

## Senior Secondary Probability Assessment Task Support for Development of Thinking Skills

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Mathematical curricula aim to develop thinking skills in students. This paper reports on the analysis of senior secondary probability assessment tasks, using Engstrom's Activity Theory (2001), to disclose the tensions and possibilities for the development of thinking skills. Senior mathematics (Year 12) modelling and problem-solving tasks (Victorian Curriculum and Assessment Authority [VCAA], 2015) on probability were analysed according to a two-tiered thinking framework (Ernst, 2021), based on several thinking frameworks including Bloom's Revised Taxonomy (Krathwohl, 2002) and the SOLO (Structure of the Observed Learning Outcome) Taxonomy (Biggs & Collis, 1982). The rules of implementation of the tasks were triangulated with data from interviews with students ( $n = 20$ ) and teachers ( $n = 14$ ) interrogating their experiences in doing or administering such tasks, respectively.

The findings of this analysis show that school-based modelling and problem-solving assessment tasks (VCAA, 2015) can support the development of thinking skills; however, many contextual factors hinder this. Teachers feel they do not have the skills and time to prepare the tasks, school rules and conventions can limit the effectiveness of tasks, students lack experience with these types of tasks, and textbooks offer limited support. As well, the supporting tools of reference books and calculators are not used to full advantage by students. Thus, many opportunities for the development of thinking skills in students are potentially lost in the implementation of internally assessed modelling and problem-solving tasks. Activity theory proved useful for describing the influences and tensions on the internally assessed tasks and the analysis of the complex elements involved.

### References

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