

## **ID 019: Mediated Learning to Foster Language Competences for Professional Purposes: Ecological Dynamic Assessment**

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### *Abstract*

This investigates the mediation that occurs between learners in an online learning environment using asynchronous dialogue to complete tasks which have no pre-determined endpoint. The mediation between the learners evident in the dialogue is attributed to the tasks that are centered around the completion of a project, that has an 'improvable object' (IO), such as a poster or PowerPoint presentation. Learner-learner online dialogue was indicative of interactionist dynamic assessment. This paper examines the role of the syllabus and the mediation between learners and compares that with the research of Feuerstein's LPAD model. Evidence of similarities between the learner's IO and Feuerstein's dynamic assessment tasks will be discussed.

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### *Introduction*

The research put forth in this paper outlines two key facets of the educational process. The first is that learners require experiences as they progress through their education and the second is that through the teacher's role becoming one of a facilitator, the onus is put on the learners to mediate each other through the completion of their tasks.

I will examine first, the experiences accrued by learners through a syllabus which provided learners with different types of tasks, each requiring a different set of skills, and requiring the learners to collaborate with each other. Second, the changes to the uploaded files or the 'improvable object' (IO) (Wells, 1999b) during the process will be compared to the tasks used in interactionist dynamic assessment practices (Feuerstein, Feuerstein, & Falik, 2010; Tzuriel & Shamir, 2007). Third, the dialogue from the learners will be used to showed instances of interactionist dynamic assessment (Poehner, 2008), through the analysis using mediated learning experience (MLE) scales (Lidz, 1991, 2002). The results will indicate that when learners are provided an environment to collaborate and provided with tasks that have them focus on an IO, interactionist dynamic assessment instances occur. The learner dialogue will be the source of data to provide evidence of this.

### *Context*

The learners for this research were 36 first year undergraduates in a university in northern Japan. They were students in their first semester of university and belonged to either the faculties of agriculture or engineering. The course was general English and most instructors who teach classes such as this focus on grammar or use general conversation textbooks such as the Interchange series (Richards, 2012), which does little to assist them in the language they will use in their career.

The basis for the syllabus created here was the policies created by the Ministry of Industry, Trade, and Economy (METI, 2010) requesting universities to build programs to help learners become 'global human resources', stressing the need for communication abilities, abilities to work in teams and understand different strengths of people, and abilities to plan and develop projects and develop work

skills. The syllabus was project-based with the onus on the learners to work in groups to plan their projects, develop their own content, and bring their projects to completion. The main tasks of the syllabus included; a main group project, a group workshop presentation, creating two assessment rubrics, a class debate, an individual presentation, and four short speeches about a graded reader (The Extensive Reading Foundation, 2017). Learners could study English through CLIL (Content and Language Integrated Learning) which has a dual focus: simultaneously promoting the content mastery and language acquisition, an amalgam of both subject learning and language learning (Coyle, Hood, & Marsh, 2010). Therefore, the focus was on being able to explain content, while implicitly learning English.

### ***Learning Environments***

Two learning environments were provided for the learners. One was the face-to-face weekly 90-minute class where the learners could discuss their projects with the teacher present to answer questions. The second was the online learning environment using the learning management system (LMS) Moodle (Dougiamas, 2011). Online forums were used to allow the learners to collaborate online, share files, and have a record of their discussions. Other components of the online course included assignment upload areas, peer-assessment functionality, and general course guides and weekly in-class schedules.

One of the goals of the course was to have learners interact as much as possible with other learners by creating new groups for each of the collaborative projects (main project, workshop, debate, assessment rubrics) as well as encourage learners to move about in class and discuss their projects with other groups to look for 'connections' between topics. Putting the onus on the learners to plan and develop their own projects proved difficult initially as they were used to a lecture-style course from their high school years (Hull & Saxon, 2009).

Yet, this created an environment which, in ecological terms is identified as a sympatric, symbiotic environment (Collin, 2004) where learners interact and their interaction was beneficial. This learning environment fostered a higher learner agency (van Lier, 2004) and autonomous learning (Oxford, 2003). The resulting dialogue was examined and it was determined that the learners were assisting and mediating each other during these tasks and were adopting the role of 'the more capable peer' (Vygotsky, 1978). The theory underlying the analysis will be discussed now.

### ***Theoretical background***

#### ***Activity theory***

Activity theory (Daniels, 2001; Engeström, 1987; Leont'ev, 1978) (figure 1) was the underlying theory used to understand the interaction between the learners in their online environment as they worked toward completing the tasks.

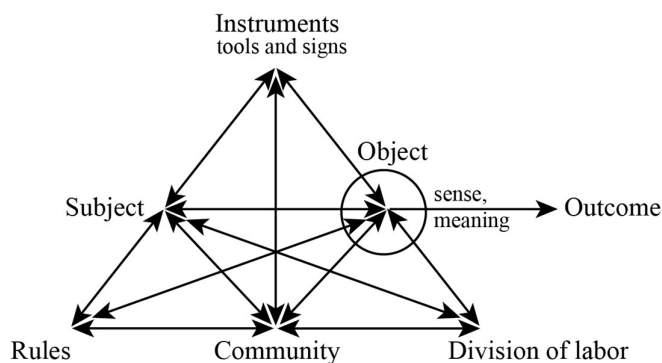


Figure 1: An activity system (adapted from Engeström, 1987, p. 78)

The subject will be understood as the group of learners with the object of the activity as their focus; 'that is what connects [their] actions to the collective activity' (Engeström, 1999, p. 31). During the projects, the objective was to have the learners jointly and collaboratively work to create and improve a 'knowledge artifact' (Wells, 1999a, p. 113), coined the 'improvable object' (IO) (Bereiter & Scardamalia, 1996; Wells, 1999b) such as 'a material artifact, ... an oral narrative or script, ...or an account of a significant historical event' Wells (1999a, p. 113).

The 'object' of their activity (Wells, 1999a, 1999b), or the 'improvable object' (Bereiter & Scardamalia, 1996; Scardamalia, Bereiter, & Lamon, 1994; Wells, 1999b), was where the learners' actions through dialogue and meaning-making are directed, transforming the object until it reached a stage where the learners considered it to be complete.

The components of the activity system are outlined below.

**Table 1: Activity system elements. (cf. Engeström & Sannino, 2010, p. 6)**

Elements	Description
Subject	The learners within one of the main project groups
Object	The IO the learners are creating. The object is turned into outcomes with the help of tools and signs, such as computers, Internet, computer software, and language.
Community	Comprises of the learners and groups who share the same general object, and the sympatric-symbiotic environment of the class that contribute ideas or information to the members for other tasks. Also includes the university faculty and administration staff.
Division of labor	The learners determine their own division of labor, dividing the work either based on what needs to be done, or by a decision from a group member.
Rules	The basic guidelines regarding etiquette in the forums and the basic outline of the tasks.
Outcome	The new skills that are obtained through collaboration, through creating and researching, working in teams, communicating in the L2. For the learners, the outcome is the IO that they have brought to completion.

### *Interactionist Dynamic Assessment - LPAD model*

Learners mediating dialogue in the online forums, as they worked toward bringing their IO to completion, was indicative of interactionist dynamic assessment. Dynamic assessment (henceforth DA) (Feuerstein, Rand, Reimer Jensen, Kaniel, & Tzuriel, 1987; Lidz, 1995; Minick, 1987; Poehner, 2008; Poehner & Lantolf, 2005) is used to assess learners' potential through mediation. During the assessor-learner mediation, the assessor can recognize where the learner may need assistance and can assist the learner's development in their zone of proximal development (ZPD) defined here;

'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' (Vygotsky, 1978, p. 86).

Interactionist DA is where 'assistance emerges from the interaction between the examiner and the learner, and is therefore highly sensitive to the learner's zpd' (Lantolf & Poehner, 2004, p. 54). In this interactionist type, Feuerstein (1979) argued that the learner's need for assistance should determine the type of interaction, so there is no pre-determined script for mediation and as the interaction, or mediation, changes based on the learner's need for assistance. He used his Learning Potential Assessment Device (LPAD) dynamic assessment model to create 'tasks' that could be used in the mediating process to determine the learner's cognitive modifiability. The LPAD model below (figure 2) represents a multidimensional tool from which a large number of assessment tasks could be constructed (Feuerstein et al., 1979). These tasks created by Feuerstein focused around three main areas; the complexity of the task, modalities, and mental operations. The center of the cylinder represents an initial task or problem presented to the learners, indicated as the 'initial task' (Feuerstein et al., 1979, p. 93).

The layers of the diverging concentric circles indicate changes to the task's 'increasing ... complexity' (p. 93). The segments of the circles represent the 'different modalities for the presentation of the same problem' (p. 93) such as pictorial, spatial, verbal, figural, or numerical. The vertical layers of this model represents mental operations that are required to solve a problem, such as making analogies or mathematical calculations (p. 94).

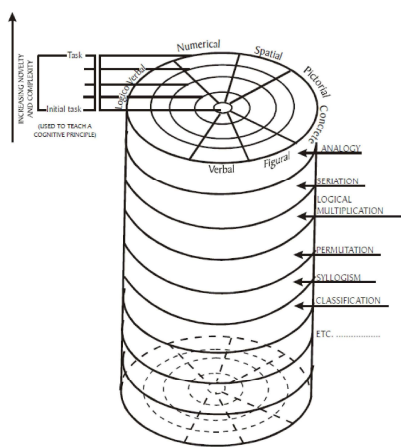


Figure 2. LPAD model (Feuerstein et al., 1979, p. 93).

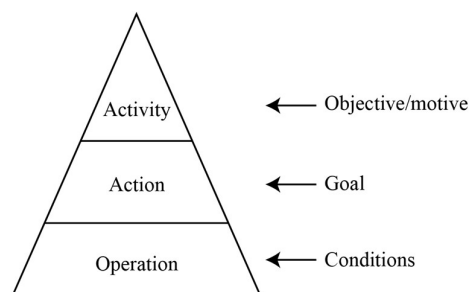
By increasing the difficulty of the tasks, adding different modalities, and by requiring selected mental operations, Feuerstein could create many different tests to derive data on different criteria (Feuerstein et al., 1979).

The IOs the learners were creating had a variety of modalities, and also contained instances of mental operations. Through their mediation the learners were assisting each other, hence similarities between the mediation of the learners in their groups to create their IO and the mediation occurring during interactionist DA using a task created using the LPAD model.

The group tasks provided the learners with opportunities to manage their tasks, manage the direction of their focus, and to search for appropriate content for their presentations. This required learners to interact and mediate their learning. While the learning process and mediation is understood to be between a teacher and a learner, there is no reason why mediation cannot be fostered between learners.

### **Task difficulty and skills development**

The complexity of the tasks were created through the syllabus design providing opportunities for the learners to accumulate experience and skills. The experiences and skills required to complete tasks needed to be introduced early on in the course so that at later stages, these experiences could be applied at higher levels of activity. The hierarchical levels of the activity system (figure 3) can be used as a guide to examine and identify operations, actions, and activities as the learners move from task to task. Learner development can be identified, specifically with respect to skills development. An example provided in Daniels (2001) from Leont'ev describes the process of learning to drive. Switching gears as an operation is 'formed as an action subordinated specifically to this goal' (p. 87).



*Figure 3: The hierarchal study of activity (from Daniels, 2001, p. 87)*

The objective for each part of the syllabus was to introduce new actions that could reach a level of automaticity, becoming operations, thus allowing the introduction of more complex actions (Wells, 1999b). 'An activity can lose its motive and become an action, and an action can become an operation when the goal changes...' (Davydov, Zinchenko, & Talyzina, 1983, p. 36, cited in Kuutti, 1996, p. 32).

For example, in the first activity, the learners upload files into the forums. The initial operations were: clicking the computer mouse to the correct URL page, searching for and choosing the correct file to upload, and uploading it. The action of uploading then became an operation for subsequent activities. Learning to access an online forum and upload a file is a skill that needs to be learned prior to learners engaging in a complex collaborative dialogue. Unnecessary tensions in the activity system may occur (Barab, Barnett, Yamagata-Lynch, Squire, & Keating, 2002) if introducing a task and new technologies simultaneously.

Through these various tasks that the learners encountered and completed, led to the overall experiences that they use later in the course. Examples of skills and the tasks that they are encountered are shown in the table 2 below.

**Table 2. Examples of skills, the associated activities, and increasing complexity.**

Skill	Rubrics	Graded Readers	Individual presentation	Workshop	Debate	Main Project
Speaking		o	o	o	o	o
Report writing		o				o
Reading/ summarizing		o	o	o	o	o
Using online forum	o			o	o	o
Submitting online	o	o	o	o	o	o
Using Word	o	o				o
Using PowerPoint			o	o	o	o
Creating poster						o
Doing group work	o			o	o	o
Using Excel				o		o
Assessing peers				o		o
Scheduling with group	o			o	o	o
Q & A				o	o	o

### *Dialogue Analysis*

The learners' dialogue that was analysed belonged to the PET bottles (Main Project) group and consisted of four learners (s1-s4). During the 15 weeks of the course they were required to create a poster and PowerPoint presentation slides and use them in a presentation, as well as create two assessment rubrics and use them to peer assess, as indicated by the cells bolded in table 3 below. Over the duration of the term, the learners in that group posted 123 forum entries and 75 file uploads over a period of approximately 14 weeks. The uploaded files primarily were Word, PowerPoint, or Excel documents. As well, learners also posted messages within the forum message area. The messages pertained to informing others of changes to the uploaded files, URLs of sites containing information relevant to their research, survey results, and content.

**Table 3: Timeline of tasks in the course for the learners s1-s4**

Task / week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
Main Project	F	c	c	c	c	F	c	F	S	c	c	c	F	S	S	U
Rubric		F	c	U								F	U			
U	Upload file (report, slides, rubric)															
F	Face-to-face discussions with teacher observing															
S	Speaking in-class (presentations, posters, book speeches)															
c	Task is continuing online and the onus is on the learners to complete it															

Throughout the term, the learners were also required to collaborate in groups to give a group presentation on an environmental issue, take part in a class debate, peer-assess two presentations, give an individual times PowerPoint presentation, and give four short speeches on their impressions of four graded reader books (The Extensive Reading Foundation, 2017).

#### **LPAD - Modalities**

Learners used different modalities as they progressed through the creation of the poster files for the main project. These modalities were in the form of text, numerical data, graphs, figures, pictures, formatted text, and chemical formulas. Examples of different modalities with examples from the dialogue are shown in table 4.

**Table 4: Modalities in the IOs**

Modalities	Example from the dialogue data
text	S1 uploads the first poster file containing text information about PET bottles. This text is in its own textbox, separating it from the other information on the page.
numerical data	S3 uploads his interview data. This was gathered through an interview with university students.
graphs	S4 adds a graph, replacing the numerical data. She also adds numerical data to the graph.
figures	S3 adds a figure of a map with a line indicating distance between two cities. This is to create an analogy.
pictures	S2 provides a picture of the environmental impact on animals.

different formatting of texts	S1 highlights the text '14%' making it bold and with a different color background. Prior to that it was smaller and not bold.
chemical formulas	S2 provides the molecular formula for BPA. This is accompanied by formatted text and other words associated with BPA, such as 'dangerous and cancer'.

### *LPAD - Mental Operations*

Learners used mental operations such as analogies, multiplications, syllogism, categorizations, and extrapolations throughout the creation of the poster using different modalities. Provided in table 5 are the mental operations used by the learners with an example is given from the dialogue.

**Table 5: Mental operations in the IOs in this study**

Mental Operation	Example from the dialogue
analogies	S4 uploads a figure to help make the comparison between the amount of oil used in the production of PET bottles with the possible distance one could drive with the same amount of oil. This was not done in his initial poster upload. (modality: figure created by s4)
multiplication	S3 calculates the amount of oil used based on Pet Bottle consumption and density of oil. This was done using Pet bottle consumption and manufacturing data, and oil properties information. (modality: numerical)
syllogisms	S1 concludes that from the interview data, most of the interviewees are not environmentally friendly. This was determined from the data he collected during the interviews. (modality: text)
categorization	S1 divides the poster up into sections based on topics that should be covered. Until that point, information was randomly being added to the poster by the group members. (modality: text)
extrapolation	S4 extrapolates the Pet Bottle consumption data for the summer months. She has collected 3 months of data for the spring months, and she is anticipating that the hotter weather will cause an increase of Pet Bottle use. She confirms this when she collects the data for June with s2 in post 1-81. (modality: formatted text)

### *Instances of mediated learning experiences*

Lidz (1991) developed a rating scale based on the clinical work of Feuerstein (Feuerstein et al., 1979; Jensen & Feuerstein, 1987), called the mediated learning experience (MLE) scale as a guideline for assessor behaviour. The role of the assessor/mediator is to provide intervention or interaction based on the content being discussed (Lidz, 1991) but as will be argued for the learners in this study, not for cognitive modifiability or to discover the learner's potential, but in order to move the IO to completion. An MLE can consist of the following components outlined in table 6.

**Table 6: A summary of MLE instances (cf. Feuerstein et al., 2010; Lidz, 1991).**

MLE codes	Description
Intentionality	an active attempt to influence another learner
Reciprocity	a response to mediation (a learner)
Meaning	learners select information meaningful to the group
Transcendence	involving concepts not in the immediate present
Competence	a feeling of competency following mastery
Sharing	the sharing of views and reactions on the same object or demonstrating how something should be done
Psychological Differentiation	the degree of encouraging without the intent of imposing or the focus on product or process
Goal-directedness and planning	managing the task

### *Dialogue examples*

In this section, dialogue examples from the four learners (s1-s4) will be used to show evidence of learner-learner mediation.

To begin with, s1 requests the learners in the group to interview other students as a step to manage the task. He provides sample questions that they can use to gather the data using concepts not in the immediate present.

s1- Good evening! Please interview the students of the subject same as ourself about next questions by next Tuesday. 1.How many pet bottles do you use in a week? 2.Do you have your own my bottle?

(MLE: Goal directedness, Transcendence)

This is followed by an example of reciprocity where s4 responds with data collected.

s4 - OK. Thanks S1! I have 23 people's answers. I'm sorry to be little. • How many petbottle do you use in a week? 0→1 people 1→5 people 2→4 people 3→9 people 4→no people 5→4

people • Do you have your own my bottle? Yes→8 people No→15 people (MLE: Reciprocity)

After the data has been collected, s1 creates a graph and puts it into the poster. He attempts to get the others to think of what to write under the graph as an explanation and at the same time is managing the task. His file upload lets the others know what he has done.

s1 - I put the graph of the interview. Let' think about the result! Uploaded File: Pet bottles poster 7.docx (MLE: Intentionality, Goal-directedness, Sharing)

In a following post, s3 provides his idea through reciprocity. His request for others to contribute is an example of intentionality.

s3 - I suggest that we should write this " We need to have my bottles to reduce emission of CO2"

Please give another ideas!!! (MLE: Reciprocity, Intentionality)

During the creation of the poster s4 attempts to influence s1 to change his part of the poster by suggesting changes.

s4 - I looked S1's poster. In left page, how about cutting "All of collected pet bottles~"? Because vsiter can image that thing,I think. And "14%" is good impact word, let's stand out.

(MLE: Intentionality)

In the following post s1 responds and has made some changes, an example of reciprocity. He uploads his file to indicate what he has done.

s1 - Thank you for advising! I cut the sentence. I think it is easy to see for us. File upload: Pet bottle 13b.docx (MLE: Reciprocity, Sharing)

Evidence in the dialogue shows that the learners are mediating each other during their process of creating their IO, and there is evidence that the tasks Feuerstein has developed for his DA purposes are identical to the IO the learners create through this mediation, both in modalities and mental operations. The complexity of the tasks was shown to be done through the syllabus design. This indicates that the IO the learners are pushing towards completion can be considered 'tasks' that fuel their mediation.

### **Conclusion**

In this paper, learner experiences and learner mediation were examined in a CLIL classroom in a first year general English course. The analysis of the online dialogue revealed evidence of interactionist DA as the learners developed different experiences and skills during the process of completing an improvable object; their poster presentation. This IO was similar to the tasks developed through Feuerstein's research in his LPAD model indicating that the learners were developing their own 'tasks', fueling their mediation.

The syllabus had been designed to provide learners with experience to acquire abilities proposed by the METI, that could be used once they entered the workforce. The evidence that interactionist dynamic assessment can occur between learners provides opportunities for further research in CLIL, dynamic assessment, and online syllabus design.

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