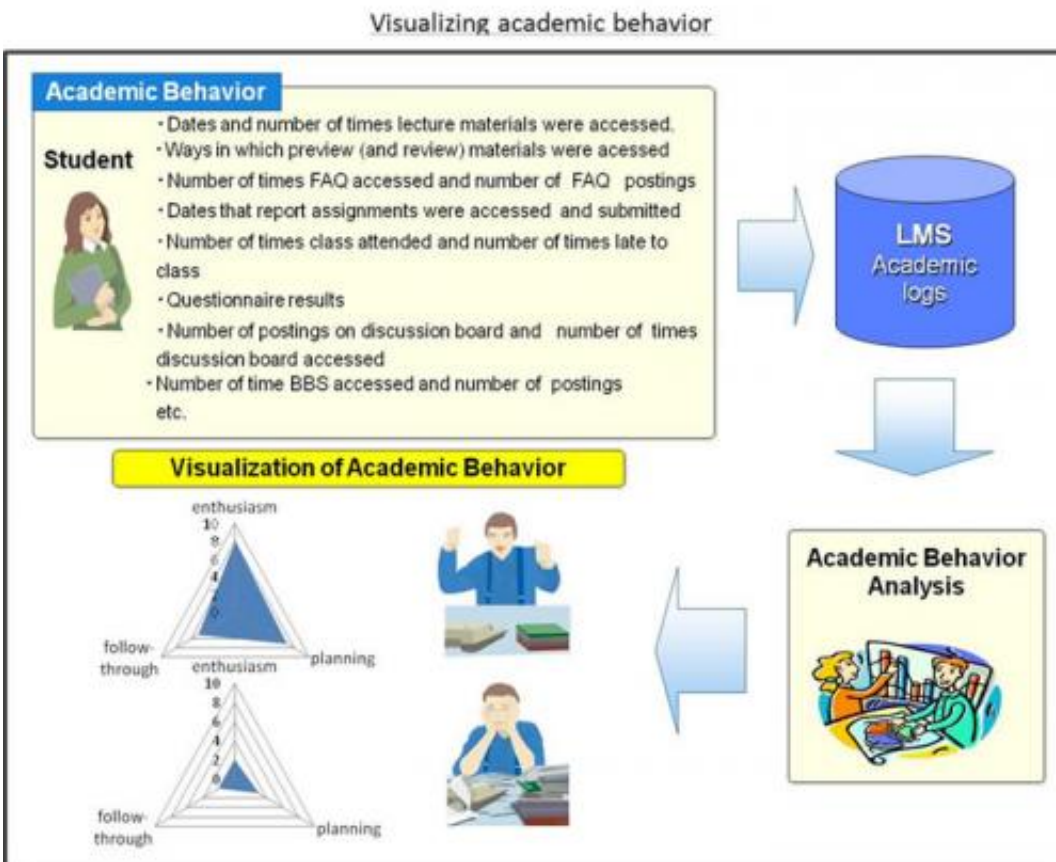# CoursePower learning-management system visualizes behavior and improves academic performance by assisting instruction

December 10 2012

Yokohama National University (YNU) and Fujitsu announced their joint

development of a new feature for CoursePower, a Fujitsu learning management system for universities. Building on academic-log data accumulated in CoursePower, the new feature analyzes each student's level of preparedness, course review habits, and participation in class discussions. Various aspects of their academic behavior, such as enthusiasm, planning, and follow-through, are also charted.

This makes it easy for instructors to grasp at a glance aspects of academic behavior that can have an important impact on a student's depth of understanding, beyond simple test and report scores, so that they can deliver individualized instruction better tailored to each student.

From June 2011 to November 2012, Fujitsu tested the relationship between academic behavior and results using academic-log data from a total of 3,412 lectures in institutions of higher learning, primarily YNU. The Company used this data to clarify those aspects of academic behavior that should be visualized. Based on this, Fujitsu and YNU developed a feature that analyzes and charts academic behavior. YNU will put this new feature into general use as part of CoursePower in April 2013.

With the analysis and use of learning-related data expected to become a significant trend worldwide, YNU and Fujitsu plan to expand the use of this feature and actively engage in promoting the use of analytics in educational instruction.

Given the declining birth rate and rapid progress of globalization in Japan, universities in the country are facing tougher competition both at home and abroad. As a form of quality assurance on their own educational methods, the School Education Law states that universities are now obliged to publish the results of internal surveys. Also, as admissions systems and high-school instruction have grown more and more diverse, there is a greater need for individualized instruction suited

to each student's particular abilities. Furthermore, with the Ministry of Education, Culture, Sports, Science, and Technology (MEXT) promoting the use of ICT in education, universities are accelerating their deployments of learning management systems (LMS), which consolidate the distribution of educational materials, conducting of tests, management of reports and scores, and other types of information.

YNU adopted CoursePower, Fujitsu's LMS, in 2010. Two years ago, Fujitsu began its own research into using log data stored in the LMS for the university's internal survey and surveys of student academic behavior.

Fujitsu and YNU worked together in developing this new feature, which they believe can play an important part in improving the quality of education.

Fujitsu developed the function after performing an analysis on log data stored in CoursePower, including dates that instructional materials were accessed, dates that report assignments were checked, and dates that reports were submitted. YNU provided its expert opinions in educational theory and statistics and assessed the system's utility.

Fujitsu listed those academic behavior thought to produce deeper understanding, and then assigned high scores to those that appeared frequently in the LMS logs (such as number of access, number of submissions, number of postings on BBS and discussion board). It then extracted 60 types of behavior that correlated with academic performance. Next, with reference to several well-known learning models, each behavior was categorized as engaging, sustaining, or preparatory. The behavior of each student class was then plotted on a radar chart with engaging, sustaining, or preparatory indexes.

YNU also assessed the use of this feature as an internal-survey tool for

gathering statistics on the number of classes per instructor, number of students per class, and LMS utilization. This assessment is being used to further enhance this feature.

Fujitsu Laboratories also worked to improve the precision of this feature by grouping classes according to various criteria, such as class size, and developed a technology for estimating how dependent the correlation between academic behavior and performance is on these groupings. Fujitsu plans to use this technology to further enhance the learning-support features in CoursePower.

Better individualized instruction, lower dropout rate

Instructors can readily grasp the academic behavior of each student based on the shape of a radar chart. The size of the area within an individual student's radar chart display the student's level of effort, which can give advance warning of students likely to drop out. By looking at the radar charts for a class as a whole, instructors can spot those students whose academic progress is flagging. They can also view more detailed reports focused on those students and automatically analyze their use of instructional materials to grasp the behavioral tendencies of individual students, such as putting off reviewing class materials until several weeks later, or consistently reviewing preparatory materials before class, resulting in more targeted individualized guidance and better classrooms.

Helping instructors to self-evaluate classes, and universities' internal surveys and assessments

The statistical features added to CoursePower as a result of this collaboration help individual instructors to observe trends in the number of classes they teach and class sizes, the use of lecture materials and

reference materials, status of teaching-material implementation (progress, pass/fail), and trends in the attendance rate of a class as a whole. Access to this information helps instructors assess their classes and student guidance on their own, and can also be used for the internal surveys and assessments performed by the university.

A mirror for the students to evaluate their own behavior

Students can also view comparative charts of academic status to see how their own attendance rate, report-submission rate, materials-usage rate, and other factors compare with the average and best scores in the class, which can prompt them to renew their efforts. It is also possible to reflect on academics at the university as a whole by scanning the academic and activity logs accumulated throughout the university.

YNU plans to use these new features to advance student guidance and to reflect on classroom performance. It also plans to tie CoursePower to the Student Portfolio System to develop academic portfolios.

Fujitsu will continue making CoursePower more and more useful, and will continue to assess and improve the new feature. In the future, it plans to add post-graduation workplace-related data for analysis, which will assist in career guidance for students. This includes helping them to plan their curricula, and can be tied into other campus systems to visualize other facets of learning in greater detail. Fujitsu will support the enhancement and development of university education, through the use of educational log data and other means.

A prototype of this product will be on exhibit for three days beginning December 17 at the Academic eXchange for Information Environment and Strategy (AXIES) 2012 Annual Meeting in Kobe. It will also be

discussed at a company seminar the morning of the 19th.

More information: www.ynu.ac.jp/english/index.html

Provided by Fujitsu