Reinforcement learning has recently reemerged due to new advances and research and is ever more used, therefore, it is easy to find recent and maintained documentation and tools. The most extensive research was conducted to understand the underlying technology of reinforcement learning and how the learning algorithms work. While most of the development could be done without a deep knowledge of the fundamental working of the algorithms, it proved to help implement the learning at a lower level providing more control, not only but it became very useful to make changes to the hyperparameters as it was understood how each works. Another focus of the research was on the Keras API, this was fundamental to understand the transition between the simple cartpole project and the 2D humanoid as the way the neural network was structured was fundamentally different.

Research on previous implementations and research, including learning to walk for the Atlas robot using similar techniques and learning algorithms, has not yet been put into practice, especially the research conducted on the reward function, this is because this are focused on 3D robots and therefore will only apply to the currently in development phase.

While all the research during the planning phase was essential for this development, not only the essential concepts of reinforcement learning and neural networks but some of the most important research was on what tools and algorithms to use as this have mostly stayed consistent and fit the requirements, even though some changes had to be made to the last phase, regarding the simulator, this had been foreseen during the planning phase. During research, Mujoco was appealing as a new open simulator with excellent capabilities although its implementation with the team’s robot was predicted to be complex during research, therefore plans to use gazebo instead were put in place and researched as it would directly integrate with ROS, contrary to Mujoco. Using Gazebo allows to use a bridge between ROS and OpenAI Gym avoiding creating a complex control interface for the robot.