

## **Abstract**

The emergent of the Internet and World Wide Web has made collaborative learning feasible to be carried out in a web-based environment. Computer Supported Collaborative Learning (CSCL) utilizes the use of information and communication technology as a mediation tool within collaborative methods of learning. At the same time, a number of applications started to make use of the agent technology to enhance their applications. This thesis endeavors to develop a web-based tool which utilizes web agents in supporting primary schools jigsaw collaborative learning. First, literature reviews on the theoretical aspects of collaborative learning are carried out. It covers the collaborative learning definition, its benefits and limitations as well as various collaborative learning techniques. The reviews further investigate CSCL and its applications for supporting primary schools education particularly in Malaysia. Then, it attempts to support the jigsaw activity proposed by a group of teachers from a workshop carried out in year 2000. As a result, a G-Jigsaw process model is formulated which comprises of Initial Level, Expert Level and Jigsaw Level of collaborations. This process model restructured the Initial Level of Aronson's Jigsaw Classroom technique to allow students' collaboration throughout every level of the collaborative session. Secondly, reviews on software agent literature, specializing on web agent are carried out. It describes how a multi-agent architecture is formulated to enable the web agents to communicate with each other in simplifying and automating the jigsaw activities. Further, this thesis presents the development and implementation of G-Jigsaw that incorporates the process model, the multi-agent architecture and the deployment of web agents in supporting the jigsaw collaborative learning. Next, it highlights the teachers (pilot testing) and students (hands-on testing) evaluations and the results indicated that

web agents greatly simplified the complex jigsaw processes. Finally, the research contributions and future enhancements are enclosed.