The Future is in the Making: A Review of Literature on Dynamic Assessment in Second Language Education

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To cite this article:

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Abstract

As a newly-introduced perspective and pedagogy in second language (L2) education, Dynamic Assessment (DA) disintegrates the long-standing dualism between instruction and assessment by unifying the simultaneous diagnosis and promotion of learners' L2 developmental potential during the evaluation process. Aligning with a future-oriented and process-focused vision to achieve educational fairness, DA has been increasingly gaining attention and has ignited much research enthusiasm by both educational scholars and practitioners. However, little has been done to date concerning an up-to-date review of this prospective domain. This article aims to provide a thorough review of the developmental trajectories of L2 DA literature with a dual purpose. First, it seeks to comprehensively tease out the general trends and themes in L2 DA development spanning over 30 years. Second, it endeavors to critically comment on the methodologies and DA approaches employed in different studies to emphasize meaningful advances in the field. In so doing, this article first introduces the key concepts of Vygotsky's Sociocultural Theory underlying the DA principle and then provides a review of empirical L2 DA works coded into three themes, i.e., the interactionist DA approach, the interventionist DA approach and the hybrid DA approach, with several sub-themes further added. Summaries and limitations of current L2 DA works are discussed and potential directions for future research are also suggested.

Keywords: dynamic assessment, sociocultural theory, second language education, literature review

Introduction

Assessment has long been a crucial aspect of second language (L2) education. Owing to the ongoing evolution of L2 teaching and learning, assessment has received even greater attention as learners, practitioners, researchers, and public institutions all rely on assessment results for a variety of purposes which include verifying learning achievements, diagnosing learner needs, devising instructional plans and structuring learning materials. However, the dualism between instruction and assessment has remained a problematic question (Poehner & Lantolf, 2010). Specifically, traditional standardized tests are only capable of measuring learners' fully matured abilities, which constitutes only a small fraction of their overall developmental picture. Learners' learning potential, which might still be ripening during the assessment process, is largely ignored. Just as Haywood (1997, p. 104) once put it, "The problem lies not in what standardized tests do, which they do very well, but instead in what they do not do…they are not good indicators of learning potential."

As learners' future is always in the making, the diagnosis of their abilities must encompass their learning potential for a fairer and more comprehensive assessment of performance. Under this backdrop, Dynamic Assessment (DA) has come to the fore in L2 practices as an innovative evaluative method and pedagogy guided by Vygotsky's Sociocultural Theory (SCT) of Mind, especially his concept of Zone of Proximal Development (ZPD). Broadly speaking, DA differentiates itself from traditional assessments by integrating instruction with assessment in a unified activity during which learners are provided with mediations (e.g., feedback) attuned to their ZPD levels aiming to identify their learning gaps as well as to ultimately contribute to their L2 development.

With growing interest in exploring the principles of DA in L2 contexts, much progress has been made to date regarding how DA could be utilized to simultaneously diagnose and maximize learner development. Nevertheless, peer-scrutinized review articles in this burgeoning field still remain scarce. The existing reviews (Li & Li, 2015; Ghanbarpour, 2017) either lack a critical evaluation or fail to sufficiently mention the latest studies emerging since 2017. As the quantity of DA studies is still on the rise and certain DA offshoots (e.g., technology-enhanced DA) have been increasingly gaining popularity in recent years, this article attempts to provide an up-to-date review of L2 DA literature in order to achieve a twofold purpose. First, it seeks to comprehensively tease out the general trends and themes in L2 DA development, focusing on representative empirical studies over a span of 30 years. Second, it aims to critically comment on the methodologies and DA approaches employed in different studies, pointing out possible future directions and hopefully contributing to meaningful advances in the field.

To achieve the above-mentioned purposes, three principal steps were involved in literature search and selection. First, a broad search of literature was conducted in online databases including the Education Resources Information Center (ERIC), ProQuest and the Web of Science. During the search, the researcher initially typed the phrase "dynamic assessment" in the search title. The keywords "second language", "foreign language", "L2" and "EFL" were then used as filters to select references within the second language/foreign language context. Second, the researcher began an "elimination process" where DA studies on children/students with language disorders/disabilities were excluded as they were irrelevant to the current topic. Additionally, only peer-reviewed DA studies were considered as these articles were thought to be of high quality under strict scrutiny by professionals in the academia. Duplicate studies were also excluded because one of the purposes of the article is to sketch out a general developmental trajectory of DA studies, so only primary studies were considered after careful examination. In the end, 28 journal articles were chosen as representative studies for review and their publication year ranged from 1991 to 2021. Last but not least, all selected articles were read and coded by the researcher with three broad themes based on the specific DA approach employed, namely, the interactionist approach, the interventionist approach and the hybrid approach. Within the interactionist approach, two sub-themes were further categorized, i.e., "interactionist DA in the traditional classrooms" and "interactionist DA in the online environment". Similarly, for the hybrid DA approach, two sub-themes were further coded under the categories of "synergizing different DA approaches" and "new perspectives in L2 DA studies". Before diving into a thorough review of the studies falling into each coded category and subcategories, this article will first familiarize those interested in applying DA in their own educational contexts with the underlying theory of DA, i.e., Vygotsky's SCT and the related ZPD concept.

Dynamic Assessment and Sociocultural Theory

DA has its root in Vygotsky's SCT, especially his ZPD concept. From an SCT perspective, cognitive development such as voluntary attention, logical memory and concept formation takes place during social interactions where a more knowledgeable participant can provide a supportive condition for the novice to participate and extend their current knowledge and skills to a higher level (Donato, 1994). This development of higher order thinking first happens on the social or inter-psychological plane through either symbolic (language) or material (computer) mediation and is then transferred to the individual or intra-psychological plane through internalization. However, not all mediations are truly beneficial to learners' development unless they are provided attuned to learners' ZPD. ZPD refers to the distance between a learner's actual developmental level as determined by independent problem-solving and the level of potential development as determined by problem-solving under the guidance of an adult or a more capable peer (Vygotsky, 1978). As one of the key constructs central to SCT, ZPD is closely related to the implementation of DA in which learners need to be provided with mediations or feedback pitched at their ZPD levels during the evaluation process in order to identify and at the same time facilitate their future learning potential. The purpose of the mediation is also a crucial matter as it should help learners to move towards independent and self-regulated performance instead of just completing the task at hand. Thus, learners' developmental potential could only be fully assessed through their responsiveness to mediation as well as their ability to transfer their gains during the mediational process to new and more demanding tasks.

Under the influence of Vygotsky, researchers have been passionate about the application of DA in L2 educational contexts, with nascent DA studies springing out in the realm of L2 assessment. Among them, two general approaches to DA have emerged, i.e., the interactionist approach and the interventionist approach (Poehner & Lantolf, 2005), based on the types of mediation provided. These two approaches interpret Vygotsky's writings in different ways and each could trace its claim to a pioneer respectively. To be specific, interactionist DA reflects a more qualitative interpretation of the Vygotskian concept. A most prevailing model of this approach derives from Reuven Feuerstein et al.'s (1979) Mediated Learning Experience (MLE) which favors the flexible one-to-one dialogic interactions between the teacher and the learner. During the interactive process, mediation is not prepared beforehand but is negotiated with the learners through assistance adjusted to their reciprocity with emphasis on tracing their microgenetic development, i.e., changes in learners' mental functioning over time (Lantolf & Thorne, 2006). The interventionist DA, however, sides more with Milton Budoff's standardized approach to provide mediations through which learners receive prefabricated prompts determined by the examiner (Budoff, 1987). Mediation is drawn from a hierarchy of standardized prompts or hints administered item by item according to individual needs and learners' responses to mediations could be quantified by numerical scores for further comparison.

The Interactionist Approach to DA

Interactionist DA in the Traditional Classrooms

Within the interactionist approach, a great number of studies employed a qualitative-oriented methodology (with the exception of Ableeva & Lantolf, 2011; Mardani & Tavakoli, 2011) with focuses on dialogic mediation co-constructed between the teacher and a small group of learners. A prototype study of this approach is Aljaareh and Lantolf's (1994) empirical research on three ESL learners' grammatical usage in L2 writing. Although their study did not fall into the DA domain in its strictest sense, it still added valuable insights into the nature of dialogic corrective feedback as mediation and how it could be provided within the learner's ZPD to promote L2 learning. A key finding was that mediation provided in a graduated and contingent way adjusted to learners' ZPD led to modifiability of their interlanguage system as they moved through their ZPD. Also, learners' cognitive transition from the inter-mental to the intra-mental sphere, or their microgenetic growth, was an essential sign of development. Seen this way, learners capable of producing the target structure with implicit feedback were thus thought to be more developmentally advanced than the ones who needed more explicit feedback to generate the same structure. It is not exaggerating to say that this study formed the bedrock for interactionist DA research by putting forward a "collaborative frame" with a regulatory scale, which guaranteed that mediations offered during the dialogic interactions were situated within learners' ZPD from implicit to explicit.

Following Feuerstein's qualitative DA model, Anton's (2009) study centered on the diagnostic function of DA in an advanced university-level Spanish program. Among the five-part diagnostic tests, the writing and speaking sections were implemented with a DA procedure. For the writing part, 5 learners were asked to revise their compositions chronologically by following the "collaborative frame" devised by Aljaareh and Lantolf (1994). For the speaking test, each learner was requested to participate in an oral interview with 4 subsections adjusted to their ZPD. The study found that DA offered richer information about learners' capabilities, which might be helpful for developing future instructional plans. However, Anton's study is not without flaws. He merely focused on the diagnostic function of DA as a placement procedure without elaborating the role of ZPD as a source of development in promoting L2 learning. When reading Vygotsky's ZPD concept we should not simply interpret it as a learner's property or construct waiting to be "diagnosed," but should instead view it as a collective and transformative activity undertaken with the learners (Poehner & van Compernolle, 2011). Put another way, the goal of DA needs to include both the diagnosis and the promotion of learner development simultaneously as a unified activity if we want to realize its full potential.

Interpreting ZPD as a transformative activity in tracking learners' microgenetic growth, Poehner (2007, 2012) conducted a series of case studies on the improvement of oral proficiency of advanced French learners. Following an "initial DA-enrichment program-repeated DA-transfer narrations" procedure, he drew on Feuerstein's MLE in which hints, leading questions, and explicit feedback were provided in an open-ended manner. Improving Anton's study, Poehner concentrated on both the identification and enhancement of learners' oral abilities with the incorporation of Feuerstein et al.'s (1988) concept of transcendence (TR). As mentioned earlier, TR sessions are crucial as learners' ability to transcend what they have internalized during DA to new and more complex tasks constitutes a crucial aspect of their developmental potential. This is also in line with Vygotsky's perspective as development should not have a concrete end point. TR sessions in which mediations are continuously offered attuned to learners' needs would thus raise their developmental performance to a new level.

Further subdividing DA transfer activities into near-, far- and very far-transfer tasks, Ableeva and Lantolf (2011) investigated the effect of DA on L2 listening comprehension of 7 intermediate university French learners through a mixed-methods design. Mediations were provided and negotiated through teacher-learner dialogues and learners' microgenesis was tracked through oral recalls. Their study managed to reveal a significant improvement in learners' abilities to comprehend authentic aural French tests through mediated enrichment sensitive to learners' ZPD. Their findings on transfer tasks also echoed that of Poehner's (2007) in discovering that development was not a smooth and steady procedure but an uneven process where learners performed inconsistently, particularly when transferring their improved abilities to very far-transfer tasks with the highest difficulty level.

Besides conventional qualitative interactionist DA sessions conducted via teacher-student dialogues, other forms of interactionist DA have also been trialed. Aligning the interactionist approach with a quantitative design, Mardani and Tavakoli (2011) employed a pretest-posttest "sandwich model" (Sternberg & Grigorenko, 2002) with interactionist DA session in the form of open dialogues "sandwiched" in between. A comparison between mean scores of the experimental group (N=15) and the control group (N=15) on English-as-a-Foreign-Language (EFL) reading comprehension showcased the positive yet gradual effects of DA on improving students' performance. Davin and Donato (2013) explored the possibility of peer mediation as a complement to teacher-directed DA in the L2 Spanish classroom. They found that although students did not refer to the mediations offered in the prior DA session, they were able to provide each other with peer scaffolding during subsequent collaborative tasks, which could be utilized to supplement future classroom-based DA. A more recent work done by Poehner and Yu (2021) attempted to explore the use of rubrics as mediations in L2 academic writing. In so doing, the ratings and annotations based on the writing rubrics provided a profile of learner ability which revealed both developed and emerging writing abilities. They also proposed the synchronic and the diachronic functions of the writing rubrics in guiding mediations during the DA interactions as well as comparing learners' pre- and post-mediation ratings.

Interactionist DA in the Online Environment

With further affordance of the Internet, researchers have also been experimenting with other means to offer mediations by extending interactionist DA to the online environment. Darhower (2014) explored the employment of past narration of 2 university L2 Spanish learners via chat sessions on the software *Instant Messenger*. Through the synchronous computer-mediated communication (SCMC) in the form of DA, learners'

socio-cognitive processes were fully revealed through their gradual internalization of the emerging abilities. Likewise, Ebadi (2016) conducted an online SCMC-based DA on grammar structures with 2 university EFL learners via the software *Skype* and *Google Wave* in conjunction with the web-based test *DIALANG* where the latter served as a diagnostic tool in determining the target structures to be used in later DA sessions. By integrating the diagnostic function of *DIALANG* with the enhancement function of the SCMC-based interactionist DA, learners' microgenetic development unfolded in a more accurate manner. Although interactionist DA conducted in the online environment is not the mainstream within the strand, this sub-category is still worth exploring given the widespread popularity of computer-mediated communication in nowadays L2 teaching.

The Interventionist Approach to DA

The dialectical unification of theory and practice, alternatively phrased as "praxis", had always been valued by Vygotsky, as he oriented towards applying theory to practice and regarding practice as the supreme test of theory (Vygotsky, 2004). Going a step further towards the practicality of DA in curriculum-based classroom settings, an interventionist approach to DA has posited a connection between DA principles and large-scale L2 classrooms. Valuing efficiency over flexibility, the bulk of interventionist DA studies have integrated computer technology into the intervention programs in order to effectively deliver tests to a large population of learners while simultaneously promoting their L2 development.

An initial attempt of linking DA to L2 classroom instructions was made by Kozulin and Garb (2002) who explored the implementation of DA on reading comprehension strategies with 23 at-risk EFL students. Their findings revealed that DA was effective in providing information on students' learning potential beyond static tests and students with identical pretest scores performed very differently after mediation. Most significantly, they initiated and underscored the calculation of the learning potential score (LPS), which represents the difference between a student's mediated and non-mediated performance with a single score. Under the guidance of LPS, the degree of the learner's observed microgenetic change becomes quantifiable and comparable to be further categorized and interpreted. Ever since its formulation, the LPS concept has been widely employed in later interventionist L2 DA studies.

Endeavoring to deal with a larger population of students in practical EFL classrooms, researchers have turned to the help of computers to implement a new branch of DA known as Computerized DA (C-DA). With rapid technological advances, C-DA has been thriving aligning with the interventionist approach, representing "one of the first attempts in bringing Vygotskian pedagogical interventions into the computerized environment" (Ai & Lu, 2018, p. 411). During C-DA, the computer program took charge of the human mediator in the classroom in automatically delivering prefabricated mediational prompts in a graduated manner attuned to different learner needs. A "pretest-intervention-posttest" sandwich format was unanimously adopted within this branch with fine-tunings adjusted for some of the studies.

To start with, Pishghadam et al. (2011) investigated the differencing effect of C-DA on reading comprehension of high- and low-achievers involving 104 Iranian EFL students. They found that despite improvement in students' test scores after the C-DA mediations, low-achievers actually benefited more than high-achievers. In a similar vein, Shabani's (2012) study on the effect of C-DA on reading comprehension of 100 Iranian EFL students managed to uncover that C-DA contributed significantly to learners' improved scores in text comprehension. Their finding also mirrored that of Pishghadam et al.'s in discovering that learners classified as low-achievers in the pretest benefited more from C-DA as their differential potential began to surface due to the mediational procedure, which otherwise would have been falsely identified in static tests. On top of that, C-DA was found to embrace the potential of sensitizing mediation to learners' needs with pre-planned hints provided stepwise contingent on learners' ZPD while not sacrificing the reliability or statistical property of the assessments.

Adding an extra self-reflection phase during the intervention where students were allowed to record their reflections on mediation along with their use of reading strategies, Teo (2012) incorporated C-DA into her own classroom teaching sessions to probe into its effect on 68 college EFL students' metacognitive strategies in L2 inferential reading. Statistical results revealed that students scored significantly higher on the posttest after C-DA while the qualitative self-reflection data showed that students became more consciously aware of their metacognition which ultimately led to their reading success. In addition, it was demonstrated that C-DA could be implemented repeatedly in or outside the classroom, thus breaking the limit of time and space with only

necessary guidance needed from the teacher. Nevertheless, it must be admitted that Teo's study still suffered from her within-group design without the comparison group and the transfer task. However, the improvement on methodology has always been a vital part of L2 C-DA research and the insufficiencies reflected in Teo's study had been successively remedied by later researchers.

Incorporating transfer tasks into their interventionist DA program, Poehner and Lantolf (2013) developed C-DA tests for L2 listening and reading comprehension involving intermediate learners with relative equivalent language proficiency. The appropriateness of the mediational prompts was also tested with each question piloted during one-to-one human-mediated interactions. As expected, statistical analysis of learners' actual and mediated scores manifested an improvement in learners' performance after C-DA with a tendency towards homogeneity in the meantime. Their inclusion of transfer items was proved essential in creating potential for learners' microgenesis and comparing learners' transfer scores with calculated LPSs provided further evidence of learning in forecasting learners' responsiveness to future instructions. Adopting a between-group design while also considering the importance of transcendence, Ebadi et al.'s (2018) explored the lexical inferencing abilities of intermediate EFL learners with similar vocabulary sizes through C-DA as well as their performance in near- and far-transfer tasks. Their findings revealed that the CDA group performed significantly better than the non-CDA group in vocabulary gains as well as in the near-transfer task. A moderate correlation was also observed between CDA learners' LPSs and near transfer scores which accorded with that of Poehner and Lantolf (2013). However, the two groups' means on far transfer tasks were not significantly different, showing signs of regression evidenced in previous studies. One thing worthy of note in their study was that all tasks were selected according to the percentage of learners' familiarity with vocabularies beyond 3000 high-frequency words of BNC word frequency list, which was a more rigorous criterion compared with the arbitrary belief-based selection in previous DA research.

The Hybrid Approach to DA

There is no doubt that both interactionist DA and interventionist DA embrace their own deficiencies. Informative as it may seem, the interactionist DA could only target a small number of students (less than 10) which renders it unrealistic to be incorporated into real L2 classrooms usually fraught with larger cohorts of students. The labor-intensive and time-consuming nature of interactionist DA foregrounds the generation of a rich learner profile but sacrifices efficiency to a great extent. Poehner (2009) once attempted to remedy this shortcoming by introducing Group DA (G-DA) which treated the class as an intact social system with mediations directed at individual members in the group as well as the whole group as they jointly moved towards task mastery. Even so, G-DA still runs the risk of putting too much weight and pressure on the human mediator's mediational skills which may vary across each session. On the other hand, the interventionist DA also cuts itself off from the opportunity in gaining a rich profile on learners' unique mental processes which could only be made possible during individualized dialogic interactions. Seeking to find a compromise to mitigate the insufficiencies of a single approach, a hybrid DA approach was proposed. Here, the researcher uses the term "hybrid" in reference to the dual nature of this approach, bringing together two layers of meaning. The first layer of meaning incorporates studies that intend to synergize different DA approaches in forming a "hybrid" approach; the second layer of meaning includes DA studies which accentuate the injection of new perspectives into current DA research so as to make the field more "hybrid".

Synergizing Different DA Approaches

Since both the interactionist and the interventionist approaches have their unavoidable deficiencies, L2 DA studies have been undergoing "a stage of flux and experimentation with procedures" (Anton, 2018, p. 320), lacking in the consensus on a common research agenda. Thus, a hybrid approach to DA harmonizing the two has been tried out in the L2 classrooms, yielding promising data with insightful pedagogical implications.

Poehner et al. (2015) initiated a hybrid model which combined the two DA offshoots to diagnose learners' development on L2 Chinese listening and reading comprehension. They first administered one-to-one interactionist DA sessions with a small number of learners, on the basis of which standardized menus of mediational prompts were created to be administered in the subsequent interventionist C-DA. Results indicated that learners made improvements on the whole but learners possessing high actual scores had achieved higher mediated scores and those with lower actual scores had benefited more from the mediation. Moreover, they cautioned that these set of scores served different functions and needed to be taken together in relation to the learner profile concerning different test items for a more comprehensible and accurate understanding of learner

development for future instructional plans. However, despite their well-designed methodology, certain insufficiencies still exist. Since C-DA operates within the class ZPD, the homogeneity of the group needs to be taken into account to ensure that learners possess similar language levels for the target structures assessed. Also, as Poehner et al. themselves admitted, systematic interviews with the learners plus classroom observations following the tests might yield additional data to guide the ongoing efforts. Bakhoda and Shabani (2019) attempted to strike a balance between different approaches by merging G-DA with C-DA to construct a new C-GDA model in assessing L2 learners' reading comprehension abilities. During the C-DA phase, five reading passages were presented via a video projector in front of 12 learners with automatic mediations provided in a hierarchical way. This phase was then integrated with G-DA during which a human mediator asked individual learners who served as primary interactants to reveal his/her thoughts while other learners acted as secondary interactants. Their study found that both the group ZPD and the individual ZPD were improved through the DA procedure, which was thought-provoking as regards to the feasibility of a hybrid approach in implementing L2 classroom-based DA. Nonetheless, in the conventional L2 classrooms with larger numbers of students, the practicality of successful C-GDA still needs to be further investigated as it demands more labor and expertise for the human mediator. Building on Poehner et al.'s (2015) model, Yang and Qian (2020) furthered the instructional value of DA by investigating its effectiveness in promoting reading comprehension of large-scale university learners with similar English proficiency. Interactionist DA sessions were conducted as pilot study to inform the subsequent mediational prompts in the C-DA enrichment program with between-group design. They found that the CDA group performed significantly better than the non-CDA group after the enrichment program and integrating C-DA into classroom teaching would yield more productive results than conventional teaching methods.

Achievement in hybrid C-DA research continues to be made with a latest study done by Kao and Kuo (2021). In their study, listening comprehension tests with DA components were successfully designed and implemented with the aid of existing computer software. Applying this C-DA program to the diagnosis and promotion of learner abilities covering three question types, their results revealed that C-DA was most effective in promoting learners' inferential listening and was meanwhile beneficial in alleviating learners' test anxiety. Introducing the variable of gender into the measurement for the first time, Delvand and Heidar (2021) examined the effect of C-GDA on 140 EFL learners' listening comprehension across gender through the *CoolSpeech* software. Interestingly, the results showed that the C-GDA group greatly outperformed the control group for both genders, but no significant difference was found across genders.

New Perspectives in L2 DA Studies

In addition to various efforts in integrating the interactionist and the interventionist DA approaches, novel perspectives also gradually crept into the DA realm, adding new dimensions to the current L2 DA literature. These studies are characterized by their interdisciplinary nature in absorbing new insights from other disciplines (e.g., psychology, computer science) to inspire innovative thinking as well as to inform future directions.

Exploring the role of emotional intelligence during the DA process, Abdolrezapour (2017) attempted to integrate "emotions" with DA to form a new intervention called emotionalized DA (EDA) where learners were guided to focus on and talk about their emotions after the reading tests. Adopting a quasi-experimental design, 50 young EFL learners were divided into 3 groups, with an experimental group receiving EDA intervention, a comparison group receiving DA and a control group taught under normal procedure. Results showed that apart from better reading performance of the DA group than the control group, post-test performance of the EDA group increased the most compared with the other two groups, proving the potential of applying emotionally-loaded DA in the L2 classrooms.

Replacing the computer program with mobile instant messaging (MIM) application to ensure a higher degree of mediation, Cacchione (2015) experimented with two classes of L2 Italian learners using *Twitter* on mobile devices as the platform for DA with the goal of tracking their online interactions (tweets) while promoting their language learning. Summative assessment scores after the DA intervention showcased learners' improvement in oral proficiency level compared with previous years. The post-intervention questionnaire also revealed learners' general satisfaction with *Twitter*-based DA. However, in order to yield more convincing results, a comparison group might be needed, which was a shortage noted by the author herself considering the study's experimentation nature. Similarly, Andujar (2020) investigated the effect of mobile-assisted DA on L2 learners' development of grammar and vocabulary through the mobile application *WhatsApp*. Adopting a

pretest-intervention-posttest design, a series of graduated teacher prompts were given to the experimental group as negative feedback at four different times. It was found that the use of emoticons via mobile chats as a kind of prompts could to a large extent minimize the limitations of the online environment (lack of gestures or intonation). Statistical analysis combined with qualitative interpretations also showcased that if applied through DA, interactions prevalent in the MIM environment bore great pedagogical potential in promoting L2 learning as learners required less explicit feedback over time. However, since mobile-assisted DA is still in its embryo stage, more research is needed regarding its successful maneuver in the L2 instructional settings. Its actual advantages over other DA formats also need to be further verified as the teacher mediator still needs to fully participate in the online conversations.

Employing Intelligent Computer-assisted Language Learning (ICALL) system with Natural Language Processing (NLP) technologies, Ai and Lu (2018) discussed the potential synergy between SCT and ICALL in mediating L2 Chinese learners' microgenetic development. They designed an ICALL enrichment program where graduated feedback were provided to learners automatically based on learners' typed responses to the open-ended online question. Meanwhile, learners' developmental trajectories could also be tracked by the ICALL system. Ai and Lu called for a "symbiotic relationship" (419) between the computer and the human teacher as human instructors could step in to offer help when the ICALL system failed to detect the source of learner errors. Compared with previous DA studies, Ai and Lu's study was a milestone in the field of L2 DA in integrating ICALL and NLP with the interventionist DA model to mediate learners' language output, particularly in situations where open-ended answers were the norm.

Adding the concept of self-efficacy into the measurement, Delvand and Heidar (2020) explored the effect of G-DA via *CoolSpeech*, a text-to-speech software, on listening comprehension of high-efficacy and low-efficacy EFL learners. With a quasi-experimental design involving two experimental and two control groups, they found that learners from the high-efficacy experimental group achieved significantly higher scores than other groups whereas teaching through software-based G-DA did not exert any significant effect on learners with low self-efficacy, implicating the differential effect of computerized G-DA intervention on learners with various perceptions of their own capabilities.

Lastly, Ghahderijani et al. (2021) did an innovative comparison study to investigate the effects of G-DA and C-DA on mediating 90 Iranian EFL learners' speaking complexity, accuracy and fluency. Through statistical analysis of learner performance, they found that both the G-DA and C-DA models significantly improved learners' speaking abilities in comparison to the control group. What's more, the C-DA group exhibited significantly better performance than the G-DA group in speaking fluency and complexity, revealing its promising potential in future pedagogical settings. Nonetheless, as the authors cautioned, digital literacy was still needed by both the teachers and students for the effective implementation of the C-DA model.

Conclusion

This article provides an updated and critical review of representative DA literature categorized by the interactionist, the interventionist and the hybrid approaches. Obviously, a more interdisciplinary DA framework synergizing various approaches and methods has gradually become the trend, echoing better with the "praxis" emphasized by Vygotsky. Among the generally positive results reported in these DA studies, several notable trends and limitations are worthy of highlighting. To begin with, intriguing patterns were discovered concerning the geographic context, the language construct and the participant characteristics across various DA programs. In light of the geographical context, the mass of reviewed L2 DA studies was conducted in the United States (12 out of 28) and Iran (10 out of 28), with the rest scattering in other Asian contexts (4 studies) and in Spain (2 studies). Surprisingly, it was found that the European context was quite underrepresented in this field. In terms of the language in question, research on the English language still occupied the dominant status, with 18 out of 28 studies focusing on English learnt as either a second or foreign language. By contrast, 4 studies concentrated on L2 Spanish learners and 2 studies on L2 French learners. The remaining 4 studies centered on either L2 Chinese or Italian, with one study done by Poehner and Lantolf (2013) dealing with both L2 Chinese and French learners simultaneously. More research is needed in under-explored language contexts in order to determine whether successful DA is contingent upon specific languages. Regarding participants recruited for DA, only 5 studies involved non-adult L2 learners, with 2 studies on primary school learners, 1 study on learners at junior-school level and 2 other studies targeting learners from 16-24 years old and 14-18 years old respectively.

Participants from the rest of the studies were all adult L2 learners mostly coming from colleges or universities. It is worth noting that keeping the age of participants as a relatively fixed variable could ensure a smoother DA implementation as teenage or mixed-age participants might require different treatment approaches (Delvand & Heidar, 2020, 2021). Last but not least, the past 30 years have seen a gradual evolution of methodologies and designs of L2 DA research ever since its infancy. For one thing, there has been a notable shift from a single methodology (either qualitative or quantitative) to a mixed-methods methodology. The growth of L2 DA studies has been accelerated by a startling expansion of mixed-methods research employing various methods or techniques to fulfill the pedagogical functions of DA as a source of learning inside the L2 classrooms. For another, a shift from the conventional small-group face-to-face dialogic DA formats to more diverse and hybrid formats of DA has also been witnessed. Among them, the exploration of technology-enhanced DA (e.g., C-DA) in large-scale L2 classrooms has increasingly gathered momentum. More innovative studies have also sprung up in integrating DA principles with mobile-assisted language learning (MALL) and intelligent computer-assisted language learning (ICALL) systems in accordance with the rapid advances of technology.

Undoubtedly, the evolving nature of language teaching and learning in the post-pandemic era calls for a brand-new research agenda in investigating the best model for effective classroom-based DA operable for both L2 learners and practitioners. Possible future directions of L2 DA research might include the increasingly seamless incorporation of computer technologies into the DA procedure in tapping various aspects of language output as well as the implementation of empirical DA programs in instructional contexts targeting under-represented languages and age groups. It is firmly believed that as an innovative pedagogy and assessment model in line with a developmental perspective, DA embraces great potential in transforming the conventional past- and outcome-based idea of assessment into a future- and process-oriented one by which learners' performance could be understood and evaluated in a more comprehensive fashion to achieve genuine educational fairness.

References

Abdolrezapour, P. (2017). Improving L2 reading comprehension through emotionalized dynamic assessment procedures. *Journal of Psycholinguistic Research*, *46*, 747–770. https://doi.org/10.1007/s10936-016-9464-9

Ableeva, R., & Lantolf, J. P. (2011). Mediated dialogue and the microgenesis of second language listening comprehension. A*ssessment in Education: Principles, Policy & Practice*, *18*(2), 133–149. https://doi.org/10.1080/0969594X.2011.555330

Ai, H., & Lu, X. (2018). Exploring the interdisciplinary synergy between sociocultural theory and intelligent computer-assisted language learning. In J. Lantolf, M. Poehner, & M. Swain (Eds.), *The routledge handbook of sociocultural theory and second language development* (pp. 409–421). Routledge.

Aljaafreh, A., & Lantolf, J. P. (1994). Negative feedback as regulation and second language learning in the zone of proximal development. *Modern Language Journal*, *78*(4), 465–483. https://doi.org/10.1111/j.1540-4781.1994.tb02064.x

Andujar, A. (2020). Mobile-mediated dynamic assessment: A new perspective for second language development. *ReCALL*, *32*(2), 178–194. https://doi.org/10.1017/S0958344019000247

Anton, M. (2009). Dynamic assessment of advanced second language learners. *Foreign Language Annals, 42*(3), 576–598. http://doi.org/10.1111/j.1944-9720.2009.01030.x

Anton, M. (2018). Dynamic diagnosis of second language abilities. In J. Lantolf, M. Poehner, & M. Swain (Eds.), *The routledge handbook of sociocultural theory and second language development* (pp. 310–323). Routledge.

Budoff, M. (1987). The validity of learning potential assessment. In C. Lidz (Ed.), *Dynamic assessment: An interactive approach to evaluating learning potential* (pp. 53–81). The Guilford Press.

Cacchione, A. (2015). Creative use of Twitter for dynamic assessment in language learning classroom at the university. *Interaction Design and Architecture(s) Journal*, *24*, 145–161. http://doi.org/10.55612/s-5002-024-009

Darhower, M. (2014). Synchronous computer-mediated dynamic assessment: A case study of L2 Spanish past narration. *CALICO Journal*, *31*(2), 221–243. https://doi.org/10.11139/cj.31.2.221-243

Davin, K. J., & Donato, R. (2013). Student collaboration and teacher-directed classroom dynamic assessment: A complementary pairing. *Foreign Language Annals, 46*(1), 5–22. https://doi.org/10.1111/flan.12012

Delvand, S. A., & Heidar, D. M. (2020). Computerized group dynamic assessment and listening comprehension ability: Does self-efficacy matter? *Journal of Language and Education*, *6*(1), 157–172. http://doi.org/10.17323/jle.2020.9834

Delvand, S. A., & Heidar, D. M. (2021). The impact of computerized group dynamic assessment on Iranian EFL learners' listening comprehension across gender. *Journal of Language Horizons*, *6*(1), 205–224. https://doi.org/10.22051/lghor.2021.34839.1440

Donato, R. (1994). Collective scaffolding in second language learning. In J. Lantolf and G. Appel (Eds.), *Vygotskian approaches to second language research* (pp. 33–56). Ablex.

Ebadi, S. (2016). Exploring DIALANG's diagnostic feedback in online L2 dynamic assessment. *Teaching English with Technology*, *16*(1), 41–58.

Ebadi, S., Weisi, H., Monkaresi, H., & Bahramlou, K. (2018). Exploring lexical inferencing as a vocabulary acquisition strategy through computerized dynamic assessment and static assessment. *Computer Assisted Language Learning*, *31*(7), 790–817. https://doi.org/10.1080/09588221.2018.1451344

Feuerstein, R., Rand, Y., & Hoffman, M. (1979). *The dynamic assessment of retarded performers: The learning potential assessment device, theory, instruments, and techniques*. University Park Press.

Feuerstein, R., Rand, Y., & Rynders, J. (1988). *Don't accept me as I am: Helping retarded performers excel*. Plenum.

Ghahderijani, B. H., Namaziandost, E., Tavakoli, M., Kumar, T., & Magizov, R. (2021). The comparative effect of group dynamic assessment (GDA) and computerized dynamic assessment (C-DA) on Iranian upper-

intermediate EFL learners' speaking complexity, accuracy, and fluency (CAF). *Language Testing in Asia*, *11*(1), 25–44. https://doi.org/10.1186/s40468-021-00144-3

Ghanbarpour, M. (2017). A qualitative meta-synthesis of research on dynamic assessment of second/foreign language learning: Implications for language teachers. *Journal of Language Teaching and Research*, *8*(4), 731–741. http://doi.org/10.17507/jltr.0804.12

Haywood, H. C. (1997). Interactive assessment. In R. Taylor (Ed.), *Assessment of individuals with mental retardation* (pp. 108–129). Singular Publishing Group.

Kao, Y., & Kuo, H. (2021). Diagnosing L2 English learners' listening difficulties and learning needs through computerized dynamic assessment. *Interactive Learning Environments*, *29*, 1–25. https://doi.org/10.1080/10494820.2021.1876738

Kozulin, A., & Garb, E. (2002). Dynamic assessment of EFL text comprehension. *School Psychology International*, *23*(1), 112–127. https://doi.org/10.1177/0143034302023001733

Lantolf, J. P., & Thorne, S. (2006). *Sociocultural theory and the genesis of second language development*. Oxford University Press.

Li, Q., & Li, D. (2015). A review of empirical studies in L2 dynamic assessment. *Chinses Journal of Applied Linguistics (Quarterly)*, *38*(1), 55–73. https://doi.org/10.1515/cjal-2015-0003

Mardani, M., & Tavakoli, M. (2011). Beyond reading comprehension: The effect of adding a dynamic assessment component on EFL reading comprehension. *Journal of Language Teaching and Research*, *2*(3), 688–696. http://doi.org/10.4304/jltr.2.3.688-696

Pishghadam, R., Barabadi, E., & Kamrood, A. (2011). The differing effect of computerized dynamic assessment of L2 reading comprehension on high and low achievers. *Journal of Language Teaching and Research*, *2*(6), 1353–1358. http://doi.org/10.4304/jltr.2.6.1353-1358

Poehner, M. E. (2007). Beyond the test: L2 dynamic assessment and the transcendence of mediated learning. *The Modern Language Journal*, *91*(3), 323–340. https://doi.org/10.1111/j.1540-4781.2007.00583.x

Poehner, M. E. (2009). Group dynamic assessment: Mediation for the L2 classroom. *TESOL Quarterly*, *43*, 471–491. https://doi.org/10.1002/j.1545-7249.2009.tb00245.x

Poehner, M. E. (2012). The zone of proximal development and the genesis of self-assessment. *The Modern Language Journal*, *96*(4), 610–622. https://doi.org/10.1111/j.1540-4781.2012.01393.x

Poehner, M. E., & Lantolf, J. P. (2005). Dynamic assessment in the language classroom. *Language Teaching Research*, *9*(3), 233–265. https://doi.org/10.1191/1362168805lr166oa

Poehner, M. E., & Lantolf, J. P. (2010). Vygotsky's teaching-assessment dialectic and L2 education: The case for dynamic assessment. *Mind, Culture and Activity*, *17*(4), 312–330. https://doi.org/10.1080/10749030903338509

Poehner, M. E., & Lantolf, J. P. (2013). Bringing the ZPD into the equation: Capturing L2 development during computerized dynamic assessment (C-DA). *Language Teaching Research*, *17*(3), 323–342. https://doi.org/10.1177/1362168813482935

Poehner, M. E., & van Compernolle, R. A. (2011). Frames of interaction in dynamic assessment: Developmental diagnoses of second language learning. A*ssessment in Education: Principles, Policy & Practice*, *18*(2), 183–198. https://doi.org/10.1080/0969594X.2011.567116

Poehner, M. E., & Yu, L. (2021). Dynamic assessment of L2 writing: Exploring the potential of rubrics as mediation in diagnosing learner emerging abilities. *TESOL Quarterly*, *56*(4), 1191–1217. https://doi.org/10.1002/tesq.3098

Poehner, M. E., Zhang, J., & Lu, X. (2015). Computerized dynamic assessment (C-DA): Diagnosing L2 development according to learner responsiveness to mediation. *Language Testing*, *32*(3), 337–357. https://doi.org/10.1177/0265532214560390

Shabani, K. (2012). Dynamic assessment of L2 learners' reading comprehension processes: A Vygotskian perspective. *Procedia*, *32*, 321–328. https://doi.org/10.1016/j.sbspro.2012.01.047

Sternberg, R., & Grigorenko, E. (2002). *Dynamic testing: The nature and measurement of learning potential*. Cambridge University Press.

Teo, A. (2012). Promoting EFL students' inferential reading skills through computerized dynamic assessment. *Language Learning and Technology*, *16*(3), 10–20. http://doi.org/10125/44292

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes.* Harvard University Press.

Vygotsky, S. (2004). The historical meaning of the crisis in psychology: a methodological investigation. In R. Rieber & D. Robinson (Eds.), *The essential Vygotsky* (pp. 227–344). Plenum.

Yang, Y., & Qian, D. (2020). Promoting L2 English learners' reading proficiency through computerized dynamic assessment. *Computer Assisted Language Learning*, *33*(5-6), 628–652. https://doi.org/10.1080/09588221.2019.1585882