CASUM Pilot for Magnetism and Electricity with 5th Grade Students

Description of the Pilot Study

CASUM was first piloted in the spring of 2011 at a rural elementary school in Colorado, within the Boulder Valley School District. We worked with a 4th grade teacher, Mandy, who had three years’ experience teaching science using FOSS. She taught two science classes; each class averaged fifteen children. The purpose of this pilot was to learn a) if the teacher could learn to conduct CASUM dialogs effectively; b) if the dialogs would engage students in conversations; c) if the students would begin to construct understandings; d) receive feedback on what worked for Mandy and her students; and e) what features of the system needed improvement. The CASUM content mirrored the scientific concepts in the FOSS module Magnetism and Electricity. Prior to the teacher running CASUM, two BLT staff with 4 years’ experience tutoring students in science using QtA modeled three CASUM conversations with Mandy’s students. After that point, the teacher felt confident to carry out CASUM with her kids. During her last five weeks of school, she carried out eleven of the fourteen CASUM dialogs we provided her.

While using the intervention, Mandy provided us with informal feedback on a regular basis via email and face to face conversations. Shortly after the end of the school year, she completed a 20 question survey which required selecting responses to statements on a Likert scale (Strongly Agree to Strongly Disagree), and typing written comments to a portion of the statements. A copy of her survey with comments is presented in Appendix A, Figure 3. Examination of both Mandy’s response selections and comments indicated that both she and her students were excited to have new technology in their classroom and felt they benefited from viewing and talking about the animations. The students were fully engaged in the conversations and in listening to and selecting response alternatives to the MC question. Mandy reported that CASUM helped children acquire and use science vocabulary. Mandy also used CASUM in innovative ways: After watching and listening to the Explanations a few times, her students were asked to watch the animation without sound and explain what they were seeing using the language they learned. In some cases they were asked to come up and trace the path of electricity in circuits or explain the science while pointing to illustrations and animations. They were then asked to construct explanations using their own words. Following these experiences, students started using the vocabulary correctly and often. Mandy reported that her students became excited when it was time to watch the videos discuss science and select and defend their answers to the MC question.
First Time Jitters: Mandy shared that she was nervous at first about using the computer and controlling the animations. But after a few sessions, she reported that she was comfortable using the technology and asking questions to facilitate the discussion, and reported that she found herself using questions to stimulate conversations in all of her subjects. She greatly appreciated the ability to pace the conversations, and to play, repeat and pause and resume the videos. She felt that scientific concepts encountered in the classroom science investigations were strongly reinforced in a way that made sense, both because of the visual support and the multimedia explanations that the kids could relate too. Several students in her class, including a special education student had limited vocabulary; she felt these students had great success learning vocabulary from the visuals and drawing on support from their classmates.

Mandy offered several clear suggestions for improving CASUM. These included: a) improving the user interface to the Flash applications to navigate within each animation (e.g., be able to back up to a specific spot, play and replay the desired interval) rather than only be able to repeat each segment, and stop and start during the segment, b) some animations were too long and present too many concepts, which made the conversation more difficult; animations should be simple and address just one or a few related concepts, and c) create more interactive animations.
Figure 1
CASUM PILOT TEACHER SURVEY
Comments from “Mandy” 4th grade teacher

PART 1 CHOOSE the best response and RESPOND to each question.

1. Which CASUM dialogs did you do with your students?

11 Electricity and Magnetism CASUM tutorials

2. Using CASUM impacted my students:

   In a positive way  In a negative way  Not at all

   The CASUM modules not only went over important information, but acted as an effective progress monitoring tool to see what key elements/vocabulary still needed reviewing.

3. CASUM animations and visuals helped students visualize scientific processes.

   Strongly Disagree  Disagree  Agree  Strongly Agree
   The animations and visuals helped my students connect the hands-on Investigations in class to an outside source. It validated their learning and helped them feel empowered.

4. CASUM animations and visuals helped students understand scientific concepts.

   Strongly Disagree  Disagree  Agree  Strongly Agree
   The animations and visuals helped my students connect the hands-on investigations in class to an outside source. It validated their learning and helped them feel empowered.

5. Using CASUM changed how we talked about science in the classroom.

   Strongly Disagree  Disagree  Agree  Strongly Agree
   Students felt empowered and confident using vocabulary terms that they had little interaction with prior to the investigations.

6. Students were fully engaged in the CASUM dialogs.

   Strongly Disagree  Disagree  Agree  Strongly Agree
   The CASUM dialogs were a platform to turn what could have been a direct instruction lesson into a dialogue where students felt heard and could make sense of their learning.

7. Students using CASUM were motivated to construct spoken explanations of science content and processes.

   Strongly Disagree  Disagree  Agree  Strongly Agree

8. CASUM conversations deepened student understandings of scientific concepts.

   Strongly Disagree  Disagree  Agree  Strongly Agree

9. CASUM conversations helped students speak more confidently.
10. Over the four Casum dialogs, the amount of time kids spoke:
   Increased  Stayed about the same  Decreased

11. On average, what percentage of your kids got the multiple choice questions correct?

   0%  25%  50%  75%  100%
   
   Between 75-100% depending on the question. Usually it was around the 85-90% mark.

12. What was the average length of your CASUM tutorials?

   15 min  20 min  30 min  45 min  60 min

13. I find that since using CASUM I am asking students more questions and engaging them more in classroom conversations?

   Strongly disagree  Disagree  Agree  Strongly Agree

14. The professional development (the workshop, teacher guides and observing an expert receiving feedback from an expert after conducting a CASUM dialog) was sufficient for me to understand and manage classroom conversations with confidence:

   Strongly disagree  Disagree  Agree  Strongly Agree
   I really loved the support I received from Cindy and the teacher guides were a great resource if I felt unsure about something or the QtA approach.

15. Using CASUM impacted my schedule:

   Strongly disagree  Disagree  Agree  Strongly Agree
   It impacted my schedule positively. It gave the class structure and the students began to expect a discussion (and were looking forward to it) and the conclusion of class.


   Strongly disagree  Disagree  Agree  Strongly Agree
   I feel more confident in the QtA approach and found myself using the different questioning techniques in math class and other areas in school. I feel like I have become a stronger teacher because of CASUM.

17. I found it simple to use the CASUM computer interface.

   Strongly Disagree  Disagree  Agree  Strongly Agree
   At times pausing the CASUM interface was difficult.
18. I am comfortable with using new technology in my classroom.

    Strongly Disagree  Disagree  Agree  Strongly Agree

I am open to all(any) technology as long as it positively benefits my students’ learning.

19. I would use a future improved version of CASUM in my regular classroom.

    Strongly Disagree  Disagree  Agree  Strongly Agree

While I feel the current CASUM version is effective, updating certain animations and presenting investigations that connect to current real world phenomenon would help.

20. The CASUM content is aligned with my existing lesson plans and curriculum.

    Strongly Disagree  Disagree  Agree  Strongly Agree

It closely aligns itself to the FOSS curriculum which connects to the BVSD curriculum I currently use in my classroom.

21. The CASUM content works with the different levels of learners I have in my classroom.

    Strongly Disagree  Disagree  Agree  Strongly Agree

The animations were VERY helpful for the learners in my classroom that have a hard time writing down their thoughts.

22. Incorporating Spanish language support into CASUM, so narrations and vocabulary could be understood by Spanish speaking students, would be a major benefit to CASUM.

    Strongly Disagree  Disagree  Agree  Strongly Agree

Though the current student population I worked with didn’t have many non-English speakers, this would be a benefit.

23. I would recommend using CASUM to other teachers.

    Strongly Disagree  Disagree  Agree  Strongly Agree

24. The narrated animations helped ESL students learn science vocabulary and concepts

    Strongly Disagree  Disagree  Agree  Strongly Agree

25. Think about the way kids responded to the different tutorials. Was there any thing in particular that you noticed the kids responding better or worse towards?

    They were more excited when there was a phenomenon to observe.

26. What would you like to see more or less of in CASUM tutorials?

    More real-world connections to decrease the abstractedness of certain science concepts.
27. What would you change about CASUM, and why? (Improving CASUM is really important to us; we will take your suggestions seriously.)

The narrator’s speaking was sometimes muffled and hard for the students to hear. Some of the lessons seemed a little long and my students’ engagement decreased during those – breaking them up into smaller lessons with a question at the end would alleviate this.

Tell us about yourself:

28. How many years have you been teaching? 4

29. Have you previously used the FOSS program to teach science? YES NO

30. If you have used FOSS, how many years have you taught science using FOSS? 3

31. Have you used FOSS to teach the measurement module before? YES NO

32. Have you ever taught a class before that was predominantly ESL students? YES NO

THANK YOU FOR ALL OF YOUR HELP