There are a number of reasons why intelligent tutoring systems (ITS) have failed to gain widespread acceptance in the classroom. These include financial problems (ITS often run on hardware and software platforms that are too expensive for schools) and the fact that many ITS are restricted to one particular domain and do not allow teachers to configure them for other domains. From interviews with teachers we identified a yet further reason: most ITS teach according to a fixed teaching strategy and do not allow teachers to alter the way in which material is taught. In this paper, we describe a system that allows one to do this. The system, called COCA (CO-operative Classroom Assistant), contains a number of user-changeable control heuristics which implement decisions that need to be made during teaching. We present these heuristics and then discuss their application in a case study with a secondary school mathematics teacher. The area in which the teacher chose to work was equations and simplifying algebraic expressions.