# Classification and characteristics of the evaluation of a GIS laboratory teaching course using an online learning system

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This report analyzes students' evaluation on a GIS laboratory teaching course that uses an online learning system. First, factor analysis is applied to students' evaluation data. Second, cluster analysis is applied to the factor score of each learner. As a result, three groups of learners are obtained. The multiple comparison method is carried out to compare the three groups with respect to factor loading, evaluation, test scores and total access time. The characteristics of the three groups are as follows. Students in the first group heavily depend on teachers. They hesitate to ask other students even if they have questions. They cannot make their own pace of their studies in the class. Teachers' support is needed until they get used to the online learning system. Students in the second group are satisfied with the laboratory teaching. They can study at their own pace with the system. They also have high expectations about future online learning systems. However they do not study positively with the system. Teachers need to encourage students in the second group to study more with the system. Students in the third group actively use the system, but their satisfaction with the laboratory teaching is low. They do not have high expectations about future online systems. Teaching methods should be improved to take advantage of the system.