SUSTAINED OVERLAP IN ZONES OF PROXIMAL DEVELOPMENT? IF SO, HOW DID THAT HAPPEN?

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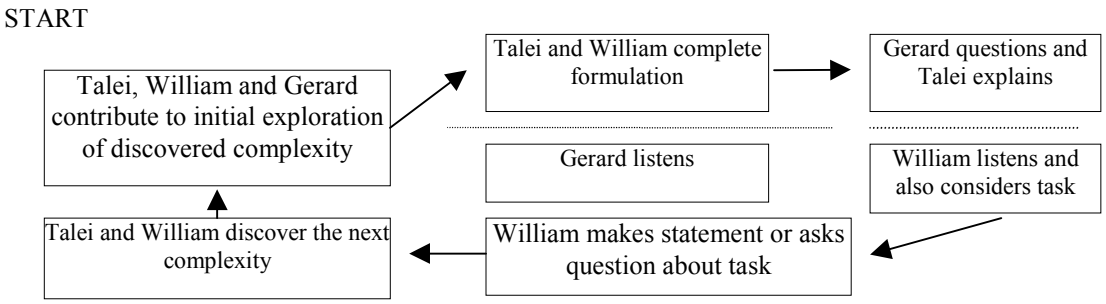
A collaborative group of senior secondary calculus students sustained a high level of engagement with an unfamiliar challenging problem and progressively developed concepts new to all group members. This is explained using a schematic representation that connects aspects of the *zone of proximal development* (Vygotsky, 1978) with *flow* (Csikszentmihalyi & Csikszentmihalyi, 1992) and *discovered complexity* (Williams, 2000). Discovered complexity occurs during task completion if a problem solver or a group of problem solvers perceive *intellectual* and *conceptual complexities* (Williams & Clarke, 1997) not evident at the commencement of the task. This altered perception arises when the group spontaneously formulate a question (intellectual challenge) that is resolved as they all work with unfamiliar mathematical ideas. Discovered complexity meets the conditions for flow; students work just above their present skill level to meet a challenge almost out of reach. Even though the group members are progressing through their individual ZPDs, the *expert other* (Vygotsky, 1978) is not apparent. Evidence of the group's interaction pattern (Figure 1) and a profile of each student's individual ability to solve unfamiliar challenging problems (Krutetskii, 1976) are used to explain how the composition of the group facilitated concept creation.

Figure 1 Usual interaction pattern as the group discover complexities



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