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# A Critical Overview of Computerized Dynamic Assessment Software Programs

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### ABSTRACT

In recent years, the particular importance of Dynamic Assessment in L2 (Aljaafreh & Lantolf, 1994; Poehner & Lantolf, 2005; Poehner, 2008; Albeeva, 2008; Anton, 2009) has been acknowledged. However, there is a severe lack of research on the two important strands of DA in the L2 domain including Computerized Dynamic Assessment (henceforth, C-DA) and Group-based DA (Poehner, 2008). C-DA mostly follows an interventionist model with mediation offered from a menu of predetermined clues, hints, and leading questions selected in a lock-step fashion (moving from most implicit to most explicit) by the computer (Poehner, 2008). The present study, as an initial attempt in the domain of C-DA, reviews the development of the C-DA software programs designed to promote learners' development. The study reports the data collection procedures and data analysis of the computer-based dynamic assessment of learners in first and second language contexts. The software program should generate important scores including non-mediated score, mediated score, and an LPS. Just two instances of the designed software generated all of these scores by means of computer. Moreover, the quality of hints offered is of significant value. C-DA can lead to hint-based education as opposed to spoon-feeding education.

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### Introduction

While computer-based assessments typically only indicate the correctness of a response, C-DA tracks learners' errors as well as the precise forms of mediation that prove beneficial. Indeed, development occurs in a present-to-future model. Since providing one-to-one mediation to any individual learner is a challenging and unmanageable task language teacher, considering the large size of classes at university undergraduate level, C-DA would yield fruitful results in promoting learners' development. Crook (1991) explains that computers can serve as a human partner or classroom teacher within the ZPD and technology makes the computerized tool relevant to the mediation periods related with internalization. Therefore, the present study attempts to explore whether computer assisted devices could facilitate the social process necessary for development when human mediators are not accessible.

As a result of interactions with other individuals and with physical and symbolic artifacts (e.g., language, books, paper and pencil, computers, numbers, diagrams, etc.), individuals construct higher forms of thinking both socially and culturally in different places and at different times and therefore, their relationship to the world is not direct but mediated (Lantolf & Poehner, 2004). Interactions between learners and more capable others represent that the ZPD determines the learners' actual and proximal development. The reason that learners interact with experts is to fulfill their lack of knowledge. The important point is that more experienced others are not essentially human beings. Other media like books or computers can take the role of significant others (Grigorenko 2008). Recently, computer-mediated tools are considered as a source of assistance, "*a medium for learning and not a method for L2 instruction*"

(Adair-Hauck et al. 2000, p. 272, emphasis in original). Through assistance and mediation provided computers, learners later can regulate themselves by appropriating the regulatory means employed by others (Lantolf, 2009).

### Kidtalk

Jacobs (1998, 2001), in the context of language learning, displayed the use of a program called KIDTALK (Kidtalk Interactive Dynamic Test of Aptitude for Language Knowledge) in which pre-school and school-age children were directed through a series of computer-based activities designed to evaluate their language aptitude. The program provided children with samples from an invented language based on Swahili that the researchers referred to as Kidtalk. The provisions were conducted through videos including puppets who introduced vocabulary and model morphological rules. After conducting the initial training phase, the children were administered the computerized KIDTALK assessment requiring them to apply their knowledge of the invented language to answer a series of questions. Jacobs (2001) observed that former non-dynamic versions of this assessment have been revised according to DA principles. She concluded that the procedure was considered dynamic since if a learner missed a question, the computer automatically took him or her back to the relevant segment of the training video and then offer an opportunity for the learner to try the question again. If the child was still unable to reply to the question correctly, the process was repeated. If on the third attempt the child still could not answer the question correctly, the computer skipped to the next item on the test. Upon completion of the assessment, the computer yielded two reports for each child. The first report assigned one point to every question the child answered correctly regardless of how many

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tries the child made while the second report provided a more detailed breakdown of the number of attempts the child took for each item.

### Computerized Leipzig Learning Test

Guthke and Beckmann (2000) have developed computerized versions of the *Leipzig Lerntest* (LLT) that work similar to KIDTALK. They designed a computerized LLT that is also rather adjustable to individuals' needs whereby training tasks are presented when examinees make errors. The program could be administered individually or in groups. They explain that in its most recent form, the computerized LLT asks learners to respond to two items for each problem type. Two items are given instead of one in order to minimize the possibility that the learner guessed correctly. If a learner could answer both items correctly, the program skips to the next problem type. However, if learners respond incorrectly to one or both of the items, a series of training tasks is displayed that are designed to help learners master the different components that comprise the complex test items. Interestingly, if learners succeed on earlier test items but fail on later ones, the program immediately takes them to the directly preceding set of training tasks. To some extent, this is analogous to computer adaptive testing, in which testing programs sequence questions based on a hierarchy of difficulty levels and weigh learners' abilities according to the point at which their performance breaks down. On the other hand, unlike in computer adaptive tests, the computerized LLT not only indicates where in the sequence of questions learners experience problems, it also offers assistance so that they might learn from the procedure and move on to more difficult items. Up to now, Guthke and colleagues have not reported empirical results from their project, but it is certainly a model language testers would wish to explore.

Compared to KIDTALK, the computerized LLT individualizes the mediation it offers by providing multiple routes that learners can follow through the test depending on the nature of the problems they experience. The program identifies various dimensions for the test items so that learners' errors indicate which dimension they did not comprehend and the training tasks focus on that dimension. Besides, since all forms of mediation are standardized, the program represents a compromise between clinical and psychometric concerns by "sensitizing mediation to the learners' needs while at the same time not sacrificing the test's statistical properties" (Guthke & Beckman, 2000, p. 42). The authors have not reported any research that compares the computerized LLT with the paper-based human-mediated version.

As explained by Poehner and Lantolf (2013), Like the *Lerntest*, KIDTALK permits only one form of mediation including a tutorial module in the former and a replaying of the introductory video in the case of the latter rather than a graduated series of prompts that become accessible to learners if they are needed. Like non-computerized DA, the central issue in the *Lerntest* and KIDTALK procedures is the extent to which the assessment purposes and the available resources allow individualized mediation. As already mentioned, in some contexts, the *Lerntest* program is appropriate. In other settings, the human-computer collaborative format described by Tzurriel and Shamir (2002) will certainly be attractive because it further increases the possibility of working within individuals' ZPDs as explained below.

### Children's Seriation Thinking Modifiability

Tzurriel and Shamir (2002) developed a computerized version of a DA procedure through which children were

assessed based on their seriation thinking, an ability linked to performance in mathematical thinking through which the children arrange their thought in a series. Tzurriel (2000) argues that the ability to seriate items is an important prerequisite to more advanced mathematical skills. The authors examined three groups. One group of children received computer-based mediation, supplemented with human mediation when necessary, and another group was provided with computer-mediated assistance, endorsed by human mediation, and the other group given only human-mediated assistance. The first and second groups significantly outperformed the last one. However, the study did not include a group of children that only received the computerized mediation.

The electronic mediation, in the computer-assisted Children's Seriation Thinking Modifiability (CSTM), also known as Think-in-Order, reflects the human mediated administration in terms of phases. The program contains an animated character that guides the student throughout the questions and teaching phases. No specific classification is required in terms of any dimension when the items to be seriated are displayed to the child. However, once the child has seriated the cards (i.e., has arranged them in a series), they are required to choose the dimension that students used in ordering the items. Whenever they respond to the questions incorrectly, they are provided with feedback based on the Graduated Prompts approach (Campione & Brown, 1987). The Think-in-Order testing program is based on the principles of the MLE, remarkably, *intentionality/reciprocity* (the ability of the mediator to consider carefully the needs of the student and to rework the tasks so that they match up with the student's needs), *transcendence* (the learner is being shown a skill or strategy that is transferable to a novel situation, instead of being focused on a specific task) and *mediation of meaning* (convey to the student the importance of the task that is being examined and responding to the student's achievement). These three principles should be present in every test whose goal is to involve the learners in the MLE (Feuerstein et al. 1979, p. 92).

### The Evaluation and Prediction Assessment

The Evaluation and Prediction Assessment (EPA), developed by Desoete, Roeyers, Buysee, and De Clercq (2002), is a multilingual, programmable computer version of the Evaluation and Prediction DA. EPA was designed by the authors at the University of Ghent, Belgium. It has been used with third-grade students with learning disabilities in the domain of mathematics. The focus of the procedure is on the meta-cognitive functions of prediction and evaluation. It program can be downloaded from 'www.dynamicassessment.com' along with a complete version available at 'Anne.Desoete@rug.ac.be'. The authors commended that meta-cognitive skills are often associated with learning disabilities, especially in the domain of mathematics, and these skills are rarely included in assessments.

Tanner and Jones (2002) reported on the teaching of meta-cognitive skills in mathematics presenting intervention with 11- and 12-year-old children. Indeed, C-DA has proved to be effective in improving student learning and success through diagnostic monitoring of their functions, providing intervention, and assessing the improvement thereafter. Nirmalakhandan (2009) developed a computer-based DA system to be used as an instrument in an undergraduate fluid mechanics course. Data gathered of this C-DA before and after implementation demonstrated significant improvement in student performance after implementation. Performance in fluid mechanics had been

higher than that in the other subjects where C-DA was not implemented.

#### **Online DA via Web**

Birjandi and Ebadi (2010, 2012) developed a web-based qualitative inquiry in the Synchronous Computer Mediated Communication (SCMC) via Web 2.0. They observed the micro-genetic development of the oral abilities of foreign language learners by means of internet. Two homogenous female students at undergraduate level were participated in this case study whose ability was measured according to traditional static tests. The students were required to fill out web literacy questionnaire in both English and Farsi posted to their emails. They interacted in one-to-one individual weekly DA sessions that continued forty minutes on writing assignments in Google Wave (GW) and Skype for a period of three months. Following the guidelines offered by SCT-based DA framework, this study opted for a qualitative approach to collect and analyze data which was well-matched to the ZPD concept. To collect data, the researchers followed a straightforward procedure including two phases: First, the students were encouraged to write a short paragraph focusing on potentially problematic grammatical structures. Having analyzed the data, the researchers set out to focus on the development of modal verbs since both of the participants had difficulty in using them. Picture stories were incorporated into the paragraph writing for the students to expose them sufficiently to the target forms through involvement in different kinds of writing prompts. Both participants were given the same tasks, but individualized mediation was used in the follow-up. During the second phase of the study, students and the mediator worked together following the enrichment program out of which the mediation regulatory scale was developed. The mediation in the enrichment program moved from the most implicit contingent help in the regulatory scale (level 0), what known as collaborative frame by Aljaafreh and Lantolf (1994), that is, the experts' mere online dialogic presence that triggers correction on the part of learners representing the minimal level of assistance accessible to the learners in the ZPD. The mediation continued with written prompts by means of web 2.0 facilities including highlighting and sticky notes given in GW (levels 1 to 4) and ended with the most explicit spoken prompt (level 5) via Skype's audio chatting. The study differentiated between the students' abilities in terms of their responsiveness to online mediation provided by the mediator through the Net. They concluded that the students' responsiveness is significantly associated with their level of ZPD regarding the time they spent on each item. It means that the higher the ZPD, the less time they spend on tasks while interacting with mediator.

#### **C-DA of L2 Comprehension**

Pishghadam and Barabadi (2012) reported on the construction and validation of a C-DA software known as Computerized Dynamic Reading Test to be used as an instrument in promoting learners' reading comprehension skills. The software was programmed to offer test takers strategy-based hints. The test presented two scores for each individual including a 'non-dynamic score' and a 'dynamic score' (to use their own terms) which was based on test takers' first try of each item and the average hints employed by them, respectively. A pool of 104 undergraduate students participated in the study. The authors confirmed the usefulness of C-DA in improving students' reading comprehension ability and in presenting information concerning their potentiality for learning. Having compared the test taker's performance on non-dynamic test with

their performance on dynamic test, they estimated that the test takers' promotion from non-dynamic test was about 30%. They proved the great potentiality of computerized DA in learners' development.

Poehner and Lantolf (2013) reported on the use of DA principles in tests of L2 listening and reading comprehension offered through an online format. The focus of the instruments was on reading and listening comprehension. The advantage of their study was that they could administer C-DA to a large sample size at the same time and to report the results in a quantitative format that is easily interpretable. The results indicated both unassisted and assisted performance on the tests. The authors used the Learning Potential Score (LPS) Formula, which makes distinction between mediated and unmediated performance to predict how learners are likely respond to future instruction. The tests entailed transfer items to determine the extent to which learner development is endorsed during the test. Transfer items are incorporated into the C-DA tests because they can increase the difficulty level of tasks to help researchers better diagnose the extent to which learner ability has developed and to predict how likely learners are to react to future instruction. The program provided three scores: actual (to capture unmediated performance); mediated (reflecting responsiveness to assistance provided on each test item); and a learning potential score (based on gain between actual and mediated performance) that displayed how much investment in future instructional activity is likely required for development to move forward. The study proved the significance of C-DA administered via the internet in learners' development.

#### **Computerized DA in ESP Courses**

Teo (2012), using the technology, designed a C-DA program to overcome the time-constraint challenge many teachers confront in their classrooms. The study was conducted at a university in Taiwan with 68 EFL college freshmen who were enrolled in a required two-semester course titled —Freshman English for Non-English Major Students (FENEMS) taught by the researcher. The course was held two hours weekly for eighteen weeks each semester. The students were from five different departments at the university including the Public Health Department, the Statistics Department, the Information Management Department, the Occupational Therapy Department, and the Respiratory Treatment Department. The participants experienced C-DA for the first time. The C-DA program was employed in a computer lab at the university where participants had their own computers and could access to the Internet to work on the C-DA program individually. Using sandwich format the author administered a traditional static test to the students as a pre-test where no mediation was provided. Following this, in the intervention phase, the computerized mediation was offered through the C-DA program. The program compared the participants' performance before and after the mediation intervention and during the intervention phase, each participant was given time to record their reading strategies and reflections in their working portfolio.

The researcher used the user-friendly View-let Quiz 3 software to integrate mediation with assessment. The software uses Adobe Flash technology and permit educators to design dynamic and interactive programs that can be saved as executable files and accessed through a web browser on the Internet. The learners could interact with and respond to the preprogrammed computerized intervention. The present research design stored the students' responses and recorded the number

of incorrect responses as well as the mediation that were activated by each student. The study included four levels of mediation, progressing gradually from implicit to explicit. After a learner finished reading a passage, he was asked an inferential question, followed by five multiple choices. He was required to select one correct answer from the choices given. If a learner answered a question incorrectly, he was provided with the computerized mediation in order of increasing explicitness. The computerized mediation ended automatically when the learners found the correct answer to the question. The maximum level of mediation each student received was four. To see the C-DA activities used in the current project worked on, refer to the following web site: <http://tinyurl.com/ch4ws8h>.

The C-DA program created in this study yielded two types of data: (1) the participants' written reflections in their working portfolio, and (2) the  $p$  value based on a paired samples  $t$ -test to see if there is a significant difference between the pre- and post-test scores as a result of the computerized mediation. The results obtained from the qualitative data concerning the participants' self-reflection in their working portfolio generated rich information indicating their meta-cognition in their reading processes and the results from the quantitative data revealed that there was a significant difference between the pre-test and post-test scores.

#### **Computer-mediated Feedback**

With the rapid development of technology computer facilities, the role of the computer in providing and mediating feedback has become a focus for research. Moreover, the increasing demand for the provision of distance courses and online research supervision has led to the use of computer by the learners to exchange ideas with each other and with the teacher and receive comments without the need for face-to-face interaction (Hyland & Hyland, 2006). As explained by Warschauer (1996), employing computer-mediated communication (CMC) helps students to actively ask for feedback through raising questions whenever they want to and take the initiative in discussions.

A particular advantage of CMC is for disadvantaged and less able students (Belcher, 1990; Hartman et al., 1991) and for L2 students (Warschauer, 2002; Greenfield, 2003) since it could empower and promote students. More recently, software programs have been created to provide feedback in a wide variety of areas including grammar. For example, the Criterion Online Writing Service (Burststein, Chodorow & Leacock, 2004) that evaluates automatically essay responses, e-rater (Burststein, 2003) that yield a holistic score for an essay with real-time feedback about grammar, usage, style, organization, and development, and Integrated Writing Environment (Daedalus, 2005, cited in Hyland & Hyland, 2006) that helps students go through an evaluative process using a series of modifiable prompts. Using the program, students could revise their drafts by reading the leading questions displayed in the upper half of a window and responding in the lower half while consulting their text in another window. Although more research is needed to examine the effectiveness of the program, students and teachers can construct questions that focus on fine-tuning writing or highlight common problems can be a productive way of using the medium.

Electronic corpora are also contributing to offer feedback on writing by means of computer by providing more opportunities for learning. For instance, Concordancers provide learners with numerous instances of particular features in large collections of texts so that they can focus on typical patterns in

writing and make use of feedback. As Milton (1999) explains, whenever students deliver their writing electronically, teachers can hyperlink errors directly to a concordance file and students can examine the contexts and collocations of the words they have used inappropriately. This kind of reflective feedback can be extremely useful for raising students' awareness of genre-specific conventions, developing independent learning skills, and enhancing writing products (Hyland, 2003; Milton, 2004, cited in Hyland & Hyland, 2006).

Ware and Warschauer (2006) developed the term *electronic feedback* that refers to automated feedback via computer. They outlined three areas of research on electronic feedback for second language writing. The first area refers to software-generated feedback that replaces or enhances direct human feedback. This kind of feedback is potentially useful and cost-effective. The second area refers to the effect of computer-mediated human feedback on ESL writing in comparison to more traditional face-to-face feedback. The third area of research is framed by a sociocultural perspective, examining the distinction between electronic modes and the feedback offered in cross-cultural and cross-linguistic exchanges through online collaborations.

With reference to the first area of research, the most recognized automated evaluation system is the Criterion e-rater (Burststein, Chodorow & Leacock, 2003) developed by the Educational Testing Services (ETS). The e-rater is programmed to seek lexical complexity, syntactic variety, topical content and grammatical errors so that it could provide feedback in the form of both holistic scores as well as specific feedback in grammar, organization, style, and usage. Learners can select from a range of practice essay topics by means of an automated web-based system. The database provides prompts offering practice in such high-stakes tests as post-secondary writing placement essays and TOEFL exams. To create a model for a single essay question, two human raters must score up to 500 essay responses. Next, the e-rater is trained on this scoring model until it constantly arrives within one point of agreement with the human raters. Whenever a third human rater should intervene to resolve the score, the agreement rate is typically 97% between e-raters and human raters. Chodorow and Burnstein (2004) carried out a data set of about 10,000 essays from student responses to seven exam prompts on the TOEFL exam and observed that e-raters differ little from human readers in achieving agreement on holistic scores. Another well-known automated electronic feedback program known as MY Access! was developed by Eliot and Mikulas (2004). Like the e-rater, students can post multiple essays and receive holistic scores on their final drafts. Although this software does not provide individualized feedback, it offers useful ranges of writing tools, including online portfolios, a writer's checklist, scoring rubrics, word banks, spell checkers, and graphic charts.

As explained by Burststein and Marcu (2003), in spite of the usefulness of the timesaving capabilities of automated feedback, many developers of this software stress that computer-generated feedback should only be regarded as supplementary to classroom instruction. A major criticism leveled at such systems is that they put emphasis on highly individualized learning at the expense of social processes. Schultz (2000) compared face-to-face with computer-mediated peer feedback using a control group experimental design. He examined the revisions that intermediate and upper-intermediate French students made across their writing in a classroom with a process-oriented

approach. She utilized the Daedalus Interchange package which allows for real-time interaction on a local area network.

As for the third area of research on electronic feedback, Warschauer (1999, 2002) conducted an ethnographic action research project to see how three different writing teachers integrated technology into their second language writing classrooms. Each of the teachers followed a different theoretical perspective regarding academic writing: Formalist, constructivist, and social constructivist. In the formalist approach, academic writing was regarded as mastery of a set of sub-skills that resulted in a grammatically-correct product usually in the form of a traditional five-paragraph essay. In this classroom, computers only provided the means to meet a singular end of training students to produce this type of writing. Using computers, students completed grammar exercises and formulaic writing tasks similar to many basic writing classrooms. In the constructivist approach, writing is not just used for academic purposes, but as a means to express personal meanings. In this classroom, the teacher made use of computers to engage her students in genres like multimedia authoring that created a range of literacies, not just formal academic writing. In the classroom with a social constructionist approach, Warschauer (1999, 2002) proved a central shift from viewing technology as the means by which conventional beliefs about writing and the teaching of writing could be made more efficient and toward a vision of technology as driving new approaches to literacy instruction. The teacher observed the usefulness of technology to interact with one another and to engage in a tutor-tee apprenticeship with the instructor. Following a similar view of literacy, Kasper (2000) concluded that new technologies could be used in focus discipline research to engage students in multiple literacies both in ESL writing instruction and in professional, social, and personal realms beyond the classroom.

Van Lier (2000) addressed the complex interplay of language and culture with the online context in which peers provide one another feedback on writing as entangled with language and culture. Kramsch and Thorne (2002) reported on the findings from a joint French- American writing exchange through which learners attend to genre and discourse in the online context. Students' writing and responding over the internet can help them to share intercultural understanding through one-to-one writing over email (O'Dowd, 2003) and asynchronous discussion groups (Belz, 2002, 2003; Thorne, 2003).

According to Poehner (2008), C-DA following an interventionist model entail mediation offered from a menu of predetermined clues, hints, and leading questions selected in a lock-step fashion (moving from most implicit to most explicit) by means of computers. While computer-based assessments typically only indicate the correctness of a response, C-DA follows learners' errors as well as the precise forms of mediation that prove helpful. This can be an indication of the distinction between adaptive test and dynamic tests. Indeed, adaptive tests just indicate the correctness or incorrectness of the responses without offering hits or prompts to the learners. What adaptive tests do is just adjusting and presenting the next question to the test taker based on his or her current level of knowledge

#### **Computerized Dynamic Grammar Test (CDGT)**

Alavi and Modarresi (forthcoming) constructed and validated a test battery of C-DA of grammar for the first time. The software package they designed to assess the grammatical abilities of the learners was called CDGT which stands for Computerized Dynamic Grammar Test. They ensured that the test enjoyed reliability and validity. The test sample used in this

study was selected from standardized TOEFL test "*Barron's how to prepare for the TOEFL test*" by Sharpe (2001). Although changes were made in the original formats of the tests, the non-dynamic test still enjoyed content validity. The internal consistency of both dynamic and non-dynamic tests was assessed with K-R 21 method of estimating reliability. To determine the statistical significance of the difference between means of mediated scores and non-mediated scores, Multiple Independent T-test was run to see if DA results in significant improvement of test takers' performance. To estimate the concurrent validity of the test, the Pearson product-moment correlation coefficient was run between mediated scores and non-mediated scores so that the effect size and also the concurrent validity of DA were examined. Since the scope of structural patterns cannot be captured in a single test battery, the researcher tried to cover the most important and frequently-used patterns.

In so doing, they categorized the structural patterns into 10 major categories including 40 subcategories. Altogether, fortunately, the number of sub-categories chosen by the researcher was 40 that equal the number of grammar questions used in TOEFL paper-based. Next, the researcher prepared 5 hints for each item. The hints constructed matched the structural issues covered in the test battery. Students were allotted 4 minutes for answering each item. The original test was in multiple-choice format so that it could not be exactly copied here. Since the researcher offered hints to the students to find the answer, multiple choice tests were not considered appropriate for his purpose. If a multiple-choice format was used, as soon as a student was given a hint, he or she knew that the answer was wrong so that he was left with 3 alternatives, and by receiving the second hint, he had just two alternatives, and so on. Thus, he could guess the correct answer from the remaining choices. The researcher decided to design communicative test of grammar as an appropriate test format.

For example, the hints for a computerized dynamic test of grammar were prepared as follows:

#### **Test:**

*Several people were injured this morning when a lorry which was carrying pipes overturned in the center of town and hit two cars. Ambulances called to the scene took a long time to get through the rush hour traffic. People who saw the accident say the lorry hit the cars after it swerved to avoid a pile of stones leaving in the road.*

#### **Hints:**

Hint 1 → That's not the right answer, try again.

Hint 2 → Look at the relative clauses in the test. They are used to include essential information.

Hint 3 → There are four relative clauses here. Sometimes we can leave the *relative pronoun + auxiliary verb* out of the clause. For example, *The man who is watering the garden is my uncle* can be reduced to *The man watering the garden is my uncle*.

Hint 4 → Pay attention to the last sentence. We can form clauses with a present participle (e.g., *watering*) in active sentences and a past participle (e.g., *watered*) in passive sentences.

Hint 5 → The right answer is **left NOT** leaving.

When the test is over, a scoring file is created on the desktop. The following information about each test taker is stored in this file: 1) test taker's non-mediated score, 2) test taker's mediated score, 3) test taker's Learning Potential Score, and 4) the time that he or she spent on the test. That DA is

effective in promoting learners' development has already been proved.

#### Final remarks

The major significance of the use of C-DA is that it is closely related to teaching methodology. It can, indeed, lead to a different language teaching method that is prompted-based language teaching as opposed to spoon-filling education. A successful teacher does not teach from A to Z, but he or she provides learners with prompts. For example, in the model we designed, the invisible teacher is in the test who supervises, monitors and scores the test. Indeed, the software test and teach the most important grammatical patterns at the same time.

More than this is the quality of the hints provided by the teacher. Writing hints or prompts is a challenging and creative task. For instance, for a specific item, we developed five hints and a learner who takes the test may answer the test item correctly by reading the third hint while another teacher or researcher may write the hints in a way that the same learner for the same grammatical item may answer the test item accurately by reading the second hint. So writing prompts is a competitive task. A good hint would lead the learner to the desired outcome. This property, as well, highlights and is in line with the process-oriented nature of grammar. As grammar is related to Logical Intelligence, writing prompts intelligently is teaching itself.

#### References

Adair-Hauck, B., Willingham-McLain, L., & Youngs, B. E. (2000). Evaluating the integration of technology and second language learning. *CALICO Journal*, 17, 269-306.

Alavi, S. M., & Modarresi, Gh. (forthcoming). A test battery of computerized dynamic assessment of grammar for EFL learners.

Albeeva, R. (2008). The effects of dynamic assessment on L2 listening comprehension. In J. P. Lantolf, & M. E. Poehner (Eds.), *Sociocultural theory and the teaching of second Languages* (pp. 57-86). London: London, Equinox.

Aljaafreh, A., & Lantolf, J. P. (1994). Negative feedback as regulation and second language learning in the zone of proximal development. *The Modern Language Journal*, 78, 465-483.

Antón, M. (2009). Dynamic assessment of advanced second language learners. *Foreign Language Annals*, 42(3), 576-598.

Belcher, D. (1990). Peer vs. teacher response in the advanced composition class. *Issues in Writing*, 2, 128-150.

Belz, J.A. (2002). Social dimensions of telecollaborative language study. *Language Learning and Technology*, 6(1), 60-81.

Belz, J. A. (2003). Linguistic perspectives on the development of intercultural competence in telecollaboration. *Language Learning & Technology*, 7(2), 68-99.

Birjandi, P. & Ebadi, S. (2010). Dynamic assessment and transcendence of oral abilities in EFL context. Paper presented in IELTI5, University of Tehran, Tehran, Iran.

Birjandi, P., & Ebadi, S. (2012). Microgenesis in dynamic assessment of L2 learners' sociocognitive development via web 2.0. *Procedia - Social and Behavioral Sciences* 32, 34-39.

Burstein, J. (2003). The *e-rater*® scoring engine: Automated essay scoring with natural language processing. In M. D. Shermis & J. Burstein (Eds.), *Automated essay scoring: A cross-disciplinary perspective*. Hillsdale, NJ: Lawrence Erlbaum Associates, Inc.

Burstein, J. & Marcus, D. (2003). A machine learning approach for identification of thesis and conclusion statements in student essays. *Computers and the Humanities*, 37, 455-467.

Burstein, J., Chodorow, M., & Leacock, C. (2004). Automated essay evaluation: The Criterion online writing service. *AI Magazine*, 25 (3), 27-36.

Campione, J. C., & Brown, A. L. (1987). Linking dynamic testing with school achievement. In C. S. Lidz (Ed.), *Dynamic testing* (pp. 82-115). New York: Guilford Press.

Chodorow, M. & Burnstein, J. (2004). Beyond essay length: Evaluating e-rater's performance on TOEFL essays. Available at <ftp://ftp.ets.org/pub/toefl/990112.pdf>.

Crook, C. (1991). Computers in the zone of proximal development: Implications for evaluation. *Computers and Education*, 17(1), 81-91.

Desoete, A., Roeyers, H., Buysse, A., & De Clercq, A. (2002). Assessment of metacognitive skills in young children with mathematics learning disabilities. In D. Van der Aalsvoort, W.C.M. Sesing, & A.J.J.M. Ruijsenaars (Eds.), *Learning potential assessment and cognitive training* (pp. 307-333). England: Elsevier Science Ltd.

Eliot, S. & Mikulas, C. (2004, April). The impact of MY Access! Use on student writing performance: A technology overview and four studies. Paper presented at the Annual Meeting of the American Educational Research Association. San Diego, CA.

Greenfield, R. (2003). Collaborative e-mail exchange for teaching secondary ESL: A case study in Hong Kong. *Language Learning and Technology*, 7 (1), 46-70.

Grigorenko, E. (2008). Dynamic assessment and response to intervention: Two sides of one coin. *Journal of Learning Disabilities*. Retrieved June 2012 from <http://ldx.sagepub.com/content/42/2/111>.

Guthke, J., & Beckmann, J.F. (2000). The learning test concept: Application in practice. In C.S. Lidz & J. Elliott, *Dynamic assessment: Prevailing models and applications* (pp.17-69). Oxford, UK: Elsevier.

Hartman, K., Neuwirth, C., Kiesler, S., Sproull, L., Cochran, C., Palmquist, M., & Zubrow, D. (1991). Patterns of social interaction and learning to write: Some effects of networked technologies. *Written Communication*, 8 (1), 79-113.

Hyland, K. (2003). *Second language writing*. New York: Cambridge University Press.

Hyland, K., & Hyland, F. (2006). Context and issues in feedback on L2 writing. In K.

Hyland, & F. Hyland (Eds.), *Feedback in second language writing: Contexts and issues* (pp. 1-19). Cambridge: CUP.

Jacobs, E. L. (1998). Kidtalk: A computerized language screening test. *Journal of Computing in Childhood Education*, 9 (2), 113-131.

Jacobs, E.L. (2001). The effects of adding dynamic assessment components to a computerized preschool language screening test. *Communication Disorders Quarterly*, 22 (4), 217-226.

Kasper, L. (2000). New technologies, new literacies: Focus discipline research and ESL learning communities. *Language Learning and Technology*, 4(2), 105-128.

Kramsch, C., & Thorne, S. (2002). Foreign language learning as global communicative practice. In D. Block & D. Cameron (Eds.), *Globalization and language teaching* (pp. 83-100). London: Routledge.

Lantolf, J. P. (2009). Dynamic assessment: The dialectic integration of instruction and assessment. *Language Teaching Journal*, 42(3), 355-368.

Milton, J. (1999). Lexical thickets and electronic gateways: Making text accessible by novice writers. In C. Candlin & K.

- Hyland, (Eds.), *Writing: Texts, processes and practices* (pp. 221-243). London: Longman.
- Nirmalakhandan, N. (2009). Use of computerized dynamic assessment (DA) to improve student achievement: A case study. *Journal of Professional Issues in Engineering Education and Practice*, 135 (2), 59-89.
- O'Dowd, R. (2003). Understanding the "other side": Intercultural learning in a Spanish-English e-mail exchange. *Language Learning & Technology*, 7(2), 118-144.
- Pishghadam, R., & Barabadi, E. (2012). Constructing and validating computerized dynamic assessment of L2 reading comprehension. *IJAL*, 15 (1), 73-95.
- Poehner, M. E. (2008). *Dynamic assessment: A Vygotskian approach to understanding and promoting L2 development*. Springer.
- Poehner, M. E., & Lantolf, J. P. (2005). Dynamic assessment in the language classroom. *Language Teaching Research*, 9, 233-265.
- Poehner, M. E., & Lantolf, J. P. (2013). Bringing the ZPD into the equation: Capturing L2 development during computerized dynamic assessment (C-DA). Retrieved June 2013 from: <http://tr.sagepub.com/content/early/2013/04/22/1362168813482935>.
- Schultz, J. M. (2000). Computers and collaborative writing in the foreign language curriculum. In M. Warschauer & R. Kern (Eds.), *Network-based language teaching: Concepts and practice* (pp. 121-150). Cambridge: Cambridge University Press.
- Tanner, H., & Jones, S. (2002). Using ICT to support interactive teaching and learning on a secondary mathematics PGCE course. *Journal of Information Technology in Teacher Education*, 11 (1), 77-91.
- Teo, A. (2012). Promoting students' inferential reading skills through computerized dynamic assessment. *Language Learning and Technology*, 16 (3), 10-20.
- Thorne, S. L. (2003). Artifacts and cultures-of-use in intercultural communication. *Language Learning & Technology*, 7(2), 38-67.
- Tzuriel, D. (2000). Dynamic assessment of young children: Educational and intervention perspectives. *Educational Psychology Review*, 12 (4), 385-420.
- Tzuriel, D., & Shamir, A. (2002). The effects of mediation in computer assisted dynamic assessment. *Journal of Computer Assisted Learning*, 18, 21-32.
- Van Lier, L. (2000). From input to affordance: Social-interactive learning from an ecological perspective. In J. P. Lantolf (Ed.), *Sociocultural theory and second language learning* (pp. 245-60). Oxford: Oxford University Press.
- Ware, P. D. & Warchauer, M. (2006). Electronic feedback and second language writing. In K. Hyland, & F. Hyland (Eds.), *Feedback in second language writing: Contexts and issues* (pp. 105-122). Cambridge: CUP.
- Warschauer, M. (1996). Comparing face-to-face and electronic discussion in the second language classroom. *CALICO Journal*, 12 (2-3), 7-26.
- Warschauer, M. (1999). *Electronic literacies: Language, culture, and power in online education*. Mahwah, NJ: Erlbaum.
- Warschauer, M. (2002). Networking into academic discourse. *Journal of English for Academic Purposes*, 1(1), 45-58.