Maximizing Vocabulary Development by Systematically Using a Depth of Lexical Processing Taxonomy, CALL Resources, and Effective Strategies

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ABSTRACT

How can one better use modern CALL resources to help language learners to build up a larger target language (TL) vocabulary quickly? A major need that quickly becomes apparent at the intersection of the fields of second language vocabulary acquisition (SLVA) and computer-assisted language learning (CALL) is the lack of sufficient research with respect to their most advantageous integration for language learning. The depth of lexical processing taxonomy presented here seeks to integrate the research studies that exist into a clear and effective approach that uses insights and innovations of both fields to create a user-friendly system for more rapid vocabulary acquisition and activation. Because of the proliferation of language-learning programs and websites, it becomes important to help define which most essential vocabulary and reading strategies should be included in those programs and websites. When designing programs and websites, the three major parameters of subjective enjoyment, objective effectiveness, and technological efficiency should all be considered. This article compares various studies to suggest how many of the features and functions of CALL tools can be used at the most appropriate stages of lexical processing and acquisition to make vocabulary learning smoother, quicker, and more effective. It helps to fill a noticeable gap by providing a clear, step-by-step taxonomy of 40 vocabulary learning strategies (VLSs), simplified into an eight-fold scale of major cognitive phases for ease of instruction and use in classes. These strategies are channeled through a logical depth of lexical processing (DLP) scale, which can help promote both learners’ receptive and productive vocabulary development, whether using traditional text-based or CALL-enhanced methods. The ultimate goal is to find practical ways to use a research-based DLP scale and VLS taxonomy to improve the teaching and monitoring of essential phases of vocabulary learning, either in traditional classes or in CALL learning environments.

KEYWORDS

Vocabulary Acquisition, Depth of Lexical Processing (DLP) Scale, Vocabulary Learning Strategy (VLS) Taxonomy

INTRODUCTION

Establishing a comprehensive and effective taxonomy of vocabulary-learning strategies useful in a CALL environment has been a research area in much need of investigation (Duquette, Renié, Laurier, 1998; Loucky, 2003c). Although many foreign language learners appear to use only a limited number of language- and lexical-learning strategies, as do most of the Japanese college students surveyed in the study presented here, teachers who wish to offer more effective instruction are looking for some system that can combine as many proven strategies, good ideas, and resources as possible to help their students more quickly improve their vocabulary knowledge, reading comprehension, and language-learning skills.

Since building learners’ understanding of word meanings is crucial to the development of many other language-learning areas, this article explores a reason-and research-based taxonomy to help teach students how to more systematically and successfully process new target language (TL) vocabulary. Specifically, the author proposes a depth of lexical processing (DLP) scale, which is related to both essential vocabulary-learning strategies and logical steps for cognitively processing and storing new words. The DLP scale can help both language instructors and learners better monitor vocabulary development, and closer monitoring can, in turn, help teachers to guide students to use specific vocabulary learning strategies (VLSs).

This article compares various vocabulary acquisition studies and suggests how many of the functions of intelligent computer-assisted language learning (ICALL) can be used at each of the appropriate stages of lexical processing and acquisition to make the process smoother, quicker, and more effective. As such, the article helps to fill a gap by providing a clear, step-by-step VLS taxonomy divided into 10 major cognitive phases. These strategies are channeled through a logical DLP scale designed to promote learners’ receptive and productive vocabulary development.

The depth of lexical processing (or levels of processing) hypothesis, as defined by Schmitt (1997, p. 328), is a “hypothesis which states that the more cognitive manipulation involved in handling information (e.g., words), the better the information will be retained.” This study investigates how this theory may need to be modified in order for it to be used more effectively in CALL environments and how it can be used to improve vocabulary instruction, study, and research. It also seeks to determine whether strategy-training instruction can help to improve the generally low levels of vocabulary-learning-strategy use consistently found among students in Japan. In particular, it aims to determine how vocabulary learning attitudes and behaviors might be changed by providing students with a clear set of lexical-processing stages and clear training in how to use them.

The specific goal of this study is to further develop Schmitt’s (1997) vocabulary learning taxonomy in ways that would make it simultaneously more teachable to students, more useful in monitoring and assessing their use of specific strategies, and more applicable to either text-based or CALL-based language learning environments. Kudo (1999) and Orita (2003) completed what seems to be an adequate replication of Schmitt’s (1997) taxonomy, using several distinct groups
of Japanese students at different levels of proficiency, but the students’ levels of proficiency were determined only by the number of years of English study. Segler, Pain, and Sorace (2001) suggested that Schmitt’s taxonomy could be developed to better concentrate on specific functions needed in a multimedia CALL environment, one in which

… learners reading a text will have the opportunity to click on unknown words and choose between several explanation options, ranging from simple translations to L2 paraphrases, to hints such as morphological clues, related words in a semantic network, example sentences containing the word, mnemonic devices like the keyword method, and multimedia glosses such as pictorial representations … providing texts with glosses/online help functions … gives learners the opportunity to consolidate, reactivate and/or review vocabulary knowledge with tools such as note-keeping, net-building, etc. (p. 39)

Segler et al. (2001) surveyed strategy types and strategy training for typical classrooms, seeking ways to use ICALL environments to enhance second-language vocabulary acquisition. They concluded that VLSs are a crucial subclass of general language-learning strategies but also noted that little work had been done in the area of VLS taxonomy development, other than that of Stoffer (1995), Schmitt (1997), and Kudo (1999). Segler et al. state that

The importance of VLS in the group of language learning strategies is reflected by the fact that the vast majority of strategies in taxonomies such as Oxford’s (1990) are either VLS (all strategies in the memory category), or can be used for vocabulary learning tasks. Although the use of a wide variety of strategies has been found to be characteristic for [sic] successful learners, the great majority of learners seem to favor some form of mechanical strategy such as repetition over deeper, more complex ones, such as contextual guessing or metacognitive strategies (Lawson & Hogben, 1996; Gu & Johnson, 1996). This finding is disappointing in the light of the Depth-of-Processing (DOP) hypothesis (Craik & Lockhart, 1972), which states that ‘deeper’ analysis of a stimulus (with ‘depth’ referring to a greater degree of semantic involvement [or elaboration]) leads to better long-term memory retention. (p. 2)

In earlier studies, this author has suggested a taxonomy of vocabulary acquisition which postulates that effective lexical processing of new vocabulary may be done by using a cyclical series of open-ended phases for assessing, accessing, archiving, analyzing, anchoring, associating, activating, anticipating, reassessing, and relearning/remeeting new terms (Loucky, 2003c). As new TL terms are processed and recycled through these various phases, automaticity of word recognition is developed, and, eventually, the item is retained. In itself, this cyclical process does not prove anything, but it does illustrate current theory on lexical processing strategies and provides a simple, research-based framework for more effective CALL program design and classroom instruction.
The author has compared the use of many types of media and methods for enhancing the vocabulary learning of Japanese college students, investigating the relative benefits of using monolingual, bilingual, and fully bilingualized (both L1 and L2 glosses) dictionaries (Loucky, 1996, 2004a, 2005b). He has also researched the use of computerized dictionaries versus more traditional textbook or paper dictionaries for improving English lexical development and reading comprehension (Loucky, 2002a, 2002b, 2003a, 2003b, 2004a, 2005b). Finally, he compared the effectiveness of the so-called “mnemonic keyword” versus the “semantic field keyword method” (Loucky, 2004b) since the latter approach had never been developed either bilingually or tested to its full potential when used in a CALL environment. As part of that ongoing study, the author undertook a study of the relationships between various patterns of strategy use, electronic dictionary use, and subsequent vocabulary growth, culminating in the DLP scale and VLS taxonomy discussed here.

LITERATURE REVIEW

Few online vocabulary development or reading courses have been created that take into account current CALL practice, SLA theory, and the practical needs and proficiency levels of language learners. The interplay among learners’ language proficiency, computer proficiency, and academic needs based on their majors must be more carefully considered.

Chapelle (2001), who outlined the foundations for electronically enhanced teaching, testing, and research, noted six major criteria to consider in determining whether a CALL task is appropriate for a given language-learning situation:

1. language learning potential
2. learner fit,
3. meaning focus,
4. authenticity,
5. impact, and
6. practicality.

Chapelle provided several tables with excellent guiding questions for logically evaluating CALL tasks (see especially her Tables 3.4-3.7). The practical questions that Chapelle raised can help CALL practitioners and developers to better design and evaluate programs by focusing their attention on the six major criteria above.

Jamieson and Chapelle (2004) further explored these criteria and established a very useful methodology for CALL research and evaluation. They stated that an evaluation argument for the appropriateness of a particular CALL program needs to be created that includes both judgmental and empirical analyses. When learning occurs in computer-mediated contexts, “The quality of CALL activities and software programs needs to be evaluated in terms of a context-specific argument supported by rationales and evidence which are based on theory and research in instructed second language acquisition (SLA)” (p. 179). Then, the degree to
which operationalized variables actually occur as features of a given CALL program forms the basis of its evaluation. We have used this principled framework for evaluating our English courses for engineers in Japan, which blend in-class communication activities with the use of various electronic dictionaries and online learning links.

For example, when language learning potential is examined, the relevant SLA principle, according to Chapelle (2001) and Jamieson and Chapelle (2004), is that an effective language-learning course, website, or program should provide enough chances for a beneficial focus on form. For effective vocabulary development this should include activities that provide enough chances to focus on the form, meaning, and use of the new word (Nation, 2001). Thus, to be more effective for a wider range of learners, online materials should provide chances for (a) input, (b) interaction, and (c) output/production. Jamieson and Chapelle provided useful charts to show how to operationalize variables and identify factors that should be considered as evidence when seeking to enhance these three aspects of a CALL program’s language-learning potential. Fellner and Apple (2005) also used criteria based on a wave model to enhance the motivation of lower level Japanese college students. They added planned recycling of learning targets, language input and communicative, real-world situations.

Shield and Kukulska-Hume (2004) have urged that language-learning websites be designed with usability in mind at all times. Usable systems are those that are easy to use, “effective to use, and enjoyable or engaging from the user’s perspective” (p. 27). Thus, the three parameters of (a) effectiveness, (b) efficiency, and (c) enjoyment for learners should be kept in constant view when developing CALL programs. It is also helpful to build user-friendly language-learning programs and websites by following research-based principles of the comprehensible input hypothesis (Krashen, 1985) and content-based instruction (Brinton, Snow, & Wesche, 1989). That is, teachers need ways of determining that the online texts they will use are comprehensible and instructionally appropriate to avoid causing frustration for learners. As Brinton et al. wrote about content-based language learning, “successful language learning occurs when students are presented with target language material in a meaningful contextualized form with the primary focus on acquiring information” (p. 17).

The last 30 years have seen an increased emphasis on both learners’ active roles and strategies, as well as upon more communicative teaching methods. Seeking ways to empower students to develop greater autonomy in their learning, ESL/EFL teachers have also encouraged more out-of-class use of language-learning strategies while also recognizing that ESL students (those living or studying in bilingual settings) usually have far more chances to learn the TL in their daily life in an English-speaking community than EFL students (those living in settings where English is used as a foreign language). Various studies (e.g., Sanaoui, 1995; Kojic-Sabo & Lightbown, 1999), seeking to discover and validate the usefulness of more effective learning strategies, have focused on how more successful students achieve their language-learning goals. Few studies, however, have made very clear distinctions between general learning strategies (see Stern, 1975, 1983)
and more specific comprehension and lexical processing strategies. Kojic-Sabo and Lightbown (1999) also noted that the factors of learner independence and initiative coupled with amount of time spent studying or using language (and vocabulary)

… are seen as two crucial factors related to higher levels of achievement … it has always been emphasized in SLA situations that mastering another language takes time. Furthermore, time alone does not seem to suffice. Foreign language learning also takes initiative on the learner’s part, a willingness to put extra effort into the learning process, to take it outside the classroom, and to build on it by independent learning activities … on their own … elaborately enough to ensure depth of processing and greater success [italics added]. (p. 190)

Consistent use of taxonomies of language-learning strategies, such as those proposed by Schmitt (1997) and Loucky (2005a) and systems that encourage greater depth of lexical processing, a wider breadth of syntactic complexity, and repeated encounters with new TL forms and meanings in as many different contexts as possible should be encouraged. This approach to language learning can often be greatly facilitated by the rapid access to lexical information provided by CALL dictionaries, translation software, and websites (Loucky, 2002a, 2002b; 2003b, 2003c, 2003d). Helping students to develop consistent computer-assisted habits of systematically organizing their processing of new language can greatly help them to maximize their TL development (Coll, 2002; Loucky, 2004a, 2005b).

Both vocabulary and comprehension components of reading should be evaluated, as well as opportunities for more integrated language skill development. Well balanced and holistic language development can be encouraged either by giving students more individual computerized interaction in multimedia formats or by providing socially oriented language-learning experiences in which students are asked to apply new learning more productively. Joe (1995, 1998) showed that one of the types of learning behaviors strongly associated with promoting L2 vocabulary acquisition is generation, requiring students to generate language forms as in a “pushed output production” condition (see Swain, 1985, 1995; de la Fuente, 2002). Vocabulary learning activities that promote attention, such as the use of a vocabulary-knowledge-scale assessment (see below), recall or retrieval, and generative use in original, creative ways by students can surely help to foster more rapid second language acquisition. Chen (2004) stated that many

CALL researchers worldwide are interested in developing and using reading materials/environments to enhance second language learners’ language competence … in the effect of multimedia annotation modes on reading comprehension and vocabulary acquisition (e.g. Chun & Plass, 1997; Seghayer, 2001) … in screening and arranging of authentic texts by controlling vocabulary items (Ghardirian, 2002) … in the use of electronic dictionaries or online glossing in reading processes (e.g. Lomicka, 1997; Roby, 1998; Laufer & Hill, 1999). (p. 51)
However, few CALL reading specialists like Chen have concentrated on the practical task of providing a supportive reading environment for both language teachers and language learners, especially online environments (however, see http://www.CALL4ALL.us, http://CALL4ALL.us//home//_all.php?fl=r) While many CALL-related articles have mainly focused on technological issues, Shield and Kukulska-Hume (2004) have affirmed that “Pedagogical and intercultural aspects of usability are often overlooked, and as a result, the contribution that content providers [teachers, researchers and web designers] could make towards the evaluation of their own web sites is not even considered” (p. 27). The arguments presented here take these factors into consideration since it is well known that higher levels of student enjoyment and engagement improve learning motivation and results.

Gallo-Crail and Zerwekh (2002) examined how 20 students of Tagalog at Northern Illinois University “used different learning strategies with different Web-based tools as they studied new vocabulary words and how this affected their success in learning and mastering the new vocabulary. … This case study describes student VLS use of five different learning strategies that were supported by Internet-based activities” (p. 56). Gallo-Crail and Zerwekh measured student achievement on quizzes and collected data on learners’ VLS preferences in five kinds of vocabulary-learning activities: (a) association by word matching: a memory strategy, (b) translation by flashcard exercise: a cognitive strategy, (c) using linguistic clues via a movable online dictionary browser with sound: a compensatory strategy, (d) cultural background knowledge via weekly culture themes online: an affective strategy, and (e) reviewing and linking known to new vocabulary: a metacognitive strategy via online preview cards using sound and charts to introduce new words coming in the next weekly theme. Students made weekly study reports on accountability charts, participated in interviews and online strategy surveys, and completed online tests. Among Gallo-Crail and Zerwekh’s findings most relevant to this study are the following. Learning efforts that combine “a semantic processing strategy and a keyword strategy … promote more vocabulary acquisition than a keyword or semantic mapping alone” (p. 56). The researchers also determined that learners familiar with and using a “wider variety of strategies achieved greater success in learning new vocabulary words than those who did not” (p. 65). The present study found this same pattern of relationships between higher VLS usage and higher vocabulary retention and use.

THE BASIS FOR THE PROPOSED TAXONOMY IN THE LITERATURE

Studies by Craik and Lockhart (1972) and Craik and Tulving (1975) showed that the more deeply new words are processed, the better they are learned. Thus, the greater the number of different ways new terms are learned and practiced, the more likely they are to be retained. More recent research findings have supported the notion of depth of processing (see Chapelle, 1998; Henriksen, 1999; Nation, 2001; Schmitt, 1997). It is also worth noting Schmitt’s statement that many VLSs which

become more important with age involve the kind of ‘deeper processing’
(imaging, association, analysis) that the Depth of Processing Hypothesis … suggests. These strategies require a greater cognitive effort, but more mature learners seem to realize their value. … Language proficiency … the type of task being done … and culture … all play a part in strategy selection. (p. 224)

It should be noted that depth of processing does not exclude the use of translation pairs as one of the initial methods of accessing and confirming new TL meanings. A translation pair has a solid memory connection and the benefit of immediate recognition, so that at early stages of language learning word-pair learning, even in decontextualized lists, can be an effective way to increase receptive vocabulary. Nevertheless, something must be done with new TL terms in order for them to be adequately assimilated into the learner’s L2 mental lexicon, as well as transferred from merely passive recognition to more active recall and productive use.

Contextualized use of language by learners generating their own productive expressions seems to be required for more thorough assimilation and retention. For new TL vocabulary to move into productive use and long-term memory, it seems that some form of negotiation of meaning must take place using actual language in tasks requiring productive output of some kind. Swain (1985) and de la Fuente (2002) have called these teacher-initiated production tasks “pushed output.” Two recent studies (Loucky 2004a, 2004b) have shown very good results for both lower level and higher level proficiency language learners when pushed output tasks are blended with CALL-enhanced bilingual glosses added to arrays of related word groups using Crow’s semantic field keyword approach (Crow & Quigley, 1985; Crow, 1986a, 1986b).

Different vocabulary-learning strategies seem to be more appropriate at different levels of learning and proficiency (e.g., initial learning strategies vs. subsequent consolidating strategies). Learners at beginning levels seem to benefit more from the use of bilingual dictionaries and word pairs. More advanced language learners, however, benefit from the use of both L1 and L2 tools (see Laufer & Hadar, 1997) because they are ready to process L2 explanations and use the L2 expressively. Both conventional wisdom and research studies have suggested that there are important links between language learners’ vocabulary knowledge and literacy skills and their academic and career achievements. For example, Wells (1985) found that the foundation of good literacy skills is laid in the home and that good learning experiences at school can help to reinforce those skills. He concluded that the “major determinant of education achievement is the extent of a child’s mastery of literacy” (p. 193).

Hatch and Brown (1995) built a five-step model of essential vocabulary-learning strategies, including “1) having sources for encountering new words, 2) getting a clear image, either visual or auditory or both, for the forms of the new words, 3) learning the meaning of the words, 4) making a strong memory connection between the forms and meanings of the words, and 5) using the words” (p. 373). The DLP scale described below generally parallels these five lexical processing steps. To make the transition from merely receptive to more active knowledge of
new words, Hatch and Brown asserted that learners must process new words or phrases through each of these five steps, “at least at some minimal level, to come to a full[y] productive knowledge of words” (p. 373). The vocabulary knowledge scale that underlies the DLP scale provides a clear measure of students’ gradual growth toward more mature lexical richness and greater productive vocabulary ability.

Nation (2001) also provided a system for analyzing vocabulary-learning strategies, one that the current study has adopted in a modified form. Nation’s three major categories of vocabulary strategies are

1. planning and choosing what to focus on,
   (This is interpreted here as meaning what teachers should focus on and help learners to focus on because many lower proficiency language learners do not know what their initial focus or processing steps in vocabulary learning should be.)
2. finding sources of information about vocabulary, and
   (This is interpreted here as accessing and elaborating new word meanings.)
3. processes for establishing vocabulary knowledge.
   (This is interpreted here as consolidating vocabulary knowledge.)

Sanaoui (1992, 1995) compared both ESL and EFL students and found clear distinctions between structured versus unstructured learners, noting that these two groups of learners differed in five important ways:

1. learners’ opportunities for vocabulary learning (i.e., independent study vs. reliance on course [and teacher] direction),
2. learners’ range of self-initiated vocabulary learning (i.e., extensive vs. restricted ranges),
3. learners’ records of lexical items they were learning (i.e., extensive/systematic vs. minimal/ad hoc),
4. how much learners reviewed their lexical records (i.e., extensive vs. little or none), and
5. whether learners practiced lexical items (creating opportunities for use in and out of class vs. relying on class instruction only).

It should also be emphasized that Sanaoui (1995) and others found that the individual approach taken by learners towards vocabulary learning (whether structured or unstructured) contributes significantly to their learning. In their recommendations, Kojic-Sabo & Lightbown (1999) underscored the importance of enhancing learners’ vocabulary learning skills by specific strategy training. They stated that teachers should make students more aware of the wide variety of strategies available for learning new vocabulary, and

… ultimately, to make them responsible for their own learning … As our results point out, it may well be that a particular group of strategies aids vocabulary learning to a greater extent than single specific strategies, or ran-
dom groupings of them. Also, it may be that the quality, rather than sheer quantity, of strategy use determines success for particular students in specific situations … . Encouraging learners to reflect on their personal practices for vocabulary study may increase their awareness of what they do, provide them with a starting point to assess the effectiveness of their efforts in relation to their progress, and help them discover other strategies that would suit their personal learning styles. After all, lexical learning is an on-going, life-long process, heavily influenced by individual preferences, personality differences, and motivational factors and a host of other variables. (pp. 190-191)

A large-scale study by Gu and Johnson (1996), similar to that of Schmitt (1997), surveyed the vocabulary knowledge scales of 850 Chinese students (third-year college non-English majors). Gu and Johnson identified five different approaches to vocabulary learning: (a) labeled encoders, (b) readers, (c) active strategy users, (d) non-encoders, and (e) passive strategy users. Examining the effect of learners’ use of VLSs, they found that skillful use of dictionaries and contextual guessing both positively correlated with general proficiency and vocabulary size. Fraser (1999a, 1999b) also examined the effect of students’ VLS use on vocabulary learning through a retrospective think-aloud technique and found that consulting a dictionary in combination with inferring meanings of words maximizes vocabulary learning. These results suggest that dictionary use and contextual guessing are not mutually exclusive; successful learners rely on both dictionaries and contextual guessing. Lessard-Clouston (1998), commenting on Gu and Johnson’s study, stated

Through multiple regression analysis [Gu and Johnson] found that two VLSs, self-initiation and selective attention, emerged as positive predictors of their participants’ proficiency, as measured by their college English test scores. They also found the VLSs of contextual guessing, skillful dictionary use, paying attention to word formation, contextual encoding, and using newly learned words correlated positively with participants’ test scores. … [and they] discovered that VLS combinations, rather than individual VLSs, may have made positive differences in their participants’ vocabulary learning [italics added]. (p. 2)

Kobayashi (2005) studied the effects of using portable electronic dictionaries versus print dictionaries on three major classes of lexical processing strategies: guessing, skipping, and consulting. Kobayashi investigated the use of these three strategies by 279 university-level Japanese learners of English. The results of her survey showed that electronic dictionaries played an important part in the students’ learning of English. The majority of the students owned electronic dictionaries and appeared to depend heavily on them. The students’ use of the electronic dictionaries also had a positive impact on their use of VLSs. The availability of the electronic dictionaries resulted in increased frequency of dictionary consultation by students, especially among those with low vocabulary knowledge. Kobayashi conceded however that
There is less research on how dictionary consultation interacts with other LPSs [lexical processing strategies]. LPSs refer to the strategies that an L2 reader uses when confronting an unknown word (Fraser, 1999a, 1999b; Paribakht & Wesche, 1999). They include consulting a dictionary, consulting others, inferring word meaning using contextual cues, and ignoring. A reader combines multiple LPSs to deal with unknown words in natural contexts. Learners are generally strategic about the words they look up, paying more attention to the words that are important for reading comprehension (Fraser, 1999b; Hulstijn, 1993). However, less successful readers engage in word-by-word decoding by looking up almost all words at the expense of overall comprehension (Adamson, 1990; Hosenfeld, 1977). (p. 395)

Other studies have also concluded that electronic dictionaries were superior to print dictionaries mainly based on reduced search time (e.g., Taylor & Chan, 1994; Koga, 1995; Inami, Nishikata, Nakayama, & Shimizu, 1997; Loucky, 2002a, 2002b, 2003b, 2003c).

Clearly, the strategic choice between dictionary use and other VLS options is an important skill for L2 readers to develop. So far, however, few studies have considered how CALL could help to raise awareness and practice in using a much broader range of effective and essential VLSs. The present study addresses this question.

THE STUDY

There are as yet few studies examining what specific kinds of vocabulary learning strategies L2 students employ when using CALL materials and how the use of these strategies may differ in quality or quantity from those used when reading print materials. To contribute towards an understanding of online reading and vocabulary development, the author developed a taxonomy of vocabulary learning strategies based on Schmitt’s (1997) useful distinction between discovery versus consolidating strategies. This 40-item VLS taxonomy gives brief descriptions of strategies used at the discovery and consolidating stages of vocabulary development (see the modified version of Schmitt’s survey in Appendix A and the results of its use in Table 3 below). Besides studies investigating the effects of hypermedia on vocabulary development, (e.g. Akbulut, 2004a, 2004b; Coll, 2002), few detailed CALL or electronic-dictionary-based studies of VLS use have been done, with the exception of the studies by Hill and Laufer (2003) and Kobayashi (2005).

Optimal conditions governing strategy use in traditional versus CALL environments need to be further developed using various computer functions and online features to encourage learners to include essential phases of lexical processing. The author undertook the present study to better assess Japanese students’ use of VLSs based on the modified version of Schmitt’s survey and a DLP checklist derived from a combination of these VLSs and an eight-phase DLP scale.

The study sought to examine how to best maximize L2 vocabulary development by using a DLP scale and VLS taxonomy together with online CALL re-
sources and systematic instruction in the use of the VLSs. The study also included a student survey on the use of electronic dictionaries (see the student survey in Appendix B). The electronic dictionary use survey was designed to solicit information about how students used various computerized functions of electronic or online dictionaries at each of the following major phases of lexical processing:

1. Assessing degree of word knowledge,
2. Accessing new word meanings,
3. Archiving new information for study,
4. Analyzing word parts and origins,
5. Anchoring new words in short-term memory,
6. Associating words in related groups for long-term retention,
7. Activating words through productive written or oral use, and
8. Reviewing/recycling and retesting them.

METHOD

Procedures and Participants

The project involved 112 students in five groups distributed over a 5-year period of time. The students in groups 1-4 were Japanese freshmen engineering students at a national university in Kyushu between 2000 and 2004. Group 5 consisted of engineering graduate students enrolled in a one-semester-only course at the same university. While most Japanese students have completed 6 years of English study at the secondary level before entering the university, the students in this project averaged 7.32 years of English study, including after school conversation and cram school English training. Table 1 lists the number students in each group and their vocabulary grade level, as assessed by a US-normed standardized reading test (Gates McGinitie). The author has found consistent results in using these levels to estimate Japanese high school and college students’ reading and vocabulary levels over two decades (Loucky, 1996, 1997a, 2002c, 2003a).

Table 1
Project Participants by Group

<table>
<thead>
<tr>
<th>Group</th>
<th>Class at university</th>
<th>Vocabulary grade level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group 1</td>
<td>Period 1</td>
<td>3.8</td>
</tr>
<tr>
<td>(n = 24, all males)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 2</td>
<td>Period 2</td>
<td>3.6</td>
</tr>
<tr>
<td>(n = 15, all males)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 3</td>
<td>Period 3</td>
<td>5.3</td>
</tr>
<tr>
<td>(n = 21, all males)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 4</td>
<td>Period 4</td>
<td>3.4</td>
</tr>
<tr>
<td>(n = 19, 1 female, 18 males)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Group 5</td>
<td>Period 5</td>
<td>3.9</td>
</tr>
<tr>
<td>(n = 33, graduate students, all males)</td>
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</table>

Every year, the students completed surveys on the VLS taxonomy and DLP
scale at the beginning and end of each year as pre- and postassessments of how their use and awareness of various VLSs changed over the course of the year. The eight phases of vocabulary learning in the DLP scale (see Table 2) that were assessed in each group may be conveniently characterized as a series of processing steps designed to enhance lexical acquisition. The strategies in Part C of the DLP scale were taught to the students early in the year, except for those in group 5 because the (graduate) students in this group were enrolled in a one-semester-only course.

Table 2
DLP Scale: Eight-Fold Path to Fluency Applying Taxonomy of Vocabulary Learning Steps, Skills, and Strategies

A. Initial Discovery Strategies

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
<th>Phase 5</th>
<th>Phase 6</th>
<th>Phase 7</th>
<th>Phase 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess</td>
<td>Access</td>
<td>Archive</td>
<td>Analyze</td>
<td>Associate</td>
<td>Activate</td>
<td>Anchor</td>
<td>Reassess, review, recycle</td>
</tr>
<tr>
<td>Attend to and check words; make chances to learn</td>
<td>Connect; always look words up</td>
<td>Record; keep clear records</td>
<td>Separate; divide words into parts (e.g., root)</td>
<td>Organize; group under a keyword</td>
<td>Produce and express; always practice</td>
<td>Fix/hook; fix with memory tricks</td>
<td>Repeat, remeet, recheck; study!</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess vocabulary level by vocabulary knowledge scales; headwords or standard reading pretests</td>
<td>MEANING FOCUSED Access definitions in L1 and L2 (rapid access/recall functions)</td>
<td>Record definitions with means to recall/ study; keep VLS notebooks; (rapid recording best)</td>
<td>ROOT-WORD CENTERED Focus on word analysis of base, affixes, and suffixes</td>
</tr>
<tr>
<td>Highlight and pre-teach common core high-frequency vocabulary; use EAP/ESP lists</td>
<td>Use various glossing types; teacher definitions before or during instruction; electronic or print dictionary lookups</td>
<td>Use Quickionary pens with optical character recognition or electronic bilingual dictionaries</td>
<td>Focus on word origins and grammar; note context and meaning while reading</td>
</tr>
</tbody>
</table>

B. Consolidating Strategies

<table>
<thead>
<tr>
<th>Phase 5</th>
<th>Phase 6</th>
<th>Phase 7</th>
<th>Phase 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Semantic field keyword approach; categorize by related classes by keywords</td>
<td>Establish in short-term memory until fixed in long-term memory; use mnemonic devices</td>
<td>USE-FOCUSED Activate new words by productive, expressive use</td>
<td>EXERCISES Measure vocabulary growth by posttest to motivate, focus attention, and warn</td>
</tr>
</tbody>
</table>

C. Eight-Phase Scale for Classroom Instruction (Checklist for Japanese Students)

<table>
<thead>
<tr>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
<th>Phase 4</th>
<th>Phase 5</th>
<th>Phase 6</th>
<th>Phase 7</th>
<th>Phase 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assess</td>
<td>Access</td>
<td>Archive</td>
<td>Analyze</td>
<td>Associate</td>
<td>Activate</td>
<td>Anchor</td>
<td>Reassess, review, recycle</td>
</tr>
<tr>
<td>Attend to and check words; make chances to learn</td>
<td>Connect; always look words up</td>
<td>Record; keep clear records</td>
<td>Separate; divide words into parts (e.g., root)</td>
<td>Organize; group under a keyword</td>
<td>Produce and express; always practice</td>
<td>Fix/hook; fix with memory tricks</td>
<td>Repeat, remeet, recheck; study!</td>
</tr>
</tbody>
</table>
As seen by the division of Table 2 into parts A and B, the author applied Schmitt’s distinctions between discovery and consolidating VLSs in the DLP scale as follows: discovery strategies included attending and assessing, accessing, archiving, and analyzing; consolidating strategies included associating, anchoring, activating, and reassessing, recycling, and reviewing.

A pilot study for the project was completed with the students in Group 1 in academic year 2000. The students were given instruction on how to monitor their use of VLSs and completed a survey on their use of them in the first semester using Schmitt’s detailed list of strategies. Some strategies were added to this original list such as “use computerized bilingual dictionary,” “use in new contexts,” and “use in creative vocabulary stories,” and other (overlapping) strategies were combined to streamline the survey. The 40 major VLSs were then grouped in the eight phases in the DLP scale. The short VLS checklist in part C of Table 2 was also developed and given to students at the end of the academic year to help them reflect on which VLSs they used during the year versus those which they thought would be helpful to use more often in the future. The results of the pilot study are reported in Table 3.

Table 3
Results of the Use of the 40-Item VLS Taxonomy with Students in Group 1
(Organized into Eight Phases of Lexical Processing)

<table>
<thead>
<tr>
<th>A. Discovery of New Word Meanings by VLS Types 1-4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Attend and assess (pretest)</td>
</tr>
<tr>
<td>2. Access Ask or ascertain meaning</td>
</tr>
<tr>
<td>3. Archive Record meanings of any new words in some way</td>
</tr>
<tr>
<td>4. Analyze Divide word into parts to get meaning by</td>
</tr>
<tr>
<td>(Circle things you do to learn new words.)</td>
</tr>
<tr>
<td>1. Evaluate which words I know. (4/24 = 17%)</td>
</tr>
<tr>
<td>2. Guess unknown words. (8/24 = 33%)</td>
</tr>
<tr>
<td>3. Mark words for Study. (4/24 = 17%)</td>
</tr>
<tr>
<td>4. If no need, I skip. (0/24 = 0%)</td>
</tr>
<tr>
<td>5. asking friend(s) or the teacher in L1. (18/24 = 92%)</td>
</tr>
<tr>
<td>6. asking the teacher in the L2. (7/24 = 29%)</td>
</tr>
<tr>
<td>7. using a computerized bilingual dictionary. (6/24 = 25%)</td>
</tr>
<tr>
<td>8. using a printed bilingual dictionary. (6/24 = 25%)</td>
</tr>
<tr>
<td>9. finding the L2 meaning in a monolingual English dictionary. (2/24 = 8%)</td>
</tr>
<tr>
<td>10. Copy word lists in vocabulary notebook or write repeatedly (7/24 = 29%)</td>
</tr>
<tr>
<td>11. on cards, (6/24 = 25%)</td>
</tr>
<tr>
<td>12. on computer, (1/24 = 4%)</td>
</tr>
<tr>
<td>13. in margin or take vocabulary notes. (7/24 = 29%)</td>
</tr>
<tr>
<td>14. base/root word, (3/24 = 12%)</td>
</tr>
<tr>
<td>15. beginning or endings. (2/24 = 8%)</td>
</tr>
<tr>
<td>16. Note spelling and pronunciation. (6/24 = 25%)</td>
</tr>
<tr>
<td>17. Grammar: find parts of speech. (5/24 = 21%)</td>
</tr>
<tr>
<td>18. Use scales to learn adverbs and adjectives. (3/24 = 12%)</td>
</tr>
<tr>
<td>19. Use word origins. (2/24 = 8%)</td>
</tr>
</tbody>
</table>
B. Consolidating New Word Forms and Meanings by VLS Types 5-8

<table>
<thead>
<tr>
<th></th>
<th>Anchor Fixing new word’s form and meaning in memory by</th>
<th>Associate I organize new words</th>
<th>Activate Do you use a new word soon in your expression by</th>
<th>Reassess, review, and recycle (posttest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20. using pictures/</td>
<td>25. by alphabet, (6/24 = 25%)</td>
<td>28. using paraphrases or in my own speaking, (9/24 = 37%)</td>
<td>33. Study regularly; repeat words over time. (4/24 = 17%)</td>
<td></td>
</tr>
<tr>
<td>hints, (9/24 = 37%)</td>
<td>26. by grammar. (4/24 = 17%)</td>
<td>29. using written sentences, (7/24 = 29%)</td>
<td>34. Review card/notes. (8/24 = 33%)</td>
<td></td>
</tr>
<tr>
<td>21. noting similar sounds, (5/24 = 21%)</td>
<td>30. acting in a play/skit or using physical action, (1/24 = 4%)</td>
<td>35. Reuse actively. (2/24 = 8%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>22. noting similar form, (5/24 = 21%)</td>
<td>31. drawing a picture to show real use, (1/24 = 4%)</td>
<td>36. Review by lists recognizing meanings. (9/24 = 37%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23. acting it out, (1/24 = 4%)</td>
<td>32. writing a creative vocabulary story. (2/24 = 8%)</td>
<td>37. Recall new words from memory links. (9/24 = 37%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24. building a link or mental hook/ clue. (1/24 = 4%)</td>
<td>a. synonym/antonym, (5/24 = 21%)</td>
<td>38. Reproduce story or learned sentences. (1/24 = 4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>b. under simple, known keywords (in semantic fields), (1/24 = 4%)</td>
<td>39. Use in new contexts. (1/24 = 4%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. with concept maps (0/24= 0%)</td>
<td>40. Review with others. (5/24 = 21%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>I don’t organize. (0/24 = 0%)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Depth of Lexical Processing Checklist (Quick Tally Form)

<table>
<thead>
<tr>
<th>Assess and attend</th>
<th>Access Ask/ ascertain meaning</th>
<th>Archive Record meanings</th>
<th>Analyze Divide word into parts to get meaning</th>
<th>Anchor Fix new word’s form and meaning</th>
<th>Associate Organize new words</th>
<th>Activate</th>
<th>Reassess, review, recycle (posttest)</th>
</tr>
</thead>
</table>

Which of these eight steps do you use REGULARLY when you meet new words? 

Which unused strategies do you think would be HELPFUL for you to use in the future? 

Total # of VLS used: __________/40  X 2.5 = __________% VLS used

Based on the results of this pilot study, Schmitt’s original survey, the modified 40-item VLS taxonomy form, and the short VLS checklist (Part C in Tables 2 and 3) were administered to students in groups 2-5 in the following years. Students in each group were given instructions in a teacher-made workbook on how to moni-
tor their use of VLSs and were encouraged to use as many of them as possible in the lexical processing stages listed in the tables above whenever they encountered new words during their readings. They completed the VLS taxonomy during the academic year and the short VLS checklist at the end of the year. Students were asked to total and compute the percentage of their VLS use (2.5 points per VLS used X 40 = 100%) and then to take the shorter DLP checklist in Part C in Table 2 and summarize their overall use of its eight phases (x/8 actively used versus x/8 thought to be helpful).

RESULTS

The responses of students in Groups 2-4 (N = 58) are reported in aggregate form in Table 4 representing the VLSs that the students used most often or found most helpful. In the cells in Table 4, the first number (e.g., 44 Ls) refers to the number of learners who reported using that strategy or finding it helpful. The second number (e.g., SS VLS 8) refers to the strategy number in Schmitt’s survey. The final number (e.g., DT 7, meaning item 7 on the author’s DLP taxonomy questionnaire) refers to the comparable strategy found in the author’s VLS taxonomy, based on its DLP scale grid number. Table 4 includes only the strategies mentioned by two or more students.

Table 4

VLSs Used or Found Helpful by Japanese College Students

A. Discovery Strategies for New Word Meanings

<table>
<thead>
<tr>
<th>Most useful</th>
<th>Second most useful</th>
<th>Third most useful</th>
<th>Fourth most useful</th>
<th>Fifth most useful</th>
</tr>
</thead>
<tbody>
<tr>
<td>44 Ls: Use English-Japanese dictionary: (SS VLS 8; DT 7 &amp; 8)</td>
<td>13 Ls: Use English-English dictionary (SS VLS 7; DT 9)</td>
<td>12 Ls: Ask classmates (SS VLS 3; DT 5, 9 &amp; 10 )</td>
<td>Ask teacher for Japanese meaning (SS VLS 4; DT 6 &amp; 10)</td>
<td>Guess meaning from context (SS VLS 13; DT 2)</td>
</tr>
<tr>
<td>36 Ls: Guess meaning from context (SS VLS 13; DT 2)</td>
<td>8 Ls: Use English-Japanese dictionary (SS VLS 8; DT 7&amp;8)</td>
<td>7 Ls: Guess meaning from context (SS VLS 13; DT 2)</td>
<td>7 Ls: Ask teacher for English meaning (SS VLS 4; DT 10)</td>
<td>5 Ls: Analyze word parts (SS VLS 9; DT 15-18)</td>
</tr>
<tr>
<td>35 Ls: Use English-English dictionary (SS VLS 7; DT 9)</td>
<td>7 Ls: Look at pictures or gestures (SS VLS 1; DT 24&amp;27)</td>
<td>5 Ls: Check part of speech (SS VLS 10; DT 19)</td>
<td>5 Ls: Check part of speech (SS VLS 7; DT 9)</td>
<td>5 Ls: Check part of speech (SS VLS 7; DT 9)</td>
</tr>
<tr>
<td>2 Ls: Ask teacher for Japanese meaning (SS VLS 5; DT 6 &amp; 9)</td>
<td>7 Ls: Ask teacher for English meaning (SS VLS 4; DT 6 &amp; 10)</td>
<td>7 Ls: Ask teacher for Japanese meaning (SS VLS 4; DT 6 &amp; 10)</td>
<td>5 Ls: Analyze word parts (SS VLS 9; DT 15-18)</td>
<td>5 Ls: Check part of speech (SS VLS 7; DT 9)</td>
</tr>
<tr>
<td>Most useful</td>
<td>Second most useful</td>
<td>Third most useful</td>
<td>Fourth most useful</td>
<td>Fifth most useful</td>
</tr>
<tr>
<td>-------------</td>
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<td>-------------------</td>
<td>------------------</td>
</tr>
<tr>
<td>5 Ls: Use English-English dictionary (SS VLS 7; DT 9)</td>
<td>4 Ls: Learn meaning in group work (SS VLS 2; DT 27 &amp; 31)</td>
<td>2 Ls: Ask for sentence example (SS VLS 6; DT 6 &amp; 10)</td>
<td>Ask for sentence example (SS VLS 6; DT 6 &amp; 10)</td>
<td>3 Ls: Learn Idioms (SS VLS 22; Not applying to unborrowed words on DT)</td>
</tr>
</tbody>
</table>

B. Consolidating Strategies for Remembering New Word Meanings

<table>
<thead>
<tr>
<th>Most useful</th>
<th>Second most useful</th>
<th>Third most useful</th>
<th>Fourth most useful</th>
<th>Fifth most useful</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 Ls: Study new words often (SS VLS 27; DT 34)</td>
<td>6 Ls: Write out new word meanings often (SS VLS 26; DT 30)</td>
<td>4 Ls: Remember by sounds (SS VLS 10/DT 25)</td>
<td>10 Ls: Study often over time (SS VLS 27; DT 34)</td>
<td>5 Ls: Write out new word meanings often (SS VLS 26; DT 30)</td>
</tr>
<tr>
<td>19 Ls: Write out new word meanings often (SS VLS 26; DT 30)</td>
<td>4 Ls: Use actions (SS VLS 7; DT 27 &amp; 31)</td>
<td>3 Ls: Imagine word and spelling (SS VLS 18 or DT 26 &amp; 38)</td>
<td>4 Ls: Write out new word meanings often (SS VLS 26; DT 30)</td>
<td>4 Ls: Take notes to recall new word (SS VLS 8; DT 11 &amp; 14)</td>
</tr>
<tr>
<td>5 Ls: Remember by sounds (SS VLS 10; DT 25)</td>
<td>4 Ls: Study often over time (SS VLS 27; DT 34)</td>
<td>3 Ls: Connect with situations (SS VLS 13; DT 27, 28, 31, 32, 33, 38, 39, &amp; 40)</td>
<td>3 Ls: Use spelling (SS VLS 18; DT 26 &amp; 38)</td>
<td>3 Ls: Learn Idioms (SS VLS 22; Not applying to unborrowed words on DT)</td>
</tr>
<tr>
<td>4 Ls: Use sentences (SS VLS 2; DT 29, 30, 33, &amp; 36)</td>
<td>3 Ls: Use sentences (SS VLS 2; DT 29, 30, 33, &amp; 36)</td>
<td>3 Ls: Use repetition (SS VLS 21; DT 34 &amp; 35)</td>
<td>3 Ls: Remember by sounds (SS VLS 10; DT 25)</td>
<td>2 Ls: Remember by sounds (SS VLS 10; DT 25)</td>
</tr>
<tr>
<td>2 Ls: Paraphrase word meaning (SS VLS 1; DT 29 &amp; 40)</td>
<td>3 Ls: Use cards (SS VLS 4; DT 12 &amp; 35)</td>
<td>3 Ls: Say aloud (SS VLS 11; DT 29, 31, &amp; 39)</td>
<td>3 Ls: Use word lists (SS VLS 5; DT 37)</td>
<td>2 Ls: Use roots and affixes (SS VLS 16; DT 15, 16, &amp; 17)</td>
</tr>
<tr>
<td>2 Ls: Take notes to recall new word (SS VLS 8; DT 11 &amp; 14)</td>
<td>3 Ls: Use flash cards (SS VLS 4; DT 12 &amp; 35)</td>
<td>3 Ls: Use word lists (SS VLS 5; DT 37)</td>
<td>2 Ls: Take notes to recall new word (SS VLS 8; DT 11 &amp; 14)</td>
<td></td>
</tr>
</tbody>
</table>
The results presented in Table 4 mirror many of findings of Schmitt (1997), Kudo (1999), and Orita (2003), among others. Schmitt and Orita found that the most frequently used VLSs for discovery were guessing from context, using a bilingual dictionary, and asking classmates. Likewise in this study, these two VLSs were the most highly preferred strategies for learning new words. The preferred VLSs were, in rank order, (a) using bilingual dictionaries (VLS 8 used by 44 learners), (b) guessing from context (VLS 13 used by 36 learners), and (c) using monolingual dictionaries (VLS 7 used by 35 learners). For consolidation, the preferred VLSs were (a) studying new words often over time (VLS 27 used by 22 learners) and writing new words out (VLS 26 used by 19 learners).

**DISCUSSION**

In this study, most of these Japanese college students showed a low average use of VLSs, except for students in the most advanced class (the graduate students in Group 5). Despite having had an average of 7.32 years of previous study in English, only about half of the students (52%) reported using even the first three of the eight stages of vocabulary learning. Although three fourths of the students (74%) thought that each of the eight types of VLSs would be useful in their language learning, their average use of all eight steps was only 37%.

Students in the lower proficiency level classes used, on average, only 26% of the 40 VLSs. The most widely used strategies were accessing unknown words in Japanese (62%, compared to only 20% for accessing unknown words in English), asking classmates for help or using an English-Japanese book dictionary (50%), archiving/recording meanings of unknown words or simply skipping over unknown words (45%), trying to guess meanings from context (40%), using monolingual dictionaries (37%), and using English to Japanese electronic dictionaries (35%, compared with 25% for using Japanese to English electronic dictionaries). The other VLSs were used by under 30% of the lower proficiency level students.

The graduate students in group 5 used a slightly higher percentage of VLSs than the lower proficiency undergraduate students, 32% versus 26%. However, the most proficient undergraduate students (Group 3), who had the highest average use of electronic dictionaries, also had the highest average use of VLSs (41%). The students in this group also had an average vocabulary gain of 1.07 over the academic year, the highest vocabulary gain observed by the researcher in the past decade at this institution. Students who used electronic dictionaries consistently and diligently generally reached higher levels of English proficiency than those who did not (Loucky, 2005c). A more detailed analysis of dictionary use by the students in Group 3 revealed that 11 out of 21 learners surveyed (52%) used electronic dictionaries (2 bilingual only and 9 fully bilingualized—with both bilingual and monolingual lexicons), whereas 6 students (29%) used only bilingual print dictionaries. Four other students (19%) did not bring a dictionary to class; they each borrowed a monolingual learner’s dictionary of their choice from a class collection. Some students carried both print and electronic dictionaries to class but tended to use their electronic devices for easier, more rapid access to unknown words.
These results seem to indicate that systematic use of electronic dictionaries can help foreign language learners to focus more time and attention on essential VLSs, especially regularly reassessing, recycling and reusing new terms. This is because quickly accessing new word information and automatically saving it for review are two of the major advantages of portable electronic dictionaries.

Schmitt (1997), Kudo (1999), Orita (2003), and the findings of this study show that most Japanese students, regardless of the number of years of English language learning, use relatively few strategies when learning new TL vocabulary, suggesting that these students have not had effective training in VLSs. Few secondary English teachers in Japan seem to be aware of VLS taxonomies to help students learn more effective strategies for discovering the meaning of unknown TL vocabulary or for consolidating their knowledge of TL vocabulary.

While about half of all students reported using the first three types of VLSs, discovery strategies following Schmitt’s model, less than one third of the students (28%) made an effort to use any of the other five types VLSs. This means that 72% of the students failed to use more cognitively or communicatively demanding processes, namely any of those VLSs characterized by lexical phases 5-8 in the DLP scale. Only the most advanced students, who routinely used electronic dictionaries, reported using the greatest number of VLSs.

In addition, this finding indicates a substantial lack of effective strategy training for most students. Comparison of students’ views of VLSs thought to be useful versus those actively used shows a very clear pattern (see Table 5).

Table 5
Comparison of VLSs Thought to Be Useful Versus Those Actively Used

<table>
<thead>
<tr>
<th>Phase of DLP scale</th>
<th>Thought to be useful</th>
<th>Actively used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Assessing</td>
<td>74%</td>
<td>45%</td>
</tr>
<tr>
<td>Accessing</td>
<td>86%</td>
<td>60%</td>
</tr>
<tr>
<td>Archiving</td>
<td>93%</td>
<td>52%</td>
</tr>
<tr>
<td>Analyzing</td>
<td>47%</td>
<td>38%</td>
</tr>
<tr>
<td>Associating</td>
<td>72%</td>
<td>36%</td>
</tr>
<tr>
<td>Anchoring</td>
<td>86%</td>
<td>33%</td>
</tr>
<tr>
<td>Activating</td>
<td>78%</td>
<td>14%</td>
</tr>
<tr>
<td>Reassessing, reviewing, and recycling</td>
<td>55%</td>
<td>21%</td>
</tr>
</tbody>
</table>

Clearly, the majority of academically strong Japanese students—if this sample of engineering students at a prestigious university in Kyushu is representative of academically strong students—seem to lack some of the most basic vocabulary learning habits. It appears that Japanese secondary English education in many cases has failed to provide students with the necessary core vocabulary to become more independent language learners and fluent readers in English. Neither has it adequately trained many of its high school and college students by giving them
a systematic and effective approach to learning how to both remember and use new TL forms and meanings. As a result, their progress in learning any foreign language in general has been severely hampered (for possible remedies to these problems, see http://www.CALL4ALL.us).

Japan’s Ministry of Education also seems to lack sufficiently clear guidelines for teaching English in elementary schools where it has just been introduced as a new subject or for structuring the learning of English vocabulary in secondary schools (Pakos, 2001). It is clear that better guidelines for vocabulary learning are urgently needed, which a systematic VLS taxonomy such as the one proposed in this article can help to remedy. Various VLS studies done with Japanese students show that the large majority of them still lack knowledge and practice of many of the major lexical processing steps essential to building up an adequate working vocabulary in a foreign language. It is only logical to assume that their failure to practice these phases of second language vocabulary learning may well be a major reason for Japanese students having low levels of vocabulary, communicative competence, and ability to perform well on more advanced English language proficiency tests, such as Cambridge or Michigan Proficiency, TOEIC, and TOEFL.

While each of the phases and strategies included in the DLP scale and the VLS taxonomy would of course benefit from further research, they seem to be most effectively employed under specific language learning conditions. Both the quantity of new lexical learning—expressed in terms of growing vocabulary size—and the quality of new lexical learning—expressed in terms of both breadth and depth—can be improved by

1. learning how to effectively apply the many useful functions of modern computer technology (see Lewis, 2002; Segler et al., 2001),
2. using a more systematic, associative memory network (or semantic field keyword) approach, (see Crow, 1986a, 1986b; Crow & Quigley, 1985; Quigley, 1986), and

More research should also be done on the beneficial language-learning effects of using various CALL reading programs (see Chen, 2004; Loucky, 2003d, 2003e) along with consistent and well guided use of computerized bilingual and/or monolingual dictionaries (see Loucky, 2002a, 2002b, 2003b, 2003c), especially when these dictionaries are systematically used to enhance the most essential lexical-processing steps elucidated by the DLP scale.

PEDAGOGICAL IMPLICATIONS

Even though a taxonomy of essential vocabulary processing strategies can be easily taught, as the author did with the students in Group 1, effective vocabulary
learning strategies must be practiced and actively used to become regular, independent language-learning habits. One can apply Sanaoui’s (1992, 1995) distinction between “structured” versus “unstructured” to evaluate learners’ approach to vocabulary learning since their approach clearly affects the resulting degree of lexical learning. Applying Sanaoui’s structured/unstructured distinction to the VLSs employed by the learners in this study results in the threefold profile of learning styles shown in Table 6.

Table 6
Profile of Three Types of Approaches to Vocabulary Learning

<table>
<thead>
<tr>
<th></th>
<th>Random, unstructured type</th>
<th>Semi-structured type</th>
<th>Systematic, structured type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uses fewer than 3 DLP steps, randomly and inconsistently.</td>
<td>Uses more than 4-5 DLP steps consistently.</td>
<td>Uses 6-8 DLP steps consistently (even 9-12).</td>
<td></td>
</tr>
<tr>
<td>Uses no particular approach or pattern adopted in use of VLSs.</td>
<td>Uses mainly discovery VLSs only.</td>
<td>Uses both discovery and consolidating VLSs together. Bilingualized EDs</td>
<td></td>
</tr>
<tr>
<td>Tends to be reluctant/unwilling to try to use new TL terms.</td>
<td>Uses TL terms if directed or pushed to produce output.</td>
<td>Tries to actively use new TL terms in own personal expression.</td>
<td></td>
</tr>
<tr>
<td>Learning is haphazard, disorganized.</td>
<td>Learning is semi-organized, simplistic.</td>
<td>Learning is well organized, complex.</td>
<td></td>
</tr>
<tr>
<td>Lacks noticeable language-learning motivation.</td>
<td>Has strong instrumental motivation only; “Just get through the course.”</td>
<td>Has both integrative and instrumental motivation.</td>
<td></td>
</tr>
<tr>
<td>Often brings no dictionary to class; does not try monolingual learner’s or computerized bilingual dictionary.</td>
<td>Uses computerized bilingual dictionary, but only with limited functions; does not usually use both bilingual and monolingual dictionaries.</td>
<td>Uses computerized bilingual dictionary with systematic, multifunctional features.</td>
<td></td>
</tr>
<tr>
<td>Makes little or no productive use or vocabulary study outside of class.</td>
<td>Engages in some vocabulary study outside of class, but not in actual use of TL terms.</td>
<td>Monitors and checks on own progress; asks and interacts socially using TL terms.</td>
<td></td>
</tr>
</tbody>
</table>

Although Sanaoui posited two types of learners, it appears that a tripartite model seems to describe many ESL/EFL learners’ use of VLSs more accurately. In particular, the intermediary type of learner, the semi-structured type in Table 6, is still in need of strategy training.

The categories Sanaoui used in his analysis correspond to those used in the VLS taxonomy and DLP scale presented here. For example, Sanaoui’s “Students’ opportunities for learning new vocabulary” (i.e., independent study vs. reliance on course [and teacher direction]) can only come about if learners are first guided to follow the initial “Assessing” phase in the DLP scale. Crucial pedagogical questions that occur under this initial category include: “Which words are important to learn, which words does a student know and to what degree, which words should they focus on versus skip or guess, and in what order?” (see Loucky, 2002d). In addition, Sanaoui’s “recording new lexical items” is included in the “Archiving” phase in the DLP scale. That is, students should be encouraged to keep well or-
ganized records of lexical items they are learning instead of minimal or ad hoc vocabulary lists. Students who have CALL devices should be encouraged to use manual and automatic word history functions, as well as auto-archive/save and print functions for future review sessions (see Loucky, 2002a, 2002b). Further, Sanaoui’s “How much learners review such words or records” is contained in phase 8 of the DLP scale, “Reassessing, reviewing, and recycling.” If learners do not know how to activate and anchor new words and phrases by deeper affective and cognitive processing, they will not be able to obtain the benefits that social interaction and planned re-encounters with TL vocabulary can bring. Finally, Sanaoui’s “degree of practice” (i.e., opportunities created for use in and out of class vs. reliance on class instruction only) can be measured by observing and evaluating how thoroughly language learners follow last five phases of the DLP scale, “Analyzing, Associating, Anchoring, Activating, and Reassessing, reviewing, and recycling.” The CALL4All website contains additional information about vocabulary learning strategies and other information about the use of CALL in second-language vocabulary acquisition and reading (see http://www.CALL4ALL.us).

Constructing an Ideal CALL Environment

Based on the considerations discussed above, the specific learning factors should be clearly distinguished for better analysis of their respective roles in second-language acquisition (SLA) in general and second-language-vocabulary acquisition (SLVA) in particular when developers construct an electronic text or CALL program. The following factors can serve as useful guidelines for constructing an ideal CALL environment to maximize SLA and SLVA:

1. inclusion of learning style preferences (often due to the how individuals have learned their first language and its linguistic characteristics, e.g., Kanji versus alphabetic orthography),
2. vocabulary learning strategies (e.g., those required by the teacher/text or imposed by the CALL program vs. those chosen by learners),
3. means of glossing (e.g., L1 translations, L2 definitions only, or fully bilingualized combinations of both L1 and L2 information, perhaps including full sentence examples of major meanings [Laufer & Hadar, 1997; Loucky 2004b] and still picture or video annotations),
4. language-learning tasks or factors included in language-learning tasks (e.g., quantity, richness, and degree of organization of new TL vocabulary),
5. depth of lexical processing or more elaborative cognitive processing (see Craik & Tulving, 1975),
6. attractiveness (e.g., quality of learner interface and ease of use),
7. degree and type of language interaction (e.g., interaction required or prompted by the program),
8. availability of technical functions (e.g., pacing of voice, text screens, types of semantic and syntactic elaboration, and multimedia links),
9. degree of learner motivation, interest, and purpose (i.e., how these are encouraged in the program), and
10. cost effectiveness (e.g., students’ preference for free online or downloadable programs, see examples at http://www.CALL4ALL.us).

**Strategies Instruction**

The use of both a DLP scale and a VLS taxonomy acquisition model would enable teachers to focus on training their students to use effective strategies to develop fluency in the TL. These instructional strategies should clearly include teaching students how to

1. assess their vocabulary knowledge and learning by means of some kind of vocabulary knowledge scale such as the one proposed by Loucky (2002a, 2005a) (see also Loucky, 2003b, 2004d; Wesche & Paribakht, 1996),
2. use intelligent, integrated CALL tools such as computerized bilingual dictionaries of various sorts, to enhance each phase of lexical processing (e.g., rapidly accessing new word meanings and recording lexical information in an organized way),
3. use a DLP scale such as that proposed here to guide them to greater variety and depth of both word and text processing (Craik & Tulving, 1975),
4. use CALL software and online programs that include a greater number of multimedia features as well as more lexical-processing steps (see Takefuta, 1999),
5. identify and focus on high-frequency, common-core vocabulary (Nation & Newton, 1997; Loucky, 2002c) and academic words (Coxhead, 2000),
6. maximize active practice of TL terms in productive development and communicative interactions in computer-mediated or face-to-face sessions (Loucky, 1997b, 1998; Hatch & Brown, 1995; Nation, 2001; Thornbury, 2002), and

In sum, language learners at an early acquisition level should focus on phonetic-word decoding and sight-word learning and, at later intermediate and advanced stages, on developing those strategies most needed for discovering new meanings from context based on predictions from known words. A consistent finding from observing the students in this project is that the higher a class’s average vocabulary level is, the greater the number of students who use electronic dictionaries and CALL resources to improve their learning (Loucky, 2002a, 2002b, 2003b, 2003c, 2004a, 2004b). From the early intermediate level, language learners should be trained in how to effectively use more rapid-access computerized tools and instant online glossing, starting at word and phrase levels with L1 translations and mov-
ing on to sentence and discourse levels of complexity with L2 glosses. Consistent use of VLS taxonomies like those reviewed here and systems that encourage (a) greater depth of lexical processing, (b) wider breadth of syntactic complexity, and (c) repeated encounters with new TL forms and meanings in as many different contexts as possible can often be significantly facilitated by the rapid access provided by portable and online CALL dictionaries and translation software (Saunders, 2002; Coll, 2002; see also http://www.call4all.us///home/_all.php?fi=d).

CONCLUSIONS

The 40-item VLS taxonomy organized by phases in the DLP scale presented here consolidates Schmitt’s (1997) original vocabulary-learning-strategies taxonomy, while, at the same time, adding both the semantic field keyword approach and the use of portable electronic or online dictionaries (distinguishing bilingual from fully bilingualized dictionaries). The DLP scale not only preserves the helpful distinction between initial discovery and subsequent consolidating strategies, but also adds a useful analytical grid of the major phases of lexical processing to help clarify SLVA processes.

The author’s review of the limited number of VLS classification systems available—each with different parameters and means of organization—led him to the conclusion that a descriptive, learner-centered approach has not helped to provide a sufficiently clear and complete system that can be easily grasped in order to be taught, learned, and used for actual language learning and research. Thus, this VLS taxonomy and DLP scale sought to combine insights from previous studies to help language teachers and language learners maximize vocabulary development. Koyama and Takeuchi (2004, p. 41) are correct in stating that “With regard to foreign language acquisition … task-induced involvement might be more important than look-up frequency (Lauffer & Hulstijn, 2001). Look-up frequency, thus, does not necessarily result in better learning.” Although Koyama and Takeuchi claimed that “words searched in a longer process in PD [print dictionary] condition could be retained better than those in ED condition” (p. 42)—supposedly supporting the depth of processing hypothesis—merely increasing learners’ time on task does not necessarily ensure deeper or more elaborative cognitive processing.

We should examine not only the amount of time on task and number of words accessed, but also the quality of lexical processing being employed by the systematic use of more thorough elaborative vocabulary learning strategies. A comparison of such studies leads us to conclude that dictionaries, whether print or electronic, are merely tools whose features and functions require training for effective use. Further, language learners have different profiles, needs, and preferences, so that various kinds of dictionaries and various kinds of information presented in dictionaries have different benefits for learners at different levels of proficiency. While print picture dictionaries are often best for younger, beginning-level learners, older learners with computer skills may be far more motivated to use CALL-based lexical resources. Deeper lexical processing seems to result in better retention, but only if other essential learning phases and strategies are included such as archiving, anchoring, and activating. These findings show where CALL can help
learners by providing more specific focus and elaboration on new word forms, meanings, and appropriate usage in each phase of vocabulary development.

Based on the review of previous research and the results presented in this study, we can tentatively conclude that (a) the more VLSs students use, the more new words they will generally learn; (b) the higher the quality of students’ use of VLSs, the more progress they will make in their vocabulary development; and (c) the more well organized and systematic students’ use of vocabulary learning steps, the better their long-term retention and activation of new terms. Finally, comparison of the groups of students involved in this project showed that those reporting a higher use of VLSs, especially those observed regularly and consistently using online or portable electronic dictionaries, achieved greater quantity and quality of lexical development, resulting in higher vocabulary level gains as well as a higher degree of structuring as they worked to assimilate, integrate, and organize their L2 mental lexicons.

CALL-Based SLVA Research Recommendations

Suggestions for improving the teaching and testing of CALL-enhanced SLVA derived from this project include several guiding principles. Future research should examine the relationship between particular types of vocabulary learning styles/strategies and learners’ patterns of dictionary use, including CALL devices and online programs. Online tracking programs should be set up to coordinate, monitor, and measure the integrated development of deeper level vocabulary-processing strategies. Learners’ reading and lexical proficiency development could then be compared to the VLSs they use and kinds of media and CALL-based input they respond to. Individual learner profiles should include not only subjective measures of individual satisfaction, such as interviews and surveys about their approach to vocabulary learning, but also objective measures of their growth in each aspect of vocabulary development, whether by standardized tests, word level checks, or vocabulary knowledge scales.

The advantage of being able to monitor and collect data from online courses should be maximized by the construction of easy-to-use online reading vocabulary profilers that not only profile text (as done by programs listed at www.call4all.us) but can also create profiles of students’ online learning behaviors and patterns of strategy use.

The more thoroughly learners process new TL words and phrases through each of the phases of lexical processing, the more fully these words and phrases will be learned in their three major aspects of form, meaning, and use. CALL programs can help improve each of these aspects by clearly enhancing input, interaction, and productive use. As Jamieson & Chapelle (2004) have said, a beneficial

Focus on form as discussed in the research on instructed SLA can be prompted through instructional activities which (a) draw learners’ attention to specific aspects of the linguistic input—enhanced input [e.g. increase text salience, modification, elaboration techniques] … (b) engage learners in interactions
requiring their negotiation and co-construction of meaning—interaction [between people, with PCs and between 4 skills within the learner] … and (c) prompt learners to produce ‘comprehensible output’—production [enhancement through better planning, correcting and help]. (p. 181)

Using electronic recording practices to archive new terms can help to fix them more rapidly in learners’ minds, as can the use of multimedia to help provide memorable illustrations, cues, links, or hooks to fix them in short-term memory. Learners’ degree of activation largely determines how well their productive vocabulary develops. Chapelle (1998) has noted that

theory and research have suggested that the saliency of the target language input (Doughty, 1991; Sharwood Smith, 1991) and opportunities for production of comprehensible output (Swain, 1985, 1998; Swain & Lapkin, 1995) are important for acquisition. These claims point to other observable interactions that can be documented in CALL activities, such as whether learners are shown input that highlights relevant linguistic features and whether they correct their linguistic output to make it comprehensible. (p. 22).

The DLP scale and VLS taxonomy framework presented in this article can help either actual or virtual teachers to guide and monitor learners in using a wide variety of SLA interactions, especially by training them to specifically monitor the effectiveness of their use.

Quality and amount of review techniques or media functions used by learners largely determine both their degree of retention and speed and the percentage of retrieval of new TL terms. Reaction and retrieval times can be improved by giving students frequent encounters with the TL terms, helping them to reactivate their knowledge by building additional memory traces. Along with reviewing and recycling techniques to improve recognition and prediction skills, reassessment of learning must be done regularly with frequent individual feedback to maximize motivation and acquisition. CALL should capitalize on these language-learning insights to design maximally efficient vocabulary-learning programs.

Finally, CALL programs should also allow for both learner-generated and computer-generated glosses, notes, and sample sentences. Interactive cognitive processing tends to be deeper and more memorable than input that is merely passively received, no matter how well organized it is. Programs that allow users to record their own vocabulary notes using self-generated examples or perhaps even ClipArt illustrations will tend to be much more memorable. One of the most challenging balancing acts of language teaching today may be determining when to use individual student-generated self-access materials versus computer-generated materials, programmed learning versus face-to-face classroom instruction. In the end, probably some combination of these approaches will prove to be the most effective way for learning foreign languages, a combination that will permit maximum language learning autonomy to develop, while taking advantage of both human expertise and computerized interfaces. The author hopes that the
overview discussed in this article of traditional versus CALL-enhanced ways of teaching and testing various aspects of vocabulary knowledge, learning strategies, and productive use will help to generate fertile ideas for improving our teaching and assessment of these essential components of language development.

REFERENCES


Loucky, J. P. (2004b). Improving cognitive, linguistic and computational processing of new vocabulary using an online semantic field keyword approach. *Japan Association of Language Teachers CALL Special Interest Group, C@lling Japan, 12* (1), 7-20.


**APPENDIX A**

Schmitt’s Vocabulary Learning Strategies Survey (Revised by Loucky, 2001)

Learning vocabulary is a very important part of learning English. To better learn new words, we should think about how we study vocabulary. There are two main steps. First, we must discover the new word’s meaning. Second, we must study the new word to remember it. This survey is designed to help you think about how you do these two steps. Section 1 lists some techniques to learn a new word’s meaning.

Of course, there are many techniques which are not listed, so please write any others you can think of in the ‘OTHER’ spaces.

Please answer this survey in the following manner. There are two lines following each of the questions. The first is to indicate whether or not you are currently employing this technique or not. If you are, mark it with an “O”, if you are not, mark it with an “X”. If the method is helpful to you, mark the next line with an “O”. If it is not helpful, mark it with an “X”. If you are not currently using the technique, but you feel that it may be helpful, mark the ‘helpfulness’ category with an “O”. If you can tell that it would not be helpful, mark it with an “X”. Please be sure to mark every line with either an “O” or an “X”. Do not leave any blanks.

**Section 2 has techniques for studying and remembering new words.**

Please answer Section 2 in the same way as you did Section 1. At the end of the list, please look at all of the techniques and choose the five most helpful. Put the letter of the most helpful technique in the Number 1 space. Put the letter of the second most helpful technique in the Number 2 space, etc.
SECTION I: DISCOVERING WORD MEANING STRATEGIES

14 Techniques for learning the meaning of new words
(Mark O if Using and if you think it is or would be Helpful) Use: Helpful:

1. Look at pictures or gestures to understand meaning
2. Learn meaning in group work
3. Ask classmates
4. Ask teacher for an English paraphrase or synonym
5. Ask teacher for a Japanese translation
6. Ask teacher for a sentence using the new word
7. Use an English-English dictionary
8. Use an English-Japanese dictionary
9. Check prefixes/suffixes, and word roots to discover meaning
10. Check part-of-speech (noun, verb, etc.)
11. Think about cognate words (words in different languages coming from same “parent” word which may have a similar meaning and form)
12. Use “scales” for certain adjective/adverb meanings (burning-hot-warm-cool-cold-freezing)
13. Guess meaning by context
14. Skip or pass new word

OTHER:
Learn related groups using Semantic Field Keyword Approach

From the above list, write the numbers of the five most helpful techniques in order of their usefulness to you below:

______ 1. (MOST helpful)
______ 2. (second most helpful)
______ 3. (third most helpful)
______ 4. (fourth most helpful)
______ 5. (fifth most helpful)

SECTION II: CONSOLIDATING NEW WORD MEANING STRATEGIES

28 Techniques for remembering new word meanings:
(Mark O if Using and if you think it is or would be a Helpful Technique for studying and remembering new words) Use: Helpful:

1. Paraphrase meaning of the new word
2. Use the new word in sentences
3. Use “scales” to study certain adjectives (burning-hot-warm-cool-cold-freezing)
4. Use Flash Cards to study new words
5. Use Word Lists to study new words
6. Have teacher check your word lists/flash cards for correctness
7. Use physical action when studying words (do throwing action when studying the word ‘throw’)
8. Take notes in class about new words
9. Study words with a group of students
10. Study the “sound” of a new word
11. Say the new word aloud when studying it
12. Study the spelling of a word
13. Connect the new word to some situation in your mind
14. Associate the word with others in the same topic
   (furniture: table, chair, tied)
15. Associate the word with others which are related to it
   (water: swim, drink, wet, blue)
16. Study the word’s root, prefixes, & suffixes
17. Study the word’s part-of-speech
18. Imagine the word and its spelling in your mind
19. Make an image of the word’s meaning
20. Study the word’s cognates (words in different languages
    coming from same “parent” word which may have a
    similar meaning and form)
21. Repetition (repeat the word to yourself)
22. Learn the new words in an idiom together at the same time
23. Think of a Japanese word that sounds similar to the new
    English word. Then make a single mental image of the
    meanings of the Japanese and English words. This “linking
    image” then reminds you of the new English word’s meaning.
    (Mnemonic Keyword Approach)
24. Use the vocabulary section of your textbook
25. Study the word’s synonyms and antonyms
26. Write the word many times
27. Continue to study the word often over a period of time
OTHER:
28. Semantic Field Keyword Approach (Learn Group of
    Related Words under a simpler Keyword at the top)

From the above list, write the numbers of the five most helpful techniques in order
of their usefulness to you below:

1. (MOST helpful)
2. (second most helpful)
3. (third most helpful)
4. (fourth most helpful)
5. (fifth most helpful)

How many years have you studied English?  A. _____
Have you ever studied English at a Juku? If yes, how many years?  B. _____
Have you ever studied English at an English Conversation School?  
If yes, how many years? (Juku=after school “cram school”)  C. _____
APPENDIX B

Survey of Computerized Bilingual Dictionaries (Loucky, 2000)

Name your Book Dictionary or Electronic/Computerized Bilingual Dictionary:
Model #: Cost:

NAME: ID/YEAR: Reading Level:
a. Grade:
Accessing & Archiving Time: b. Headwords:
________ minutes c. %VLS Used:
(for 15 Laufer & Hadar terms) d. DLP Level:
e. AVQ/IP:

1. Assessing Vocabulary Size:
Check your manual to see how many words it has for
a. English:
b. Japanese—(or other L1):
c. Kanji Study--
d. How many words do you think you know in English?

2. Accessing--Frequency of Use--How many times do you use it each day?
a. For English to Japanese what % of the time?
b. For Japanese to English, what % of the time?
c. To check unknown Kanji, what % of the time?

3. Archiving--How do you record new words found?
a. In my textbook in the margins
b. On paper or in a Vocabulary Notebook
c. I don’t record new words
d. My CBD can record and save new words I’ve looked up. If so, tell how:
e. Can it do Automatic Recording and Review (of last 1-20 words)
   (called a History Search)
f. Can you save and store new words manually?
g. Can you Save and Print Text Files or Notes on new words?

4. Analyzing Special Functions or Features: Does your CBD have any Special Functions or Features which help you to break up new words into parts to better understand their grammar, origins or meaning? If so, please try to explain how to use them and tell how often you do so. (Use Manual)
Does it give special information about word parts, grammar, or the origin of words?

   Does it give any common phrases? ___ Yes ___ No ___ Not Sure
   Does it give any sentence examples? ___ Yes ___ No ___ Not Sure

5. Anchoring New Words in Memory--Does your Electronic Dictionary have any special Visual Images or Auditory Sounds or other special functions to help illustrate new word meanings, forms or use to help you better remember them?

   ___ Yes ___ No

If so, tell what these special functions are and try to explain how they work to help you fix new words in your memory.
6. Associating Functions--Does your Electronic Dictionary help you to organize your vocabulary learning in any way? For example, can you put words into Study Groups? Do you organize your vocabulary learning or notebook in any special order or way to help you remember new words? Do you group any words together to better remember or learn them? If so, please tell how you do so. If your Computerized Dictionary, Translation Website, or software helps you to do this in any way, please tell how:

7. Activating Functions--Does your Electronic Dictionary give you any ways to USE new words right away? ___ Yes ___ No If so, how? Can you think of some ways ON YOUR OWN that you could USE new words you have looked up more actively or creatively? If so, tell how:

8. Review: Do you review any new words after finding their meanings? ___ No ___ Sometimes ___ Yes, usually If so, tell how does your Electronic Dictionary help you to review or retest new words? Does your ED/CBD have any Vocabulary Practice Games that you can use for review and practice? If so describe. If it had, what level would you start to study at? Does your CBD have any Special Functions or Features which help you study new words, such as challenge games, memos, word search history, etc. to help you learn, analyze, review or remember new words? ___ Yes ___ No ___ Not Sure If so, please explain how to use them:

APPENDIX C

Dual Assessment Vocabulary Instructor-Evaluator

A. Simplified Form for Self-Reporting on Receptive Recognition of Input:
(Use to assess Recognition Knowledge or Recognition Memory)

<table>
<thead>
<tr>
<th>Recognition</th>
<th>Recognition</th>
<th>Self-Report</th>
<th>Unclear:</th>
<th>Unknown Word:</th>
<th>100 Items</th>
<th>1-20 Short Survey</th>
</tr>
</thead>
<tbody>
<tr>
<td>Know L1 Japanese Translation</td>
<td>Know L2 English Definition</td>
<td>Think I Can Use Word in a Sentence</td>
<td>Have Heard, or Read but Unsure; Can Recall this Phrase:</td>
<td>No Idea at all</td>
<td>Important EAP Terms; Adjectives (or Verbs), etc.</td>
<td>Word Form</td>
</tr>
</tbody>
</table>

A. B. C. D. E. Word Form Word #

B. Simplified Form for Objective Assessment of Language Output
(Use to assess Recall Knowledge or Recall Memory)

<table>
<thead>
<tr>
<th>Recall:</th>
<th>Recall:</th>
<th>Generative Production:</th>
<th>Unclear:</th>
<th>Unknown Word:</th>
<th>Word Token or Family</th>
<th>Modified ICU # EAP List</th>
</tr>
</thead>
<tbody>
<tr>
<td>Give L1 Japanese Translation</td>
<td>Give L2 English Definition</td>
<td>Use this Word in a Sentence</td>
<td>Have Heard, but Not Sure Try to Give Collocation Phrase Form</td>
<td>No Idea at all **</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A ( %) B ( %) C ( %) D ( %) E ( %) Word Form Word #
Semantic Knowledge vs. Syntactic Skill/Word Relations

MEANING FOCUS***USE FOCUS*FORM FOCUS

* This test may be given in either a written or oral form. A written test would assess a learner’s word recognition of de-contextualized target words first, whereas an oral test would assess both their aural comprehension and then their oral production skills.

** Teachers should aim to provide illustrative sentences for all target words, giving them to students after these two test forms are given. Have them focus on learning missed words in these three steps: 1) by first guessing from the context of these example sentences, 2) writing down what they think those target words mean. Finally, they should be taught to 3) confirm or correct their guesses by asking for correct meanings or looking up any missed words in their dictionaries, learning to use book, portable electronic and online Web dictionaries (See author’s www.CALL4All.us Dictionary heading for extensive examples in over 500 language pairs).

AUTHOR’S BIODATA

John Paul Loucky has taught all areas of EFL in Japan for 20 years. His research in second language vocabulary acquisition includes comparing types of dictionaries, including various computerized versions, Kanji versus English vocabulary development, threshold levels, vocabulary knowledge scales, and depth of lexical processing and vocabulary learning strategy taxonomies.

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