The Effect of Introducing a Key Words Meeting in Junior High School Teaching

Shuji KOGA*[1,2], Akio TOMODA*[3], Shuji KANEKO*[1], Kazuhiro KURISHIMA*[1], Doosub JAHNG*[1]
Graduate School of Life Science and Systems Engineering, Kyushu Institute of Technology*[1]
Usui Junior High School, Kama City[*2] Ida Junior High School, Tagawa City[*3]

Overview Remarkable advances have taken place in the introduction of information and communication technology (ICT) in educational settings, making the provision of effective educational support an urgent issue. In this study, the authors used a "key words meeting" (KWM) to visualize learning status during class and then implement a teaching practice cycle intended to encourage improvements in learning and educational environments. This paper reports on ways to make use of information obtained from the relationship between regular examinations and students' learning status as well as changes experienced by teachers and their level of satisfaction.

Keywords: junior high school education, Internet usage, educational information, learning environment, teaching practice

1. Introduction

Recent years have seen remarkable progress being made in terms of the introduction of information and communication technology (ICT) in educational settings, with teaching material innovations such as electronic textbooks and electronic blackboards, as well as the development of e-learning and other independent study materials. In addition, the introduction of ICT to education has not only improved the work efficiency of users and shortened the time required for material presentation, but has also resulted in demands for forms of support that will enhance the effect of the use of ICT on learning activities. Also, debates have emerged over how best to sample and analyze an enormous corpus of learning history information log data accumulated in systems everyday, the potential of which has been gaining attention in the field of learning analytics, in the context of discovering how best to improve learning and teaching environments. Given such circumstances, effective educational supports making use of ICT have become an urgent challenge, such that it is now necessary to explore teaching practice cycles (i.e., methods for class design, class preparation, and class improvement) to help achieve these ends.

The concept of a "key words meeting" (KWM) developed by Jahng perceives class settings as a site of informational transmission, representing an educational learning support tool for ascertaining whether the material being transmitted by a teacher has been received by students. A major feature of KWM is the ability of such meetings to quantify the transmission of class content. For this study, we implemented a teaching practice cycle intended to encourage improvements in the learning and educational environment. We report on ways to make use of information obtained from the relationship between regular examinations and students' learning status, as well as changes experienced by teachers and their level of satisfaction.

2. Method

In the 2014 to 2015 school year, we introduced the use of KWM to classes in the four subjects of English, mathematics, science, and social studies at two junior high schools. Table 1 shows an overview of the participating schools, subjects, number of classes using KWM, and number of students.

Among the target classes, the Year 1 junior high school mathematics classes had the longest usage. For these classes, we carried out a correlation analysis for using the mean value of regular examinations carried out in the first and second terms (total of three examinations), and the results of individual students' keyword retainment for classes that made use of KWM. In addition, once all classes had finished, we carried out semi-structured interviews with the six teachers in charge of the participating classes about the effect of KWM in the teaching practice cycles using KWM and examined the results obtained.

3. Results

Examination of the correlation between the results of regular examinations and individuals'

keyword retainment showed the existence of a positive correlation ($r=0.62$, $p<0.01$). Figure 1 shows a scatter plot diagram of these results. Table 2 summarizes the content of interview responses about changes experienced by teachers and their level of satisfaction.

4. Discussion

From the existence of a positive correlation between the results of regular examinations and individuals' keyword retainment, it seems that students with low retainment require that teachers provide supplementary review prior to examinations. Methods of measuring students' learning status by notebook checks and short quizzes frequently involve the exercise of subjective judgments by teachers, and by supplementing these with quantitative insights into learning status obtained using KWM, we anticipate that teachers will be able to grasp students' learning status in more detail so as to be better able to devise measures according to their particular status.

Regarding changes experienced by teachers, interviews included references to the fact that KWM provided an opportunity for reflection on the classes and that students had begun asking questions through KWM. It was found that the visualization of students' learning status through KWM was leveraged as information for improving teachers' own teaching practice, and deepened teachers' understanding of their students. Moreover, with regard to teachers' levels of satisfaction, despite perceiving the significance of undertaking KWM, teachers also mentioned their desire for a support environment in terms of time constraints and the need for support for the school as a whole. Identifying the kind of support environment to build represents a future challenge.

Acknowledgements

This research was subsidized by a JSPS KAKENHI Grant Number JP26560123.

Table 1. Overview of subjects that made use of KWM

2014 School Year "Junior High School A"			
Grade	Subject	No. of classes	No. of students
Junior High Year 3	Math	2	23
Junior High Year 3	Social Studies	5	22
Junior High Year 1	English	5	23
Junior High Year 1	Social Studies	1	23
2015 School Year "Junior High School A"			
Grade	Subject	No. of classes	No. of students
Junior High Year 1 (Class A)	Math	6	29
Junior High Year 1 (Class B)	Math	6	27
Junior High Year 1 (Class C)	Math	6	28
2015 School Year "Junior High School B"			
Grade	Subject	No. of classes	No. of students
Junior High Year 1	Science	2	20

Table 2. Changes experienced by teachers and their level of satisfaction

Q1. Comparing your experience before and after using KWM, would you say that anything has changed about you as a teacher?

- I began to review prior to tests while keeping an eye on students' retainment.
- I thought I attempted more firmly to ensure students' retainment of the words.
- From merely teaching the words, I began to think about class flow and parts that required study of the teaching materials.
- Since I had to incorporate the keywords at the stage of class preparation, my method of preparation changed - since I felt that the keywords are the focus of the class.
- Since I have to arrange the important words for the students to memorize beforehand, I began rechecking the important parts of the classes – the parts that we had gone through so far and the parts where we had to go into more depth. This is something that I remain conscious of in subsequent classes as well.
- The task of introducing key words did not result in any major changes.

Q2. Did anything change in terms of teachers' class preparation or feedback time?

- It certainly takes time, I think, but I don't think of it as burdensome. The fact that I could accomplish this on my smartphone at home was extremely helpful.
- There was no change in terms of time. Since I don't give feedback, I do not know about it.
- I didn't feel that the time increased. If I was more conscientious about it, I think the time would probably increase.
- The time required for feedback didn't increase that much.
- I basically take a lot of time for class preparation. Since there's not much class preparation because I give summary handouts at the end of a unit, I put the time into feedback tasks.
- Although my preparation and the way I create classes has changed, since I hadn't previously used KWM in preparation or feedback in my work, it ended up taking a considerable about of time.

Q3. Did you perceive any changes in communication with your students?

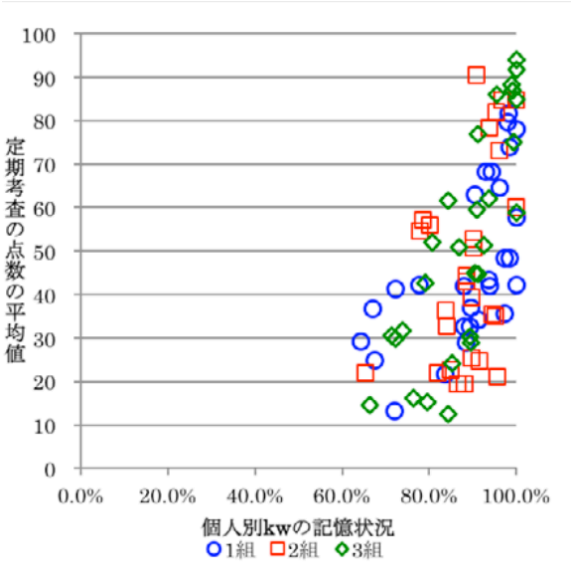
- Since KWM became a topic for discussion, we were able to talk about that. Students also began checking feedback, and asking me to confirm their understanding.
- I believe I did. After we had used KWM once or twice, some kids began mentioning to me that they would like to do it again.
- Students began asking questions before tests.
- I think it would have been a little more fun if we had done the student photography a little earlier. Some students enlarged the photos they had taken and looked at them again. They would hand them in during class on a daily basis. I thought it would have been fun to keep making it a daily thing.
- I don't really think so.
- No changes. There may have been some changes if I had been able to give feedback, but I wasn't able to provide feedback to that degree.

Q4. Would you recommend KWM to your colleagues or for other subjects?

- I think it would depend on the subject. Personally, I think it was interesting even if I wasn't able to put it to very good use myself. I think that someone who is motivated, or someone who is interested in the tool should give it a try.
- I think it might be difficult for teachers whose class format is already established.
- I don't think I would recommend it. I think it would tough for most teachers to implement.
- It's difficult. Time restraints are a problem. While I think that it would be fine if one were able to take the time during the class, trying to collect data outside of the class would be a burden.
- It would be tough under current conditions, though I think it would probably be feasible if a few others around them were also implementing KWM. I think that those with smart phones or who are highly computer literate will be able to handle it smoothly. It might be more realistic to take it as a tool for facilitating information exchange and communication between teachers.
- If we disregard the element of time, I think it may be interesting to use it in the context of science or social studies classes. On the other hand, as some teachers are averse to introducing new things, I feel it would be difficult to recommend KWM in practice.

Q5. Would you like to keep using it next year?

- I would like to use it. I feel it makes sense to do it on a regular basis. I regret not being able to do it regularly.
- I think so. I want examples of its use in social studies at the junior high school level. I'm not confident about using it, but I would say I may be able to use it.
- I think I'd like to use it if it could be spread to all courses in the school. I feel that an environment for using KWM should be put in place. It felt particularly difficult to provide feedback and make students check it every time. There is also the anxiety that even if a teacher does provide feedback, it may not always be acknowledged by students.
- I think it would be good to use next year.
- That would depend on why we use KWM. I don't think there is any point unless we establish what will be used as a device, as curricular content, or as environmental enhancements. If we just do the content, then on paper would be fine. In addition to the functional improvement of KWM, it must be possible for the students to use KWM both at and after school.
- I'd like to use it. That said, I'm not certain whether I'll have enough time.



X-axis label: Individuals' keyword retainment

Y-axis label: Mean score on regular examinations

○Class1 □Class2 ◇Class3

Figure 1. Scatter plot diagram of mean score on regularexaminations and individuals' keyword recall