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An ecological perspective on classroom-based assessment

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An Ecological Perspective on Classroom-Based Assessment

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Abstract

Classroom-based assessment (CBA) takes place in learning environments influenced by myriad individual and contextual factors. Nevertheless, factors related to individual differences and learner psychology are seldom considered in creating instructional environments designed to facilitate learners' use of CBA. This article introduces the concept of *language assessment ecology* (*LAE*)—a dynamic classroom environment where learners' needs are addressed through deliberate and informed orchestration of a language learning environment so that learners can make effective use of assessment for their learning. Informed by Ecological Systems Theory, we postulate that LAE is a multi-layered system, where learners' engagement with CBA is an outcome of alignment between learning contexts and learners' cognitive-psychological needs. At the outset of this article, we provide a review of current CBA frameworks to underscore the merits of LAE. Contextual and learner variables that need to be considered in an LAE are then identified and discussed. From a complex dynamic systems perspective, the versatility and complexity of the

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interplay among these variables will be stressed. The article concludes with the implications of LAE for conducting CBA research.

LANGUAGE ASSESSMENT AND CONTEXTS (AS OPPOSED TO CONTEXT)

Over the past several decades, there has been a widening of scope in language assessment research to focus not only on large-scale high-stakes language tests but also on lower-stakes assessments in the classroom, including those that are formative in nature (Turner, 2012). Classroom-based assessment (CBA) refers to teacher-led classroom activities developed to elicit learners' performance on language tasks to shed light on learners' language proficiency and learning needs which teachers use to reorientate their teaching (Lewkowicz & Leung, 2021). Research on CBA, particularly in the second language (L2) English classrooms, has been growing, including in the areas of peer assessment, self-assessment, portfolio-based assessment, and computer-mediated assessment practices. The mounting interest in CBA has led to the proliferation in related areas of research such as stakeholders' assessment literacy, which is important for understanding the agents of assessment, their purposes in conducting assessments, and how these activities are mediated by their understanding of what assessment is and how it might be carried out (Fulcher, 2012), most recently using narrative research methods (Harding & Brunfaut, 2020).

Different from high-stakes language tests, implementation of CBA in L2 classrooms is complex because it needs to take into consideration the *context* where CBA is enacted. In this article, informed by Ecological Systems Theory (Bronfenbrenner, 1979; Neal & Neal, 2013), "context" is interpreted broadly to refer to forces external to the focal individuals (in the case of L2 assessment, the learners), including not only environments but people within the environments. For example, the classroom where CBA is implemented and L2 teachers who enact the CBA are both considered as "context" because they are external to learners. In fact, conceptualizations of CBA have acknowledged the presence and significance of context (see a review of these conceptual frameworks of CBA in the next section). While these conceptualizations of CBA confirm that context plays a vital role in researching CBA, they focus predominantly on the immediate classroom context,

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without acknowledging the wider sociocultural and temporal contexts that may influence the ways teachers design and implement CBA and the ways L2 learners respond to CBA.

In this article, we present a view that context needs to be reconsidered as a multi-layered construct (i.e., "*contexts*" instead of "context"). Drawing on Ecological Systems Theory and the biological metaphor of "ecology", we reconceptualize the notion of *contexts* as a multi-dimensional ecosystem, extending beyond the immediate classroom context. Second, we aim to underscore the reciprocal relationship between contexts and individuals. In other words, whereas teachers' and learners' perceptions and experiences are shaped by the contexts in which they are situated, individuals also play an active role in reconstructing the contexts around them. This is encapsulated in the concept of language assessment ecology (LAE) that we are introducing. After reviewing existing CBA conceptual frameworks, we introduce the theoretical underpinnings of LAE and unpack its three dimensions: engagement, contextual, and learner dimensions.

EXISTING CONCEPTUAL FRAMEWORKS OF CBA

Classroom-based assessment researchers have attempted to conceptualize CBA as a distinctive form of language assessment from high-stakes tests. To do so, researchers identify the heterogeneous contexts where CBA is implemented in their conceptualizations. Rea-Dickins and Gardner (2000) argue that contexts, where CBA is implemented, need to be considered. By "contexts," Rea-Dickins and Gardner (2000) refer mainly to school-related environments such as the language curriculum, classroom language use, learner language when socializing with peers, and the language tasks that learners are asked to perform. Classroom-focused contexts mentioned in their case study relate to language teachers' assessment literacy, including teachers' use of learner performance, and understanding of assessment data.

Leung (2004) proposes conceptualizing CBA through the notion of construct-referenced assessment. "Construct" here moves beyond the traditional meaning of construct in assessment and psychometric research (i.e., theoretical or conceptual notion/idea) to refer to "the collective curriculum and pedagogical principles, norms, and values observed by teachers in particular communities" (p. 24). What Leung (2004) refers to as "construct" is, thus, reminiscent of a dimension of "contexts" of CBA that we are focusing on in this article. According to Leung (2004), the design and implementation of CBA are subject to a plethora of external factors. These external factors are related to language teachers as members acculturated to the professional community of L2 teachers,

who design and implement CBA based on the criteria that they perceive to be important in fostering L2 development.

Hill and McNamara (2012) advance an evidence-based framework for researching CBA, focusing again mostly on classroom contexts. The classroom context comprises elements related to language teachers and learners. Regarding teacher variables, Hill and McNamara (2012) consider teachers' actions related to assessment (e.g., language teachers' planning and implementation of CBA), teachers' expectations (e.g., standards and criteria as exemplified in teacher-initiated feedback), and teachers' beliefs (e.g., teachers' understanding of the nature and functions of assessment). As for student variables, Hill and McNamara (2012) focus on learners' beliefs about L2 learning, teaching, and assessment.

Table 1 summarizes the dimensions of context covered by current frameworks of CBA. It shows that established thinking related to "context" in CBA research focuses primarily on the classroom and school level, including the influences of L2 curriculum, language tasks, teachers' beliefs and actions about L2 pedagogy, acquisition, and assessment, medium of instruction, and so forth. Leung (2004) extends beyond the immediate educational context to focus on L2 teacher

TABLE 1
"Contexts" Considered in Existing CBA Frameworks

Locus of context	Activity	CBA frameworks		
		Rea-Dickins and Gardner (2000)	Leung (2004)	Hill and McNamara (2012)
Classroom-level	Language tasks	✓		
	Language teachers' assessment literacy	✓		✓
	Language teachers' beliefs about language teaching and learning		✓	✓
School level	Language curriculum	✓	✓	
	Classroom language use	✓		
Professional	community-level	Language teachers' collective beliefs about language teaching and learning		✓

Note. CBA = classroom-based assessment.

professional communities as an additional layer of context, arguing that CBA practices are susceptible to the collective expectations and values of L2 practitioners. For instance, these expectations and values can be related to the purpose of CBA and conceptions of successful language use. Existing CBA frameworks rarely consider dimensions of context beyond the classroom and school, for example, societal influences as expounded in Sociocultural Theory (Lantolf, 2000). The fact that these frameworks focus only on classroom-level and school-level contexts is understandable because some of these frameworks (Hill & McNamara, 2012; Rea-Dickins & Gardner, 2000) are developed based on data from young language learners. In the context of assessment for young L2 learners, most CBA would be teacher-led and take place in the classroom. Therefore, the contextual forces that influence the design and implementation of CBA are usually limited to classrooms and schools. Nevertheless, CBA in other educational contexts such as higher education is more complex and diverse (e.g., CBA is not only teacher-led but learner-led, for example, in self- and peer assessment. Technology also plays a prominent role in CBA with adult learners such as the use of learner analytics), which warrants the consideration of a wider spectrum of contextual factors. CBA research focusing on populations other than young L2 learners also needs to account for a plethora of individual learner differences and how they interacts with contextual factors. The concept of LAE advanced here aims to address the aforementioned limitations of existing CBA frameworks.

AN "ECOLOGICAL" TURN IN TESOL

The term "ecology" refers to a sub-field in biology where researchers examine interconnections between living organisms and the environments they inhabit. In educational research, the term has been used by researchers who are drawn to its metaphorical connotation to denote a sociocultural view of teaching and learning (e.g., Lantolf, 2000). In L2 research, many researchers acknowledge that learning does not take place in a social vacuum (e.g., Eskildsen, 2020). In essence, an ecological perspective to L2 research conceptualizes language learning as the amalgamation of relationships between learners and the environments which surround them (van Lier, 1997). It concerns not only the presence/absence of specific contextual components in the learning environment (the ecology), but also whether language learners, as goal-driven active agents, are able to perceive the "matches" and "mismatches" between learners' needs and environments (see our example later for illustration) (van Lier, 2004, p. 96). van Lier (1997) extrapolated this perspective and metaphorical use of
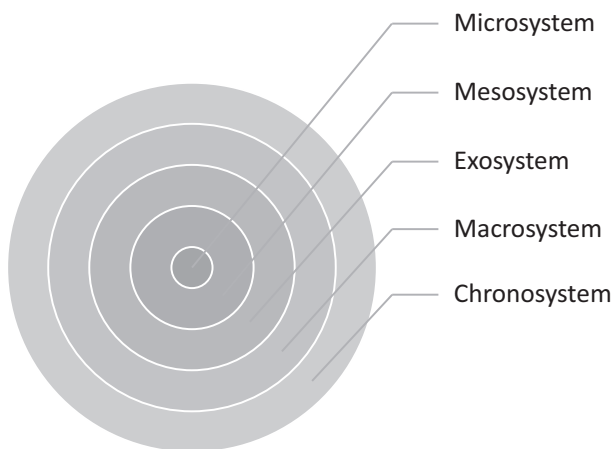
FIGURE 1. Ecologies in Bronfenbrenner's (1979) nested Ecological Systems Theory.

ecology to observational L2 classroom research settings. Since then, there have been growing, yet piecemeal attempts to apply an ecological perspective to areas of L2 research (e.g., computer-assisted language learning, language policy) but rarely on CBA research (Chong et al., 2022). It is, therefore, the goal of this article to explore the applicability of an ecological perspective to CBA.

The ecological perspective stems from Ecological Systems Theory. Bronfenbrenner's (1979) nested model of Ecological Systems Theory is represented diagrammatically as five concentric circles, representing five ecologies or systems surrounding an individual (Figure 1).

TABLE 2

Ecological Systems Theory with TESOL Examples

System	Definition	TESOL Example
Microsystem	A setting where the individual in focus has direct interactions with other people	The classroom where the individual is a learner who interacts with, for example, his/her peers and teacher
Mesosystem	A setting where two of the individual's microsystems interact	A meeting between a learner's parents (from the "family" setting) and his/her teacher (from the "school" setting)
Exosystem	A setting where the individual is excluded directly but is subject to its influence	The school-based assessment policymaking in a particular country
Macrosystem	The broader cultural setting where the individual is situated	The examination-oriented culture of a particular country
Chronosystem	Temporal change in settings where the focused individual is situated	Transition from primary to secondary curriculum

Bronfenbrenner (1979) defines "system" as a setting where people engage in interactions. Therefore, it is important to note that, from an ecological perspective, contexts refer to not only "settings" but also "people" within those settings. Table 2 defines each "system" with an example relevant to TESOL.

COMPONENTS OF LAE

To capture the plurality of "contexts", we put forward the notion of LAE, which represents a dynamic classroom/language learning environment where learners' needs are considered through the deliberate and informed design of a language learning environment so that learners can make effective use of assessment for their learning (Figure 2). Informed by Ecological Systems Theory, we postulate that LAE is a multi-layered system, where learners' engagement with CBA, which is defined as learners' purposeful and meaningful use of assessment to develop their learning, is an outcome of alignment between learning contexts and learners' cognitive-psychological needs. We propose that LAE comprises three interrelated dimensions: engagement dimension, contextual dimension, and learner dimension, informed by relevant theoretical and conceptual frameworks (Table 3).
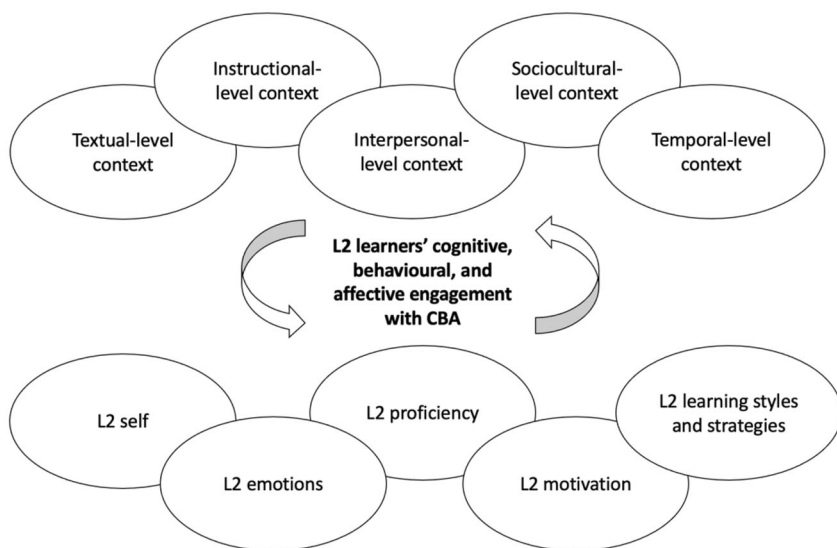

FIGURE 2. Visualization of the concept of language assessment ecology.

TABLE 3
Theoretical and Conceptual Underpinnings of LAE

LAE dimension	Theoretical and conceptual underpinnings
Engagement	Ellis' (2010) conceptual framework of engagement in SLA
Contextual	Bronfenbrenner's (1979) Ecological Systems Theory
Learner	Dörnyei and Ryan's (2015) state-of-the-art review of individual learner differences in SLA and language education

Note. LAE = language assessment ecology; SLA = second language acquisition.

Engagement Dimension of LAE

In second language acquisition (SLA) research, learner engagement is conceptualized as a tripartite construct: cognitive, behavioral, and affective (Ellis, 2010). We apply Ellis' (2010) definition to understand L2 learners' engagement with CBA. Cognitive engagement refers to L2 learners' perceptions of the usefulness of the assessment, for instance, the extent to which the assessment activity aligns with their learning goals. It also refers to learners' understanding of the purpose and instructions of assessment tasks. Behaviourally, engagement is defined as learners' actions prompted by CBA. From the perspective of formative assessment, these actions can include, for example, students' uptake of teacher feedback. Affective engagement entails learners' emotional responses triggered by CBA. It is worth noting that the three types of learner engagement need to be considered holistically because they affect one another (Mercer & Dörnyei, 2020).

Contextual Dimension of LAE

Our review of current CBA frameworks (Table 1) reveals that "contexts" play an indispensable role in influencing CBA practices and effectiveness. This is understandable because, from a sociocultural perspective, it is widely acknowledged that L2 development is an outcome of involvement in cultural-mediated social activities (Lantolf & Beckett, 2009). In fact, scholarship on the social dimensions of language testing that reflects concerns about the consequences of the test (mis)use and social justice is burgeoning (e.g., McNamara et al., 2019). Building on current CBA frameworks, we propose that "contexts" should be interpreted more broadly to encompass not only the immediate classroom or school context, but also the sociocultural and temporal aspects. To systemize the contextual dimensions to be considered, we refer to Ecological Systems Theory, which postulates that individuals

(in this case, L2 learners) are directly and indirectly situated in five dimensions of context (Table 2). Accordingly, we propose that the contextual dimension of LAE needs to comprise five layers: *textual* (e.g., an assessment activity sheet), *instructional* (e.g., enactment of an assessment activity), *interpersonal* (e.g., learner-learner, learner-teacher relationship, and interaction), *sociocultural* (e.g., educational system and culture), and *temporal* (e.g., change in assessment activities, interactions, and educational system/culture) (Figure 2).

Learner Dimension of LAE

The learner dimension of LAE relates to language learners' psychology in affecting learners' engagement with CBA. Individual learner differences are widely discussed in SLA and language education literature. In their seminal book on the psychology of language learners, Dörnyei and Ryan (2015) provide one of the most comprehensive reviews of the literature on individual learner differences in SLA and cognate fields (e.g., psychology). They outline L2 learner attributes that are not comprehensive but are well-documented in the literature base: personality, language ability and aptitude, motivation, learning styles and cognitive styles, learning strategies and self-regulation, emotions, learner beliefs, willingness to communicate, and self-concept. Based on the above attributes, we propose the inclusion of the following individual differences variables in LAE: L2 self, L2 proficiency, L2 motivation, L2 learning styles and strategies, and L2 emotions (Table 4).[1]

INTERPLAY AMONG COMPONENTS IN LAE

L2 learning is not a linear process but a dynamic and complex system (Larsen-Freeman, 1997). When L2 learning is viewed as a dynamic system, it entails a system that is complex and everchanging. It is "complex" because the system comprises various sub-systems (reminiscent to the dimensions of context in Figure 2) and there is a plethora of variables within each (sub-)system (i.e., learner variables in Figure 2). The system is also "everchanging" because it is shaped and reshaped by the

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[1] We understand there are other individual learner differences that are documented in L2 research such as age. Since our focus is on CBA, we intend to include learner variables that are most relevant to language assessment in the classroom. Moreover, because of the limited scope of this short piece, we refrain from going into lengthy discussions of each variable and its interchangeable terminologies (e.g., motivation overlaps with autonomy and agency a great deal).

TABLE 4
Learner Dimension of LAE

Component	Definition based on Dörnyei and Ryan (2015)
L2 self	L2 learners' beliefs about language learning, their personality, and their language aptitude
L2 emotions	L2 learners' emotions induced by CBA e.g., anxiety, joy, boredom
L2 proficiency	L2 learners' language ability
L2 motivation	L2 learners' willingness to communicate, participate, and self-regulate in CBA
L2 learning styles and strategies	L2 learners' preferences and strategies to learn the L2 effectively

Note. CBA = classroom-based assessment; LAE = language assessment ecology.

interplay between contextual and learner dimensions. A complex dynamic systems perspective can be applied to researching CBA. To date, however, few CBA studies have attempted to unravel the relationships among the contextual and learner variables outlined in Figure 2. Current CBA studies focus on isolated variables to understand how these variables influence practice and the usefulness of CBA. In a related field of research focusing on feedback in formative assessment, researchers have begun to conceptualize and synthesize empirical evidence vis-à-vis context-learner interface (Chong, 2021; Chong & Shen, 2022). For example, in their synthesis of 14 qualitative studies on written corrective feedback in ESL and EFL contexts, Chong and Shen (2022) confirm that the "malleable nature of learner factors and contextual factors operate independently and jointly" to influence feedback practices (p. 11). They also identify (mis)alignment among learner and contextual variables as a determiner of the learner' deep and surface engagement with feedback. With LAE as a conceptual lens, what we are proposing is a research agenda that acknowledges the complexity and dynamicity of CBA and aims to unravel the multifaceted and longitudinal interactions among internal and external forces that influence CBA.

CONCLUSION

In this article, we introduce the concept of LAE to CBA research, which is informed by Ecological Systems Theory. Contextual and individual learner factors that need to be considered in LAE are introduced and their inclusion is justified. A comparison of LAE with the current conceptual frameworks of CBA reveals the unique contributions of LAE.

In sum, there are several contributions of the notion of LAE to CBA research. First, LAE reinforces the perception that CBA is a continuous process. With a purpose to collect evidence of language learning, CBA happens on a moment-to-moment basis (Turner, 2012). By considering the temporal dimension of context, the notion of LAE enables researchers to capture the changes not only in CBA activities over time but also how learners and instructional environments evolve longitudinally. Second, the concept of LAE recognizes learners as active agents in the CBA process. Language learners are individuals with unique attributes and needs. It is, therefore, important for language assessment researchers to explore how the design and implementation of CBA consider individual learner differences. Third, LAE highlights the importance of convergence or divergence between learner factors and contextual factors. LAE enables researchers to identify learner variables and contextual variables. It also allows researchers to observe two-way interactions between individual and contextual factors – (1) ways assessment is designed to cater to the needs of learners and (2) ways individual attributes are developed through getting involved with CBA.

Future research on CBA can utilize the notion of LAE to unravel the complexity of learners' and teachers' perceptions and experiences using such qualitative research methods as narrative inquiry; drawing from its learner and contextual dimensions, the concept of LAE can also be used to explicate mediating factors affecting how language assessment information is collected, analyzed, and acted upon in the classroom. Another research direction involves explicating the relationships among the contextual and learner variables through structural equation modeling. There is a need to validate the concept of LAE. Evidence-centered design (e.g., Mislevy et al., 2003), which has been used to collect evidentiary bases to validate theoretical assessment frameworks, could also be used to validate the components of LAE.

AUTHOR CONTRIBUTIONS

Sin Wang Chong conceives the concept of "language assessment ecology". Sin Wang Chong and Talia Isaacs contribute to writing and revising the manuscript. Sin Wang Chong and Talia Isaacs approve the submission of the manuscript.

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CONFLICT OF INTEREST

We report no conflict of interest.

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REFERENCES

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.

Chong, S. W. (2021). Reconsidering student feedback literacy from an ecological perspective. *Assessment & Evaluation in Higher Education, 46*(1), 92–104. https://doi.org/10.1080/02602938.2020.1730765

Chong, S. W., Isaacs, T., & McKinley, J. (2022). Ecological systems theory and second language research. *Language Teaching*, 1–16. https://doi.org/10.1017/s0261444822000283

Chong, S. W., & Shen, R. (2022). Learner engagement with written corrective feedback in ESL and EFL contexts: A qualitative research synthesis using a perception-based framework. *Assessment & Evaluation in Higher Education* Advanced online publication. https://doi.org/10.1080/02602938.2022.2072468

Dörnyei, Z., & Ryan, S. (2015). *The psychology of the language learner revisited.* London, England: Routledge.

Ellis, R. (2010). A framework for investigating oral and written corrective feedback. *Studies in Second Language Acquisition, 32*(2), 335–349. https://doi.org/10.1017/S0272263109990544

Eskildsen, S. (2020). From constructions to social action: The substance of English and its learning from an interactional usage-based perspective. In C. Hall & R. Wicaksono (Eds.), *Ontologies of English: Conceptualising the language for learning, teaching, and assessment* (pp. 59–79). Cambridge, England: Cambridge University Press.

Fulcher, G. (2012). Assessment literacy for the language classroom. *Language Assessment Quarterly, 9*(2), 224–243. https://doi.org/10.1080/15434303.2011.642041

Harding, L., & Brunfaut, T. (2020). Trajectories of language assessment literacy in a teacher-researcher partnership: Locating elements of praxis through narrative inquiry. In M. E. Poehner & O. Inbar-Lourie (Eds.), *Toward a reconceptualization of second language classroom assessment: Praxis and researcher-teacher partnership* (pp. 61–84). Berlin, Germany: Springer.

Hill, K., & McNamara, T. (2012). Developing a comprehensive, empirically based research framework for classroom-based assessment. *Language Testing, 29*(3), 395–420. https://doi.org/10.1177/0265532211428317

Lantolf, J. (2000). *Sociocultural theory and second language learning.* Oxford, England: Oxford University Press.

Lantolf, J. P., & Beckett, T. G. (2009). Sociocultural theory and second language acquisition. *Language Teaching, 42*(4), 459–475. https://doi.org/10.1017/s0261444809990048

Larsen-Freeman, D. (1997). Chaos/complexity science and second language acquisition. *Applied Linguistics, 18*(2), 141–165. https://doi.org/10.1093/applin/18.2.141

Leung, C. (2004). Developing formative teacher assessment: Knowledge, practice, and change. *Language Assessment Quarterly, 1*(1), 19–41. https://doi.org/10.1207/s15434311laq0101_3

Lewkowicz, J., & Leung, C. (2021). Classroom-based assessment. *Language Teaching, 54*(1), 47–57. https://doi.org/10.1017/S0261444820000506

van Lier, L. (1997). Approaches to observation in classroom research: Observation from an ecological perspective. *TESOL Quarterly, 31*(4), 783–787.

van Lier, L. (2004). *The ecology and semiotics of language learning: A sociocultural perspective.* Amsterdam, The Netherlands: Kluwer Academic Publishers.

McNamara, T., Knoch, U., & Fan, J. (2019). *Fairness, justice, and language assessment: The role of measurement.* Oxford, England: Oxford University Press.

Mercer, S., & Dörnyei, Z. (2020). *Engaging language learners in contemporary classrooms.* Cambridge, England: Cambridge University Press.

Mislevy, R. J., Almond, R. G., & Lukas, J. F. (2003). *A brief introduction to evidence-centered design (Research Report 03-16).* Educational Testing Service.

Neal, J. W., & Neal, Z. P. (2013). Nested or networked? Future directions for ecological systems theory. *Social Development, 22*(4), 722–737. https://doi.org/10.1111/sode.12018

Rea-Dickins, P., & Gardner, S. (2000). Snares and silver bullets: Disentangling the construct of formative assessment. *Language Testing, 17*(2), 215–243. https://doi.org/10.1177/026553220001700206

Turner, C. (2012). Classroom assessment. In G. Fulcher & F. Davidson (Eds.), *The Routledge handbook of language testing* (pp. 65–78). London, England: Routledge.