

The Development of Mentoring Support System Based on Self-Regulated Learning Theory: Concept and Design

Masanori Yamada, The University of Tokyo* mark@mark-lab.net
Yoshiko Goda, Ootemae University
Yutaka Saito, Aoyama Gakuin University
Toshio Mochizuki, The University of Tokyo
Takeshi, Matsuda, Aoyama Gakuin University

Abstract: The role of mentor in e-learning is brought to attention, in order to support learner in e-learning. However, it is difficult to conduct appropriate support from the viewpoint of affective side, because mentors cannot work well. There are mainly two reasons; mentor's work overload, and the less opportunities to support learners for successive learning. Learners in e-learning are required to be self-regulated learners such as making a learning plan, set the learning objective, and use suitable learning strategies. Supporting for mentoring for fostering self-regulated learner will be great helpful for mentors, in order to conduct effective mentoring. This research aims to be clear the design of mentoring-support system focused on self-regulated learning for the support of mentor.

1. Introduction

As information and communication technology advances, interest has grown in the role of mentor, who has the professional knowledge and skill to support learners in e-learning. Not only university but also company employs mentors, in order to motivate learners and increase course completion rate (Japan e-learning consortium, 2008). Keeping high motivation and the development of learning strategies for e-learning are important, in order to promote course completion rate, satisfaction with e-learning courses, and learning performance.

Mentoring for these issues is commonly conducted through interaction between learners and mentors during e-learning courses. Mentors support learners, referring to learning status such as access log and the rate of assignment submission. Mentors not only assist learners from the viewpoint of affective side, but also have to be engaged in help desk about learning contents and technology assistance. However, there are two big problems, in order to conduct successive and expansive mentoring, even if researchers and members of human resource department develop mentoring methods and foster mentors. One is the difficulty to ensure cost-effectiveness of mentoring. If the number of learners per mentor increases for the coverage the cost of the training and employment of mentor, it seems to lead the deterioration of mentoring, because of high workload. In particular, it takes much time mentors to know the learner's situation, when learners change the learning schedule or learning objective and so on. That often causes the late response.

The other is that mentor's working time concentrates on learning course term. This feature causes to focus on the assistance of learner from the viewpoint of motivation, then mentors have the less opportunity to support learner to be self-regulated learner. Self-regulated learning is learning strategy to control learning plan and continue effective learning with the enhancement of motivation and learning skill (Zimmerman, 1998). In online learning, learners have to keep self-pacing consciousness, because teachers do not instruct the learners. Self-regulated learning will be one of the central factors in successive online learning (Kougo et al, 2004), considering the increasing number of online learning over the world. Self-regulated learning has effect on learning performance directly (Pintrich &

DeGroot, 1990). It is suggested that there are three opportunities to support learners to be self-regulated learner; before learning for making a learning plan, while learning for successive learning and motivation, and after learning for the promotion of reflection (Zimmerman & Campillo, 2003). This process is displayed in figure 1. Supporting

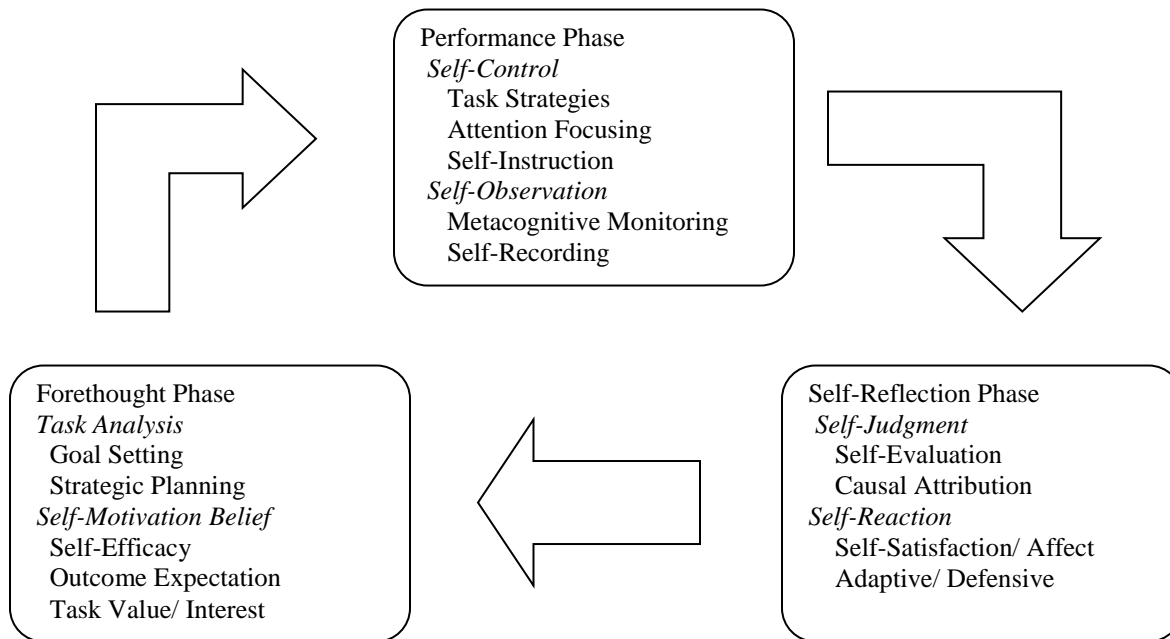


Figure.1: Self-Regulated Learning Process (Zimmerman & Campillo, 2003)

the use of meta-cognitive strategies in planning stage in the self-regulated learning process seems to be effective on foster self-regulated learner (Schunk & Zimmerman, 2008). Moreover fostering self-regulated learners may contribute to decrease mentors' work over load, and to make more opportunity to support learners. However, it is very difficult for mentors to support to make a learning plan to achieve learning objective or promote self-reflection during learning, because mentoring for the planning is usually conducted before learning, and mentoring for the promotion of self-reflection is conducted after learning. These problems should be solved in order to improve e-learning management. This research aims to clarify the possible factors, which should be considered to design mentoring support system for the promotion of self-regulated learning.

2. Functions of mentoring method recommendation system: from the viewpoint of self-regulated learning

This research tries to design, and develop mentoring support system. This system allows mentors to support for mentoring in “making learning plan” and “controlling learner’s motivation” stages in self-regulated learning process (Schunk & Zimmerman, 2008). Now we consider the functions as follow:

- 1) Categorization of learning style and learning courses
- 2) Visualization of learning style and learning courses on two-dimension map
- 3) Predicting learner’s drop-put

In order to develop the first and second functions, learning style and the required degree of self-regulated learning in each learning course are categorized into four patterns, after the investigation about learning style based on learning style questionnaire such as “Style Analysis Survey” (Oxford, 1993), Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich & DeGroot, 1990) and course types based on the number of assignment submission requirement and so on. This system calculates primary component score using questionnaire above, focusing on two components. Next, system displays learning style based on self-regulation in learning such as whether learners are scheduled or not (Learning Style Visualizer). When mentors click learner’s icon which is displayed in two-dimensional map, this system will show the gap between the present learner’s self-regulation score and required self-regulation score in learning courses. Moreover, this system recommends appropriate mentoring methods in order to fill the gap in self-regulated score. It is expected that learners can be self-regulated learner through mentoring recommended by this system. This can lead to reduce working load.

The third function, which assists mentors to know learner’s situation, allows mentors to conduct mentoring, in order to prevent learners from dropping-out of learning courses. First, this system calculates the correlation between the present learners and past learners’ data based on learning style score. Learner style score is the synthetic variable based on the results of principal component analysis toward learning style questionnaire. This system extracts similar learners’ data from the learners’ data which has correlation coefficient over 0.6 to 1. Therefore, this system calculates drop-out rate (the number of drop-out learners out of similar learners divided by the number of all similar learners multiplied by 100). Referring to this rate, this system predicts learner’s drop-out. For example, if this system detects high drop-out rate, background of learner’s image will change color to white. Figure 2 displays overview of this system. Figure 3 shows the design of learning style visualizer. Figure 4 shows the design of the function of the prediction of dropout.

In previous research, Ueno (2007) developed the automation e-mentor, which sends affective-support email to learners judging from the frequency of access and assignment submission and so on. Morishita et al (2003) investigated the feature of drop-out learners in 2002, and in 2003, they have tried to reduce drop-out rate by sending warning e-mail indicating the possibility of flunk in class, predicting potential drop-out learners based on the results of investigation in 2002. They had started to support from 10th week to 12th week after starting lecture. But, the effects of this support were not confirmed. These research support learners know learners’ situation, predicting drop-out based on the data collected while and after learners are engaged in learning tasks. However these types of system can be late to support learners. In worst case, mentors cannot help learners, because of late response. When mentors know learners situation, learner may drop out of courses. Ideally, mentors know whether learners will drop out of courses, in order to reduce drop-out rate. This system aims to support mentors to know learners’ situation before learners start learning courses. Thus, mentors will be able to support potential drop-out learners, and it is expected to reduce drop-out rate.

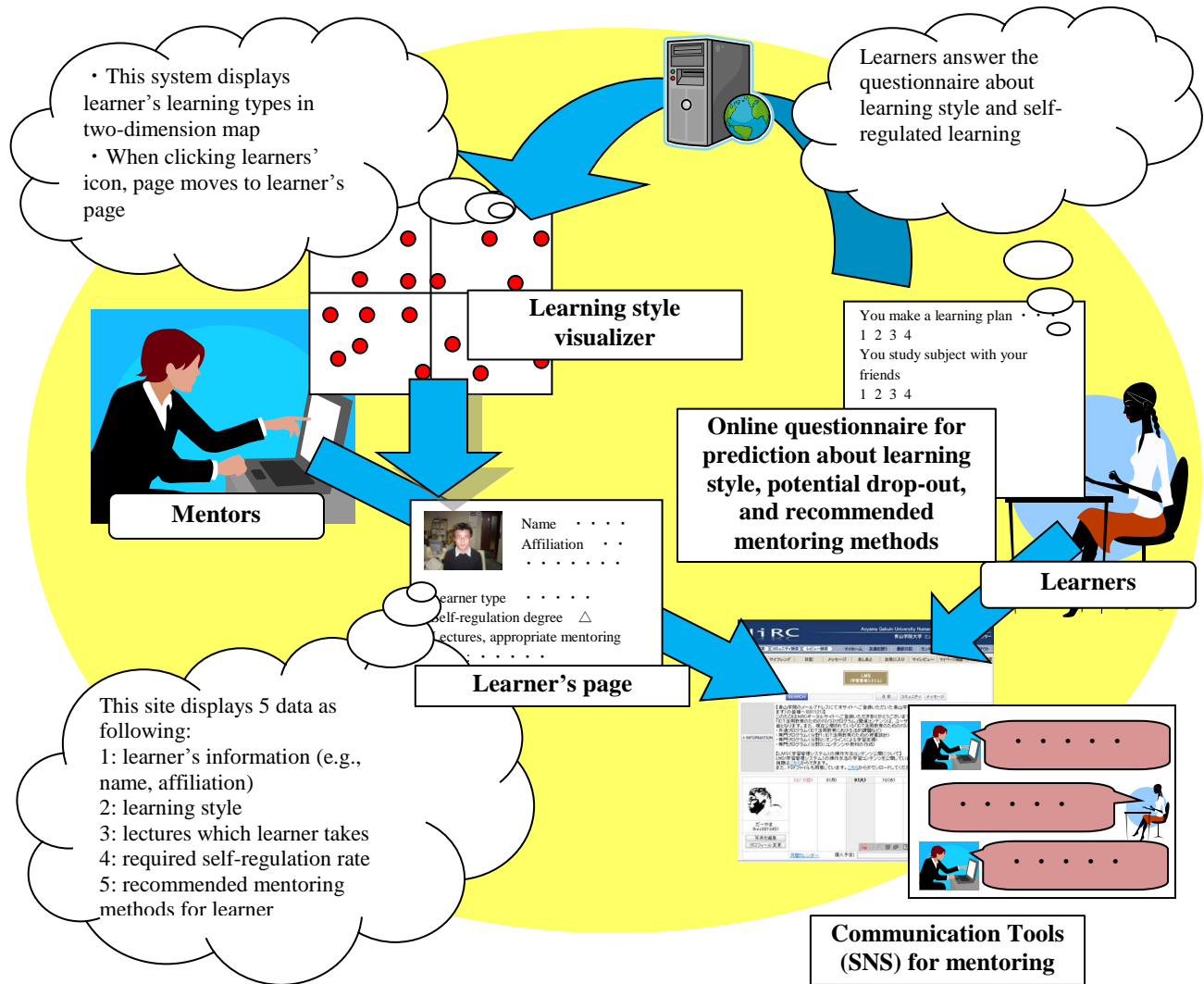


Figure 2. Overall flow of this system



Figure 3 Design of Learning Style Visualizer (Sample)

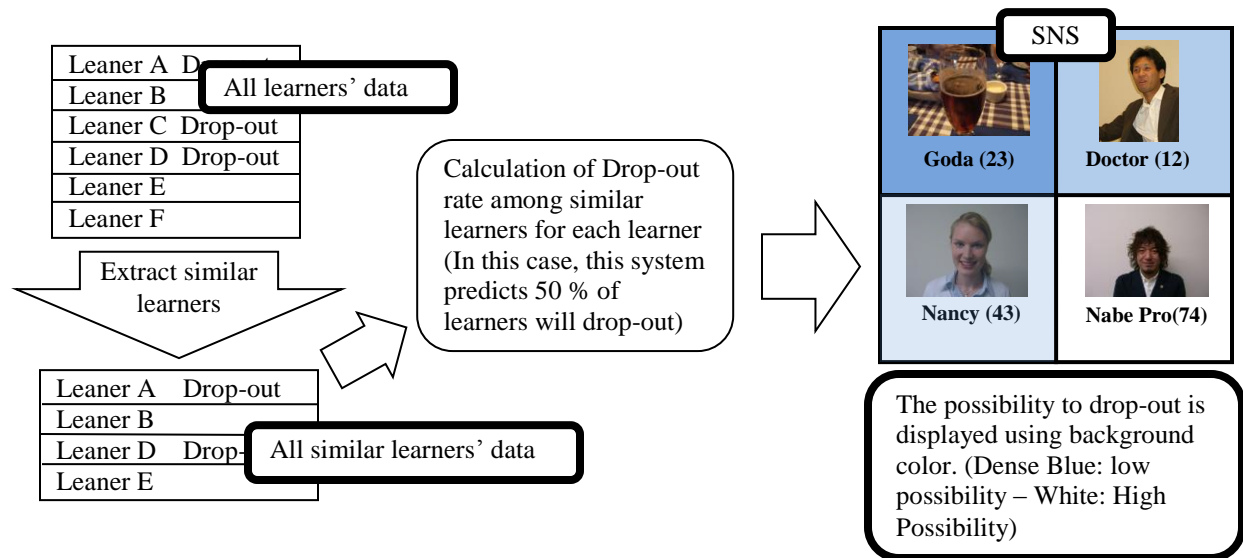


Figure 4: Design of the Function of the Prediction of Dropout

3. Future works

This research aims to design and develop mentoring-support system based on self-regulated learning theory. Before the design and development, we consider the possible ways to drive potential drop-out learners to learn continuously. Self-regulated learning theory can be helpful to allow mentors to support potential drop-out learners. This system tries to allow mentors to support learners before starting courses, in order to conduct effective mentoring on the reduction of drop-out rate. Now, we develop synthesis variables using the primary component analysis for the prediction of potential learners. We have already conducted the perceived data about learning attitude and cognitive learning style from the viewpoint of self-regulated learning.

In this year, first, we organize and schematize the mentoring methods for the assistance for making a learning plan in order to build mentoring methods database. We design and develop this system in detail, and evaluate the effects of this system on the prediction accuracy and usefulness.

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