TSG 34 Compare contributions by Lee, Leung & Goddijn

By A Lee and A Leung

It is interesting to note that although two types of tasks look very different, we see quite a lot of similarities in our contexts and concerns about the design of tasks.

Regarding the context, both sets of tasks originate from non-traditional competitions. [This is mentioned briefly in our paper and the items for the relevant competitions can be accessed at http://web.hku.hk/~amslee/Math_Contests/. English translation is available for individual items of secondary level.] We share the same view with Aad regarding the purposes and principles for developing the Maths B-day assignments. In both cases, we are interested in exploring unfamiliar problems, which are challenging for participants yet accessible by some weaker ones. This is relevant to pedagogical consideration in classroom setting as we would like to engage most students in the same task, though probably through different routes or to different extents. [In our computer based contests, we observe that very often a participant may find a question difficult to answer yet willing to drag around points to get a sense of what could be generated.] Both of us would agree that the competitions could provide a platform for experimenting more naturally design and use of new learning tasks.

We are also interested in engaging teachers in the process of designing the tasks for the competitions, but have only tried once in 2006, from which we may share more about our experiences in working with teachers in this process. The possibility of genuine collaboration among students in a team is also an important concern of us when designing tasks for the competitions.

One crucial element in the assignments of Maths B-day is the opportunity for guided re-invention. We are interested to learn more about how such elements can be identified and developed.

In our computer tasks, we tried to use constrained exploration in the design: only one dimension of variation (degree of freedom) for the exploration is allowed for the pre-constructed figure. The purpose is to create a discernable outcome space where students' cognitive behaviours can be recorded (even collectively) in a tractable fashion.

Both design approaches are about careful controls, situating students in a pre-designed mathematical environment where (sometime predictable) activities and concepts can be brought about. What would be interesting is to compare and contrast the controls in the two tasks. One task is heavily framed under the axiomatic formal Euclidean system focusing on definitions and logical reasoning while the other is situated under a dynamic spatio-graphic virtual interface focusing more on intuition and visual reasoning. We wonder whether there's room for integration of the two different approaches.