Considerations in Designing and Validating the *Diagnostic Inventory for Self-Regulated Language Learning (DISLL)*: Status of the Process

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Abstract

This article describes a new questionnaire, the "Diagnostic Inventory for Self-Regulated Language Learning" (DISLL), for assessing self-regulated learning strategies of students of English as an additional language. We discuss self-regulated learning models, evaluate existing questionnaires for assessing language learners' self-regulated strategy use, and present a rationale for the DISLL. We explain Zimmerman's (2000) three-phase model, adapted with simplified phase names: *planning, doing,* and *reflecting*. Every DISLL phase starts with a brief scenario to help learners judge how often they employ each strategy in that phase. Already completed are a review of the DISLL 1.0 by 18 international researchers, the step-by-step creation of the DISLL 1.1, and the profiling of vocabulary in the DISLL 1.1 to ensure the simplicity necessary for intermediate-level learners. We present an argument-based validation framework, to be supported by piloting the DISLL 1.2 in Iran, Saudi Arabia, Spain, and Poland and even broader piloting of the DISLL 1.3. Statistical analyses will involve quantitative methods, e.g., exploratory and confirmatory factor analysis, reliability analysis, and confirmatory composite analysis. At least one site will also use qualitative think-aloud protocols. The DISLL will be released into the public domain for free use after version 1.3.

Keywords: *Self-regulated Learning, Questionnaire Development, Diagnostic, Learning Strategies, Questionnaire Validation*

¹Introduction

This article tells the story of the development of a new questionnaire, the "Diagnostic Inventory for Self-Regulated Language Learning" (DISLL), for assessing learners' use of learning strategies for English as an additional language. Learning strategies are "deliberate, goal-directed attempts to manage and control efforts to learn [the language]" (Oxford, 2011, p. 12.). Learning strategies are what language learners *do* to meet their learning goals, "whether that 'doing' is a mental activity such as using visual images to activate knowledge or a physical one such as making a chart or table to remember something" (Gregersen & MacIntyre, 2014, p. 147). Four categories of self-regulated language learning strategies are cognitive, metacognitive, social and affective. *Cognitive strategies* emphasize thoughts and include strategies such as analyzing words and sentences, summarizing, rehearsing, finding the main idea, recognizing language patterns, applying rules, and managing beliefs about language learning. *Metacognitive strategies* go "beyond the cognitive" and encompass setting goals, planning and organizing for a language task, setting up a productive study environment, monitoring performance during a task, evaluating performance after a task is over, and regulating time and resources for learning. *Social strategies* involve asking for help, working with others on learning tasks, interacting with native speakers of the language, and seeking other kinds of social support for learning. *Affective strategies* deal with generating positive feelings about language learning, overcoming negative emotions, returning to a calm state after stress, seeking pleasure in language learning, and using self-talk to stay motivated. Strategies from these four categories of language learning strategies are reflected in the DISLL. Language teachers can offer explicit, task-related strategy instruction that involves using, reflecting on, and discussing such learning strategies (Goh, 2018).

Part 1 of this article provides useful background information about self-regulated learning in general and about self-regulated language learning. It also describes four existing questionnaires for self-regulated language learning and reports that these questionnaires, while valuable, are insufficient to measure self-regulated language learning strategies across multiple language skills and vocabulary learning. That is a major reason why the DISLL is needed. Part 2 depicts Zimmerman's (2000) model of self-regulated learning, which serves as the basis for the DISLL. Part 3 explains the content of the DISLL and the careful steps involved in designing, creating, and testing it. Part 4 offers an innovative validation framework involving arguments and inferences that must be upheld by data. Part 5 delineates potential uses of the DISLL and ongoing research directions.

Background of the DISLL

This part of the article presents the following:

- Self-regulated learning models and strategies
- Self-regulated language learning
- Questionnaires for assessing self-regulated language learning strategies
- Rationale for a new self-regulated language learning questionnaire

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Self-regulated Learning Models and Strategies

Theorists differ on the number of phases that occur in self-regulated learning. For Vygotsky (1978), the sociocultural process leading to self-regulated learning (though he did not use that term in Russian) has three phases: first, "social speech" or other-regulation, involving dialogues with a more capable person or interactions with cultural tools, like books or technology; second, the learner's "egocentric speech," a form of self-talk but without self-regulation; and third, the learner's "inner speech," or self-regulation. Self-regulation was one of Vygotsky's key theories as applied to psychology and education (Díaz, Neal, & Amaya-Williams, 2012; Fox & Riconscente, 2008; McCaslin & Hickey, 2001). Donato and McCormick (1994), Oxford (1999, 2011, 2017), and Scarcella and Oxford (1992) analyzed Vygotsky's implications for self-regulated language learning strategies.

A model by Winne (2011, 2018, based on Winne & Hadwin, 1998) has four self-regulated learning phases: 1) identifying the task and noticing one's own task-relevant knowledge, 2) setting a strategic goal and a plan to meet that goal, 3) monitoring performance during the task, and 4) evaluating performance after the task is over. The two initial phases in Winne's (2011, 2018) model are roughly encapsulated in the first phase of Zimmerman's three-phase self-regulated learning model, which is described in Part 2 as the basis for designing the DISLL. Winne's (2011, 2018) model of self-regulated learning proposes a contrast between learning strategies and finer-grained "study tactics." Winne stressed that individual learners need to discover which strategies and tactics work best for them, and he wisely encouraged the use of strategies and tactics for maintaining motivation. We have been discussing self-regulated learning in general, but now we turn to self-regulated language learning.

Self-regulated Language Learning

In the last quarter of the twentieth century, a great emphasis was on the learning strategies of self-directed, autonomous language learning. The term "self-regulated language learning" had not yet come into common use. Rubin (1975) described the "good language learner" as a highly motivated user of task-appropriate learning strategies. This description was well received and highly influential. Researchers and theorists explained that successful language learners employ a range of relevant strategies (see Cohen, 1990, 1998; Oxford, 1990; Wenden, 1991).

Using a cognitive information-processing model, O'Malley and Chamot (1990) argued that self-regulated language learning strategies begin as declarative (conscious) knowledge. In that model, extensive practice can transform a conscious self-regulated language learning strategy into a subconscious "procedure" (habit). However, Oxford (2011) showed that a habit (a proceduralised strategy that is below consciousness) can sometimes re-transform into a conscious strategy when the learner runs into a stumbling block or another situation requiring truly strategic thought and action. Also see Wang (2021) for a different discussion of varied levels of consciousness in self-regulated learning.

Dörnyei (2005) suggested that the concept of self-regulation should replace the strategy concept. The claim was subtly retracted by Dörnyei and Ryan (2015), a move that Wang (2021) validated.

An anthology (Cohen & Macaro, 2007) looked back at thirty years of language-learner strategies research and practice. Books by Griffiths explored features of good language learners (2008) and described the spiraling, positive effects of language learning strategies (2013,

2018). Two of Oxford's books (2011, 2017) discussed self-regulated language learning strategy use, instruction, assessment, and research, and the latter of the two volumes also explored strategies vis-à-vis complex dynamic systems theory and offered an emotion-assessment questionnaire for language learners (Gkonou & Oxford, 2017).

Self-regulated language learning strategies are discussed from many perspectives (e.g., Chamot & Harris, 2018; Gavriilidou & Mitis, 2021; Gregersen & MacIntyre, 2014; Oxford & Amerstorfer, 2018). Studies involving sociocultural theories of self-regulated language learning strategies have become increasingly important to the field (e.g., Gao, 2010; Gao & Hu, 2020; Oxford, 2011, 2017; Ranalli, 2012; Rose, 2010; Rose et al., 2018; Rose & Harbon, 2013; Thomas et al., 2022).

Questionnaires for Assessing Self-regulated Language Learning Strategies
Prior language learning strategy questionnaires that reflect credible models of self-regulated learning have been limited in one clear sense. These questionnaires each focus on strategic self-regulation in only one language skill (e.g., listening or writing) or one general area of language development (e.g., vocabulary learning). Here we briefly describe four such self-regulated language learning questionnaires: two for listening, one for writing and one for vocabulary.

Vandergrift et al. (2006) presented the development and validation of the "Metacognitive Awareness Listening Questionnaire" (MALQ), results of which were correlated with listening comprehension test scores. The aim was to help learners develop metacognitive awareness (Flavell, 1979) and "metacognition in action" for listening. The MALQ was tested with 966 language learners and later with 512. Exploratory and confirmatory factor analysis revealed five factors: problem-solving, planning and evaluation, mental translation, person knowledge, and directed attention. The MALQ showed that listeners used strategies to direct their attention and stay on task while listening.

Wakamoto and Rose (2021) created the "Listening Comprehension Strategy Questionnaire" (LCS-Q) as a reflection of self-regulated language learning in developing skills in English as a lingua franca. LCS-Q validation involved exploratory factor analysis (120 learners) and confirmatory factor analysis (255 learners) in a university environment in Japan. Three factors emerged: cognitive strategies, metacognitive strategies, and practice (self-regulation) strategies. This model significantly predicted listening comprehension on an international communication test, but only the practice (self-regulation) factor was a significant independent predictor.

"The Writing Strategies for Self-Regulated Learning Questionnaire" (WSSRLQ, Teng & Zhang, 2016), based on Zimmerman's model (see Part 2), is a 40-item multidimensional measure involving cognition, metacognition, social behaviour, and motivational regulation. A total of 790 learners of EFL from northeast Chinese universities took the WSSRLQ. Exploratory and confirmatory factor analyses uncovered a model of nine correlated factors of EFL writing strategies. Multiple regression showed that six factors (text processing, idea planning, goal-oriented monitoring/evaluating, feedback handling, motivational self-talk, and emotional control) predicted writing proficiency, while three others (interest enhancement, course memory, and peer learning) did not.

Gu (2018) reported on the update and validation of his "Vocabulary Learning Questionnaire" (Gu & Johnson, 1996). The questionnaire mainly focused on the cognitive

aspects of strategic vocabulary learning, including vocabulary handling strategies, reinforcement strategies, and activation strategies. A short metacognitive component included beliefs about vocabulary learning and metacognitive regulation of vocabulary learning. The update focused on the shortening of previous versions and the creation of an ESOL version. It also trialed a 100-point slider bar (a graphical indicator for users to choose a value by moving the bar), as compared to previous 7-point Likert scale versions. Construct validation was done through exploratory factor analysis of data collected from 682 university-level English language learners in China. This reduced the final version (VLQ6.4) to 62 items. The VLQ was said to be primarily a research tool, although diagnostic uses for teachers and learners were also proposed.

Rationale for the DISLL

After closely examining the self-regulated language learning questionnaires above, we were certain that no valid, reliable, and practical questionnaire existed for assessing self-regulated language learning strategies suitable for *all* language skills (e.g., reading, writing, listening, speaking) and language areas (e.g., vocabulary). Because the available self-regulated language learning measures were limited in this way, several questionnaires would have been required to obtain a self-regulated language learning profile across multiple language skills and vocabulary learning for any individual student or a group. However, such a profile would have been impossible, because the current measures of self-regulated language learning were based on different principles, theories, and metrics, so their results could not be meaningfully aggregated or compared to provide the desired profile. The DISLL was designed to ameliorate these problems. The conceptualisation of the DISLL follows.

Conceptualisation of the DISLL

Here we discuss the purpose and theoretical underpinnings of the DISLL. The instrument was based primarily on Zimmerman's (2000) theory (see also Zimmerman & Schunk, 2001, 2011).

Purpose

The DISLL is currently written in English for use by intermediate-level language learners. It can be adapted for beginner ESL/EFL learners and translated into other languages. The DISLL is intended to be diagnostic for both learners and teachers. Learners can use the DISLL to raise their awareness of self-regulation strategies they now employ and discover new strategy options. Teachers can employ the DISLL to discover their students' current strategies and make instructional decisions regarding the strategies to teach in order to expand students' self-regulatory repertoires. For a more detailed portrayal of learners' self-regulatory learning processes, the DISLL can be used in conjunction with other formative tools, such as task-based questionnaires, interviews, and think-aloud protocols (see Part 5).

Theoretical Framework

In Zimmerman's cyclical model, the three phases are forethought, performance control, and self-reflection. See Figure 1.

Figure 1

Zimmerman's Three-phase Self-regulated Learning Model (Zimmerman & Schunk, 2001)
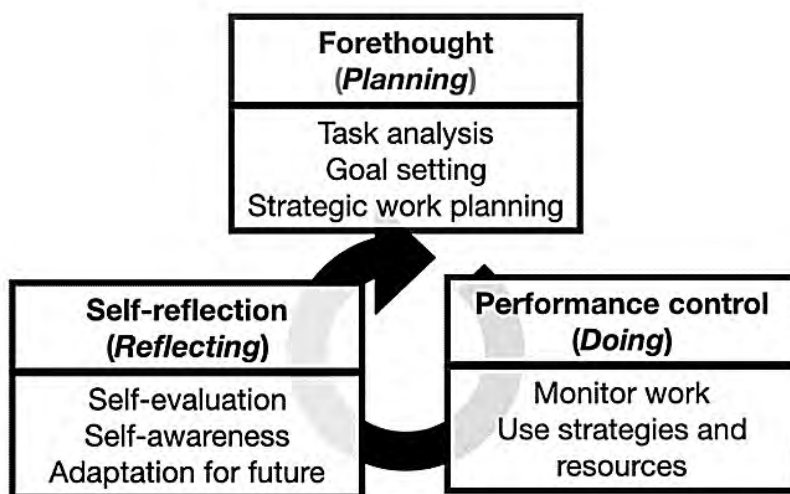
According to Wang (2021), "[e]lements of Zimmerman's model (2000) suggest the conditions from which self-regulation emerges, the motivation to self-regulate, and key variables that foster self-regulated learning (such as self-efficacy, attitudes, values, and goals)" (p. 221). Self-regulated learners activate and sustain positive goal-oriented cognitions, affects, and behaviours (Zimmerman & Schunk, 2001).

In this model, *forethought* refers to the planning stage that precedes acting on the task. During this phase, learners analyse the activity, examine the purpose of the activity, set realistic goals for completing it, and identify resources and strategies that can help if they encounter difficulties with the task. During the forethought phase, strategies can also be implemented to regulate emotions (such as anxiety) and foster motivation.

The second phase, *performance control*, refers to processes employed in doing the task. This phase involves using strategies and resources for monitoring one's work. For example, in this phase learners connect the task to prior knowledge, orchestrate strategy use by trying new strategies, identify any problems during the task, and ask themselves whether the strategy that is being used is working effectively. If it is not working well, learners can shift to another strategy or other strategies as needed. In the performance phase, learners can employ strategies to regulate emotion and volition (the impetus to continue task performance once it has begun). For example, if learners feel the task is overwhelming, strategies are necessary to keep learners in a state that is sufficiently positive to do the task. If learners perceive the task is boring or stupid, strategies are needed to overcome those attitudes and to shore up volition.

The third phase, *self-reflection*, involves self-awareness, self-evaluation, and adaptation for the future. For example, learners use evaluation strategies to assess how well they performed on the task (e.g., cognitive effort, consistency), identify the knowledge or skill developed during the task, and to judge the effectiveness of the strategies during the task. Learners also consider the effectiveness of their goal setting, the amount of effort expended for the task, and potential modifications in their future strategy use. This prepares learners to make informed choices of strategies for another task. In addition to appraisal of cognitive elements, self-reflection allows (re)considering self-beliefs. For example, learners can attribute their success

or failure on a language learning task to internal factors, such as their own competence, strategies, or attitudes, or to external factors, such as luck, task difficulty, or other people.

Though the above comments about the three phases strongly stress the individual student, social elements are also present. For example, learners set goals partly based on the desire to emulate other people or due to the assumed or expressed expectations of instructors, parents, or others. Self-evaluation in the reflection phase is often influenced by feedback from others, by learners' own comparisons of their performance with that of other learners, and by collaborative criteria for performance in team endeavors.

In the DISLL, we refer to these three stages as planning, doing, and reflecting. We chose this tripartite model because it resonates with language learning strategies and activities; relates to task-based learning and overall regulation of cognitive, metacognitive, affective, and social aspects of language learning; and is useful for teachers and learners. Inspired by Zimmerman's model, Oxford (2011, 2017) noted that strategically self-regulated learners achieve learning goals by controlling their learning, regulating their performance and their cognitive and affective states, and managing to the extent possible the environmental and social conditions for learning.

Oxford (2017) drew upon several self-regulated learning models and illustrated Zimmerman's three phases of self-regulated learning in a generic form, the Generalised Task Phase Sequence for Self-Regulated Learning (Figure 2). The double lines indicate that there is feedback among the phases, and that learners do not always follow the phases in order.

Figure 2
Generalised Task Phase Sequence for Self-Regulated Learning (Oxford, 2017)
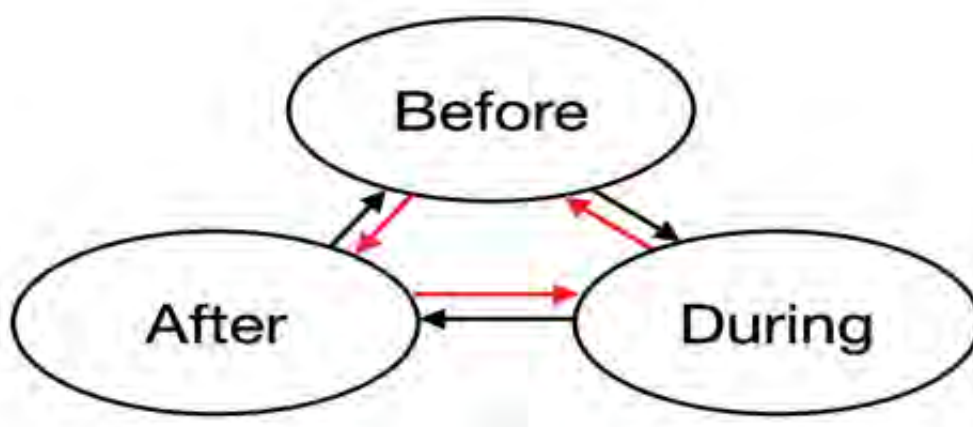
We have just explained the theoretical basis of self-regulated learning as applied to our study. In the next section, we discuss the steps in creating the DISLL.

Specific Steps in Developing the DISLL
Part 1 reviewed a range of self-regulated learning theories and self-regulated language learning measures, and Part 2 described the theoretical framework for the DISLL. In Part 3 we discuss the specific development of the DISLL.

Devising Scenarios for the Phases

Based on early theory-oriented decisions and our comparisons of existing questionnaires for self-regulated language learning, we drafted the DISLL 1.0. We decided early not to use an authentic language learning task as a basis for creating and implementing the DISLL. Authentic language tasks often take significant amounts of time. Though we recognize the value of authentic task-based assessments, such measures can only be used for brief language tasks during any single assessment session. As a practical compromise between the generic elicitation of strategy use and the time-consuming, intensive task-specific elicitation of strategies, we wrote a short scenario for each phase (before, during, and after the task) to help learners understand and contextualise the strategies within each phase.

- The scenario for the *planning* phase is: "You are about to start an activity that your teacher has presented to you. As you prepare to do the activity, which actions would you take?"
- The *doing* phase scenario is: "Picture yourself doing an English activity that your teacher has presented to you. What would you do during the activity?"
- The *reflecting* phase scenario is: "You have just finished an English activity that your teacher gave you. Reflect on your effort, actions, and results."

Drafting Items

Initially, 60 items were drafted to cover a wide range of language learning strategies under the three phases. We intended for the DISLL to be easily understood by language learners, so the sentence structure and the vocabulary used in items and scenarios went through an initial revision based on Gu's (2018) criteria: clarity, simplicity and intelligibility. Format decisions about an online version of the inventory followed. The DISLL 1.0 version was ready to be shared.

Conducting a Review by External Experts

The 60-item DISLL 1.0 was first presented in general terms at the fourth international "Situating Strategy Use" Conference (SSU4) in November 2022. Encouraged by the positive response from SSU4, we identified a group of external experts to review the DISLL 1.0 by completing an open-ended evaluation form. Eighteen top researchers from 12 countries provided extensive comments on the DISLL 1.0. These researchers were asked to examine the DISLL 1.0 in as much detail as they liked. For each of the three sections (self-regulation phases), planning, doing, and reflecting, five questions were asked:

1. Do you think there are any changes we should make in the scenario?
2. Do the items reflect the construct of self-regulated learning for this section?
3. Are there any other items we need to include in this section?
4. Do we need to delete any existing items in this section?
5. Do we need to revise any existing items in this section?

Five more questions were also asked about general issues about the DISLL 1.0:

1. Are the questions in each section clear and comprehensible for low-mid/intermediate learners?
2. Are there any vague items?

3.   Are there any items with technical flaws?
4.   Do you have any suggestions on the format of the questionnaire?
5.   Do you have any other advice for us?

External experts were thus invited to review, analyse, and make recommendations about every aspect of the DISLL 1.0. This included the three sections, which represented Zimmerman's self-regulation phases; the three scenarios, which guided the strategies in each section; the individual items in the sections; and the overall questionnaire. Exceptionally rich, thoughtful responses arose during this review.

Revising the DISLL 1.0 to Create the DISLL 1.1
We revised the DISLL 1.0 based on the review by external experts. While revising the DISLL 1.0, we also kept in mind Gu's criteria (clarity, simplicity, and intelligibility) and checked the relevance of each item to its self-regulation phase. This slow, intensive, but exciting process resulted in the 51-item DISLL 1.1, in which items are fairly evenly divided to represent Zimmerman's three phases of self-regulation, which we call planning (16 items), doing (18 items), and reflecting (17 items).

Analysing the DISLL 1.1 Vocabulary Profile
In addition to keeping the sentence structures simple in the questionnaire, we ensured that only the most frequent words were included. We analysed the vocabulary profile of the DISLL 1.1 by applying Cobb's Compleat Lexical Tutor (https://www.lextutor.ca/vp/comp/). The procedure we chose was based on a combined BNC-COCA corpus. Our analysis showed that 97.4% of the words on the DISLL 1.1 were in the first 2,000 most frequent words in the English language, and that 99.5% fell within the first 3,000 most frequent words. The only two words outside of this range included "dictionary" and "discouraged," which are frequently used by language learners and teachers. Nation's (2006) research indicates that 98% of known words are needed in order to understand a text with ease. We can therefore safely claim that the DISLL should be easy to understand among our target population of language learners.

Progress to Date in Constructing and Testing the DISLL
So far we have devised scenarios for the three phases (before, during, and after the task), created items for the DISLL 1.0, conducted an expert review of the DISLL 1.0, revised all items based on the expert review to create the DISLL 1.1, and analysed the vocabulary level of the DISLL 1.1 using a well-accepted approach. We now turn to Part 4, which explains the framework for validating the DISLL.

Framework for Validating the DISLL
For the design and validation of the DISLL, we use the argument-based framework (Kane, 2013). This framework represents a major current approach to validating educational assessment. In this framework, validity is seen as a claim (or a set of claims) leading to the overall judgment of the adequacy and appropriateness of the interpretation and use of test scores.

Argumentation-based Framework
Validation in the argument-based framework takes essentially two steps, or in Kane's terms, two arguments: the Interpretation and Use Argument and the Validity Argument. To validate a test, we need to first outline the chain of inferences and all associated major claims based on test results (Interpretation and Use Argument). Next, we try to find evidence that supports each claim and make an overall judgment about how adequate and appropriate our inferences are (Validity Argument). In doing so, Toulmin's (2003) argumentation framework is used to provide support to the warrants (assumptions) of each claim and to support or reject potential rebuttals that may threaten to overturn the claim. Compared to traditional approaches to validation, the argument-based validation framework provides a systematic and structured approach to gathering and evaluating evidence in support of the validity of an assessment.

Interpretation and Use Argument for the DISLL
Table 1 shows the major inferences and corresponding claims we are making with DISLL results. These inferences have been guiding our design of the instrument. Validation of the DISLL is essentially a process of finding evidence to support these inferences and claims.

Table 1
DISSL Claims and Inference Chain: Interpretation and Use Argument

Inferences	Claims
Scoring	The DISLL can accurately capture major self-regulated language learning strategies.
Generalisation	DISLL results can be extended to similar items, learning tasks, learning contexts, and learner samples.
Extrapolation	DISLL results are indicative of levels of self-regulated language learning in authentic language learning.
Use	The DISLL is useful in diagnosing and promoting self-regulated language learning.

The first inference we make after a DISLL score is obtained is that the scoring for each phase and overall has been done appropriately. This is basically claiming that the instrument can accurately capture major self-regulated language learning strategies. Next, we want to generalise the finding and claim that the pattern we find through the DISLL about self-regulated language learning strategies is true at different times, across similar learning tasks, and in similar learning contexts. We also want to extrapolate the findings and claim that DISLL results are indeed indicative of strategies for self-regulated language learning in real-world situations. Finally, we also want to infer that the DISLL is useful and that teachers and learners can use the DISLL to diagnose and promote self-regulated language learning. Validation of the DISLL is the marshalling of evidence to support each and all of these inferences and claims. This is discussed next.

Validity Argument for the DISLL
This argument has four inferences. These are related to scoring, generalisation, extrapolation, and use.

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To claim that the DISLL can accurately capture major self-regulated language learning strategies (*scoring* inference), we are assuming that all items in the instrument are relevant to and representative of the construct of self-regulated learning strategies. We also assume that the three phases, planning, doing, and reflecting, are independent and related subconstructs. In addition, since the DISLL is targeting intermediate language learners, our assumption is that respondents at the intermediate level or above would have no problem understanding the questionnaire. If all these assumptions (warrants) are found true, we would be able to support the scoring inference.

A major warrant for the claim that the DISLL can accurately capture main self-regulated language learning strategies is that the instrument shows acceptable psychometric properties, including convergent and discriminant validity. Convergent validity evidence would demonstrate that the items under each of the three DISLL subconstructs are positively and highly correlated with each other. Discriminant validity evidence would show that each subconstruct is distinct from the other two. In other words, within-subconstruct correlations are stronger than between-subconstruct correlations.

When we make the *generalisation* inference, we are basically claiming that DISLL results can be extended to similar items, learning tasks, learning contexts, and learner samples. If we find evidence supporting the assumption that items eliciting the same subconstruct in the DISLL inventory are consistent among themselves, and if we also find evidence that respondents provide similar answers to questions under the same subconstruct, we can conclude that the generalisation inference is supported. This is essentially a matter of consistency and reliability evidence. Typically, we can obtain stability evidence by administering the DISLL to a group of respondents on two separate occasions and comparing their scores. If the scores remain consistent over time, it suggests that the items are measuring the construct reliably. We can also obtain internal consistency by analysing the responses to the DISLL items and calculating Cronbach's alpha for each subconstruct. If Cronbach's alpha is high, it indicates that the items within the same subconstruct are measuring a consistent underlying attribute.

Furthermore, to support the generalisation of DISLL results across different learning contexts and learner samples, it is important to demonstrate similar results. If the DISLL consistently produces comparable outcomes across different learning contexts (e.g., classrooms, online learning) and learner samples (e.g., diverse populations, different proficiency levels), it strengthens the argument for generalisability. Evidence of similar results can be obtained by conducting studies in various contexts and with diverse learner samples, analysing the data, and comparing the outcomes across these different conditions. Collectively, these types of evidence contribute to the validity of generalising DISLL results to similar items, learning tasks, learning contexts, and learner samples.

After making sure that the DISLL elicits what we want to elicit accurately and that it does so consistently, we make another inference, that DISLL results reflect the respondents' authentic strategic learning performance in the real world (*extrapolation*). One warrant for this claim is that the strategies elicited through the DISLL items are indeed used by learners. This implies that the items in the inventory effectively capture the strategies employed by individuals engaging in self-regulated language learning strategies. We can collect evidence to support this warrant by employing research methods such as think-aloud protocols, where

participants verbalise their thoughts while engaging in language learning tasks. By analysing the think-aloud data, researchers can gain insights into the specific strategies employed by learners and the manner in which these strategies are employed, providing evidence that the DISLL items align with learners' actual practices.

Another assumption is that levels of strategic learning can be distinguished using the DISLL. This suggests that the inventory is capable of differentiating between individuals who employ different use levels of language learning strategies. To gather evidence supporting this warrant, various research methods such as eye-tracking, interviews, and observations can be used. These methods can provide evidence of the different approaches and levels of strategic learning exhibited by individuals. For example, eye-tracking studies can reveal differences in attention allocation and gaze patterns, interviews can elicit information about learners' conscious strategies and metacognitive processes, and observations can capture observable behaviours associated with different levels of strategic learning.

Usefulness is the final inference link under the Interpretation and Use Argument. We basically claim that the DISLL is useful in diagnosing and promoting self-regulated language learning. One warrant for this claim is that DISLL results can provide information to improve self-regulated language learning. This implies that the information obtained from the DISLL assessment can be used to identify areas of strength and areas that require improvement in self-regulated language learning strategies. The straightforward support for this warrant is evidence of diagnosis. By analysing the DISLL results, researchers or educators can gain insights into learners' specific strengths and weaknesses in self-regulated language learning and provide targeted interventions or strategies for improvement.

Another warrant in support of the use inference is that the DISLL is related to language learning results. This suggests that the scores or outcomes obtained from the DISLL assessment have a meaningful connection to learners' actual language learning performance or outcomes. Evidence for this warrant can be collected if experimental results demonstrate that the promotion of DISLL strategies can lead to improved self-regulation and learning outcomes. By adding the DISLL to other data-gathering mechanisms, researchers can conduct experiments or interventions that aim to enhance self-regulated language learning strategies and observe whether these improvements translate into better language learning results and better self-regulated learning behaviours.

Additionally, relating the DISLL to learning results concurrently (i.e., measuring DISLL and language learning outcomes in roughly the same time span) and predictively (i.e., using DISLL scores to predict future learning outcomes) can serve as potential evidence. Concurrent evidence involves examining the correlation or relationship between DISLL scores and language learning results obtained at the same time. Predictive evidence involves using DISLL scores as predictors to forecast future language learning outcomes. If there are consistent and statistically significant correlations or predictive relationships between DISLL scores and language learning results, it strengthens the argument for using the DISLL in assessing and predicting self-regulated language learning.

The argument-based approach to validity offers a comprehensive and coherent framework for validating assessment instruments. The framework is increasingly used in the validation of tests (Chapelle, 2020) and formative assessment (Gu, 2021). This is the first time the framework is planned for validating a questionnaire. It has been proven useful in guiding us

right from the beginning stage of design and will be guiding us throughout the validation process. The DISLL is still at an early stage of development. Existing evidence suggests a very promising future for the instrument.

Concluding Remarks

In this article, we presented our considerations in designing and validating the "Diagnostic Inventory for Self-Regulated Language Learning" (DISLL). We established the need for a new instrument that helps diagnose language learners' general orientations in self-regulated learning. We next outlined our considerations in choosing Zimmerman's (2000) model of self-regulated learning as the theoretical and empirical construct for the DISLL. The article also documented the process by which we designed the questionnaire and its items, together with some initial procedures for validation. A comprehensive and coherent argument-based framework for validation was presented to show what evidence we plan to obtain in order to validate the interpretation and use of DISLL results.

Now we go more deeply into recommended uses of the DISLL. The DISLL can be used by teachers, learners, and researchers for information-gathering purposes. Here is a set of valuable options.

Specific Uses in the Classroom

The DISLL will be released into the public domain for free use after version 1.3. Anyone planning to use it will be able to obtain the questionnaire online. Here we describe a few suggested scenarios where the instrument can be used in the classroom. At the beginning of an academic year, the DISLL can be administered as a quick diagnostic tool that will help teachers gauge the strengths and weaknesses in self-regulated language learning strategies among a whole cohort of new students. Results thus obtained can then be used to make informed decisions such as placement or differentiated instruction. Students can use the DISLL at regular intervals to monitor their own improvement in self-regulated language learning. Researchers will also find the DISLL useful as a carefully designed and validated measure of self-regulated language learning. Intervention studies aiming to foster student self-regulated language learning abilities often need to collect evidence of their effectiveness. Pre- and post-intervention administration of the DISLL will produce one meaningful source of data.

We highly recommend the good practice of triangulation from multiple sources of data and from multiple data-gathering tools, including the DISLL. It would be a good idea for teachers to employ a portfolio approach to profile various dimensions of their students' self-regulated language learning needs. In this case, the DISLL will be a useful tool in charting class patterns and progress patterns of the self-regulated language learning strategies that a group of students is aware of using. This information could be supplemented by other close measures of strategic learning, such as strategic processing during the performance of an authentic language learning task. The resulting profile can offer powerful information in helping students become more effective in language learning.

The Value of Questionnaire Research in Varied Settings

Questionnaire research has remained one of the most commonly employed tools for eliciting learning strategies. While we call for a diversification of explorations on a wider variety of

assessment tools, we firmly believe that there is not only a place for further questionnaire research but also a need for more intensified efforts on questionnaire design, validation, and analysis (Gu, 2016). Each measurement tool is good for its designed purpose and is only as good as the epistemological stance behind the construct it is designed to measure.

If there is such a thing as a user manual, we would like to highlight right at the start the theoretical construct that has been operationalised in the DISLL. It is Zimmerman's (2000) three-phase self-regulated learning model as applied to generic language learning tasks. As implied in Parts 1 and 2 of this article, various self-regulated learning models, employed or adapted for self-regulated language learning, would necessitate different instrumentation, which, in turn, would help elicit self-regulated language learning strategies examined from different angles. We maintain that the model we adopted is the most suitable for our purpose and for our target population.

As a diagnostic tool the DISLL can help teachers and learners identify not just individual learners' self-regulated language learning but also the overall orientation to self-regulated language learning of an entire class or of multiple classes. Information thus obtained will need to be taken together with that from other elicitation measures, such as task-specific think-aloud protocols or in-depth interviews in smaller samples before any instructional decisions are made.

For Ongoing Research

Before the DISLL is formally released, we are planning two rounds of piloting focused on the instrument's psychometric properties and construct validation, mostly for the scoring inference and the generalisation inference. The DISLL 1.2 will be piloted with students in multiple countries. Pilot tests in Iran, Saudi Arabia, Spain, and Poland are tentatively planned so far. By the time this article is published, some pilot tests will already be occurring. Pilot data will be analysed using multiple quantitative techniques (e.g., exploratory and confirmatory factor analysis, reliability analysis, confirmatory composite analysis, or Rasch analysis). In at least one site, think-aloud protocols will also be employed with a small sample of students to discover how learners understand the DISLL items and react to them emotionally or motivationally. After the first piloting and subsequent revision, large-scale piloting of DISLL 1.3 will occur with students in a range of other ESOL contexts. Quantitative and qualitative analysis will accompany further studies.

Learning how to learn is not only a skill that helps achieve desired learning results; it is also a desired outcome of education that empowers the learner beyond language classrooms and school walls. We hope that the DISLL can become a useful assessment tool in the future, especially in the language teacher's classroom toolkit but also for research in larger groups beyond the individual classroom.

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