Designing a Japanese Language Learning System that Recommends Materials Depending on Learner's Interests and Learning Stages

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ABSTRACT

We developed a recommendation system of Japanese language learning materials for learners with relatively light motivation. The main features of this system are providing "Upper-Lower tasks", and "adequate recommendation of language contact situations". A formative evaluation suggested that learners are probably able to learn Japanese with this system, but the validity of recommendation and clearness of system structure must be further examined.

Keywords:)Instructional design, motivation, recommendation system

INTRODUCTION

Learners can get motivation for learning when they find relevance or value of learning task to their job, and keep it with a feeling of satisfaction by addressing adequate level assignments (Deci, 1975; Keller, 1983; Pintrich, 1989).

Empirically speaking from the first author's view as a teacher of Japanese language, there is few useful e-learning materials of Japanese grammar that inspire learners to study it actively, because many of the materials let the learners to read the contents in numerical order, or to select completely in free-ordered contents. It could decrease beginner's motivation.

In the past, leading learners of Japanese were foreign students with their own definite goals, such as study of Japanese economics and/or technologies in Japan. However, a recent report of Japan Foundation (2008) shows decline of the number of students and decline in motivation.

We consider that the decline comes from the shift of purposes of Japanese language study from "Utility-based tendencies" to "Knowledge-based tendencies," such as "communication" and "learning about manga, anime, etc." (Kai et al., 2010). We named the learners with relatively light motivation as a "casual learners." We have developed a module recommendation system, which can make the casual learners more motivated. The purpose of this study was to take an expert review to evaluate the system.

A RECOMMENDATION SYSTEM

Situation-Centered Structure

As is shown in Figure 1, the system has two-layered structure, which contains many learning tasks. They are upper (situational) tasks and lower (grammatical) tasks. In upper (situational) tasks, learners are instructed to cope with certain situations by using appropriate Japanese expressions, thus they are situation-centered. In lower (grammatical) tasks, which are 40 links to grammatical learning contents, provides learners the knowledge of Japanese language as a tool in upper (situational) task. The learners

select a situation first, then work on grammatical learning. There are many-to-many relationships between the upper and the lower (grammatical) tasks.

Supplemental Functions to Provide Appropriate Recommendations

Recommendation

Upper (situational) tasks contain many kinds of topics and situations to correspond to learners' personal preferences. The more situational tasks can be offered in this system, the more appropriate tasks a learner can obtain. Katz and Assor (2006) pointed out that being able to make choices in learning would motivate learners when the options meet the students' need for autonomy, competence, and relatedness. They also argued that the choices should not be too complex (competence support), and are congruent with the values of the students' culture (relatedness support). On the other hands, with too many choices, "overload may be bewilderment and high levels of anxiety and stress", and "opportunities become so numerous that we feel overwhelmed. Instead of feeling in control, we feel unable to cope (Schwartz, 2004, p.104)."

Therefore, we came up with the idea that our recommendation engine will pick up an upper (situational) task by analyzing similarities among users' choices. We have adopted an open-source collaborative filtering recommendation engine, called "Cicindela (2011)." as our base system.

Learning Controller

Each lower (grammatical) task has minimum prerequisites so that a learner cannot have an upper (situational) task contained a nonqualified lower (grammatical) task as a recommended candidate. We call this mechanism a learning controller. Figure 1 shows an example of how the learning controller works. Suppose the system received upper (situational) tasks #3, 4, 2, 1, 5 from the recommendation engine, then the system checks the prerequisites of these tasks. Tasks #2, 3 would be rejected as recommendations, because lower task #2, 3, 4 have not finished yet.
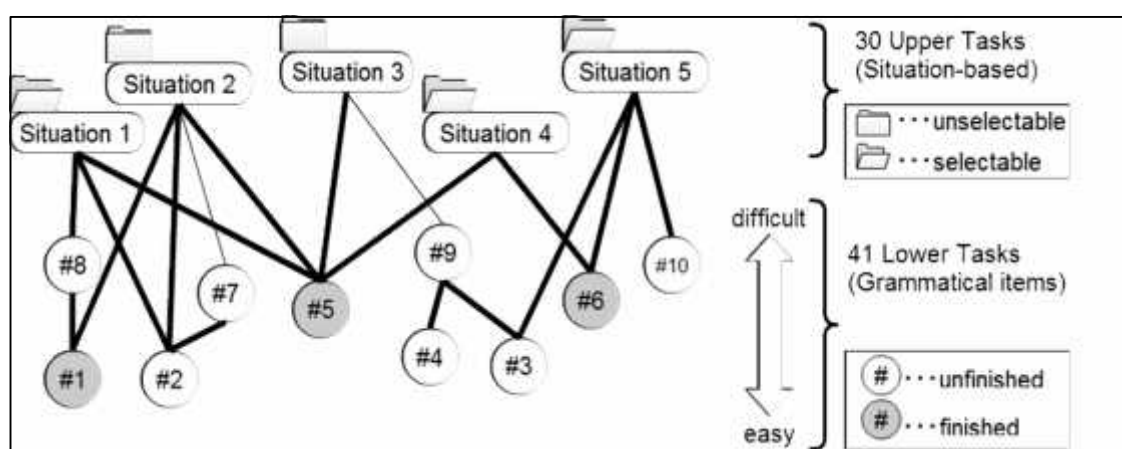

Figure 1. An Example of Learning Control

Flow of Learning

At the initial login, a learner is asked to answer a questionnaire about personal interests. Then, three upper (situational) tasks are displayed (Figure 2-A). When one of them is chosen, then "my page" appears as shown ou the right side of Figure 2.

On "my page" window, the chosen upper (situational) task appears at the top of the window. The learners can make sure current task anytime (Figure 2-B). In the middle of the window, unlearned lower (grammatical) tasks needed for the upper (situational) task are displayed (Figure 2-C). The learner can see endorsers of what she can do with the grammar, like "let's communicate your love to him," instead of the name of grammatical item like "past perfect tense." Clicking on one of the examples takes learners to the learning contents. After getting all required lower (grammatical) tasks cleared, the learner go back to the upper (situational) task and finish it. Then, the learner is guided to choose a next upper (situational) task (Figure 2-D).

At that time, the learner can obtain upper (situational) task candidates that have only finished lower (grammatical) tasks as prerequisites. It is because the recommended upper (situational) tasks can be considered to have relevance to the learner, it can promote transfer and retention of the learning. Also, if learners can go directly to challenge a question of the upper (situational) task, they don't have to waste time to do lower (grammatical) tasks.

Figure 2. Screens of the System

If the system works as we expected, all displayed candidates meet the learner's relatedness and are not too difficult to learn. Learners would be able to choose tasks from candidates as they like. More motivated the learner becomes, the less drop out we expect with this system.

EVALUATION

For design and usability validity test to explore an improvement plan, we took an expert review from a reviewer who has a good background in Japanese teaching and distance learning. The reviewer had 10 years of Japanese teaching experiences various settings, including classrooms and distance learning (synchronous and asynchronous), both in groups and one-on-one. She also has experiences of using Japanese textbooks that are widely used by Japanese instructors like "Minna no Nihongo" and "Genki".

Evaluation Procedure

An evaluation test was conducted as follows:

1. Read an document about the intent and purpose of the system and instruction,
2. Operate three upper (situational) tasks and some lower (grammatical) tasks needed after answering a questionnaire about her interests,
3. Answer a questionnaire about usability, validity, and attractiveness,
4. Take an Interview.

Results

Table 1 shows the results of the questionnaire and an interview. The results of the review show that the system was acceptable in terms of its manipulation. No question was occurred about both concepts

and manipulation. She was also affirmative to the concept of recommendation mechanism. However, she also pointed out some problems listed in Table 1. The problem includes understanding how the learning controller works, results of recommendation, and maintaining learning motivation with the repeated same pattern.

Table 1. Results of the questionnaire and interview

Question items	Response
Understandability of mechanism	Understandable only one has received a full explanation
Understandability of operation	Understandable only one has received a full explanation
Seems to be fun	Not so enjoyable
Want to use the system as an instructor	Want to use when it will be improved
Questionnaire about interests	It was no burden to input Question items looks to be for the Japanese. Learners' age and gender also need to be considered.
Familiarity of recommended tasks	Familiarity decreased with the number of tasks. **First task**: not so relevant, but it is needed for everyday use. **Second task**: not so relevant **Third task**: not so relevant
Example sentences and situations are easily to understand for learners	Satisfactory
Concept of upper-lower structure of tasks seems to be fun	It is a matter of learner's preference.
Interview	
- Repeating same task patterns may make learners get tired easily (lack of novelty). - Concept of upper-lower task structure is hard to make sence (Because example sentences of lower task has no relation to its upper task.)	

CONCLUDING REMARKS

As the expert review shows, some improvements are needed to be done in the future. We will improve the user interface, quantity of monitor data, and the content of instruction. We also survey the effects and usability of the system by analyzing real data collected in future evaluation studies. Especially, modifying the unclearness of "upper-lower task" structure is an urgent issue. In this version, we displayed "endorsers" (example of use, how to use the grammar) to both upper and lower (grammatical) tasks, and providing lots of information, which made the reviewer confused. It may be better to show usage example only to upper (situational) tasks. There is room for further study in determining the balance of dramatic impact and clearness.

We will keep working toward practical use by upgrading and expanding this system such as multilingualization and adding quantity of quizzes. Furthermore, we will attempt to develop another language version, and application in other fundamental education at a university in the future.

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