Polygon Task

Class X is a high attaining group which you have taken over at the start of Year 10. So far Class X has been taught mathematics as a list of rules and they have been practising the application of these rules in a range of examples. These students have learnt to perform well in a competitive classroom environment in which they work on tasks and they are rewarded for the correctness and rapidness of their work. In your teaching you aim to instigate a different approach that includes justifications for the used rules and the relations amongst them.

In a session on the sum of the angles of a polygon, you have asked the students to

- work with a Dynamic Geometry software in order to sketch polygons with 3, 4, 5, 6, 7, … sides and
- report the number of sides and the sum of the angles in a table, in order to conclude with a general rule about the sum of the angles of a polygon.

After a couple of trials the students conclude that the sum equals 180^o multiplied by the number of sides minus two and verify this rule with trials of polygons with several numbers of sides.

At that point you ask the students to explain why this rule is correct and the dialogue below follows:

YOU: Why is this formula correct? Can you give any explanation?

STUDENT A: It works for all the polygons we tried.

YOU: How do you know that this will work for all polygons?

STUDENT B: It isn't necessary. What we need is a formula that works.

STUDENT C: Yes, we spent so much time playing with the software. If you had given us the formula and a list of problems to work on, by now we would have got more done.

STUDENT A: Practice makes perfect.

Questions:

a. What do you think are the issues in this situation?

b. What are you going to say to each one of these students?

c. Are you going to change your approach? Justify your response.

Publications with reference to the *Polygon Task*

Biza, I., Nardi, E., & Joel, G. (2015). Balancing classroom management with mathematical learning: Using practice-based task design in mathematics teacher education. *Mathematics Teacher Education and Development, 17(2), 182-198.* Available at: http://www.merga.net.au/ojs/index.php/mted/article/view/264

Biza, I., Joel, G., & Nardi, E. (2015). Transforming trainees' aspirational thinking into solid practice. *Mathematics Teaching*, 246, 36-40.

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Let us know whether this task is useful at @mathtask or email Irene Biza at i.biza@uea.ac.uk. For more tasks, visit MathTASK.