Learning Analysis of English and Programming Languages

Recently, several fully online universities that facilitate a wide variety of lifestyles have emerged. During the COVID-19 pandemic, online and hybrid lessons became necessary and developed as a new form of learning. In addition, flipped classrooms, where self-study is conducted prior to face-to-face lessons, have attracted substantial attention as a way to increase student independence even in conventional universities. Thus, the demand for self-study has increased. However, the conventional self-study system relies on the learning contents prepared in advance, which makes it impossible to respond according to the learning state of individual learners. Using video chat, we can simulate a face-to-face class; however, constraints on the teacher's time make it impossible to talk in real-time with a learner who wants to learn at any time.

Hence, we are promoting a research project to explore a self-study system that can provide optimal learning content (on-demand lesson) to individual learner depending on their learning state, without requiring real-time access to teacher guidance.

This study is being conducted from the following perspectives. First, we consider the evaluation method. The most common method of evaluating learning effects has been questionnaire-based evaluation post learning. Here, the learning state during learning is evaluated quantitatively by analyzing the biometric information of the learner. Next, we analyze similar and dissimilar language learning, such as English and programming languages, visual- and text-based languages, to clarify the differences and identify appropriate learning methods.

In this presentation, I will discuss some of the results from our research project, such as the analysis of stumbling points, grammatical errors, and logic errors while learning programming languages; learning analysis of text-based and visual-based languages; analysis of biometric information while learning English and programming languages; and proposals for pronunciation practice using automatic speech recognition functions, such as Siri.