Final Assignment – Representing Knowledge

Emily Lacock

(67281162)

February 8, 2017

EDST 403

**Original lesson plan**

**Date: Wednesday, November 2nd 2016**

**Lesson title**: Finding the Area of Composite Shapes – Introductory Lesson

**Subject**: Math 7

**Length**: 30-40 minutes

**Curriculum objectives**:

* *Represent mathematical ideas in concrete, pictorial, and symbolic forms*
* *Apply multiple strategies to solve problems in both abstract and contextualized situations*

**Activities**: in groups of 5, find the area of the six different composite shapes drawn on large equation sheets around the room

**Organization**:

(First 5 minutes): go through answers from last day’s homework questions

(Next 5-10 minutes): quick review on area of square/rectangle, circle, and triangle

(Next 5-10 minutes): Sample equation with the class on the board. Get students to check the post-it note under their desk to determine which group they will be a part of

(Next 25 minutes): Students spend 4-5 minutes at each equation, solving the problem as a group.

\*If there is additional time at the end, go through the solutions with the class

**Supplies**: Six large equation sheets, post-its (under each desk) to make groups

**Where students struggled with understanding**

This lesson was part one of three consecutive Math periods that I taught during the first week of my short practicum in November. The objective was to extend on students’ prior knowledge and understanding of finding area and perimeter of quadrilaterals to solve for the area and perimeter of composite shapes. My school advisor asked that I teach this introductory lesson, followed by another lesson that would challenge the students with some slightly harder questions, followed by creating, invigilating, and marking a quiz. I have included the quiz in my blog post. The average quiz score was 3.57/5.00 (~71%).

In terms of understanding area of composite shapes, some students struggled to grasp the concept that they simply needed to add or subtract the area of two (or multiple) shapes, broken apart. Each student has their own formula sheet, which I allowed them to use during the quiz. This eased their nerves a bit but it was clear to me which students didn’t complete all of their homework before writing the test, because they weren’t able to select the appropriate formula(s).

Another concept that students struggled with was finding the perimeter of composite shapes. Instead of calculating the outside length of the figure, they would indicate the sum of the lengths of every line included in the figure. This showed me that some students didn’t understand the definition of the word perimeter and that the concept needs to be reviewed if I were to teach this lesson again.

**Modified Learning Experience**

I put the students into random groups of 5, which ended up being too many bodies in one space. In redoing this lesson, I would pre-make groups by putting one student who is very strong in Math paired with two other students who often struggle with the subject, so that there is a maximum of three students per group. I found that bringing kinesthetic learning into my lesson was a great idea; it is very necessary to get this group of kids up and out of their seats in order to keep them engaged and interested. Kinesthetic learning is important because as discussed during our lecture on Monday, January 16th, the body and the mind are not dissociated. It is important for the body of the learner to be an active part of the learning process (Iqbal, 2017).

My lesson included a practice question, which I went through with the whole group, and based on their “thumbs up” feedback it seemed to me like the majority of the class understood how to solve the problem. In redoing this lesson, I would do at least two (very different) practice questions with the group before getting them to work on their own. I would also modify the way in which I gage their understanding: I would get them to close their eyes/ put their heads down on their desks when giving me this ‘thumbs up’ style of feedback. I think this anonymity allows students to feel more comfortable in being honest about their level of understanding and it also shows me which students require extra attention, so that I can differentiate my instruction to cater to their learning needs. This check-in would also allow me to make use of my ‘instructor intuition’, as discussed in the Burke & Safler-Smith (2006) article. The authors mention that “in teaching, specific and clear guidelines are sometimes absent, and instructors must employ their intuition to direct decision making” to alter their instructional methods (p. 173).

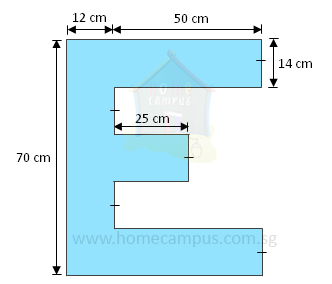
Once students get into their pre-determined groups, I would require each individual to copy down the question at their station and to solve it showing every step. I would let them know at the beginning of the lesson that this work would be collected for a completion mark, to ensure full participation from every student. The nature of this lesson is to encourage student co-operation and to improve group work skills. As noted by Noddings (2015), “in everything we do as teachers, we keep in mind the unifying purpose of producing better adults” (p. 235). The ability to work well with others and to be a team-player are essential competencies in order to succeed in today’s workforce. Further, Noddings emphasizes the importance of not restricting our teaching to a type of instruction that contains a stated objective and direct instruction (p. 235). The author goes on to state that teachers should be encouraged to use a variety of object lessons, including small group work, Socratic questioning, among other techniques (p. 235).

**Image or Metaphor to Represent Key Idea**

If I were to teach this same set of lessons again I would make Lesson 1 an introductory lesson that reviews and explains more in-depth the definition of area and perimeter. I would make Lesson 2 more project- and inquiry-based. The new curriculum requires students to “develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving” (Mathematics 7, 2016). It also focuses on getting students to “represent mathematical ideas in concrete, pictorial, and symbolic forms” (2016). To fulfill this curricular requirement, I would ask students to write their initials in block letters and ask that they give every side a length (in the unit of their choice). I would then ask them to find the total area of their initials followed by the total perimeter. If time permits, they could colour in their work. Not only would this project appeal most to visual learners, I think it would personalize students’ learning and would show me, the teacher, which students are struggling to grasp the concept (and who may not have completed all of their homework properly).

I would also ask students to explain, in words, to their neighbour how they went about finding the area and perimeter of their initials. In explaining verbally the process behind their thinking, students are able to “reflect on mathematical thinking” and “explain and justify mathematical ideas and decisions”, as outlined in the curriculum document (2016).

Below is an example of what this project would look like:



**Closing thoughts**

All in all, I felt that my original lesson went OK. Had I implemented some of the techniques outlined in my ‘modified learning experience’ in the original plan, students’ overall understanding of the topic and test scores may have been better. Drawing upon kinesthetic learning, collaborative group work, and visual learning tactics are all competencies that I hope to integrate into my teaching throughout my long practicum and as a future educator.

**References**

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