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# Dynamic Assessment in Synchronous Computer Mediated Communication (SCMC)

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## Abstract

The theoretical motivation behind dynamic assessment (DA) emerges from Vygotsky's theory of the mediated mind. This study represents a web-based qualitative inquiry employing interactionsist DA which follows Vygotsky's preference for cooperative dialoging by integrating SCMC features of the visual salience, self-paced setting of written discourse and web 2.0 applications of web links , sticky notes and highlighting to shed light on microgenitic development of learners' L2 grammatical structure in writing. It also addresses the inadequacy of proficiency levels obtained in the psychometric-based DIALANG in pinpointing learners' future potentials for development. Microgenisis as a general analytical framework is used for data analysis. The results of the study indicated that through microgentic analysis in DA via web 2.0 based tools of Google Wave and Skype, it is possible to obtain a richer and more accurate understanding of students' potential level of L2 grammatical development.

**Keywords:** DA, SCMC, Web2.0, Microgenetic development, Mediation

## 1. Introduction

Theoretically grounded in the Vygotskian Zone of Proximal Development (ZPD) (Vygotsky,1962), DA explores the learners' developmental processes and provides insight into their potentials for future development by providing them with necessary assistance during

the performance of the assessment task through collaborative dialogue. The post-psychometric view of DA is a challenge to the traditional psychometric views that support a dualistic view of instruction and assessment. In prospective DA, the retrospective traditional goal of producing generalizations from a snapshot of performance is replaced by ongoing, graduated, contingent and dialogic intervention (Aljaafreh & Lantolf, 1994) in development to realize the learning potentials in future, based on the learners' history and interactive test performance.

At the heart of Vygotskyan and sociocultural approaches to language learning and dynamic assessment are the concepts of mediation and social learning (Lantolf ,2000; Lantolf & Thorne 2006).These key components of DA have taken on special relevance with the advent of social networks and online communities through web 2.0 applications that are described by O'Reilly (2005) as an evolution from the linking of information to the linking of people with an increased emphasis on user generated content, data and content sharing and collaborative effort in Synchronous Computer Mediated Communication (henceforth SCMC).

SCMC provides a multimodal communicative environment in which learners are afforded opportunities to grow both linguistically and socially. SCMC offers learners opportunities to take notice of errors and make output modifications through visual salience of written discourse, self-paced setting and enduring nature of written turns (Lee, 2004; Lai & Zhao, 2006; Sauro, 2009).

The literature on DA is mostly confined to the boundaries of the classroom interactions and recent attempts to integrate technology to take charge of mediation ( Summers, 2008; Tzuriel & Shamir, 2002; Jacobs, 2001) conducted in interventionist DA in which mediation is not attuned to the needs of each individual learner.

The current study employs DIALANG structure section as a diagnostic tool to form the basis of interactionist DA in SCMC. As a diagnostic web-based assessment tool, DIALANG provides test-takers with scores related to the Common European Framework of Reference for Languages (CEFR). The main challenge leveled against DIALANG lies in the fact that the feedback given is not attuned to the learners'

ZPD, and proficiency levels obtained in the psychometric-based DIALANG are inadequate in pinpointing learners' future potentials for development. Given the collaborative nature of Web 2.0 and process orientation of SCMC which characterize constructivist paradigm, in which knowledge and meaning are seen as constructed rather than provided (Parker & Chao, 2007) ,online DA seems to be an appropriate means to assess students' performance. The current study represents a microgenitic analysis in a web-based qualitative inquiry. It employs interactionsist DA which follows Vygotsky's preference for cooperative dialoging in a SCMC environment using web 2.0 applications to shed light on learners' L2 grammatical development in writing. The present study sets out to open new horizons in DA implementation by employing the "boots trapping effect" of SCMC that reduces the cognitive demand of L2 language production (Blake, 2005), and Web 2.0 applications which allow for authoring flexibility, content creation, and the generation of new knowledge through collaborative interaction. The following questions guided the present study:

1-What does dynamic assessment in SCMC reveal about the microgenitic development of L2 learners' grammatical structure in writing?

2-What are learners' perspectives on SCMC-based DA in web2.0?

## 2. Review of Related Literature

### 2.1 Dynamic Assessment

Dynamic assessment is a new approach to assessment which is based on dynamic interaction between the examiner and the examinee in which the examiner mediates the examinee with support in the form of leading questions and prompts. It is the examinees' responsiveness to mediation that provides an indication of their likely future development (Leunng, 2007). Theoretically originated from the works of Vygotsky in general and his concept of zone of proximal development in particular , DA focuses on the learning processes and serves as a means of measuring the ZPD and is opposed to non-dynamic assessment that focuses on already learned products (Lidz,1987). Sternberg and Grigorenko (2002) point out that a central tenet of the DA approach is that it considers

abilities to be "malleable and flexible rather than fixed" (p.1). DA is generally classified into two categories: interventionist and interactionist. Interventionist DA involves quantifiable prespecified assistance in the form of pretest/ intervention/post-test format and is oriented toward quantifiable psychometric measurement. In interactionist DA, on the other hand, the qualitative interpretation of a person's learning potential is prioritized over measurement. Unlike interventional DA, which is well adapted to large-scale assessment, interactive DA is administrated individually in line with Vygotsky's concept of the zone of proximal development. The qualitatively oriented interactioist DA addresses learners' potentials for future development in a highly flexible way through individualised mediation.

Most DA studies (Aljaafreh and Lantolf, 1994; Poehner, 2005; Summers, 2008; Ableeva, 2010) implemented the microgenetic method as the general analytical framework. The microgenetic method primarily concerns the reorganization and development of mediation over a relatively short span of time (Lantolf, 2000, p.3). Mitchell and Myles (1998) describe microgenesis 'a local, contextualized learning process that can sometimes be traced visibly in the course of talk between expert and novice.' (p.198). Wertsch defines it as 'a very short-term longitudinal study' (1985, p.55).Gutierrez (2008) points out that microgenesis refers simultaneously to both the method and the object of study and she emphasizes that 'this conceptual duality makes microgenetic analysis a fruitful method to investigate learning (microgenesis) as it unfolds during interaction' (p. 2) .

Aljaafreh and Lantolf (1994) advocated assessment practices that include learners' potential level of development in novice expert interaction. They examined potential level of development through a microgenetic analysis. Lantolf (2000) observes that interest in microgenetic growth lies in the reorganization and development of mediation over a relatively short span of time .To determine the microgenetic development in the learner's interlanguage, Aljaafreh and Lantolf developed a 5- level regulatory scale utilizing two principles: the frequency and the type of assistance regulated by what they called the mechanisms of effective help relating to intervention within the ZPD. This mechanism requires that assistance provided to learners be

graduated, contingent, dialogic and tailored to the learners' ZPD. According to Johnson (2004 cited in Oskoz, 2005), the principal theoretical assumption behind a scale using Aljaafreh and Lantolf's two principles of type and frequency of assistance is that "the more explicit assistance the candidate requires, the less advanced the candidate is in his or her potential development within the ZPD" (p. 186).

The vast majority of interactionist DA research has been conducted in oral conversation in tightly bounded classroom context (Poehner, 2005; Summers, 2008; Ableeva, 2010). The possibility of applying interactionist DA to the newly developed Web 2.0 applications in SCMC as a ripe communicative context to observe students' potential level of development has not been explored in DA literature .

**2.2 SCMC in Web 2.0**

Computer mediated communication (CMC) is divided into two basic modes including synchronous (SCMC) which occurs in real time and asynchronous (ACMC) offline communication capacity (Levy & Stockwell, 2006; Luppicini, 2007; Pfaffman, 2008). In SCMC, participants can have real-time interaction via chat rooms, instant messengers, or video conferencing. They can post typed messages which appear on the computer screen and can scroll back and forth to review shared content. Several beneficial features have been reported in the literature which make SCMC a useful medium for conducting collaborative interaction. Warschauer (1997) indicates that SCMC enables quick feedback in real time interaction, a new hybrid form of communication that brings speech and writing together and finally obviates time and space dependence. It has been claimed that the visual salience of text chat, the self-paced setting and more processing time in SCMC increase learner' opportunities to take notice of errors, and to pay attention to linguistic forms, which in turn results in an increased quantity and quality of learner output (Kern, 1995; Chun, 1994; Warschauer, 1996 ; Kern & Warschauer, 2000; Shekari & Tahririan, 2006).

Sociocultural theory (SCT) as a theoretical framework has been increasingly applied to the studies of SCMC (Chapelle, 2001; Kern & Warschauer, 2000; Oskoz, 2005; Slabbery, 2000). It is believed that

multimodal SCMC (Thorne, 2008) - like all other human creations - should be considered a cultural tool that mediates the transformation process from lowermental functions to the higher, cultural functions (Vygotsky, 1978). Nguyen (2008) points out that SCMC offers learners access to two types of mediators which develop their cognitive processes: technical tools and other human beings.

SCMC evolved from the first generation of web which was characterized by information transfer and users' limited participation and publication into the second generation of web 2.0 that affords extensive collaboration in real –time interaction through multimodal discourse of online service providers such as Google wave, Skype, and Google talk. These platforms contribute significantly to collaborative interaction and social networking by integrating audio, video and text features to highly enrich the mediation process in DA.

Web 2.0 as the second generation of web includes an increased user generated content, data and content sharing, collaborative effort, rich media content, complex social interactions together with the use of various web based software and applications. The interactive nature of web 2.0 and its collaborative applications is associated with the social-constructivist view of learning in which knowledge and meaning are seen as constructed rather than provided (Parker & Chao, 2007).Web 2.0 applications foster interdependence between ideas, individuals, communities and information networks, supported by technology to use collective intelligence in rich and dynamic social environments, (McLoughlin & Lee, 2008). The highly enriched mediation in dynamic assessment through web 2.0-based SCMC contributes to the dialogic collaboration between learners and mediators which in turn results in learners' development beyond their current capabilities.

**2.3 SCMC-Based Dynamic Assessment in Web 2.0**

The collaborative features of SCMC in web 2.0 result in collaborative construction of knowledge that creates a new manifestation of Vygotsky' notions of scaffolding in ZPD (Beauvois, 1997). The multimodal discourse of SCMC affords learners collaborative dialogue through hypermedia. Hypermedia is the "computerized way of representing the semantic network in human memory through its nodes and links" (Liu

and Reed, 1995, p.16). Slaberry (1996) asserts that hypermedia systems are assumed to foster higher order thinking skills and extend learners' zone of proximal development.

There is a limited body of literature on dynamic assessment in SCMC within the SCT framework. We are only aware of research studies carried out by Oskoz (2005) and Salaberry (2000). Oskoz investigated how learners scaffolded each other in L2 Spanish chat sessions using Aljafreeh and Lantolf's (1994) pioneering regulatory scale. Oskoz (2005) argues that a shift in pedagogy from an individual product-based learning to cooperative process orientation demands new evaluation tools and new research agenda. DA, focusing on the process rather than on the product, presents itself as an alternative approach to assess students' performance in SCMC ( p.517) .In her inquiry into peer-to-peer mediation in online DA, Oskoz reaches the general conclusion that "it is possible to observe students' potential level of development in online chat" (p. 528).

Focusing on the effects of text-based online chat on L2 development, Salaberry (2000) compared the language of four Spanish learners in an offline setting versus an online setting. Salaberry claims that SCMC is more effective for development of Spanish morphosyntax. He found that the process of scaffolding and morphosyntactic developments were more evident in the online setting. Salaberry concludes that SCMC discourse may represent a pedagogically sound environment for L2 development. In the previous studies on L2 DA in SCMC, mediation in enrichment program which is one of the basic principles of Feurestian's mediated learning experience (MLE) and a cornerstone of DA, was carried out only in spoken form. The present study combines both written and spoken forms for mediation using the privileges of multimodal discourse of the collaborative web 2.0 and SCMC features of increased processing and planning time, slower pace of conversation and enduring interaction (Payne & Whitney, 2002).

## 3. Methodology

Following an SCT-based DA framework, this study gives priority to a qualitative approach which is best suited to the ZPD concept. Many SCT researchers advise basing the assessment of the ZPD on qualitative evaluation in order to shed more light on learners' development

(e.g.Minick, 1987; Lantolf and Thorne, 2006, Summers, 2008; Ableeva, 2010). Summers (2008) believes that, the underlying beliefs as set forth in SCT and DA reject the binary interpretation of data. Following the ideas of Smagorinsky (1995), he believes that when one tries to control for research effects by minimizing the role of the researcher or research tools, the belief that cognitive development is created in the interpsychological realm is abandoned. In the present study a qualitative approach is applied to interpret the data obtained during the interactionist DA sessions and transfer tasks. Based on these premises, the study implements the microgenetic method as the general analytical framework. Microgenisis as the object and method of inquiry is particularly suitable for the present study because it allows for the tracking of learners' development over a certain period of time. Moreover, it is highly compatible with collaborative web 2,0 technology and process-based SCMC that offer tracking systems to digitally record learners' microgenitic development of L2 grammatical structure over a three-month period .

**3 .1 Participants**

The participants in the study were two female Iranian university students who were selected through the following stages: First, the purpose of the study was briefly explained at the outset to the interested university students, it was clarified that the final selection of participants would be largely based on their having access to broadband internet at home. Second, interested students were asked to fill out web literacy questionnaire adapted from Hedayati (2005) (see appendix A) in both English and Farsi posted to their emails .Following a sociocultural perspective, it was expected that the data elicited through questionnaire and participants' profiles (see appendix B) would provide insights into learners' L2 learning and web literacy history that would allow better organization of the experimental stage of the study. Third, the volunteered participants were invited to download the web-based diagnostic test of DIALANG which is free and available at www.dialang.org . In DIALANG, the Common European Framework of Reference – CEFR (Council of Europe, 2001) – is the basis for the test framework and part of the specifications. Test results are reported on

the six levels of the CEFR scale, which ranges from A1 (the lowest level) to C2 (the highest level). They were required to take the structure section of the test and email the results to the researchers. On the basis of DIALANG proficiency levels two female students at A1 level were selected for later comparison for the degree of responsiveness to mediation. The reported diagnostic feedback was incorporated into the structuring of the enrichment program in SCMC-based ineractionist DA. The selected participants had one-to-one individual weekly DA sessions with one of the researchers as mediator that lasted forty minutes on writing assignments in Google Wave (GW) and Skype for a period of three months.

**3.2 Context of the Study**

After an analysis of various web 2.0 applications available online, the researchers selected the newly released Google Wave (GW) and Skype mainly for ease of use and allowing students to enjoy a wide array of collaborative tools such as highlighting and sticky notes in real time . Unlike other SCMC platforms, Google Wave allows access to immediate and live unfolding of the students' writings in real time, i.e. as they write, their drafts are shared on both screens. It also provides students with the opportunity to revise their drafts even after sharing them with their partners while their revisions are automatically tracked by the embedded playback application in GW. Playback lets the researcher slide through the history of the wave to see how it has changed over its history for later microgeitic analysis of development of the target structures.GW also provides enough time for mediators to plan tailored mediation to the learners' ZPD by monitoring their drafts as they type in GW.

The choice of SCMC in web 2.0 as the context of the study was largely motivated by the conception that the ZPD is not restricted to the individual's internal symbol systems alone, but includes the tools in a social context through which learners mediate thought and activity. Wertsch (1991) asserts that the mind "extends beyond the skin" (p. 14); that is, it is socially distributed and is a function of activity involving cultural tools ( Smagorinsky, 1995, p .197).

To ensure that students are acquainted with the features of Skype and

GW, the researchers took them to the university's IT centre at the beginning of the study for training in the use of the online communication tools. The data collection procedures formally started when the learners felt comfortable navigating these learning environments.

**3.3 Data Collection Procedures**

Data collection consisted of the following phases: Firstly, participants in the study were prompted to write a short paragraph focusing on problematic grammatical structures reported on the diagnostic feedback of DIALANG structure section. After analyzing the data , the researchers decided to focus on the development of modal verbs because they were difficult for both participants in the study. To ensure that learners received sufficient opportunity to focus on target forms they were engaged in different kinds of writing prompts through picture stories to be incorporated into their paragraph writing. The writing tasks were the same for both participants, but the follow up mediation was on individualized basis. In the second phase, students and the mediator worked together through the enrichment program using regulatory scale (table 1) that emerged out of the researchers' mediation with different students in their private conversation classes over Skype. Lantolf and Thorne (2006 p. 19) define mediation as "the observation that human beings do not act directly on the world-rather their activities are mediated by symbolic artifacts." Mediation is the process by which other-regulated activities are transformed into self-regulated ones. It is mediation that causes cognitive development.

The mediation in the enrichment program started with the most implicit contingent help in regulatory scale (level 0), what Aljaafreh and Lantolf (1994)called collaborative frame, i.e. the experts' mere online dialogic presence that triggers correction on the part of learners which represents the minimal level assistance available to the learners in the ZPD. It continued with written prompts using web 2.0 facilities of highlighting and sticky notes offered in GW(levels 1 to 4) and finalized with the most explicit spoken prompt (level 5) via Skype's audio chatting .See (table 1)

**Table 1:** Web 2.0 Regulatory Scale of Mediation from Implicit to Explicit Assistance

| Level | Type | Explanation |
|---|---|---|
| 0 | Collaborative frame | The experts' mere online dialogic presence |
| 1 | Yellow highlighting | Yellow highlighting of the erroneous sentence |
| 2 | Red highlighting | Red highlighting of particular erroneous section within the sentence |
| 3 | Using sticky notes for sharing web links | Using sticky notes consisting of related web links to target structure tutorials available online |
| 4 | Choice offering through sticky notes | Offering choices through sticky notes to raise the learners' awareness on the target forms, |
| 5 | Oral explanation and exemplification | The explanation and exemplification of form orally presented to the learners via Skyps' audio chatting. |

The enrichment program in the current study is based on the principles of interactionist DA in which the mediation emerges out of the cooperative dialoguing between the mediator and the learners; there are no a priori categories of mediation or hierarchies of prompts (Poehner, 2005). The regulatory scale in the present study is used flexibly just as a framework for the strategic behavior of the mediator. It is not meant to be prescriptive or to be generalized for ZPD interactions in other contexts.

In the final phase of data collection, interviews were conducted with students on the learners' perspectives on the whole process of online DA in SCMC. The semi- structured oral interviews (See appendix C for questions) were conducted by the researchers in L1 and lasted approximately forty minutes for each subject. The purpose of these interviews was to provide an opportunity for the participants to discuss their perspectives on online DA in SCMC. These interviews also provided the researcher with an opportunity to member check which is considered a step to establish trustworthiness in qualitative research (Merriam, 1997).

To evaluate mediation within the ZPD, Aljaafreh and Lantolf (1994) developed five transitional levels of mediation strategies to track learners' microgenetic development from other-regulated to self-regulated performance within DA sessions and transfer tasks. The five levels of strategy intervention have been implemented in Oskoz's (2005) study to assess learners' language development (Table 2 highlights the main points of each level. Following Aljaafreh and Lantolf's (1994 ) study,the criterion to represent microgenetic development in the present study was determined by the 'quality' and 'frequency' of help provided through mediation as the learners moved through ZPD in five transition levels(see table 2) toward the control over target structures. (Aljaafreh and Lantolf ,1994,p.470)

**Table 2:** Levels of internalization from other-regulation to self-regulation functioning Level description Adapted from Ohta (2000)

| Level 1 |
|---|
| The learner is unable to notice or correct the error, even with intervention. |
| Level 2 |
| The learner is able to notice the error, but cannot correct it, even with intervention, requiring explicit help. |
| Level 3 |
| The learner is able to notice and correct the error, but only with assistance. The learner understands the assistance and is able to incorporate the feedback offered. |
| Level 4 |
| The learner notices and corrects an error with minimal or no obvious feedback and begins to assume full responsibility for error correction. However, the structure is not yet fully internalized since the learner often produces the target form incorrectly. The learner may even reject feedback when unsolicited. |
| Level 5 |
| The learner becomes more consistent in using the target structure correctly in all contexts. The learner is fully able to notice and correct his/her own errors without intervention. |

## 4. Data analysis

Poehner (2008) argues that shifting our understanding of assessment from a criterion-referenced or norm-referenced perspective to a development-referenced perspective prioritizes development over psychometric concerns. This new goal requires a new qualitative concerns for data analysis, such as trustworthiness, triangulation and thick description. Summers (2008) asserts that the ability to trust research is of paramount importance. To establish trustworthiness in a study triangulation is used which involves using multiple data sources in order to gain a more comprehensive understanding of the case (Patton, 2002). In the present study, trustworthiness is ensured by the use of data triangulation. Online DA mediation sessions and transfer tasks between students and mediators were recorded. These recordings were analyzed for emergent microgentic development of target structures. Moreover, these analyses are supplemented with questionnaires and follow up interviews with students .The external validity was enhanced by offering thick and rich description of the research context and participants through recorded mediation sessions, questionnaires and interviews with the participants.

According to Darhower (2002) data reduction is necessary to maintain consistent and systematic data analysis. Reduction is achieved by the selection of language related episodes. Swain (2001) described language related episode (LRE) as ‘‘any part of a dialogue where students talk about the language they are producing, question their language use, or other- or self-correct their language production” (p. 287). Research has shown that LREs as mini dialogues in which learners ask or talk about language, or explicitly or implicitly question their own language use or that of others represent language learning in progress and therefore are the site of language learning (Swain & Lapkin, 1998; Swain, 1998). LREs contain linguistic problems that provide a record of the observation of moment-by-moment mediation within the ZPD. In the present study instances of dialogic engagement during DA sessions and transfer tasks in LREs are the unit of analysis. The researchers looked for some signs of development in the use of the target forms in each SCMC-based interactionist DA session which lasted for approximately 40 minutes to determine the learners potentials and their capacity to self regulate their

performance while engaging in DA sessions and more challenging transfer tasks.

**4.1 Language Related Episodes (LREs)**

The first language related episode (LRE) was taken from an interaction between the researcher (R) and Student 1(S1) as they worked together to evaluate and revise a sample of her writing. In the following excerpt, she produced the sentence "*when I came to the airport, I could asked the taxi driver," and the researcher offered assistance as the student attempted to overcome the modal+ tense problem in the following online mediation.

**Episode A Session 1( S1 )**

S1.When I came to the airport, I could asked the taxi driver…. (Level 1)

R. Highlighted the erroneous sentence in yellow.

S1.When I came to the airport, I could asked the taxi driver… (Level 2)

R. Highlighted the target structure error to zoom in.

Follow this link:
http://www.englishpage.com/modals/modalintro.

S1. When I came to the airport, I can asked the taxi driver

R. Provided web links on target structure lessons available online through sticky notes.

S1. When I came to the airport, I couldn't asked the taxi driver….(Level 4)

Which one is correct?

Could ask or could asked

R. Offered choices through sticky notes.

S1. When I came to the airport, I could asked the taxi driver… (Level 5)

R. Explained and exemplified the target structure orally over Skype.

This episode represented the mediation between researcher and S1 on modals in which he had to provide the learner with all sorts of implicit and explicit help covering all the levels of assistance from the level 1(the most implicit) to level 5(the most explicit) in the regulatory scale (See table 1).The data in this excerpt revealed that the learner was unresponsive to mediation on this structure and consequently in level1 of internalization of assistance which is characterized by the learners' lack of ability to notice or correct the error, even with intervention. (See table 2). Her repeated failure to grasp the target structure through mediation gave the researcher better understanding of her potential level of development because as Vygotsky (1978) points out, we often learn more about how a cognitive system operates when we observe it under conditions of failure and breakdown than when we observe the system functioning smoothly.

**Episode B Session 3 ( S1 )**

S1.I have a sister that she could speaks English and French.(Level 1)

R. Highlighted the erroneous sentence in yellow.

S1.I had a sister that she could speaks English and French.(Level 2)

R. Highlighted the target structure error to zoom in

S1. 1.I had a sister that she could speaks English and French.(level 3)

R. Provided web links on target structure lessons available online through sticky notes

Follow this link: http://www.englishpage.com/modals/modalintro.

S1.I had a sister that she could speak English and French.

Good, Bravo

Two weeks later, in episode B during session 3 the same problem occurred with S1. Once again, the mediator attempted to help the learner overcome the difficulty. This time, however, the learner reacted positively to less explicit assistance, and she was partially

responsive to mediation. It appears then that the learner's level of understanding had changed between the first and third sessions. In both cases, she was unable to control the structures independently and asked the researcher to help. However, the frequency and type of help offered changed. In other words, she basically showed signs of development in her ZPD in the second session by responding to less explicit help. The learner clearly moved up in her ZPD to level 3 of internalization of assistance in which she was able to notice and correct the error, but only with assistance from the mediator. Although the learner managed to produce the target structure correctly in the last sentence in mediation, the underlined faulty relative clause was not dealt with explicitly as it was not the main focus of the study. This raises the question of how to develop contingency plans to deal with the unexpected problems that occur through mediation.The above excerpt demonstrated microgenitic development of the learner from intermental to intramental plane. Unlike DA, in psychometric-based NDA, only the learner's independent performance based on zone of actual development (ZAD) would have been looked at, and this development would probably not have been visible.

**Episode C Session 2 (S2)**

S2.It is because she can speaks different language.(Level 1)

R. Highlighted the erroneous sentence in yellow.

S2.It is because she could speaks different language.( Level 2)

R. Highlighted the target structure error to zoom in

S2.It is because she could speak different language.( Level 3)

Follow this link: http://www.englishpage.com/

R. Provided web links on target structure lessons available online through sticky notes

S2. It is because she can speak a different language.

Good, Bravo

The data emerged in this episode demonstrated that the second student (S2) was more responsive to mediation than S1. She could notice the erroneous section requiring less explicit assistance and corrected the error through the online modal tutorial link provided in the sticky notes of level 3 of regulatory scale. Aljaferah and Lantolf (1994) argue that a learner who is able to produce a particular structure in response to more implicit forms of regulation is developmentally more advanced than one who needs more explicit and direct feedback for the same structure .The data evidenced that S2 could take responsibility for her autonomous learning by exploring the link provided. She was able to notice and incorporate the assistance which characterizes level 3 of internalization of assistance in ZPD.

**Episode D Session 4 (S2)**

S2.I lived with my brother and I couldn't to be happy in the house. (Level 1)

R. Highlighted the erroneous sentence in yellow.

S2.I lived with my brother and I couldn't to be happy in the house. (Level 2)

R. Highlighted the target structure error to zoom in

S2.I lived with my brother and I couldn't be happy in the house.

Good, Bravo

Three weeks later in episode D, the researcher traced an error in S2's writing on the same modal problem. As soon as the mediator highlighted the erroneous section in red, S2 corrected the error instantly. As a matter of fact what she needed for self-regulation was just a second chance with much less explicit assistance. The data highlighted the fact that S2 actually moved up to level 4 of internalization of assistance in which she noticed and corrected the error with minimal or no obvious feedback assistance. However,

the structure was not yet fully internalized at this stage since the learner sometimes produced the target form incorrectly in her writing. In order to investigate the internalization of the assistance provided in enrichment program, the researcher decided to take mediation into the new level of transfer tasks or what Pohner (2007) called transcendence activities .

Pohener (2007) points out that in DA, generalizations to hypothetical situations are replaced with concrete transcendence (TR) activities in which mediators and learners collaboratively carry out new tasks, with prior interactions serving as a point of departure. In session 5 both learners were asked to write a composition about the things that they couldn't do in the past but they can do now as a kind of transcendence to find out to what extent the learners were able to generalize their understanding of the target structure to new and more challenging tasks. Tracing the same modal + main verb construction in transcendence writings for both learners revealed evidence of microgenitic development. In addition to differences that emerged in DA sessions between the learners in their levels of internalization, a new set of difference surfaced in dialogic collaboration during transcendence. Although S2 gained a firm grasp of the construction and demonstrated the highest level of internalization of assistance using target structure independently and with more consistency in TR, S1 experienced some backsliding and needed more mediation to higher levels of self-regulation. Vygotsky (1978) argues that both progressive and regressive moves are viewed as two legitimate sides of the L2 development within the ZPD. It should be reminded that these two crucial stages of DA and TR are neglected in traditional assessment.

## 5. Discussion and Pedagogical Implications

The present study attempted to exploit the multimodal discourse of web 2.0 in conducting one-to-one interactionist DA by employing the "boots trapping effect" of SCMC that reduces the cognitive demand of L2 language production (Blake 2005), and Web 2.0 applications which provide for authoring flexibility, content

creation and generation of new knowledge through collaborative interaction. Web 2.0 collaborative features allowed for the integration of both written and spoken prompts into online DA to further enrich the mediation and obtain a richer understanding of the learners' microgenitic development in L2 structure in SCMC. The microgentic analysis of the LREs in this study highlighted the inadequacy of proficiency levels reported in the psychometric-based DIALANG results in pinpointing learners' future potentials for L2 grammar development. It was demonstrated that two learners who happened to be at the same A1 level had different potentialities for learning the target structure. If these two learners had been assessed in a traditional approach, the examiner would have probably concluded that neither of them could control the modal+ verb properly. The interactionist DA in this study revealed that the two students were clearly not at the same level in their understanding of this form. The first learner was not able to self-correct and needed very specific help to use the modal verbs. The second student, in contrast, actually understood the structure well and only needed a second chance to produce an adequate modal. Regarding the first research question, from a DA perspective we made different predictions of each learner's potentials for development. The findings in this study evidenced that it might be possible to obtain a richer and more accurate understanding of students' potential level of development in SCMC-based DA via web 2.0.

To find out about learners' perspectives on SCMC-based DA, a post-study interview (See appendix C for questions) was conducted in Persian with both participants in the study. Both participants indicated that along with the target structure, their web literacy has dramatically improved. This reiterates Simpson's (2005) position in which he points out that sociocultural theory takes a multi-faceted view of human development, and can apply to any new knowledge. Sociocultural theory thus allows us to view language learning as just one part of a learner's development. Tulviste (1991, cited in Smagorinsky, 1995) maintains that an environment, or overlapping social networks, can present a learner with a variety of types of

problems to solve. Development can thus take several directions simultaneously (p.195). Arguably, mediation in SCMC, not only resulted in the development of grammatical structure ,but aided in the development of the skills of electronic literacy, which constituted a part of learners' electronic communicative competence (Chapelle, 2001). As for the effectiveness of moves in regulatory scale, they both favored level(3) in which the learners were given opportunity to explore the web by following the posted links to the relevant web sites focusing on the target structure. This "autonomous constructivist activity" (Kessler,2009) reportedly enabled students to establish a sense of responsibility for the ongoing mediation, extend their ZPD and contribute generally to learning autonomy which involves simultaneous interdependence and independence through SCT lens.

Regarding the efficiency and effectiveness of CALL applications in instruction, ( Salaberry, 2000) argues in favor of the efficiency of the CMC context and claims that such efficiency does not necessarily entail an increase in the effectiveness of the instruction delivered in this way ( P.29). Contrary to Salaberry's claim ,the microgentic analysis of the data highlighted the fact that collaborative dialoguing through web 2.0 features of highlighting and sticky notes in this study resulted in L2 grammatical development as the learners moved forward within their ZPD represented in the levels of internalization from other-regulation to self-regulation functioning. Both participants in the study reiterated in the post study interview that highlighting made their errors salient and providing links via sticky notes have been effective in focusing their attention on the target structure and resulting collaborative interactions with the researchers. Arguably, the specific characteristics of web 2.0 based SCMC of visual salience and enduring interaction may increase the chances that learners will focus their attention on forms, thereby increasing the likelihood that grammatical development will occur in such an environment.

The potential fit between the capabilities of SCMC in web 2.0 as a cultural tool and the demands of the interactionist DA along with the situational constraints such as physical distance between

researcher and participants made SCMC a legitimate discourse for the study. Mann and Stewart (2000) describe this new emergent discourse as “electronic word” which combines characteristics of both oral and written language (p. 182). What makes GW stand out among all other SCMC platforms is the ability to monitor the unfolding of writing process in real time. This will provide unique opportunity to monitor and keep track of students’ moves before they finish the drafts. Lidz (1991) details the importance of planning when conducting DA. In fact, she states, "the assessor interaction with the learner needs to observe and test out how effectively the child utilizes self-regulatory process" (p. 147). Unlike Aljaferah and Lantolf's (1994) study which was conducted in tightly bounded classroom situation without any access to the students writing before they finish, the researchers in this study had plenty of time to prepare a contingent mediation plan tailored to students’ ZPD based on ongoing process of writing.

The instructional implications of DA in SCMC lies in the fact that the learners’ microgenitic development profiles can be used for development of emergent syllabus (Boettcher,2007)which is based on the emergent patterns of learners’ behavior and unpredictability of the course. The emergent syllabus consequently allows the development of individual learning plans for learners with different levels of responsiveness to mediation. By integrating SCMC into course syllabi, language educators provide learners with a virtually supportive learning environment, in which they contextualize their learning when they interact with other learners independent of time and space and exceed the limits of typical decontextualized classrooms. Moreover, the online interactions as a demonstration of learners’ interlanguage can be tracked and retrieved for further analysis of microgenitic development.

## 6. Limitations and suggestions for further research

A potential limitation of this study was the small sample size. This was, in part, the result of logistical constraints – such as limitations on access to broadband internet and the availability of participants –that were beyond the control of the researcher. AS Mitchell and

Myles (1998) argue in SCT-based research, although small-scale qualitative and interpretive procedures and commitment to argue in SCT-based research, although small-scale qualitative and interpretive procedures and commitment to ethnographic techniques have greatly enriched our insights to classroom processes, however, these research approaches are affected by some of the usual difficulties in developing casual explanation and generalizations through naturalistic research. Most research in SCT did not specifically address whether responses to implicit prompts in mediation led to L2 development. Gutierrez (2008) raises a crucial issue in SCT –based research and rightly questions" is it possible to claim that the L2 change observable during interaction does become internalized?" (p.231). Further research is needed to address the above theoretical challenges with larger population and in depth analysis not only to investigate the linguistic development but to focus on discoursal and pragmatic dimensions of communicative activity.

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## Appendix A

| **Web Familiarity Questionnaire** | | | |
|---|---|---|---|
| **Questions** | **never** | **Less than once a week** | **Once a week or more often** |
| 1- How often do you have access to the internet in the following places:<br><br>a. at home<br>b. at the university<br>c. in the library<br>d. in the net cafe | | | |
| 2-How often do you use internet? | | | |

| | | | |
|---|---|---|---|
| 3-How often do you use send and receive emails? | | | |
| 4- How often do you chat online in Farsi? | | | |
| 5- How often do you chat online in English? | | | |
| 6- How often do you use each of the following Web 2.0 pplications?<br>a. Skype<br>b. Google wave<br>c. Weblogs<br>d. Wikis<br>e. Social bookmarking | | | |
| **Questions** | **Not comfortable** | **Somewhat comfortable** | **Comfortable** |
| 7.How comfortable are you with using internet for language learning? | | | |
| 8.How comfortable would you be writing in English while chatting online? | | | |

## APPENDIX B
## Participant Profiles

| **Students** | **L1** | **Dialang** | **Gender** | **Age** | **Number of years studied English** | **The level of comfort with web 2.0 applications** | **The frequency of using online chatts** |
|---|---|---|---|---|---|---|---|
| S1 | Farsi | A1 | F | 19 | 5 | comfortable | Most of the time |
| S2 | Farsi | A1 | F | 22 | 6 | Somewhat comfortable | often |

## Appendix C

### Questions for semi-structured interview

1-Describe your overall experience of the online exchanges with the mediator.

2. Tell me about the moves during the online mediation that were particularly helpful or confusing.

3. What were the advantages and disadvantages of the web 2.0 applications of Skype and Google wave used in the study?

4. What types of assistance provided through levels of regulatory scale were the most and the least interesting? Why?

5. Did you find SCMC an effective medium to enrich mediation in online DA?

6. As the weeks passed by in the study, how did you feel about your development of the target structure?