A study on automatic advising for students in online flipped classroom

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There is a need to bring up an attitude of independent learning in higher education. To encourage students to take the initiative, online classes have been used in prior studies. In student-centered learning, students are expected to think about what and how they learn. However, students who are not accustomed to this type of learning have challenges proceeding on their own. Additionally, they struggle to become independent. Teachers are supposed to track these pupils' development and support it, although it can be challenging to do so weekly. On the other hand, as learning is increasingly online, learners' learning status is being stored as electronic data and made available for use. As a result, this study investigated the feasibility of automatic advising according to the learner's situation based on information such as learning logs and reflections from the learning management system (LMS) that are accumulated through online learning. In this study, automatic advising is assumed to be a three-step flow.

1) Assessing Learners' independence with multiple items based on learner data
2) Generating advising text based on learner evaluations.
3) Sending advising texts to students.

Regarding evaluation, Mizogami describes three levels of depth of independent learning. The first stage is defined as the "assignment-dependent type," a stage in which the student is interested in and engaged in the assignment. The next stage is defined as the "self-regulation type," a stage in which students devise learning goals and strategies through metacognition. The establishment of long-term life goals and identity is the purpose of the last stage, which is known as "life type".

Mizogami states that a single course is not sufficient to develop "life type" students, so this study will focus on advising to guide learners from the "assignment-dependent type" to "self-regulation type." In this study, learning "task-dependent" to "self-regulating," and each is assessed separately. First, evaluate the learning situation. According to Shirasawa, independence is divided into four basic categories and evaluated in terms of how much learning was avoided and how much was directed into knowledge acquisition. In this study, in addition to textbook browsing, exercise solving, and computer-based testing (CBT) results that can be obtained from the LMS as data equivalent to the above perspectives, worksheet efforts and class participation assigned for each class will be used to assess the students. However, preliminary verification indicates that some of the characteristics of the group of learners participating in the classes targeted in this study do not fit into the four categories of Shirasawa. As a result, the characteristics of the four categories are redefined. Specifically, based on the students' data, k-means clustering is conducted to classify the data into four types of clusters, and the characteristics of each cluster are read and assessed from the statistics. Second, evaluating learning goals. Self-regulated learning refers to the state of being able to learn while repeating the three

elements of self-regulated learning: goal setting, learning, and reflection. In particular, goal setting influences both learning and reflection, so this study will evaluate whether the content of goal setting is in line with the points of self-regulated learning. In this study, the confirmation was carried out on students enrolled in the required course “Java Programming 2022” for second-year students of Chitose Institute of Science and Technology. The following are excerpts from the responses to the questionnaire to the students who were advised (n = 44).

Forty respondents indicated that they thought the learning evaluation for you was appropriate in response to the question 70%－80% of the students responded “yes” to both questions when asked if there was anything in the advice on learning status and goal setting that they would take into consideration in the following class. These results indicate that student evaluations are valid and that the content of advising is useful to students to some extent. However, there are opposing viewpoints as well, such as “The suggestion was straightforward” and “I want the situation to be better than it is right now.” There are still some issues with some students’ ambiguous and the simplicity of the advice based on the phrase combinations.