

# Tool-mediated collaborative learning: Peer-assessment workshop case study

**Mark de Boer**

*Iwate University*

**Simon Townsend**

*Iwate University*

*In this paper we will discuss an action research project where students created an article and also created the assessment tools to assess it. Through collaborative tool-mediated learning, students shared language both to create the article and to create the assessment criteria. In creating the assessment tools and then using the tools to assess, students also developed the skills to learn how to assess. An adapted model of the third generation activity theory is also introduced to identify the processes of how this type of assignment unfolds, how the learners learn and also identifies the zone of proximal development through the process.*

## Introduction

In this case study we are looking at the relationship between language acquisition and collaboration in tool-mediated learning. Students collaboratively create assessment criterion that will be used to assess an article they write. Both the assessment criterion and the article are done face-to-face in a classroom environment and on-line using Moodle (Dougiamas, 2011a), a Learning Management System (LMS). Activity Theory (Engeström, 1999a) will be applied to this teaching context and we will propose a modified third generation activity theory model to show how collaboration benefits language acquisition and, from the other perspective, how communication increases collaboration skills. In tool-mediated learning the emphasis is given to learning processes, and to the ways in which students are encouraged to participate, share, explore, collaborate, negotiate, present, critically reflect and co-assess (McConnell, 2006). To evaluate the process

and to measure their development, the study was repeated over two stages. This paper will look primarily at the process and the assessment results.

In the first part of this paper we will examine the pertinent literature, then we will move on to the methodology and at that point introduce the third generation activity theory adapted model. Then we will discuss the structure of the class and the lessons before moving onto the discussion of the results and the conclusion.

## Literature review

### *Tool-mediated learning*

Tool-mediated learning is a term that defines an environment where students use tools such as computers and language to mediate their learning. Although Blended Learning is a popular term for an environment that “combines face-to-face instruction with technology-mediated instruction” (Graham & Dziuban, 2008, p. 270), in this paper we will be using “tool-mediated learning,” a more Vygotskian appropriate term (Bonk & Cunningham, 1998; Cole, 1999; Engeström, 1991; Li, 2010; Vygotsky, 1978), in lieu of “blended learning.”

### *ICT contents*

The classes in this case study were structured around an ICT contents project at Iwate University (deBoer, 2011a). These classes are English communication classes, but English is not overtly taught, but rather English is the medium of instruction. Videos are used as part of the curriculum that relate to the students’ area of study in the university, which in this case are humanities students who study environmental issues, so the videos that were selected for these students were based around environmental issues.

### *Collaboration*

The process of collaboration is a key factor in the lessons for this case study. Peer support and collaborative assessment helps students extend their academic skills and abilities. It seems that sharing and reviewing each other’s work motivates them to extend their normal approaches to learning and helps them become more sophisticated in their thinking (McConnell, 2006).

### *Assessment*

Both formative and summative assessment (deBoer, 2011b; Taras, 2005) are essential in the learning process. Collaborative peer-peer assessment (McConnell, 2006) was integrated into the task as students were required to assess each other’s assignments as part of the formative assessment in the course. Stahl (2006) states that by integrating the assessment into tasks, it reflects real-world assessment rather than simply an assignment with artificial assessment attached at the end. In order to prompt collaboration, the students were given the task of creating assessment criteria to peer-assess the assignment that they were creating. In this study, the students can benefit both from peer-feedback formative assessment followed by collaboratively constructed peer summative assessment. McConnell states “... students involved in networked collaborative assessment actively and critically reflect on

their learning and on the benefits of collaborative assessment” (2006, p. 142). If lecturers are the only major source of judgment about the quality of learning and assessing, students do not learn about the quality of learning. Students developing assessment experience gives them the know-how and skill to assess their own learning. It is likely that this skill can be transferred to other lifelong learning situations and contexts. Equipping learners with such skills should be a key aspect of the so-called “learning society” (Boud, 2000). By merely providing them with the assessment and having them work in isolation to learn English as a subject defeats the very nature of learning English to begin with. Resnick (1987) states that the gap between schooling and what we actually do in the work force is becoming larger. By providing the students with additional skill sets, we can begin to shift their mindset to teach them how to learn. Students need to find a new way to do their schoolwork.

### *Rubrics*

A rubric is a set of assessment criteria in which each criterion is evaluated under a set of standards (van Gog et al., 2008). A rubric was collaboratively created by the students and then implemented into the Moodle Workshop Activity (Dougiamas, 2011b) by the teacher. During the assessment phase students use the rubric as a guide to evaluate their peers’ work. Although McConnell has suggested that students may be reluctant to assign “pass” or “fail” to their peers (2006, p. 143), using a rubrics type of assessment criteria within the **LMS** does not force the students to assign an actual grade. Each criterion has a grade attached, but during the assessment process the students evaluate other student’s work based on the criterion only and therefore the assessment becomes qualitative. The students are also graded on their ability to assess, so being fair on their part also reflects on their own grade. The rubrics used in this case study can be seen in Appendix A.

### *Tools-and-results*

Tools are artifacts that humans use to establish an indirect, or *mediated*, relationship between ourselves and the world (Lantolf, 2000). These are material objects such as computers and telecommunications networks (Cole, 1999) as well as symbolic tools such as numbers, art, music and above all language (Lantolf, 2000). In Vygotskian thinking, we create tools in order to attain a particular goal and without these tools this goal would be very difficult or impossible to achieve (Negueruela, 2008). There is a difference though, in creating a tool for a purpose (tools-for-results) versus the process of creating a tool, which will be part of the final product (tools-and-results). Newman and Holzman (1993) argue in making the distinction between tools-for-results and tools-and-results, tools-for-results are tools that are constructed with a specific purpose or functionality in mind. The goal of the tool meets the reason for doing something, for instance quiz to compel my students to study to achieve a particular communicative goal. Tools-and-results on the other hand can be the process of creating an assessment criteria rubric that is also a result of the students’ learning experience. In agreement with Negueruela (2008), conceptual development is fostered through tool-and-result activity, and to provide the students with assessment criteria to assess with; being a tool-for-result activity, would fail to promote conceptual understanding of the entire assessment process. It is imperative to have the students learn the process of assessment through the process of developing the assessment criteria. “Only a tool and result approach to mediation fully realizes human development

as a transformative revolutionary activity. Engaging learners in their own symbolic tools opens the door to developmental trajectories that cannot be predicted a priori or mapped onto a pre-determined course syllabus" (Serrano-Lopez & Poehner, 2008, p. 327).

### *Second generation activity theory (Engeström, 1987, cited in Daniels, 2001, p. 89)*

Stahl (2006) states that researchers need to turn to a number of theories of communication, education, and cognition when trying to understand how to design classroom pedagogies, since the goal of providing effective computer support and learning is complex. Collaborative interaction, knowledge building, and activity theory are such theories. Moving away from the traditional classroom, where the students focus on the course material so that they can pass tests (Engeström, 1991), the second generation activity theory (Fig. 1) is applied to this context where the focus of the students is on the process of development. "The importance of the second generation of activity theory was that it brought interrelations between the individual subject and his or her community into focus" (Daniels, 2001).

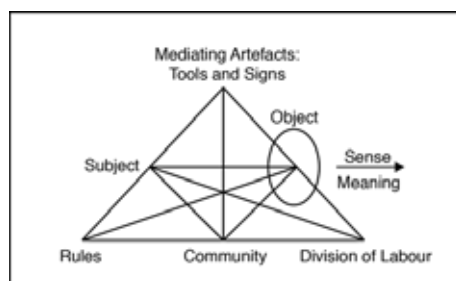


Figure 1. Second generation activity theory model (Engeström, 1987, cited in Daniels, 2001, p. 89).

Students study to become expansive learners "so that they can design and implement their own futures as their prevalent practices show symptoms of crisis" (Engeström, 1991, p. 256). The structure of the classroom and the approach to the lessons become very different. The subjects of the system are the students of the classroom who interact with members of the community. The community could be professors in the university or outside into the world through internet or e-mail. Students use tools such as the **LMS** to share information. The division of labor is decided amongst students, delegation of roles based on their strengths and weaknesses make the collaboration much more effective and contributes to knowledge building. Students work collaboratively and their process is in an expansive learning cycle (Engeström, 1999b). This will be examined further in the paper.

### *Third generation activity theory (Engeström, 1987, cited in Daniels, 2001, p. 92)*

The third generation activity theory (Fig. 2) was "built on the idea of multiple interacting activity systems focused on a partially shared object" (Engeström, 2009).

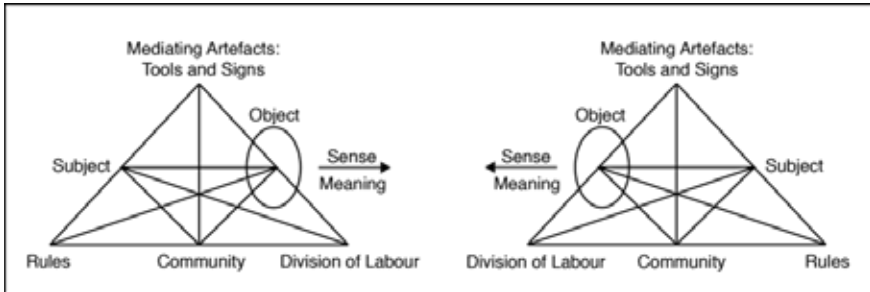


Figure 2. A two-system activity theory model designed at the development of the third generation activity theory (Engeström, 1987, cited in Daniels, 2001, p. 92)

The object of a collective activity is constantly changing and through the constant negotiation and struggle between different goals and perspectives of the participants activity can be achieved (Engeström, 1999b, cited in Daniels, 2001). The object of each system has a collectively meaningful object constructed by the activity system (object 2) and to a potentially shared or jointly constructed object (object 3; Fig. 3). We will examine this in more detail in the theoretical framework section of methodology.

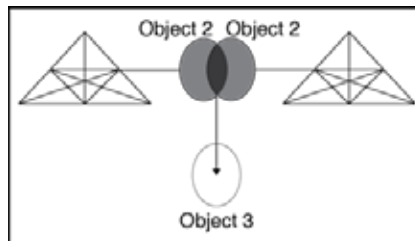


Figure 3. Third generation activity theory (Engeström, 1987, cited in Daniels, 2001)

### *Language acquisition*

The language that is developed is essentially used to acquire more language or to further the language development. Through face-to-face discussions (Long & Porter, 1985) and through online collaboration, students are also able to pick up additional language from other students. The focus is not on learning the language for a test but doing something that results in needing the language, and therefore the language is potentially acquired (McConnell, 2006). Socio-cultural theory proposes that through joint activity, learners can construct knowledge collaboratively. This co-construction of knowledge engages learners in cognitive processes that are implicated in L2 learning (Lantolf, 1996). Broadening the spectrum though, the subject is not just the individual, but can also be the classroom environment (Engeström, 1991). The community then becomes the area outside of the classroom, or external factors such as the collaboration that occurs inside the **LMS** outside class time or even just the use of the internet for research on a specific project. By broadening this community base, students are exposed to a much larger environment of English than

they normally would encounter in a classroom EFL environment. Gathered knowledge can then be collaboratively shared between students either through asynchronous chat in a forum or in face-to-face dialogue in the classroom. Swain (1997, 2000) found that learners in collaborative dialogues were able to achieve what none of them was able to achieve individually and the solutions students reached during these dialogues were retained in their language resources system. DeBoer (2009, Unpublished thesis) and later Muller & deBoer (2012) also showed that scaffolding played a large role in the student's language development. "Scaffolding that ensued came from misinterpretation or misunderstanding in their explanations, or realizing that there was a lack of knowledge required to facilitate understanding. Peers became a meaning testing ground in a kind of repair strategy milieu" (2012, p. 160). Social interaction in the classroom or through communication online engenders the Zone of Proximal Development (**ZPD**; (Vygotsky, 1978). He describes the **ZPD** as "... the distance between the actual development 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" (ibid, p. 86). A common assumption is that we learn language to communicate, yet with Vygotsky's approach, we attempt to communicate, and in doing so, acquire language (Scovel, 2001).

## Methodology

In this section we will discuss the structure of the classes, what was done in the classes, and then the theoretical framework will be discussed and of what we are examining in this case study.

### Participants

This is a first-year university communication class with the focus being on content-based curriculum using tool-mediated learning. There are two 90 minute classes a week and although they are taught by two teachers (the authors) we are in constant collaboration and have designed the classes to work as a continuous 30 class course rather than two individual 15 class courses. There are 38 students in the class.

### The lessons

The case study is divided into two stages; *stage one*: lessons one through four (Table 1) and *stage two*: lessons five through eight (Table 2). The videos used were to do with environmental issues and were given to the students as YouTube links inside the **LMS**. The videos ranged from about two to three minutes in length.

**The article:** The students were instructed in lessons one through four to create a one-page article using the main concept of the video as the theme and they were also able to use online resources to find additional information. They also had access to a forum within their groups to share information such as web links, language and notes. These groups were randomly created through the **LMS** group participant tool. Small groups also encourage high levels of risk-taking and openness because members can develop trust with each other (McConnell, 2006). Stage 2 was identical to stage 1 and was used to measure the differences in what the students could achieve.

Table 1: Case study stage 1

| <b>Stage 1 (lessons 1 through 4)</b> | <b>Outline</b>  | <b>Description (sequence of activities)</b>  |
|--------------------------------------|---|--|
| Lesson 1                             | Class survey<br>Video 1<br>Quiz 1 (Homework)<br>Article       | —Students took the initial survey.<br>—Students viewed video one and took notes.<br>—The students collaborated on the subject matter from the video (vocabulary and concepts).<br>—Students began to create an article based on the video content.<br>—The students were given a quiz on the video to do for homework.           |
| Lesson 2                             | Assessment criteria   | —Students collaboratively created the initial assessment criteria in groups.   |
| Lesson 3                             | Video 2<br>Article<br>Feedback circles<br>Assessment criteria | —Students viewed a second video that had similar content to the first. Students took notes.<br>—Students worked on their articles while the teacher walked around and answered questions.<br>—Feedback circles were used for students to get peer feedback on their articles.<br>—Each group uploaded their assessment criteria. |
| Lesson 4                             | Peer assessment   | —Using the <b>LMS</b> workshop activity, students used the class-chosen assessment criteria to assess three articles.  |

Table 2: Case study stage 2

| <b>Stage 2 (lessons 5 through 8)</b> | <b>Outline</b>  | <b>Description (sequence of activities)</b>   |
|--------------------------------------|---|---|
| Lesson 5                             | Video 3<br>Quiz (Homework)<br>Article 2                   | —Students viewed video three and took notes.<br>—The students collaborated on the subject matter from the video (vocabulary and concepts).<br>—Students began to create an article based on the video content.<br>—The students were given a quiz on the video to do for homework.                        |
| Lesson 6                             | Assessment criteria 2<br>Article 2<br>Feedback circles A2 | —Students collaboratively created the assessment criteria in groups.<br>—Students worked on their articles while the teacher walked around and answered questions.<br>—Feedback circles were used for students to get peer feedback on their articles.<br>—Each group uploaded their assessment criteria. |
| Lesson 7                             | Peer assessment<br>Article 2 / Rubric 2                   | —Using the LMS workshop activity, students used the class-chosen assessment criteria to assess six articles.  |
| Lesson 8                             | Peer assessment<br>Article 1 / Rubric 2<br>Final survey   | —Students did a third workshop activity in the LMS. They used their article from stage one and the assessment criteria from stage two to assess six articles.<br>—Students took the final survey.   |

## Theoretical framework

In this paper we are examining two things that are happening. On one hand students are collaborating to produce assessment criteria. The focus is on the process of collaboration. On the other hand, students are working on an article and although the article may be the final product, the language resource that the students draw from to create the article gets shared as the students share resources and language to accomplish this. What we are most interested in is the relationship between these two systems. Why are we interested in these two systems and why are we interested in the relationship between these systems? For some time, we have been looking at the Activity Theory and pondering the question; Where is the ZPD? (Vygotsky, 1978). Since language is partially shared between these two systems (object 2) then the development of the language through collaboration and the collaboration to develop language may be seen as equivalent to the ZPD. This research is still undergoing, but due to the structure of the lessons we felt that we needed to introduce this theory in this paper. To begin, let us look at the two systems that are occurring.

## Language resources

Table 3 outlines the organization of second-generation activity theory as applied to the activity of the students writing the article.

Table 3: Applying 2nd generation activity theory model to the research study (article creation)

| <b>Artefacts, tools and practices</b>  |  |   |   |
|--|--|---|---|
| <b>Social strategies</b><br>–Class work<br>–Collaborative small group work   | <b>Assignments</b><br>–Articles<br>–Previous article experience  | <b>Cognitive</b><br>–Critical thinking<br>–Decision making  | <b>Moodle LMS</b><br>–Choice activity<br>–Internet research<br>–Quizzes<br>–Videos<br>–Forum    |
| <b>Subjects</b><br>–First year university students (38)<br>–Teachers (2)<br>–Other students  |  |   | <b>Object</b><br>–Use the language resource to communicate and collaborate with other students. |
| <b>Rules</b><br>–Participate in verbal feedback activities about the quality of English in the articles.<br>–Learn to collaborate to learn language to write their article | <b>University community</b><br>–Agriculture and Engineering course students<br>–Outside community, internet, web tools | <b>Outcome</b><br>–Deeper understanding on how the language works and what language is used for.  |   |
|  |  | <b>Division of labor</b><br>–Teachers facilitate, guide and assist learners<br>–Students research the web, use the forum to communicate or gather information about the topic. Students share the information with each other |   |



## Assessment criteria

Table 4 outlines the activity system for the building of the assessment criteria. This is a tools-and-results activity. Students create the assessment criteria that they will turn around and use to assess their peers. This experience also enabled them to build a better assessment rubric during the second stage of the process. Students collaborated using the **LMS** forum. Simply providing a forum and telling students to collaborate would not generate much and that would only be relying on the tool (forum) to do the work for you. Giving the students something to do and then saying, “Oh by the way, there is a forum that you can use to help you” produces much better results. This can be given the analogy to giving someone a spade and telling them to dig for the sake of it, versus asking someone to plant some trees and saying “Oh, here’s a spade if you need it.”

Table 4: Applying the second generation activity theory model to the case study (assessment criteria)

| <b>Artefacts, tools and practices</b>  |   |   |   |
|--|---|---|---|
| <b>Social Strategies</b>   | <b>Assignments</b>  | <b>Cognitive</b>  | <b>Moodle LMS</b>                                     |
| —Collaborative small group work  | —Assessment criteria<br>—Prior assessment criteria experience                           | —Critical thinking<br>—Decision making  | —Workshop activity<br>—Forum                          |
| <b>Object</b>  |   |   | <b>Subjects</b>                                       |
| —Develop strategies to learn how to create and use an assessment tool.   |   |   | —First year university students (38)<br>—Teachers (2) |
| <b>Outcome</b>   |   |   |   |
| —Understanding of the assessment process and collaboration to achieve results..                                  |   |   |   |
| <b>Division of labor</b>   | <b>University community</b>   | <b>Rules</b>  |   |
| —Teachers facilitate, guide and assist learners<br>—Students create the assessment criteria and do the assessing | —Agriculture and Engineering course students<br>—Outside community, internet, web tools | —Participate in verbal feedback activities<br>—Learn to collaborate to learn language<br>—Respect their classmates during the peer assessment process |   |

## Object 3

To recap, in one system the students are creating an article and sharing language with classmates during the process. The language resource that builds up through this collaboration contributes to their learning the language. Let us call this the “Language resource

system.” In the other system, the students are creating the assessment criteria that will assess the article in a tools-and-results activity. The collaboration that occurs provides the students with the experience of using the language to communicate. Let us call this the “Collaboration system.” These two systems are not dependent on each other, as language acquisition can occur through self-study and outside of the classroom, and at the same time collaboration skills do not necessarily lend themselves directly to language acquisition. But, in the classroom and outside the classroom on-line collaboration in our system, students are required to collaborate in English. Through collaboration and the development of these collaboration skills, their English develops. Through the use of English and the development of interlanguage, their collaboration skills develop. Because these two systems are very distinct, we are going to propose that each system in itself becomes a mediating artifact (Fig. 4). The partially shared object (object 2) is language. Object 3 becomes the collaboratively constructed understanding of the language.

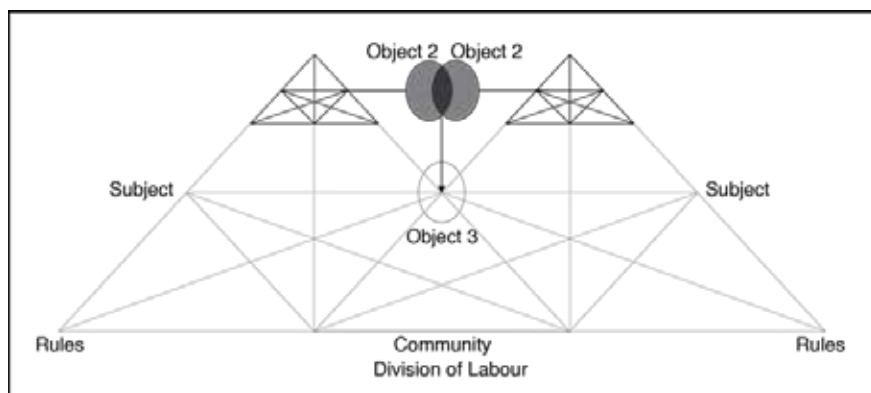


Figure 4. Third generation activity model adapted from Daniels (Engeström, 2009). The two systems become the mediating artefacts for an adapted model.

### *The Zone of Proximal Development*

As we have defined object 3 we need to now define outcome. We propose that outcome is the development of the language. As the students learn how to use the language and their interlanguage (Selinker, 1972) can develop, acquisition can start to take place. Through the interaction with other students in the classroom and outside the classroom, the students receive the help that they need for them to acquire the language. The distance from the understanding of the language-to-language acquisition is the Zone of Proximal Development. As Chaiklin (2003) states the ZPD is not about learning, it is about development. “In short, zone of proximal development is not concerned with the development of skill of any particular task, but must be related to development” (p. 43).

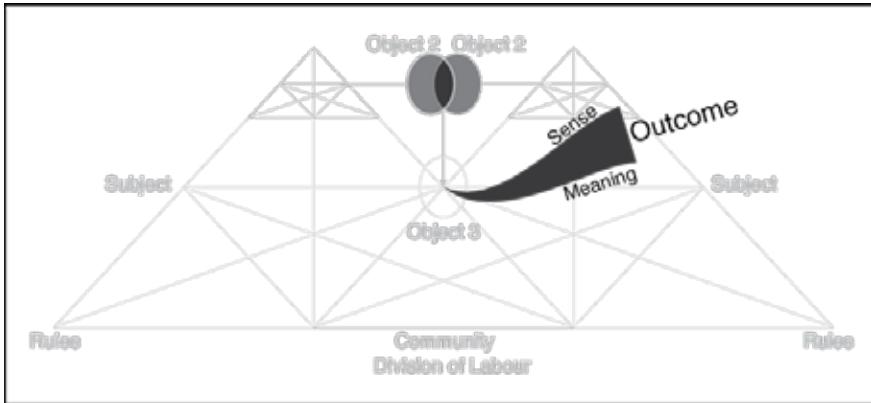


Figure 5. Third generation activity model adapted from Daniels where the outcome is a collaboratively constructed outcome of the two systems (Engeström, 1991).

In this figure (Fig. 5), the distance from object 3 to the outcome we propose as the zone of proximal development.

### *Expansive cycle*

“At the level of collective activity systems, such an expansive cycle may be seen as the equivalent of the zone of proximal development discussed by Vygotsky (1978) at the level of individual learning” (Engeström, 1999a, p. 34). The collaborative creation of the assessment criteria process is related to Engeström’s expansive learning cycle.

- students create a rubric model
- students create an article
- they use the rubric model as a tool for assessment
- they reflect on the process
- they create a new rubric based on their reflections
- they create a new article based on assessment feedback
- they use the new rubric model for assessment


In the processes of learner training that took place in this action research, the onus was put on the students to provide the tools that would be used to achieve the learning objectives. As stated by Engeström, “Learners must learn something that is not yet there and therefore acquire their future activity while creating it” (1991, p. 254). During the assignments given students created assessment criteria as the object of one activity that would become the tool for assessment of their assignment during the next activity.

### **Feedback circles**

In the survey, questions eight and twelve addressed the issue of peer-peer feedback both in class as well as through verbal feedback. Part of the process of writing the articles was the formative peer feedback (deBoer, 2011b). Students who are trained in the strategies to

interact in cooperative working groups will benefit and do better (Oxford, 1990). Through these types of communicative processes "...the participants in collaboration need to make their evolving understandings visible to each other; this is the very essence of collaborative interaction" (Stahl, 2006, p. 365). It was these processes modeled that can be linked to the peer-learning strategies as these students now have become more effective collaborative learners (Table 5).

Table 5: An explanation of the feedback circle process

|  |   |  |
|--|---|--|
| <b>Feedback circles</b>  |  | <p>Students in turn showed their article on the computer screen. Their peers spent one minute giving positive feedback. Following this, their peers made suggestions on how to improve their article. Then for one minute the author of the article would ask the group members follow up.</p> |
| <ul style="list-style-type: none"> <li>• Article 1 (A1)</li> <li>• Article 2 (A2)</li> </ul> |   |  |

## Workshop

The workshop activity in the **LMS** is designed for peer-peer assessment based on assessment criteria, labeled as a "rubric." The teacher is responsible for changing the stages from setup through to closing and is also responsible for settings of the workshop. For the purposes of this paper, other than the basic workings, the details of the workshop will not be discussed.

The assessment criteria was decided by the students and integrated into the workshop by the teacher during the setup phase. During the submission phase, students uploaded their articles into the workshop and the teacher randomly allocated the articles for assessment. During the assessment phase, students looked at each article and using the "rubric," evaluated the article qualitatively. The workshop is anonymous so students do not know who assessed their paper. Once the assessment is complete, the teacher moves the workshop to the grading evaluation phase. Once this is complete, the workshop is closed. The students therefore receive two grades; one for their submission based on the averages of their peer evaluations and one for their assessment, based on how well they assessed their peers articles.

### Assessment criteria (Rubric)

A very basic "rubric" template was provided to the students to create the assessment criteria, and the teacher did not intervene during the collaboration process. The students were told to create the assessment criteria using categories for assessment as well as descriptions of those categories. The teachers made no direct connection linking the article and the criteria at all during instruction or feedback times.

### Assessment criteria: rubric one (R1)

The term assessment criteria refers to a description of the elements or aspects of performance that will be assessed, and assessment standards refers to a description of the quality

of performance (e.g., excellent/good/average/poor) on each of those aspects that can be expected of participants at different stages (Arter & Spandel, 1992).

Table 6 in Appendix A shows a sample of the first assessment criteria (R<sub>1</sub>) that the students created. It has a four-point grade scale in the score pane and this specific category “construction” has been broken into five components. Within the LMS workshop activity itself the students would have three choices for grades. Without any grade descriptions it gave the students very little to work with to qualitatively assess within each category.

### Workshop one (A1 / R1)

Following are the results of the peer assessment on article one (A<sub>1</sub>) using assessment criteria rubric one (R<sub>1</sub>). Table 7 shows the submission and assessment grades. In all cases, even though there were 38 students in the class, there were only 36 students that submitted for the first and third workshops and 35 for the second workshop. Because peer assessment is done during class time, if a student is absent they cannot submit and therefore is also not present to do the assessment either.

Table 7: Workshop 1 Grades

| <b>Submission</b> |  | <b>Assessment</b> |  |
|-------------------|--|-------------------|--|
| Components        |  | Components        |  |
| ● Grade (80)      |  | ● Grade (20)      |  |
| ● Students (36)   |  | ● Students (36)   |  |
| ● Rubric 1 (R1)   |  | ● Rubric 1 (R1)   |  |
| ● Article 1 (A1)  |  | ● Article 1 (A1)  |  |
| Results           |  | Results           |  |
| ● Average 63.4    |  | ● Average 19.3    |  |
| ● SD 9.7          |  | ● SD 2.4          |  |

Although there was variation in the grades given in the peer-assessment, the assessment criteria R<sub>1</sub> was insufficient in detail to provide the students with very much room for variation. Therefore students were very similar in their assessment choices, as can be seen by the lack of variation in the grades provided for assessment. Moodle determines grades for assessment based on the average of all grades as outlined on the Moodle Web site for using the workshop activity (Dougiamas, 2011b). Based on this experience, students took a different approach in creating the second rubric.

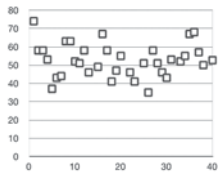
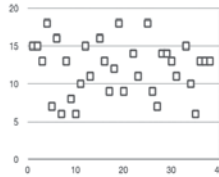
### Assessment criteria: rubric two (R2)

This second assessment criterion is much more developed. Most significant is the detailed explanation for each category grade (See Table 8 in Appendix A).

### Workshop two (Article 2 / Rubric 2)

Following are the results of the peer assessment on article two (A<sub>2</sub>) using the second assessment criteria (R<sub>2</sub>) (Table 9).

Table 9: Workshop 2 Grades

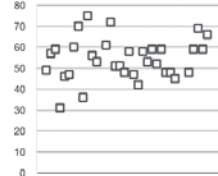
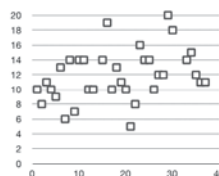
| <b>Submission</b>  |   | <b>Assessment</b>  |   |
|--|---|--|---|
| Components   |   | Components   |   |
| <ul style="list-style-type: none"> <li>● Grade (80)</li> <li>● Students (35)</li> <li>● Rubric 2 (R2)</li> <li>● Article 2 (A2)</li> </ul> |  | <ul style="list-style-type: none"> <li>● Grade (20)</li> <li>● Students (35)</li> <li>● Rubric 2 (R2)</li> <li>● Article 2 (A2)</li> </ul> |  |
| Results  |   | Results  |   |
| <ul style="list-style-type: none"> <li>● Average 52.6</li> <li>● SD 9</li> </ul>   |   | <ul style="list-style-type: none"> <li>● Average 12.1</li> <li>● SD 3.5</li> </ul>   |   |

The grades for assessment this time around differ significantly. It is worthy to note that with the more detailed assessment criteria the overall average of the submission grades was lower.

### Workshop three A1 / R2 results

To test the validity of the second assessment criterion, a third workshop was set up for the students to re-assess their first article using the second assessment criteria rubric 2. The findings showed that rubric two was the reason for the change in assessment grades, it was not due to an improvement in article two (See Table 10).

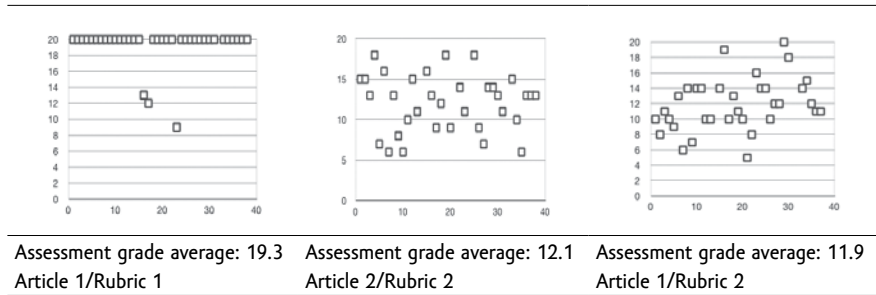
Table 10: Results for workshop 3 (Article 1 / Rubric 2)

| <b>Submission</b>  |  | <b>Assessment</b>  |  |
|--|--|--|--|
| Components   |  | Components   |  |
| <ul style="list-style-type: none"> <li>● Grade (80)</li> <li>● Students (36)</li> <li>● Rubric 2 (R2)</li> <li>● Article 1 (A1)</li> </ul> |  | <ul style="list-style-type: none"> <li>● Grade (20)</li> <li>● Students (36)</li> <li>● Rubric 2 (R2)</li> <li>● Article 1 (A1)</li> </ul> |  |
| Results  |  | Results  |  |
| <ul style="list-style-type: none"> <li>● Average 54.3</li> <li>● SD 9.7</li> </ul>   |  | <ul style="list-style-type: none"> <li>● Average 11.9</li> <li>● SD 3.4</li> </ul>   |  |

The results show that the second assessment criterion was effective in assessing article 1 and there was a greater range in the grades given for assessment for each article. Students achieved a lower grade on their assessment ability which is to be expected based on the qualitative nature of the assessment.

Table 11 shows the comparisons between the grade averages for all three workshops.

Table 11: Assessment grades W1 / W2 / W3



## The surveys

Since new learning strategies were introduced, we wanted to qualitatively assess the students' opinions using a survey. The same survey was given to the students before the lessons started and after the lessons were finished. The English survey was translated into Japanese for the students. The survey was done through the **LMS** and was anonymous.

A four-point Likert scale was used for the survey choices and one additional "I don't know," in order to avoid a neutral answer in a five-point scale. The "I don't know" was added if the students were unable to honestly answer the question. Both surveys were identical.

The initial survey was intended to learn about the students' experience with collaboration and peer-peer assessment. The final survey would indicate their new opinions toward these learning strategies. The difference in the surveys was used to assess whether or not the students' awareness of the new learning processes was recognized. The results of the survey also provided us with feedback for further development.

The survey was used to look at three areas in particular; assessment, peer-peer assessment and collaboration. Each category was made up of five questions that related to the type of activities and the teaching methodology adopted. Category 1 "Assessment" asked questions about their views of assessment. Categories 2 "Peer to peer assessment" was used to examine their opinions on assessing and being assessed by their peers. Category 3 "Collaboration" focused on finding out students' understanding of these new learning strategies. See appendix B for the survey questions.

## Results

All survey results can be found in Appendix B. The following analysis is based on the results from the survey.

**Category 1:** In question one, student opinion shifted with more students responding that final tests for measuring ability are less effective. In these lessons, assessment was done on what the students were able to create, not what the teacher decided they should be tested on. Question two and three, response shows that students may have recognized and thought favorably towards the implementation of various types of assessment into the curriculum. This is backed up by students who also think they can learn various skills through assessment as shown in the final responses for question four. As for question five,

students usually only study for assessment, shows a trend that less students agree and more students disagree. An assumption could be made that fewer students by the end of the course were studying for the purpose of only assessment. The repeated processes to create an assessment criteria and use it in the rubrics for peer assessment in the online workshop may have influenced these trends of attitudinal changes concluding students have switched their focus and concentrated more on learning.

**Category 2:** Responses in questions six through eight show that students believe that student created assessment outlines and peer-peer assessment can be used as part of the learning process. The feedback circles became a contributing factor making students feel more comfortable about receiving feedback from students. As seen in the positive responses shown in question 7, verbal and written feedback skills were adopted. Furthermore, positive shifts in responses in question nine and ten show that students think that they can learn from being assessed by and assessing their classmates.

**Category 3:** Responses for all questions in this category show that the student's awareness of the usefulness of collaboration for learning increased. A strong shift in the survey to the "strongly agree" choice indicates that students agree that collaboration benefits learning. Students were working in small groups of 3 or 4. Group work may have been the supporting ground to foster the development of new classroom skills and learning strategies. The end responses in question 13 shifted very positively indicating students think that assessing in a group environment is beneficial reflects the positive influences of group work throughout the course. And as question 15 points out, students now think more strongly that learning from each other is an important part of the learning process.

McConnell (2006) states:

If students are actively involved in decisions about how to learn and what to learn and why they are learning, and are also actively involved in decisions about the criteria for assessment and the process of judging their own and others' work, then their relationship to their studies will probably be qualitatively different from that of students who are treated as recipients of teaching and who are the objective of others', unilateral, assessment (p. 92).

The overall increased awareness helped us to understand that the students understood the purpose of these new learning strategies. Their change in opinions as a result of various assessment strategies shows favorably that the lesson approach has been well received in this case study.

## Conclusion

In this paper we have looked at tool-mediated learning and examined it using an LMS workshop activity. There was a large attitudinal shift in favor of collaborative learning and peer-peer assessment based on the survey feedback from the students. From both the creating of the article and the assessment criteria and the collaboration that ensued, language was learned, as it was needed to create the article and learned for the purpose of collaboration. Students are developing skills that help them become expansive learners.



zone of proximal development is generated and how we as educators can use this model to generate tool-mediated learning classrooms that help students develop apply knowledge rather than learn how to pass a test.

## References

- Arter, J. A., & Spandel, V. (1992). Using Portfolios of Student Work in Instruction and Assessment. *Educational Measurement: Issues and Practice*, 11(1), 36–44.
- Bonk, C. J., & Cunningham, D. J. (1998). Searching for learner-centered, constructivist, and sociocultural components of collaborative educational learning tools. In C. J. Bonk & K. S. King (Eds.), *Electronic collaborators*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Boud, D. (2000). Sustainable Assessment: Rethinking assessment for the learning society. *Studies in Continuing Education*, 22(2), 151–167.
- Chaiklin, S. (2003). The zone of proximal development in Vygotsky's analysis of learning and instruction. In A. Kozulin, B. Gindis, V. S. Ageyev & S. M. Miller (Eds.), *Vygotsky's educational theory in cultural context*. New York, NY: Cambridge University Press.
- Cole, M. (1999). Cultural psychology: Some general principles and a concrete example. In Y. Engeström, R. Miettinen & R.-L. Punamäki (Eds.), *Perspectives on activity theory* (pp. 87–106). New York: Cambridge University Press.
- Daniels, H. (2001). *Vygotsky and Pedagogy*. Oxford, UK: Routledge.
- deBoer, M. (2009 – Unpublished thesis). Discourse analysis of peer scaffolding and language development in a Vygotskian-driven classroom. (Masters), University of Birmingham, UK.
- deBoer, M. (2011a). ICT contents project at Iwate University. In A. Stewart (Ed.), *JALT2010 conference proceedings*. Tokyo: JALT.
- deBoer, M. (2011b). Assessment strategies in e-learning: Formative and summative assessment in a tool-mediated learning environment. *Iwate University International Center Annual Journal*.
- Dougiamas, M. (2011a). Moodle (Version 2.1) [Computer software]. Perth, Australia.
- Dougiamas, M. (2011b). Using Workshop Moodle 2.2. Retrieved January 29, 2012, from [http://docs.moodle.org/22/en/Using\\_Workshop](http://docs.moodle.org/22/en/Using_Workshop)
- Engeström, Y. (1987). *Learning by Expanding. An Activity-theoretical approach to developmental research*. Helsinki: Orienta-Konsultit Oy.
- Engeström, Y. (1991). Non scolae sed vitae discimus: toward overcoming the encapsulation of school learning. *Learning and instruction*, 1(3), 243–259.
- Engeström, Y. (1999a). Activity theory and individual and social transformation. In Y. Engeström, R. Miettinen & R.-L. Punamäki (Eds.), *Perspectives on activity theory* (pp. 19–38). New York: Cambridge University Press.
- Engeström, Y. (1999b). Innovative learning in work teams: Analyzing cycles of knowledge creation in practice. In Y. Engeström, R. Miettinen & R.-L. Punamäki (Eds.), *Perspectives on activity theory* (pp. 377–404). New York: Cambridge University Press.
- Engeström, Y. (1999c). *Changing practice through research: Changing research through practice*. Paper presented at the Keynote Address, 7th Annual International Conference on Post Compulsory Education and Training, Griffith University, Australia.
- Engeström, Y. (2009). The future of activity theory: A rough draft. In A. Sannino, H. Daniels & K. D. Gutiérrez (Eds.), *Learning and expanding with activity theory* (pp. 303–328). New York: Cambridge University Press.

- Graham, C. R., & Dziuban, C. (2008). Blended learning environments. In J. M. Spector, M. D. Merrill, J. V. Merriënboer & M. P. Driscoll (Eds.), *Handbook of research on educational communications and technology* (Third Edition ed., pp. 269–276). New York, **NY**: Lawrence Erlbaum.
- Lantolf, J. P. (1996). SLA theory building: “Letting all the flowers bloom!”. *Language Learning*, 46(4), 713–749.
- Lantolf, J. P. (2000). Introducing sociocultural theory. In J. P. Lantolf (Ed.), *Sociocultural theory and second language learning* (pp. 1–26). Oxford: Oxford University Press.
- Li, X. (2010). Effects of web-enhanced course materials on college students’ class engagement and learning outcomes. In C. M. Stewart, C. C. Schifter & M. E. M. Selverian (Eds.), *Teaching and learning with technology*. Beyond constructivism (pp. 28–48). New York, **NY**: Routledge.
- Long, M. H., & Porter, P. A. (1985). Group work, interlanguage talk, and second language acquisition. *TESOL Quarterly*, 19(2), 207–228.
- McConnell, D. (2006). *E-learning groups and communities*. New York, **NY**: Open University Press.
- Muller, T., & deBoer, M. (2012). Student use of language scaffolding. In T. Muller, S. Herder, J. Adamson & P. S. Brown (Eds.), *Innovating EFL teaching in Asia* (pp. 145–161). **UK**: Palgrave Macmillan.
- Negueruela, E. (2008). Revolutionary pedagogies: learning that leads (to) second language development. In J. P. Lantolf & M. E. Poehner (Eds.), *Sociocultural theory and the teaching of second languages*. London, **UK**: Equinox Publishing Ltd.
- Newman, F., & Holzman, L. (1993). *Lev Vygotsky. Revolutionary scientist*. New York, **NY**: Routledge.
- Oxford, R. L. (1990). *Language learning strategies: What every teacher should know*. Boston, **MA**: Heinle and Heinle.
- Resnick, L. B. (1987). The 1987 Presidential Address: Learning in school and out. *Educational Researcher*, 16(9), 13–20.
- Scovel, T. (2001). *Learning new languages. A guide to second language acquisition*. Boston: Heinle & Heinle.
- Selinker, L. (1972). Interlanguage. *International review of Applied Linguistics*, 10(2), 209–241.
- Serrano-Lopez, M., & Poehner, M. E. (2008). Materializing linguistic concepts through 3-D clay modeling: a tool-and-result approach to mediating L2 Spanish development. In J. P. Lantolf & M. E. Poehner (Eds.), *Sociocultural theory and the teaching of second languages*. London, **UK**: Equinox Publishing Ltd.
- Stahl, G. (2006). *Group cognition. Computer support for building collaborative knowledge*. Cambridge, **MA**: MIT Press.
- Swain, M. (1997). Collaborative dialogue: its contribution to second language learning. *Revista Canaria de Estudios Ingleses*, 34, 115–132.
- Swain, M. (2000). The output hypothesis and beyond: Mediating acquisition through collaborative dialogue. In J. P. Lantolf (Ed.), *Sociocultural theory and second language learning*. Oxford: Oxford University Press.
- Taras, M. (2005). Assessment – summative and formative – Some theoretical reflections. *British journal of educational studies*, 53(4), 466–478.

- van Gog, T., Paas, F., Savenye, W., Robinson, R., Niemczyk, M., Atkinson, R., Johnson, T. E., O'Connor, D. L., Rikers, R. M. J. P., Ayres, P., Duley, A. R., Ward, P., & Hancock, P. A. (2008). Data collection and analysis. In J. M. Spector, M. D. Merrill, J. V. Merriënboer & M. P. Driscoll (Eds.), *Handbook of research on educational communications and technology* (3rd ed., pp. 763–806). New York, NY: Routledge.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

## Author biodata

**Mark deBoer** is an Associate Professor at Iwate University. He is currently doing his PhD through the University of Birmingham. His research focus is on tool-mediated learning and Vygotsky's concept of the zone of proximal development.

**Simon Townsend** has been an instructor at Iwate University for 6 years. He is currently doing his Masters in **TESL/TEFL** through the University of Birmingham. His research focus is on tool-mediated learning focusing on peer-assessment strategies.

## Appendix A

The rubric that was created by the students for the first stage of assessment.

Table 6. The first assessment criteria with assessment standards. Produced by students. (incomplete) (Rubric1)

| Category     | Element    | Grade 0–4 | Reason |
|--------------|------------|-----------|--------|
| Text         | Size       | _____     |        |
|              | Color      | _____     |        |
|              | Style      | _____     |        |
|              | Place      | _____     |        |
|              | Category   | _____     |        |
| Construction | Title      | _____     |        |
|              | Contents   | _____     |        |
|              | Example    | _____     |        |
|              | Question   | _____     |        |
|              | Headline   | _____     |        |
| Contents     | Conclusion | _____     |        |
|              | Graph      | _____     |        |
|              | Picture    | _____     |        |
|              | Diagram    | _____     |        |
|              | Key word   | _____     |        |
|              | Opinion    | _____     |        |
|              | Suggestion | _____     |        |

| Category    | Element   | Grade 0-4 | Reason |
|-------------|-----------|-----------|--------|
| Design      | Square    |           |        |
|             | Circle    |           |        |
|             | Border    |           |        |
|             | Frame     |           |        |
|             | Underline |           |        |
|             | Font      |           |        |
| Information | Accuracy  |           |        |
|             | Amount    |           |        |
|             | Fact      |           |        |
|             | Merit     |           |        |
|             | Demerit   |           |        |

The rubric that was created by the students for the second stage of assessment.

Table 8. Second assessment criteria with assessment standards completed. Produced by students. (Rubric2)

| Category     | Element      | Grade            |                  |                    |                   |                |
|--------------|--------------|------------------|------------------|--------------------|-------------------|----------------|
|              |              | 0                | 1                | 2                  | 3                 | 4              |
| Graph        | Easy to see  | No graph.        | Few graphs.      | Connection with    | Easy to see       | Easy to        |
|              | Manifest     | No connection    | Bad arrangement. | sentence.          | Unmistakable      | understand.    |
|              | Quality      | with main point. | Small connection | Attract attention. | Conspicuous       | Good quality.  |
|              | Space (size) | Too small.       | with main point. | Appropriate        | Good kind of      | Good           |
|              | Connection   | Unnatural        | No quality.      | size and           | graph.            | arrangement.   |
|              | Arrangement  | Hard to see.     |                  | arrangement        | Appropriate size. | Clear          |
|              | Type         |                  |                  | plain.             |                   | Striking       |
| Construction | Title        | No title.        | Poor substance.  | Poor substance.    | Good example      | Good contents, |
|              | Contents     | No headline and  | No headline.     | No example.        | and question.     | example,       |
|              | Example      | short text.      | Short text.      | Bad color match.   | Bright color.     | question and   |
|              | Question     | Poor substance.  | No example.      | A few graphs.      | Accent            | conclusion.    |
|              | Headline     | No question.     | No question.     | Good design.       | Bold word.        | Easy to        |
|              | Conclusion   | No question.     | No impact.       | Under line.        | Easy to see       | understand     |
|              | Text         | Very simple.     | No graph.        | Good title.        | outline.          | main point.    |
| Contents     | Diagram      |                  |                  |                    |                   |                |
|              | Information  | No picture       | Few picture      | Few picture        | Important         | Useful         |
|              | Title        | Unnecessary      | Short sentence   | Appropriate        | information       | information.   |
|              | Diagram      | information      | Rough sentence   | substance          | Good title        | Concise        |
|              | Clue         | Very short       | Nothing good     | Easy to read       | Peculiar sentence | conclusion.    |
|              | Opinion      | sentence         | information      | Concise sentence   | Appropriate       | Reliability.   |
|              | Suggestion   | interval         |                  | View about main    | picture           | Easy to        |
|              | Text         | No main point    |                  | point              |                   | understand.    |
| Picture      |              |                  |                  |                    |                   |                |

| Category     | Element               | Grade                           |                                       |                             |                            |                                   |
|--------------|-----------------------|---------------------------------|---------------------------------------|-----------------------------|----------------------------|-----------------------------------|
|              |                       | 0                               | 1                                     | 2                           | 3                          | 4                                 |
| Design       | Square                | Only text.                      | No square, circle, border, and frame. | No circle and underline.    | Use underline. Good frame. | Use different font and underline. |
|              | Circle                | No diagram and no graph.        |                                       | Use same font.              | Bright color.              | Good frame.                       |
|              | Border                | Simple color and simple format. | Use same format.                      | Hard to see.                | Easy to see.               | Easy to understand.               |
|              | Frame                 | No impact to see.               | Too simple to understand.             | Poor variation.             | Various design             | Good design.                      |
|              | Underline             |                                 |                                       |                             | Easy to see.               |                                   |
|              | Font                  |                                 |                                       |                             |                            |                                   |
|              | Color                 |                                 |                                       |                             |                            |                                   |
|              | Diagram               |                                 |                                       |                             |                            |                                   |
| Conclusion   | Contents              | Very short writing.             | Short sentence.                       | So-so writing.              | Good writing.              | Many writings.                    |
|              | Opinion               | No opinion.                     | A loose idea.                         | A few opinions.             | Explain clearly.           | Explain very clearly.             |
|              | Length                | Wrong grammar.                  | Wrong grammar.                        | Good contents.              | Good contents.             | Right grammar.                    |
|              | Settlement            | No conscienceless               | Thin contents.                        | Easy to see.                | Right grammar.             | Right grammar.                    |
|              | Conciseness           |                                 |                                       |                             |                            | Good opinion.                     |
|              | Easy to see           |                                 |                                       |                             |                            | Good contents.                    |
|              | Grammar               |                                 |                                       |                             |                            |                                   |
| Illustration | Size                  | No picture.                     | Few picture.                          | Some numbers.               | Just size.                 | A lot of numbers.                 |
|              | Explanation           | No relation.                    | Hard to see.                          | Good color.                 | Some numbers.              | Good design.                      |
|              | Relation              | No explanation.                 | Thin relation.                        | Small explanation.          | Good relation.             | Good quality.                     |
|              | Design                | Simple color.                   | So-so design.                         | Appropriate placement.      | Good color.                | Clear color.                      |
|              | Number                | Non-appropriate placement.      | Hard to see.                          |                             | Good placement.            | Close relation.                   |
|              | Color                 |                                 |                                       |                             |                            |                                   |
|              | Quality               |                                 |                                       |                             |                            |                                   |
| Title        | Color                 | No title                        | Unsuitable color                      | No figuring out             | Stand out                  | Stand out                         |
|              | Size                  | No color                        | No figuring out size                  | size                        | Ease of under-standing     | Ease of under-standing.           |
|              | Format                | Unsuitable title                |                                       | Not ease of under-standing. | Bold title.                | Nice color and format.            |
|              | Ease of understanding | Hard to understand main point.  | Not ease of under-standing.           | Not stand out.              | Appropriate color.         | Good design.                      |
|              | Design                | Hard to read.                   | So-so relation.                       | So-so easy to see.          | Easy to read.              |                                   |
|              | arrangement           |                                 |                                       |                             |                            |                                   |
|              | Under line            |                                 |                                       |                             |                            |                                   |
|              | Marker                |                                 |                                       |                             |                            |                                   |

## Appendix B

In the case of the final survey for tables 12–14, there were two students absent and were unable to participate in the final survey.

Table 12. Survey questions 1 through 5 (Assessment)

| Assessment   | Survey       | Strongly agree | Agree  | Disagree | Strongly disagree | I don't know |
|--|--------------|----------------|--------|----------|-------------------|--------------|
| 1. Tests are an effective way to measure student's ability.                              | Initial (38) | 5.26%          | 60.53% | 18.42%   | 2.63%             | 13.16%       |
|  | Final (36)   | 8.33%          | 58.33% | 27.78%   | 2.78%             | 2.78%        |
| 2. Various types of assessment should be incorporated into a language curriculum.        | Initial (38) | 0%             | 65.79% | 18.42%   | 0%                | 15.79%       |
|  | Final (36)   | 13.89%         | 63.89% | 11.11%   | 0%                | 11.11%       |
| 3. Assessment given by the teacher gives students good feedback about their progress.    | Initial (38) | 10.53%         | 65.79% | 5.26%    | 0%                | 18.42%       |
|  | Final (36)   | 19.44%         | 69.44% | 8.33%    | 0%                | 2.78%        |
| 4. Students can learn important learning skills through different assessment activities. | Initial (38) | 5.26%          | 44.74% | 28.95%   | 5.26%             | 15.79%       |
|  | Final (36)   | 22.22%         | 50.00% | 11.11%   | 2.78%             | 13.89%       |
| 5. Students usually study for the particular assessment they are doing.                  | Initial (38) | 13.16%         | 26.32% | 28.95%   | 15.79%            | 15.79%       |
|  | Final (36)   | 8.33%          | 19.44% | 38.89%   | 13.89%            | 19.44%       |

Table 13. Survey questions 6 through 10 (Peer-peer assessment)

| Peer-peer Assessment  | Survey       | Strongly agree | Agree  | Disagree | Strongly disagree | I don't know |
|---|--------------|----------------|--------|----------|-------------------|--------------|
| 6. Assessment outlines can be used as part of the learning process in a secondary language classroom. | Initial (38) | 7.89%          | 52.63% | 10.53%   | 2.63%             | 26.32%       |
|   | Final (36)   | 16.67%         | 58.33% | 11.11%   | 0%                | 13.89%       |
| 7. Students feel comfortable to receive feedback from other students in class.                        | Initial (38) | 10.53%         | 55.26% | 15.79%   | 5.26%             | 13.16%       |
|   | Final (36)   | 22.22%         | 58.33% | 5.56%    | 2.78%             | 11.11%       |
| 8. Student feedback can include written and verbally given in various activities.                     | Initial (38) | 5.26%          | 44.74% | 18.42%   | 2.63%             | 28.95%       |
|   | Final (36)   | 11.11%         | 63.89% | 5.56%    | 2.78%             | 16.67%       |

| Peer-peer Assessment   | Survey       | Strongly agree | Agree  | Disagree | Strongly disagree | I don't know |
|--|--------------|----------------|--------|----------|-------------------|--------------|
| 9. Assessment made and used by students can assist them to achieve class aims and objectives.          | Initial (38) | 10.53%         | 52.63% | 21.05%   | 5.26%             | 10.53%       |
|  | Final (36)   | 19.44%         | 66.67% | 5.56%    | 2.78%             | 5.56%        |
| 10. Students can take on different roles as assessors to learn important language skills and concepts. | Initial (38) | 13.16%         | 60.53% | 13.16%   | 5.26%             | 7.89%        |
|  | Final (36)   | 27.78%         | 63.89% | 5.56%    | 2.78%             | 0%           |

Table 14. Survey questions 11 through 15 (Collaboration)

| Collaboration   | Survey       | Strongly agree | Agree  | Disagree | Strongly disagree | I don't know |
|---|--------------|----------------|--------|----------|-------------------|--------------|
| 11. Group work is beneficial for students to understand the assessment requirements.                      | Initial (38) | 7.89%          | 60.53% | 7.89%    | 2.63%             | 21.05%       |
|   | Final (36)   | 19.44%         | 63.89% | 11.11%   | 0%                | 5.56%        |
| 12. Receiving feedback from other students in group activities in class is useful.                        | Initial (38) | 13.16%         | 68.42% | 2.63%    | 5.26%             | 10.53%       |
|   | Final (36)   | 30.56%         | 61.11% | 0%       | 2.78%             | 5.56%        |
| 13. It is appropriate for students to work in small groups and assess other students work.                | Initial (38) | 7.89%          | 63.89% | 5.26%    | 0%                | 23.68%       |
|   | Final (36)   | 27.78%         | 55.56% | 11.11%   | 2.78%             | 2.78%        |
| 14. Computer assisted activities can be suitable for small group assessment activities.                   | Initial (38) | 7.89%          | 50.00% | 18.42%   | 0%                | 23.68%       |
|   | Final (36)   | 27.78%         | 38.89% | 13.89%   | 0%                | 19.44%       |
| 15. Working in small groups allows students to discuss and provide effective student-to-student feedback. | Initial (38) | 18.42%         | 57.89% | 2.63%    | 5.26%             | 15.79%       |
|   | Final (36)   | 36.11%         | 55.56% | 2.78%    | 0%                | 5.56%        |