Utilization of ICT Devices in Japanese High School

ICT devices are helpful for difficult situation.

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Abstract: The objectives of this study are to clarify the effective utilization method and timing of ICT devices in Japanese high school. The author utilized the projector in math classes throughout the year in 2012. The objective of this class was to make the students understand how to use their textbooks, because the descriptions in the textbooks were difficult for students. The author was able to explain clearly, the information in the textbook by showing the contents of the textbook on screen with a projector. This process has not been performed by a conventional class so far. The author made an important finding after reviewing the video afterwards. By recording the conversation of students at break time, and analyzing video in class using ICT device by other teachers, the author found what students really expected. According to the results of the questionnaire, the students who did not feel stress took the good point in test. On the contrary, students who felt stress took the bad point in test. Stress is caused by various factors. ICT devices are helpful for difficult situation like this. The author analyzed how teachers should utilize ICT devices in classroom teaching in a way that teachers and students did not feel stress. The author will continue this research with an English teacher to discover how to teach English in an enjoyable way.

1. Introduction

The use of devices such as interactive white-board has become commonplace in elementary schools and various research is being pursued, so one may wonder why the author is addressing the issue of "the Utilization of ICT devices." However, the author believes that this is one of reasons why education in Japan has not as yet improved.

The author conducted field research at senior high schools in Osaka Prefecture. In Osaka, students are ranked and classified for their academic ability at the junior high school level, resulting in considerable disparity among senior high schools. Schools range from those with a focus on preparing students for university to those which have difficulty providing adequate lessons. The current situation is that as the education budget is cut back, schools are not being outfitted with ICT devices that are particularly needed for classes. This includes, for example, ultra-short throw high-performance projectors and interactive white-boards. At the school where the author worked last year, not one projector was available for author's exclusive use in class lessons, and there were about ten low-performance projectors that were difficult to use. Within these adverse conditions, there was a very strong wish to want ICT devices for classroom use enhanced. As a teacher, the author often felt like efforts were in vain even if the author wanted to give good lessons as problem students would sometimes disrupt classes.

2, Research and Observations

The purpose of this research is to confirm whether or not the utilization of ICT devices really leads to an improvement in class lessons particularly in senior high schools where there are many problem students, and to clarify points to keep in mind when utilizing these devices in the field, and effective methods of use. The devices were used in math classes, and the main devices used being ultra-short throw projectors equipped with Wi-Fi. Laptop computers and student smartphones that were also utilized as required. Moreover, the projector was purchased at the author's own expense. Lessons were recorded every hour with a video camera and analyzed. During break time, the author mingled among the students and listened to their conversations, and was unable to record them. At the end of the year, a questionnaire was taken and statistical analysis was performed.

First, the school textbook was scanned to create JPEG images which were copied to USB memory stick for direct connection to the projector. The merits of the projector included being able to project images onto a screen without the use of a laptop computer, being able to enlarge and reduce the image size and change images easily using a remote control, needing to carry around only the projector, not needing to turn off the lamp, and being able to use the blackboard as a screen. The author observed teachers who conducted lessons by connecting their smartphones and iPads to existing school projectors. The remarkable advances in ICT devices has made all this possible.

What the author first noticed after beginning to use the projector was that displaying the school textbook using the projector and explaining the content at length would cause students to become drowsy. Therefore, the author limited explanations to under a few minutes and had students solve practice problems while watching the screen. If the author instructed students to solve practice problems by referring to examples in the textbook, the students and the author would end up having a hard time if the author's lessons were not understood. However, by telling students to "write down the solution in the same way" while indicating the area in question on screen, my lessons came across better and the author had a clear effect.

3. Analysis

Survey questions given to students at the end of the year:

(1)   Do you think that you study most effectively while talking with someone you like?

(2)   Do you have a part-time job?

(3)   This is a question for people who have had a part-time job. Have you ever fallen asleep during class the day after working at your part-time job?

(4)   Do you feel burdened when you are called on to answer a problem during math class?

(5)   While the problems in the textbook are difficult, were you able to understand them after the projector was used to explain how to understand them?

(6)   Do you lose your motivation when your teachers or parents tell you to study?

  Of these 6 questions, item (3) was evaluated on a scale from one to three, and all other items were evaluated on a scale from one to seven from "very much" to "not at all." The figure at right was produced from implementing a principal component analysis of questions (1), (4), (5), and (6). One can see from this how the use of the projector had a positive effect on student willingness to learn.

  An analysis of each student showed that student A who had low academic ability at the time of entering the school began to achieve perfect scores beginning from second term midterm tests, and ultimately achieved the top math grades in this class. This student responded that the use of the projector was very effective.
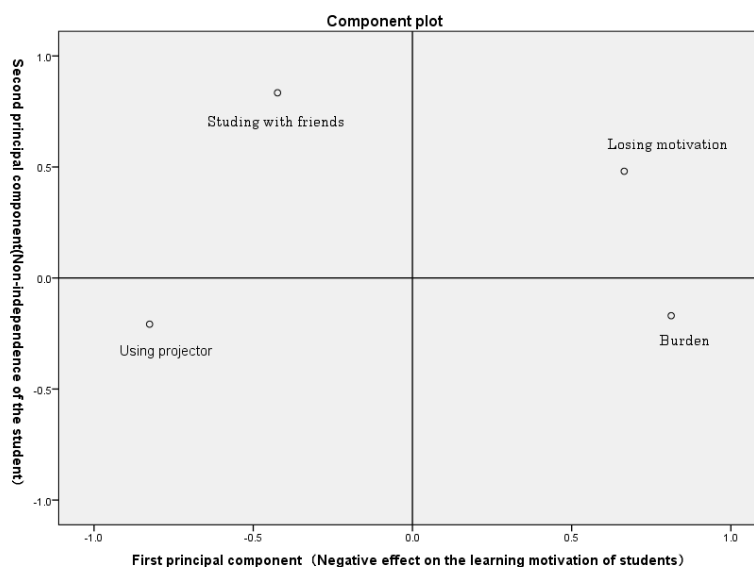
On the other hand, student B started to get zeros from second term midterm tests. Due to the student's home situation, this student had lost interested in studying and did not even opening her textbook or notebook. Nevertheless, she was still able to occasionally participate in class lessons by looking at the textbook displayed on the screen. Next, student C's grades plummeted starting from second term midterm tests, but this was because student C had started working at a part-time job due to household circumstances and would fall asleep in class the day after work. Until this point, she had never fallen asleep in class. Previously, when this student would respond that she didn't understand, the author would re-explained the problem by writing it down on the blackboard again, by using the projector, the author was able to explain it easily by re-displaying the problem on screen. This student also responded that using the projector was very effective.

4. Conclusion

  This research is currently being continued by an English teacher. When the author first made this request to young teacher, the author was informed he would start implementing these measures from after the summer holidays, but when the author went to observe his classes in June, he had already gotten used to effectively using the devices and had improved his lessons using his own inventiveness. Based on these observations, the author believes the "Utilization of ICT devices act" will have immediate effect once high schools are provided ICT devices.

References

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