learning potential. However, the efficacy of the mixed approach research design requires further investigation to ensure its accuracy and reliability in diagnosing learners' challenges and enhancing their listening comprehension. In addition, the validation of modifiability metrics for L2 listening is another direction. Research should examine the reliability, predictive validity, and instructional utility of different operationalizations (e.g., number of prompts, level of prompts).

### **5.3 Classroom Implementation and Teacher Roles**

More research is needed on how CDA can be effectively integrated into large-size classroom contexts. Teachers need to be familiar with principles of dynamic assessment and know how to use CDA-generated reports to guide their instruction. Also, teachers need to have professional development to support CDA use. CDA programs should be combined with peer mediation or teacher-led mediation to create a rich, multi-layered scaffolding environment. Studies should also examine the impact of CDA on classroom dynamics, learner motivation, and instructional efficiency.

## **6. Conclusion**

Unlike standardized assessments that measure already-developed abilities through independent performance, DA identifies both mature and emerging capabilities by examining how learners respond to mediator-provided support. Such responsiveness is a key indicator of future development<sup>[10]</sup>, offering diagnostic insights to inform language teaching and learning. DA comprises two main approaches: interventionist and interactionist. The interventionist approach uses pre-scripted mediation for large-scale use but often lacks individual flexibility<sup>[7]</sup>. The interactionist approach relies on dialogic mediation negotiated between assessor and learner, enabling richer assessment though time-consuming and less scalable<sup>[23]</sup>. To combine their strengths, researchers have turned to computerized dynamic assessment (CDA) in L2 education<sup>[35][36]</sup>. Findings indicate CDA is a promising innovation for L2 listening research and pedagogy. By embedding pre-scripted mediational prompts, CDA reveals not only independent performance but also learning potential.

Existing evidence shows CDA can improve L2 listening performance under both mediated and independent conditions. Learners' responsiveness to mediation predicts outcomes beyond traditional pretest scores, underscoring DA's unique value. However, significant gaps remain: lack of longitudinal studies, limited generalizability, unresolved mediation effectiveness, and technical/pedagogical challenges. Future research should adopt rigorous designs, leverage advancing technologies, and address individual ZPDs. Mixed-methods approaches can help explore how CDA promotes listening development. Crucially, research must move beyond labs to integrate CDA into authentic classrooms. For L2 listening—essential yet notoriously difficult to support through instruction—CDA offers individualized, timely assistance at scale. Though not a one-size-fits-all solution, it complements existing language educators' and researchers' toolkits. By refining CDA designs, validating its measures, and deepening understanding of its instructional effects, the field can unlock its potential to transform both listening assessment and how we help learners become more competent and autonomous listeners.

## **Acknowledgements**

This research was supported by the Shenzhen Polytechnic Research Fund (No. 6023310006S) at Shenzhen Polytechnic University.

## **References**

[1] Vandergrift, L., & Baker, S. (2015). *Learner variables in second language listening comprehension: An exploratory path analysis*[J]. *Language learning*, 65(2), 390-416.

- [2] Vandergrift, L. (2007). *Recent developments in second and foreign language listening comprehension research*[J]. *Language Teaching*, 40, 191-210.
- [3] Vygotsky, L.S. (1978). *Mind in Society: The development of higher psychological processes*[M]. Cambridge, MA: Harvard University Press.
- [4] Lantolf, J. P., & Poehner, M. E. (2014). *Sociocultural theory and the pedagogical imperative in L2 education: Vygotskian praxis and the research/practice divide*[M]. New York: Routledge.
- [5] Poehner, M. E., & Lantolf, J. P. (2013). *Bringing the ZPD into the equation: Capturing L2 development during computerized dynamic assessment (CDA)*[J]. *Language Teaching Research*, 17(3), 323-342. <https://doi.org/10.1177/1362168813482935>
- [6] Gao, J., H. Zhao, C. Yu & R. Xu. (2023). *Exploring the feasibility of ChatGpt for event extraction*[J]. *arXiv preprint arXiv: 2303.03836*.
- [7] Poehner, M. E. (2005). *Dynamic assessment among advanced L2 learners of French*[D]. Unpublished doctoral dissertation, The Pennsylvania State University, University Park, PA, USA.
- [8] Luria, A. R. (1979). *The making of mind: A personal account of Soviet psychology* (M. Cole & S. Cole, Eds.)[M]. Harvard University Press.
- [9] Lantolf, J. P., & Appel, G. (1994). *Theoretical framework: an introduction to Vygotskian approaches to second language research*[C]. In J. P. Lantolf & G. Appel (Eds.), *Vygotskian approaches to second language research* (pp. 1-32). Westport, CT: Ablex Publishing.
- [10] Poehner, M. E. (2008). *Dynamic Assessment: A Vygotskian approach to understanding and promoting second language development*[M]. Berlin: Springer Publishing.
- [11] Wertsch, J. V. (1985). *Vygotsky and the social formation of mind*[M]. Cambridge, MA: Harvard University press.
- [12] Sternberg, R.J. & E.L. Grigorenko. (2002). *Dynamic Testing. The Nature and Measurement of Learning Potential*[M]. Cambridge: Cambridge University Press.
- [13] Lantolf, J. P. (2009). *Dynamic assessment: The dialectic integration of instruction and assessment*[J]. *Language Teaching*, 42(3), 355-368. doi:10.1017/S0261444808005569
- [14] Lidz, C. S., & Gindis, B. (2003). *Dynamic assessment of the evolving cognitive functions in children*[C]. In A. Kozulin, B. Gindis, V. S. Ageyev & S. M. Miller (Eds.), *Vygotsky's educational theory in cultural context* (pp.99-116). Cambridge: Cambridge University Press.
- [15] Tzurriel, D. & Shamir, A. (2002). *The effects of mediation in computer assisted dynamic assessment*[J]. *Journal of Computer Assisted Learning*, 18, 21-32.
- [16] Guthke, J., & Beckmann, J. F. (2000). *The learning test concept and its application in practice*[C]. In C. S. Lidz & J. G. Elliott (Eds.), *Dynamic assessment: prevailing models and applications*. Amsterdam: Elsevier.
- [17] Jacobs, E.L. (2001). *The Effects of Adding Dynamic Assessment Components to a Computerized Preschool Language Screening Test*[J]. *Communication Disorders Quarterly*, 22(4), 217-226.
- [18] Ableeva, R., & Lantolf, J. (2011). *Mediated dialogue and the microgenesis of second language listening comprehension*[J]. *Assessment in Education: Principles, Policy & Practice*, 18(2), 133-149. <https://doi.org/10.1080/0969594X.2011.555330>
- [19] Alavi, M., Kaivanpanah, S., & Shabani, K. (2011). *Group dynamic assessment: an inventory of mediational strategies for teaching listening*[J]. *Journal of Teaching Language Skills*, 30(4), 27-58. <https://doi.org/10.22099/jtls.2011.370>
- [20] Ali, M. K., Mohammad, Dl. Saeed. G., & Seyyed M. R. A. (2019). *Diagnosing L2 learners' development through online computerized dynamic assessment*[J]. *Computer Assisted Language Learning*. DOI: 10.1080/09588221.2019.1645181
- [21] Kao, K. T., & Kuo, H. C. (2021). *Diagnosing l2 English learners' listening difficulties and learning needs through computerized dynamic assessment*[J]. *Interactive Learning Environments*. DOI: 10.1080/10494820.2021.1876738
- [22] Liu, H. Y. & Liu, Q. (2020). *Dynamic Assessment of College students' Oral English for Academic Purposes (in Chinese)*[J]. *Foreign Language Testing and Teaching*, (1), 53-60.
- [23] Aljaafreh, A. J., & Lantolf, J. P. (1994). *Negative feedback as regulation and second language learning in the zone of proximal development*[J]. *The Modern Language Journal*, 78(4), 465-483. <https://doi.org/10.1111/j.1540-4781.1994.tb02064.x>
- [24] Kozulin, A. & Garb, E. (2002). *Dynamic assessment of EFL text comprehension*[J]. *School Psychology International*, 23(1), 112-127.
- [25] Sun, Z., Xu, P., & Wang, J. (2023). *Dynamic assessment of the learning potential of Chinese as a second language*[J]. *Language Assessment Quarterly*, 20(1), 127-142. <https://doi.org/10.1080/15434303.2022.2151911>
- [26] Teo, A. (2012). *Promoting EFL students' inferential reading skills through computerized dynamic assessment*[J]. *Language Learning & Technology*, 16(3), 10-20.

- [27] Ableeva, R. (2010). *Dynamic assessment of listening comprehension in second language learning[D]*. Unpublished doctoral dissertation, The Pennsylvania State University, University Park, PA, USA.
- [28] Pishghadam, R., Barabadi, E., & Kamrood, A. M. (2011). *The differing effect of computerized dynamic assessment of L2 reading comprehension on high and low achievers[J]*. *Journal of Language Teaching and Research*, 2(6), 1353-1358. <https://doi.org/10.4304/jltr.2.6.1353-1358>
- [29] Hidri, S., & Fekri, L. P. (2020). *Developing and using hints in computerized dynamic assessment of a TOEFL iBT reading exam[J]*. *Heliyon*, 6(9), e04985. <https://doi.org/10.1016/j.heliyon.2020.e04985>
- [30] Kao, K. T., & Kuo, H. C. (2021). *Diagnosing 12 English learners' listening difficulties and learning needs through computerized dynamic assessment[J]*. *Interactive Learning Environments*. DOI: 10.1080/10494820.2021.1876738
- [31] Barabadi, E., Khajavy, G.H. & Kamrood, A.M. (2018). *Applying Interventionist and Interactionist Approaches to Dynamic Assessment for L2 Listening Comprehension[J]*. *International Journal of Instruction*, 11(3), 681-700. <https://doi.org/10.12973/iji.2018.11346a>
- [32] Parisa A. & Nasim, G. (2021). *Enhancing learning potential score in EFL listening comprehension and self-regulation through self-regulated dynamic assessment procedures[J]*. *Language Testing in Asia*, 1-19. <https://doi.org/10.1186/s40468-021-00126-5>
- [33] Ebadi, S., Karimi, E. & Vakili, S. (2024). *Investigating EFL learners' inferential listening comprehension skills through computerized dynamic assessment[J]*. *Computer Assisted Language Learning*. DOI: 10.1080/09588221.2024.2386554
- [34] Feuerstein, R., Rand, Y. & Rynders, J. E. (1988). *Don't Accept Me as I Am. Helping Retarded Performers Excel[M]*. New York: Plenum.
- [35] Tzuriel, D., & Hanuka - Levi, D. (2026). *Computerized dynamic assessment of seriation thinking modifiability: Effects of mediation on seriation and readiness for math among kindergarten and grade 1 children[J]*. *British Journal of Educational Psychology*. <https://doi.org/10.1111/bjep.70059>
- [36] Karimpour, S., & Behbahani, H. K. (2025). *A sociocultural inquiry into contributions of computerized dynamic assessment to L2 learners' vocabulary acquisition: the moderating role of brain dominance[J]*. *Computer Assisted Language Learning*, 1-23. <https://doi.org/10.1080/09588221.2025.2511053>