

# Learning Log Dashboard: to see your own progress

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**Abstract:** This paper proposes a learning log dashboard interface design issues for a mobile learning system called SCROLL (System for Capturing and Reusing Ubiquitous Learning Log). SCROLL allows learners to record and share their daily learning experiences as ULL (ubiquitous learning logs) with locations, photos, words, sentences and/or videos using their smartphones. Moreover SCROLL provides quiz that are generated from ULL so that they can remember past learning experiences. Learners add many words, photos on their account and always repeat this action, like as continuous training. It will be sometimes happened forgetting quiz even works on those words in the past. The overall goal of this learning log dashboard is to enable learners to reflect on their own activity, to reinforce what they have learned and to learn from each other. Learners also can see the information about her/his progress on learning log dashboard.

**Keyword:** Learning log dashboard, ubiquitous technology, language learning, memory

## 1. Introduction

In today's world a great revolution is occurring in the mobile device with the release of new generation smartphones represented by iPhone and Android. The new generation smartphones accommodate learners with many advanced functions such as the multi-touch interface, virtual keyboard, GPS navigation, a full browser and record notes. It allows learners for immediate access to data online wherever one is at home, travelling or at work. One key feature of smartphones is that they are equipped with a range of sensors such as the accelerometer, GPS, compass and so on. Using such functions of smartphones, SCROLL (System for Capturing and Reusing Ubiquitous Learning Log) has been developed originally (Ogata et al., 2011).

SCROLL is a system to assist learners to simply capture, review and reflect their learning logs, reuse the knowledge when it is needed. It adopts an approach of sharing learner-created contents among learners. It means that a learner's learning log cannot merely available for her/him, but also can be shared with other learners who have the same learning needs.

The term "learning log" is originally used for personalized learning resources for children (Wikipedia, n.d). In this study, learning log is defined as a recorded form of knowledge or learning experience acquired in our daily lives. It serves as memory storage for notable or important knowledge to review, to remind and to reflect. For example, a learning log can be a Japanese word or a piece of English sentence taken down by a language learner.

The target learners of SCROLL are overseas students who study Japanese language in Japan. It is because they acquire lots of knowledge from their daily lives, for example, when they go to a post office, shopping in a market or seeing a doctor in the hospital. Such a learning activity is a kind of episodic memory (Tulving et al., 1973) for the learner for which it can help the students to remember the knowledge for a long term (Tulving et al., 1973). Butler and his colleagues find that testing can also improve long-term retention and the strategy of repeated testing enhances learning more than repeated reading (Butler et al., 2007).

Learners' vocabularies increase highly by learning many new words everyday and by sharing them with others. In order to help learners to see their own progress and reflect information they add, we

propose the function "Learning log dashboard" (L2D). L2D uses the log of learners in SCROLL to enable learners to reflect on their own activity and recall what they have learned. The dashboard also enables learners to see their own progress at a glance. For example: updates, success, statistics, information and how many logs they need practice. Thus, a learner will repeatedly practice words by the quizzes in order to avoid from repetitive mistakes, and eventually s/he will be greatly motivated.

Therefore L2D will give learners an easy way to find the best next things to do and increase motivation of them. This paper is organized as follows: in the next section we present L2D. Future work and conclusion are presented in section 3.

## 2. Learning Log Dashboard

Learning Log Dashboard (L2D) is a function of SCROLL, which is to enable learners to reflect on their own activity and to see their own progress. L2D focuses on statistical data on every learner's usage of the system. L2D shows the number of learning logs that a learner uploaded and the number of completed quizzes, as well as memorized learning logs and incorrect answers of the quizzes. It is easy to see incorrect answers on a word and to control in the dashboard.

Learners can distinguish each learning log, which is differently represented in several colors. Last results are presented in scores distinguished in colors: if a learner answers incorrectly for the first time the learning logs are marked in **green**, for the second time the learning log color turns **yellow**. If an incorrect answer is repeated for the third time, the color becomes **red** in turn (Figure 1). It means that learners have to deeply concentrate on their mistakes and use incorrect answers in practice. If a new learner has not added a log to the system yet, L2D is blank. Figure 2 shows a workflow of L2D. Explanation of figure 2 :

1. First, learners need to register themselves to SCROLL system. Learners can work on quizzes. Initial logs are learner's learning log.
2. When a learner finishes working on the quiz, the incorrect answers are marked in green and stored in the L2D. Correct answers will be saved in memorized logs.
3. The next time if the learner repeatedly answers incorrectly while reworking on the same quiz, the answered learning logs shall be marked in yellow. If the learner makes mistakes on the same word 3 or more times, such word shall be marked in red color.
4. If the learner completes the quiz successfully without any making mistakes on the same words s/he previously answered incorrectly, then color of the logs will be changed back. For example, if the learner correctly answers the same words 3 times, the color of the logs will continue to change until they move to memorized logs. After finishing a quiz the L2D will automatically update the information.
5. Memorized learning logs consist of memory of learner's last quiz and s/he can see it at least 100 last words. Moreover it will be easy to see updates, simple to work on it.
6. The recommended learning logs (Figure 3) are summarized on the display which shows the incorrect and correct answers of learner's past works. According Pimsleur's proposal (Pimsleur 1967) of memory schedule, which defines the length of recall interval, it is 5 times of the previous interval's length. He also discovered tenth recall of a word of second language that will not take place until 113 days or more than four months later. That one should hold the learner for well over a year. According to the memory schedule after three months, learning logs will be reappearing previous learning logs to a learner for reinforcement in recommended logs. Learners also can examine themselves by practicing the quizzes in recommended learning logs. If a learner answered correctly to the quiz, the learning log disappears from the dashboard.

Learners usually repeat mistakes on one word even if they worked quiz previously. Learners especially who are studying Japanese letters and characters should practice more to memorize. Figure 1 shows the information of learning logs that a learner answers the questions incorrectly (once twice, or more than 3 times). Learners are also able to see their progress and achievements. Then they are able to concentrate on the words answered incorrectly. If a learner clicks on the "Enjoy the quiz" button in green color, the dashboard system will automatically provide a set of quiz (Figure 4). The set of quiz contains learning logs of a learner who answered incorrectly once. According to the colors of the buttons a learner can work on quizzes. For example: red color button provides the set of quiz that

contains learning logs of a learner who answered incorrectly 3 or more times. If the learner skips the set of quiz without completing it, the dashboard will remind her/him about the necessity of completion of the task via a message to encourage her/him to study. A learner eventually will know all of the words by heart.

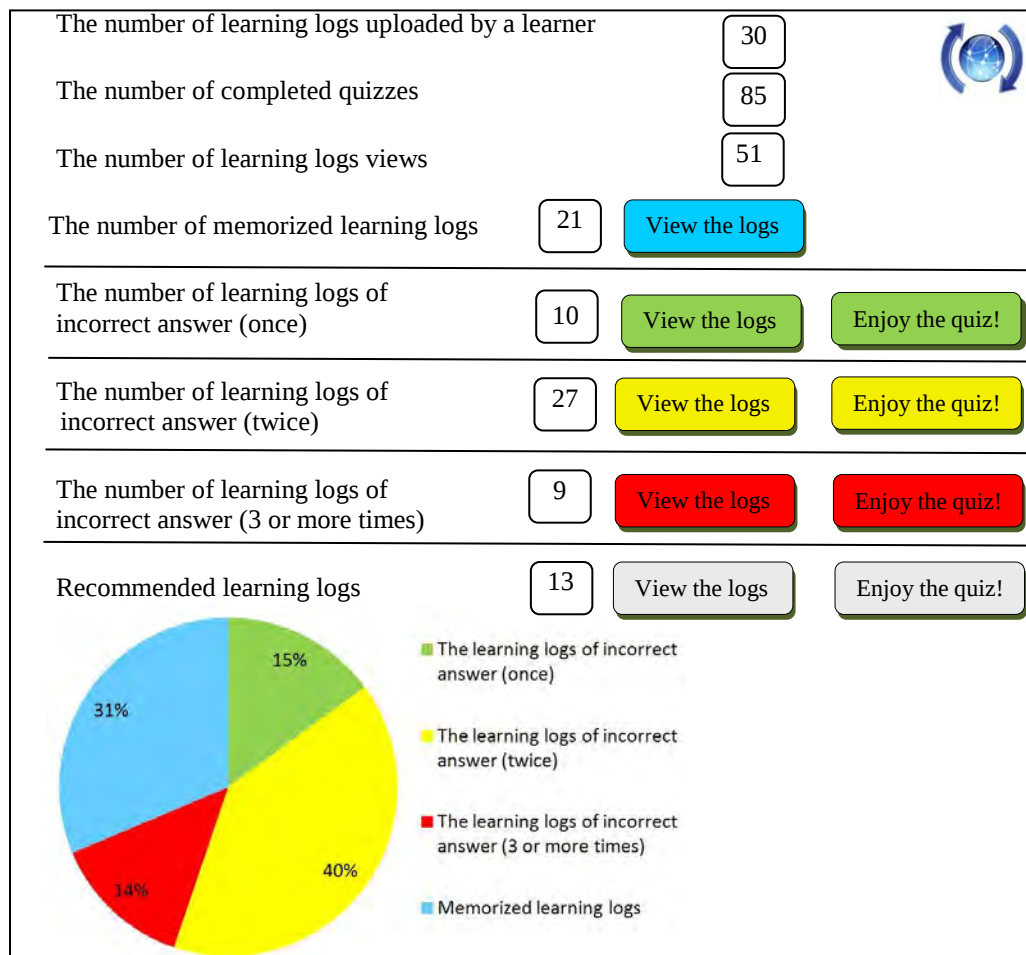


Figure 1. The image of the designed L2D

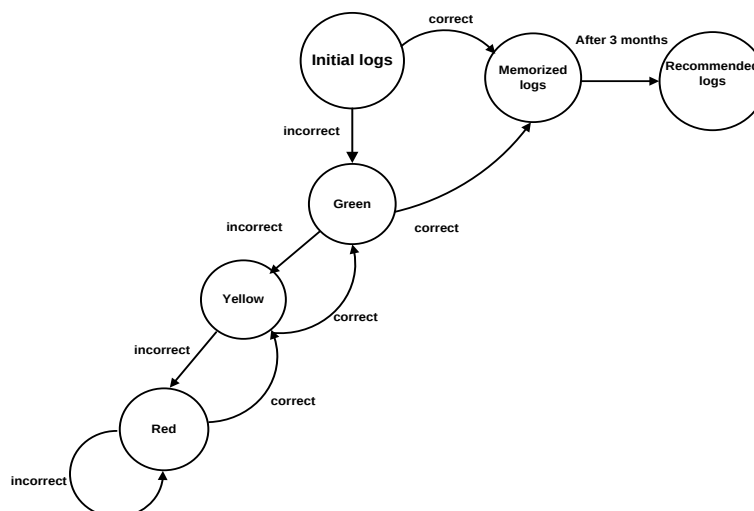


Figure 2. Workflow of the learning log dashboard



Enjoy the quiz!

Figure 3. Recommended logs

The dashboard presents a table that indicates the quiz overview of each learner. Figure 4 shows the information of learning logs of a learner who answered incorrectly once. If the learner successfully performs the quiz, then the learning logs of correct answers will move to the memorized section.



Enjoy the quiz!

Figure 4. The information of the learning logs of incorrect answer (once)

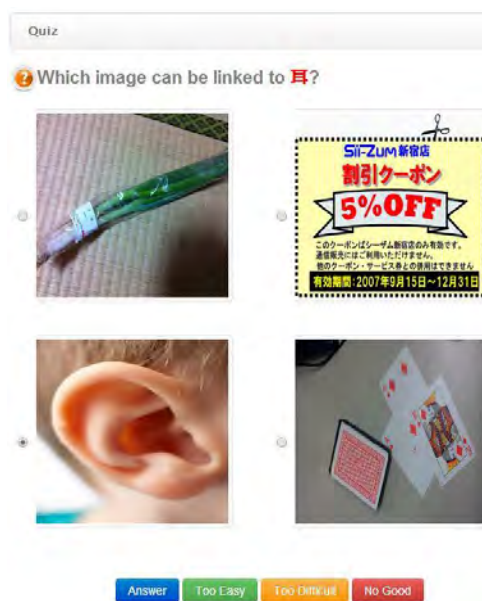


Figure 5. Actual quiz of SCROLL

Basic research on human learning ability and memory has shown that practice of information retrieval (information testing) has powerful effects on learning process and long term retention of information in human memory (Karpicke et al., 2009).

The quiz function of the system (Li et al., 2011) is based on the following two theories: the theory of encoding specificity (Tulving et al., 1973) and the theory of test-enhanced (Karpicke et al., 2009) learning. According to the former theory, a number of factors including the place where we obtained knowledge or we took photos can be encoded as initial retrieval cues. The initial retrieval cues are very effective for activation of stored memory (Tulving et al., 1973). Regular testing enhances learning process more than repeated reading. Because repeated reading often confers limited benefit beyond that gained from the initial reading of the material. (Karpicke et al., 2009).

Three types of quizzes can be generated automatically by the system: including yes/no quiz, text-based multiple-choice quiz and image-added multiple-choice quiz (Figure 5). These quizzes are interesting and attractive method for learning. For example, “quiz with image” is designed to ask learners to choose a word in order to describe images given by the system. The system immediately checks whether the answer provided by the learner is correct or not (Ogata et al., 2011).

With the learning of a new word, the process of forgetting begins at the same time once and proceeds very rapidly. If a learner remembers the word until s/he completely forgets it, her/his memory potential shall be increased.

### 3. Conclusion and Future work

This paper aimed to describe issues on Learning Log Dashboard System interface design in SCROLL. Learners can add their words into the system, which is designed to recall memory of students (especially who are learning foreign languages) based on their learning contexts. Learners can examine and make self-assessment by practicing the quizzes. It is common, when learners repeat the same mistake even though they repeatedly work on the quiz. Those especially who are studying Japanese letters and characters should practice such quizzes more often to improve their memory capacity. Learners can see their own progress as well as control their activity from the dashboard. A learner shall be aware of common mistakes, too.

Learner's eventual interest in dashboard focuses on its role in primary meaning of word and usage, word-board. Incorrect answers, the repeated mistakes of a learner are also important for a learner because s/he does not make mistakes anymore on that word. It is a good promotion and a big opportunity for a learner to know what is her/his incorrect answers and learn everywhere and anytime.

It is essential in the future to conduct in-depth researchers and experiments on evaluation of L2D's efficiency. How does it help the learner in their tasks?, How much does it help?, Do learners find the effort needed to use the system worthwhile in regards to the impact on their learning?.

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