Electronic Intervention Strategies in Dynamic Assessment in an Omani EFL Classroom

Priya Mathew, Rahma Al-Mahrooqi and Christopher Denman

Abstract This paper explores the suitability of Dynamic Assessment (DA) as a method of formal testing when the intervention is both electronic and supported by face-to-face encounters. The principles of DA appear in Vygotsky's socio-cultural theory (SCT) which postulates that cognitive development occurs when there is productive interaction. In DA, as opposed to psychometric tests, the learner is offered mediation during or after assessment. Performance with the assistance of the mediator helps the assessor to determine the learner's progress in the "zone of proximal development" or ZPD. Vygotsky describes the ZPD as the distance between a learner's actual level of development without mediation and their level of potential development when interacting with an able mediator. Participants in this study were a group of 12 EFL learners enrolled in the foundation programme of an Omani university that was designed to equip them with the language skills required for English-medium tertiary education. Students emailed pre-specified academic essays during the course of a semester to the first author who then offered them feedback using a word processor's review function. Students were then assessed on their ability to incorporate the researcher's feedback which ranged from implicit to explicit. A focus group interview with participants was held in addition to a series of observations to explore emergent trends associated with DA. Overall results suggest that electronic forms of DA involving mediation attuned to participants' ZPD are more effective than pre-scripted prompts based on assessors' guesses about the kinds of intervention learners may require during assessment. The paper concludes by suggesting that electronic forms of DA ensure students get the best possible mediation when they are undertaking important assessment processes and therefore may be of benefit in Omani EFL tertiary contexts.

P. Mathew (✉)
Middle East College, Seeb, Oman
e-mail: Priya@mec.edu.om

R. Al-Mahrooqi · C. Denman
Humanities Research Centre, Sultan Qaboos University, Muscat, Oman
e-mail: Denman@squ.edu.om

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1 Introduction

The inadequacy of assessing L2 proficiency using psychometric tests alone has been raised by a number of authors. For example, Luria (1961), one of Vygotsky's most influential colleagues, differentiated between "static" and "dynamic" assessment and stated that two crucial pieces of information are missing from the former: the learner's performance with assistance and the ability to transfer skills to other tasks. In static assessment, the examinee completes the test independently without mediation. Sternberg and Grigorenko (2002, p. vii) claim that in this approach to assessment:

> At some point in time after the administration of the test is over, each examinee typically receives the only feedback he or she will get: a report on a score or set of scores. By that time, the examinee is studying for one or more future tests.

In DA, however, both instruction and assessment occur simultaneously, thus helping the instructor/assessor to better comprehend students' emerging skills and not just those already acquired. The final assessment score in this approach is considered on the basis of the students' performance with assistance, while their performance in transfer tasks lets the assessor determine if skills acquired during DA have been internalized. Despite its potential utility, however, research into DA in the classroom and in more traditional teaching frameworks has remained somewhat limited as have studies on its potential impact on L2 development (Poehner & Lantolf, 2005), and especially in Arab contexts. Within these contexts in particular, it is time for practitioners with an intimate knowledge of their students and their specific learning contexts to seek assessment processes that yield greater insights into learners' cognitive development. As Norton (2007, p. 91) states, "recognition of the centrality of assessment to the learning process means that all who teach and facilitate student learning need to reflect critically on assessment practices in higher education".

In assessing descriptive writing in particular, the danger of subjectivity can be avoided when there is "dialogic mediation"—the foundation of interactionist DA—between assessor and learner. Evaluation should be fair, especially when it is in formal and high-stakes situations. In the current study, the researcher/practitioner sought to suggest an approach to assessment incorporating DA that might be effective and fair in an Omani learning context. In doing so, the research sought to address the gap that Meihami and Meihami (2014, p. 37) describe:

> To date, L2 DA research has not focused on implementation of the procedure during regular classroom instruction but has instead occurred in one-to-one sessions outside the classroom and has been implemented by a teacher/researcher with expertise in applied linguistics.

With this gap foregrounded, the current research employed a DA approach to provide electronic feedback to a group of 12 EFL learners enrolled in an Omani university's English-language foundation program. Participants emailed copies of academic essays they had written as part of course requirements throughout the third semester of academic year 2012/2013 to author 1 who then offered feedback using the revision function of a commonly-used word processing program. Participants were then assessed on their ability to respond to the researcher's feedback, while a focus group interview and classroom observations were also conducted to examine the potential utility of DA in the Omani tertiary-level context.

2 Literature Review

2.1 Vygotsky's Sociocultural Theory (SCT) and Zone of Proximal Development (ZPD)

The influence of SCT in Second Language Acquisition (SLA) studies has become increasingly important over the course of the past two decades. Lev Vygotsky, a Russian psychologist, first wrote about SCT in the 1920s. He postulates that cognitive development occurs through "the productive intrusion of other people and cultural tools in the [developmental] process" (Newman, Griffin, & Cole, 1989, p. 68). In both individual-based and input-processing models of development, the environment contributes to development, and the focus is on determining to what extent the change can be attributed to either the individual or environment. Conversely, in SCT, the individual does not directly interact with the environment; instead, cultural artefacts and other individuals mediate interaction with it.

Vygotsky (1978) also stressed the importance of examining the learner's "zone of actual development" and "zone of proximal development" (ZPD). He defines ZPD as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (p. 86). When this concept is applied to assessment, the implication is that learners need to receive instruction in the ZPD which is ahead of their current cognitive functioning in order to promote development. Meihami and Meihami (2014, p. 36) claim that:

> The significance of the ZPD is that it provides a framework for the diagnosis of learner abilities and an orienting basis for intervention to support their development. In other words, it is a means of accessing and at the same time promoting the process of development rather than focusing on its product, as happens in more conventional approaches to assessment.

A skilled mediator is thereby able to promote development or "internalization", which Lantolf (2000, p. 14) defines as "the process through which a person moves from carrying out concrete actions in conjunction with the assistance of material

artefacts and of other individuals to carrying out actions mentally without any apparent external assistance". This mirrors Feuerstein's Mediated Learning Theory (MLE) which stresses the importance of the mediator in altering the relationship between the environment and the learner in order to bring about development. The deliberate pitching of instruction in the ZPD, the interactivity between the learner and the mediator, and the resulting development and ability to transfer skills, are described in MLE by the terms intentionality, reciprocity and transcendence.

3 Principles of DA Realized in ZPD Theory

The principal tenet of the DA approach is encapsulated in Vygotsky's (1978, p. 204) statement: "We must not measure the child, we must interpret the child". DA posits that assisted performance during assessment, as opposed to independent performance, gives better insight into the development potential of the examinee. According to the principles of DA which, as discussed above, are rooted in Vygotsky's concept of the ZPD, any assessment that does not take into account the learner's ability to modify performance after mediation is incomplete.

A leading advocate of interactionist DA, Feuerstein's theory of Structural Cognitive Modifiability echoes ZPD theory. The author holds that traditional tests are responsible for "ignoring a possibility that the predicted destiny may not materialize if powerful intervention takes place" (Feuerstein, Rand, & Rynders, 1988, p. 83). Lidz and Gindis (2003, p. 103) support this stance by claiming that "traditional standardized assessment follows the child's cognitive performance to the point of 'failure' in independent functioning, whereas DA in the Vygotskian tradition leads the child to the point of achievement of success in joint or shared activity". When mediation is offered in the ZPD, learners' maturing abilities are targeted. Mediation or intervention during assessment sometimes makes development possible within a single session, which Wertsch (1985) terms "microgenesis". Traditional psychometric assessments, on the other hand, view changes in the performance of the learner during assessment as a danger to test reliability.

Two approaches to DA can be classified as interventionist and interactionist. Poehner and Lantolf (2005) describe the former as involving a pre-test-treatment-post-test experimental approach. In this approach, the assessor offers assistance on an item-by-item basis which is based on a pre-established menu of test hints. In the interactionist approach, a skilled mediator provides assistance through dialogue that is precisely attuned to the ZPD of the individual learner. Davin (2013) claims that it is this approach to DA that is the most commonly employed within existing L2 acquisition research. Researchers concede that the mediation offered in interventionist DA does not cater precisely to the ZPD of each individual learner because the interaction is not dyadic. As Poehner and Lantolf (2013, p. 324) point out, "in developing the tests with a focus on efficiency and breath of administration, it is necessary to compromise the more fine-grained and individually negotiated modes of mediation that have characterized most L2 DA

research to date". One way to overcome this potential issue, however, is by using interactionist DA in an online format for a reasonably large number of students—the approach adopted in the current research.

4 Studies in DA

Many studies have employed interventionist and interaction approaches to DA in both layering and sandwich formats. For example, Lantolf and Aljaafreh's (1995) research into writing, over a period of eight weeks, involved helping learners' deal with instruction in the use of modals, verb tenses, prepositions and articles. The authors reported the progress of learners with mediation in addition to regression until the learner Fully grasped the concept. In addition, Poehner (2007) used DA with university students studying French as a second language. The researcher employed both dynamic and static pre-tests, followed by an L2 instructional period, and concluded with dynamic and static post-tests and two transfer tasks. Poehner reported that mediation performed in this manner was able to bring to the surface problem areas with listening comprehension that might have otherwise remained hidden. In addition, in order to make better placement decisions, Anton (2009) used the interactionist method of DA to differentiate among students who obtained similar scores in the static pre-test.

Despite the potential utility of DA as reported by these studies, Davin (2013) maintains that the form of DA administration involving assessor-learner dyads is time-consuming and can therefore limit the number of participants that the mediator can potentially work with. In order to overcome this obstacle, a number of authors have sought to implement DA principles in an online format. For instance, Poehner and Lantolf (2013) adopted an online format for L2 reading and listening. Learners were checked on their ability in transfer tasks, while a non-dynamic test score, a mediated test score, and a "learning potential score" were arrived at to be used as a basis for making instructional decisions. The authors state that, by taking into consideration these influential concerns, the online application of DA can be of great benefit in L2 learning contexts. Davin (2013) also adopted a cumulative interventionist DA approach and supplemented it with instructional conversation to provide learners with a more flexible mediation attuned to their ZPD. The author highlights the complementary nature of these approaches and recommends the conjoint use of these frameworks to avoid the potential pitfalls of interventionist DA.

As the above studies suggest, mediation in DA has taken many forms and, for this reason, it is important for mediators to decide whether DA should be pre-scripted or flexible (Lantolf & Poehner, 2004) and where it should be placed. That is, this placement could be within the "sandwich" format between the pre-test and post-test, or in the "cake" format layered throughout the process of instruction and assessment (Sternberg & Grigorenko, 2002, p. 27).

In addition to these considerations, much of the SLA research on corrective feedback has tended to focus on whether it should be implicit or explicit. For

example, Ellis et al.'s (2009) survey of 11 studies on corrective feedback reports that explicit feedback is more effective for improving performance. Moreover, the authors also claim this to be especially true of lower proficiency learners. In addition, Aljaafreh and Lantolf (1994) argued for the use of both implicit and explicit feedback that employs learners' ZPD for guidance orientation. They observed that explicit feedback obscured the development process from the instructor and even perhaps inhibited the process. Hence, the important difference between feedback in SLA theory and the SCT-guided mediation offered in DA.

5 Learning Potential Score

As discussed above, one of the fundamental tenets of Vygotsky's SCT theory is the ZPD, which requires the DA practitioner to take into account the difference between independent and mediated performance. This gives the assessor insights into the ZPD of the learner or the amount of cognitive development that happens when applying the intervention strategy. Both Feuerstein, Rand, and Rynders' (1988) MLE and Budoff's (1987) theory of "Learning Potential Assessment" (LPA) support this notion. Sternberg and Grigorenko (2002) also emphasize the need to quantify the process of assessing a student's learning potential or LPA. These approaches hold promise for practitioners who need to be accountable for the scores allotted in formal assessment, especially while grading non-multiple choice and true/false answers.

In response, Kozulin and Garb (2002) created a formula to quantify an individual's learning potential. They claimed that this formula offers a theoretical basis from which to determine those students with high and low levels of learning potential. When the authors applied this formula to their study of reading comprehension, they reported significant differences between actual and mediated performance. Kozulin and Garb claimed that learners who had identical scores in the non-dynamic pre-test showed variations in their performance after mediation. This suggests the effectiveness of the formula for differentiating between learners who might perform similarly in psychometric tests, while also helping the instructor/assessor to keep track of the learner's progress.

6 Methodology

6.1 Research Questions

In order to explore the potential utility of an electronic DA approach in an Omani tertiary-level EFL foundation course, the following research questions were posited:

1. How useful is DA through electronic intervention in helping the assessor to determine the cognitive progress of a learner?
2. Is DA through electronic intervention a potentially useful formal tool for continuous assessment?
3. From the learners' perspectives, what problems, if any, are associated with using online DA feedback?

7 Participants

The participants of the present study were 12 students enrolled in the Foundation Programme of the Middle East College (MEC), the largest private college in the Sultanate of Oman. The participants were female and aged between 18 and 21. All students applying for admission to undergraduate courses at the college need to have a language proficiency equivalent to an IELTS band of 5.5 in the four tested skills. Those students who do not achieve this upon entry to the college must enroll in the 1 year English foundation programme which is aligned with the standards prescribed by Oman's Ministry of Higher Education. MEC's Foundation Programme has a three-semester structure and three tiers of English which approximate elementary, pre-intermediate and intermediate levels.

The population of level 3 students at the research site numbered 170, while the cohort chosen for this study totalled 32. This particular cohort was chosen because the first author was also the writing instructor for this group. The 12 students from this class who volunteered to participate were asked to submit their essays by email from weeks 8 to 13 of the semester. In order to recruit the 12 participants, purposive sampling was used to help determine how DA influenced the performance of high, average and low scorers on non-dynamic pre-tests. Therefore, four students from each level (high, average and low) were chosen and their non-dynamic pre-test scores, post-test scores after mediation, and learning potential scores were analyzed. The categorization of students into the three different levels of proficiency was based on several factors: non-dynamic pre-test scores, observation of students in class, face-to-face interactions, the seriousness of their errors, and uptake of corrective feedback. For example, Learners 4 and 8 have been categorized as average and high scorers respectively based on a combination of these factors, in spite of their similar scores in the non-dynamic pre-test. Since DA was used as a tool for continuous assessment, it was decided to follow the performance of the L2 participants in three cycles of pre-test, mediation and post-test in order for the assessors/researchers to accurately gauge their ZPD. Thus, each learner was assessed three times using electronic intervention DA strategies.

As one of the pre-specified outcomes that learners are required to achieve, semester three MEC foundation program students learn how to write essays of a minimum length of 250 words adhering to prescribed academic writing conventions. Given the centrality of academic writing skills to the successful completion of

the foundation program, this study examines the use of online DA in the evaluation of three essays which were written in class. In terms of the focus group interview, the researcher explained at the commencement of the study that respondents would be participating in a study investigating the feasibility and suitability of using a DA approach to evaluation by integrating electronic resources. Participants were once again reminded of the objective of the focus group discussion, after which author 1 reassured them that their grades would not be affected by the opinions they expressed and that their choice of participating or not participating in the research would in no way impact upon their standing in the course.

8 Data Collection and Analysis

Electronic intervention strategies using DA principles were implemented in an intact level 3 writing class at the research site. One of the requirements for the intermediate or level 3 group based on the Omani standards is to write an academic text with a minimum of 250 words that displays control of layout, organization, punctuation, spelling, sentence structure, grammar, and vocabulary. The instructor offered participants mediation attuned to their ZPDs using the review function of a word processing program. The instructor employed an interactionist approach since this format allowed for feedback which is more finely tuned to the needs of each learner.

The open-ended dialogic mediation that occurs in the interactionist DA approach required more effort from the mediator as the responses were not pre-scripted. Feedback ranged from explicit to implicit depending on demonstrated uptake by the individual learner. For example, if the instructor found that implicit feedback was not as effective with some students, she made it more explicit to prevent learner frustration. In these cases, once the learner exhibited some progress in response to the explicit feedback, the instructor then employed more implicit feedback to check whether the concept had been internalized. Instruction on how to write academic essays in the prescribed academic genre was provided during the scheduled six hours of weekly in-class tutorials.

Conducting several DA cycles ensures that transfer tasks are attempted with every new essay that the learner writes. The instructor is thus able to not only determine the openness of the learner to mediation but also the learner's ability to apply internalized concepts to other tasks. Therefore, the DA cycle approach towards understanding a learner's development helped the instructor to evaluate the learner better. This promoted fairness in evaluation as DA affords insights into the learner's metalanguage during mediation in the ZPD.

Minick (1989) notes that interactionist DA might make it more difficult to quantify, analyse and draw comparisons between learners. Since these interactions are not easily quantifiable, the mediator draws up a profile of each learner, detailing cognitive development and responsiveness to mediation in order to arrive at conclusions regarding the learner's ZPD. However, an attempt was made to quantify

the process of interactionist DA applied in this study by using LPS scores as calculated using Kozulin and Garb's (2002) formula:

$$\frac{\text{LPS} = (\text{S post} - \text{S pre}) + (\text{S post}) = (2\,\text{S post} - \text{S pre})}{\text{Max S Max S Max S}}$$

In this equation, *S post* stands for learner scores in the post-test, *S pre* for scores in the pre-test and *Max S* for maximum marks that can be scored. These researchers interpreted students, LPS scores in roughly the following manner: high (LPS $\geq$ 1.0), mid-level (0.88 $\geq$ LPS $\leq$ 0.79) and low scorers (LPS $\leq$ 0.71) based on their learning potential scores.

The same formula was also used by Poehner and Lantolf's (2013) study of computerized DA in second language reading and listening comprehension as a way of calculating examinees' LPS scores. Although the researchers' approach was interventionist and, in this way, differed from the interactionist approach employed in the current research, it was possible to quantify the latter by considering the scores before and after mediation. Scores were calculated using the writing in-house rubric developed by the university which focuses on the four features of structure, cohesion, grammar and vocabulary. The scripts were double-marked by author 1 and another instructor at the research site to ensure reliability.

9 Results and Discussion

9.1 Essay Scores and DA

Appendix 1 features a list of the 12 participants' scores before and after electronic DA in addition to their learning potential score. Learning potential scores found in this appendix reveal that all students scoring high and average marks on the pre-test displayed a greater responsiveness to mediation than those scoring low marks as their LPSs fell into the high and mid-level ranges. Interviews with participants and observation of classroom performance revealed high levels of motivation to improve writing skills, which participants felt were crucial for academic success.

However, the LPS of around half (n = 2) of the poor performers on the pre-test indicated a higher openness to mediation than the other two poor scorers. For example, learner 11, who performed poorly on the pre-test, exhibited more openness to mediation in the first DA cycle than in subsequent cycles. An informal discussion with this participant during the period of classroom observation revealed that she was unable to focus on the feedback given during DA because she was busy meeting other assignment deadlines. Learner 9 showed consistency in her LPS. Interviews and class observations confirmed her high levels of motivation. Interestingly, this participant improved her performance to such a degree after mediation that her LPSs were on a par with those who scored well on the first pre-test.

The first author's informal interview with learner 12 revealed that she did not feel motivated to improve her work. She felt that her language skills were too poor, and she lacked confidence to make the required changes to her essays. She also cited a lack of familiarity with computers—the means through which essays were submitted and DA offered—as a reason for her limited progress. Hence, the intrusion of affective variables, such as the lack of confidence and motivation, may impede mediation in low performers.

Interestingly, learners 1 through 9 and learner 12 indicated an ability to transfer the skills acquired in their first DA to subsequent tasks. However, transfer studies in L2 DA carried out by Poehner (2007) and Ableeva (2010) do not report consistent improvement in learners' performance after initial DA sessions. The consistent improvement in transfer task performance observed in this study was perhaps due to the similarities between the required written tasks. That is, in the second and third tasks addressed in each DA cycle, participants had to attempt essays of the same genre which were scored using the same rubric.

An examination of poor scorers' performance indicates that affective factors, such as confidence and motivation, in addition to academic factors like a lack of study skills, interfered with mediation. Hence LPSs are a useful indication of when other types of intervention like counseling might be necessary. Since there were three DA cycles implemented in the current research, early intervention was possible and the maximum benefit accrued to the student as each individual was given the kind of intervention that was most appropriate.

10 Focus Interview

The focus group was used as a method of data collection since the researchers felt that students would be more comfortable talking as a group and that participants would be prompted to reflect more deeply on the topic being discussed when engaged in a "social context". More specifically, as Patton (2002, p. 386) explains:

> Unlike a series of one-on-one interviews, in a focus group participants get to hear each other's responses and to make additional comments beyond their own original responses as they hear what other people have to say. However, participants need not agree with each other or reach any kind of consensus. Nor is it necessary for people to disagree. The object is to get high-quality data in a social context where people can consider their own views in the context of the views of others.

The focus group interview lasted about 30 min. Eight students who were a mix of high, average and low scorers volunteered to participate. Many of the students who took part in the discussion felt that it was difficult to type their essays using word processing software and that they also did not have the technical know-how to deal with sending emails. However, all participants agreed that this process helped familiarize them with these electronic tools and displayed a sense of enthusiasm about their newly-achieved electronic skills. One participant reported that one of the

results of integrating technology into the DA process was to improve students' electronic literacy skills. This echoes Warschauer and Kern's (2005) finding that an outcome of using computer networks in L2 classrooms was that "students in these classes did not experience new technologies principally as an aid to second language learning; rather, they saw themselves as developing new literacy skills in a new medium of critical importance for their lives" (p. 45).

In terms of participants' perceptions about sending essays by email, many reported that they felt they were engaging in something appropriate for university-level students. One participant even claimed that she felt "important" in front of her little brothers and sisters when doing her work electronically and receiving feedback from her teacher through email. The illegible handwriting of teachers when marking students' essays on paper was also discussed as a point of concern with more traditional written methods of feedback. Participants claimed that online DA feedback helped them to make corrections and ask for help from others. However, they were not motivated to find out what their mistakes actually were when the corrections were done on paper in the teacher's handwriting. One respondent even claimed to feel depressed when she saw red pen marks on her paper essay. A number of respondents also pointed out that electronic forms of DA enabled them to finish their work at home and get immediate feedback from the teacher without having to wait for the next class.

In addition, electronic DA allowed participants to use the spelling and grammar tools available with word processing software to check for linguistic mistakes. They were able to use these tools and therefore found the process of typing essays easier and more rewarding. Warschauer and Kern (2005, pp. 1–2) articulate this point in the following explanation: "the fact that computer-mediated communication occurs in a written, electronically archived form gives students additional opportunities to plan their discourse and to notice and reflect on language use in the messages they compose and read".

An important point of DA is that it emphasizes the importance of mediation attuned to the individual's ZPD. Indeed, students actually acknowledged that less explicit feedback made them "figure it out"—that is, encouraged them to work out their errors and how to deal with these—themselves. Thus, a major advantage of using the interactionist approach can be seen from the viewpoint of the mediation the teacher was able to provide which prompted students to self-correct. Interestingly, low scoring participants in the pre-test said that they were encouraged to write more when submissions were made online. On the other hand, the number of essays written did not vary between higher and lower scorers, thus suggesting that the electronic mode of submission and feedback may be motivating even for lower level scorers.

The following extended excerpt from the focus group interview highlights a number of these themes. Pseudonyms have been used to protect the identity of participants.

Researcher: Let us talk about the way you submit your essays nowadays.
Mariya: Teacher, the letters of keyboard were difficult at first but now easier and quickly
Lujaina: Very easy
Maha: We can correct our mistakes.
Lujaina: Spelling
Afra: Also correct mistakes
Maha: Also grammar
Researcher: What do you think, Hafsa?
Huriya: (nodding) I agree.
Noor: Because I am first year here, I did not know how to send email. Now I know.
Raya: I hate red. When I see the red pen marks on the paper, I am depressed. With online feedback the teacher says only 'grammar'. She does not say my mistake directly so I can think. I feel with the paper she is finding fault but with online I can think of my mistake. I know there is a mistake and I can figure it out myself.
Haya: I can correct my own mistakes. Sometimes I go to the teacher but mostly I am able to correct myself.
Lujaina: Sometimes I get help from my friends who help me…because they are good in English.
Afra: Writing on computer is easy.
Researcher: Why is that?
Afra: Paper is more mistake but computer corrects mistakes.
Lujaina: Not only spelling but grammar. There are red and green lines.
Maha: Green is grammar.
Researcher: Did you correct your mistakes when I gave you feedback on paper?
Lujaina: Um…no.
Mariya: But when you give online we correct. Before it was difficult typing but now easy.
Raya: We don't have to write the whole essay again, we just need to correct the mistakes.
Maha: We can read easily now because the teacher types her comments but before teacher's handwriting is difficult.
Noor: Something new for us.
Raya: Yes, that is true. Gives us the feeling that we are doing something important. For 12 years we were writing on paper and we are bored with it. My little brothers and sisters are impressed when they see me writing my essays on the computer.
Noor: Yes. Same for me.
Maha: Can finish extra work at home and send it directly at that moment. So we don't waste time. We have more time to learn extra things in class.
Researcher: Do you write more essays now than you did when you had to write on paper?
Noor: No.
Mariya: Same as before.
Afra: (smiling) Yes…because teacher checks.
Lujaina: Yes.

11 Classroom Observation

Classroom observations tended to confirm a number of trends emerging from the electronic DA and focus group interviews. For example, for very low scorers in the pre-test, it was observed that implicit feedback offered by the teacher/researcher was not effective as students found it impossible to self-correct without a large amount of direct help. Hence, these participants had to wait for an opportunity to meet the instructor face-to-face so that the item in question could be explained. However, despite this potential limitation, with some low-scoring students the researchers observed that the need to wait for instructor face-to-face time actually resulted in more peer interaction. In addition, many participants appeared to take electronically available feedback much more seriously than corrections done by hand. Consequently, they scored higher marks in the second half of the semester when it was mandatory to submit their academic essays online.

As a way of encouraging engagement with the electronic feedback, the teacher saved all three of the participants' submitted academic essays under personalized electronic folders to enable them to accurately track student submissions. This storage and tracking system was displayed to participants during class time using the digital projector so that all students could see their work saved and documented. The researchers observed that this improved students' motivation to complete their work as it was very clear that the researchers closely monitored essay submissions. Previously with the essays submitted on paper, the teacher often found it hard to keep track of various learner submissions as the learners themselves were required to maintain their own essay portfolios and to submit these only at the end of the semester. This system often resulted in the scenario wherein, at the end of the semester when teachers asked students to submit their essay folders, there was often a mad scramble to finish essays, which many students tended to write haphazardly or to copy from their more punctual peers. Instances of plagiarism were also quite common.

12 Discussion

When teachers use more traditional methods of assessing students, there is often a bias towards the number of essays completed rather than their actual quality. This is especially the case when the teacher is responsible for marking a large number of essays within a short time period. Moreover, improvements witnessed in student second drafts are often based on the teacher's general sense of the student's abilities formed from their overall performance in class. When the class size is between 32 and 35 students, this tends to encourage highly subjective evaluations. The first author reflected on her own practice at the research site and also had numerous informal discussions with other teachers regarding these. When electronic interactionist DA is used over three cycles, the assessment is based on a more thorough

understanding of the student's abilities or "openness to mediation" as the researcher could easily compare the first and second drafts because of instant access to student work saved and catalogued electronically.

Face-to-face encounters also helped the first author to evaluate those students who did not respond to implicit electronic feedback. What is noteworthy about this point from the current study is the willingness from even low scorers to seek to understand and correct their mistakes. As the students in the focus group interviews and classroom observations expressed time and again, technology for them is a great motivator. This study clearly conveys the call from the "net generation" for their instructors to integrate technology into teaching and assessment.

This study explored the feasibility of using electronic DA as an instrument of continuous evaluation based on the premise that it gives the evaluator a better grasp of the learner's development over the course of a single semester. However, perhaps studying DA cycles longitudinally over the course of a few semesters with larger sample sizes might shed light on motivational, cultural, social and other factors which could account for the degree of learner modifiability. Having a quantifiable variable like the LPS, rather than qualitative learner profiles and analysis, makes further research in this area much more feasible. In addition, an experimental research design might help researchers to understand more about the difference between traditional paper-and-pen feedback and electronic mediation based on DA principles.

13 Limitations and Conclusions

As with many such approaches to DA, the main drawback here concerns the limited number of students who can participate due to the labour-intensive nature of interactionist DA. Poehner and Lantolf's (2013) study involving interventionist DA in computerized testing does, in fact, highlight the nature of this disadvantage. It should nonetheless be noted that, in the present study, the researchers handled a sizeable number of participants over three DA cycles. However, if the number of cycles were reduced and if the cycles were more evenly spaced, with perhaps one of the cycles occurring towards the beginning of the semester and another towards the end, it would be much easier for the instructor to successfully manage the workload. Poehner and Lantolf discussed future developments in DA, and this study is a partial response to what they envisage for it—an attempt to explore more open-ended approaches to computerized DA:

> Other models of DA have been proposed for computerized administration, and these may also serve as a point of departure for L2 DA researchers. We are in the beginning stages of what promises to be a lengthy and challenging process. For example, there is no reason to limit C-DA to the multiple-choice testing format. In fact, we are currently developing a language comprehension test that uses a cloze format with more open-ended types of mediation. We also see assessments that include language production tasks as an especially important, though challenging, context for C-DA (p. 337).

A number of researchers agree that mediation precisely attuned to the ZPD of the individual learner is more effective than pre-scripted prompts based on assessors' guesses about the kind of intervention learners may require during assessment. It is only fair that students should get the best possible mediation when they are going through an important assessment process. When they go through three DA cycles, it "minimizes the risk of an erroneous evaluation, by definition. It provides mediation that is constantly adjusted and attuned to the learner's or group's responsiveness to mediation. At the same time, it promotes the very development it seeks to assess in the first place" (Poehner & Lantolf, 2005, p. 252). Therefore, DA in this form can be used by the instructor to evaluate students fairly during formal assessment as it provides deeper insights into the precise stage of learner development and reveals whether there is development or regression. Moreover, all participants in the current study responded very well to the electronic mode of feedback utilized, and the researchers believe that the additional benefit of electronic literacy is another advantage of using this mode of feedback.

Appendix 1: DA Cycle Scores and LPS by Participant

Participant #1

DA cycle	Non-dynamic pre-test	Post-test after mediation	Learning potential score
1	67	74	1.08
2	63	75	1.16
3	70	75	1.06

High Scorer 1 in Pre-test 1

Participant #2

DA cycle	Non-dynamic pre-test	Post-test after mediation	Learning potential score
1	58	67	1.01
2	55	64	0.97
3	50	60	0.93

High Scorer 2 in Pre-test 1

Participant #3

DA cycle	Non-dynamic pre-test	Post-test after mediation	Learning potential score
1	65	70	1.00
2	70	75	1.06
3	74	75	1.01

High Scorer 3 in Pre-test 1

Participant #4

DA cycle	Non-dynamic pre-test	Post-test after mediation	Learning potential score
1	55	60	0.86
2	60	60	1.00
3	60	60	1.00

High Scorer 4 in Pre-test 1

Participant #5

DA cycle	Non-dynamic pre-test	Post-test after mediation	Learning potential score
1	48	58	0.90
2	55	65	1.00
3	58	68	1.04

Average Scorer 1 in Pre-test 1

Participant #6

DA cycle	Non-dynamic pre-test	Post-test after mediation	Learning potential score
1	40	50	0.80
2	45	55	0.86
3	48	58	0.90

Average Scorer 2 in Pre-test 1

Participant #7

DA cycle	Non-dynamic pre-test	Post-test after mediation	Learning potential score
1	48	58	0.90
2	62	65	0.90
3	65	70	1.00

Average Scorer 3 in Pre-test 1

Participant #8

DA cycle	Non-dynamic pre-test	Post-test after mediation	Learning potential score
1	55	60	0.86
2	58	62	0.88
3	62	65	0.90

Average Scorer 4 in Pre-test 1

Participant #9

DA cycle	Non-dynamic pre-test	Post-test after mediation	Learning potential score
1	25	45	0.86
2	40	50	0.80
3	48	55	0.82

Poor Scorer 1 in Pre-test 1

Participant #10

DA cycle	Non-dynamic pre-test	Post-test after mediation	Learning potential score
1	30	40	0.66
2	28	33	0.50
3	25	25	0.33

Poor Scorer 2 in Pre-test 1

Participant #11

DA cycle	Non-dynamic pre-test	Post-test after mediation	Learning potential score
1	15	40	0.86
2	30	40	0.66
3	25	40	0.73

Poor Scorer 3 in Pre-test 1

Participant #12

DA cycle	Non-dynamic pre-test	Post-test after mediation	Learning potential score
1	28	35	0.56
2	30	35	0.53
3	30	35	0.53

Poor Scorer 4 in Pre-Test 1

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