Time Analysis

Task	Time estimated at start (hours)	Total actual time (hours)
Learning Techniques and tasks	8	8
Research and Investigation	2	8.75
Requirements Gathering	4	9.5
Requirements Analysis	9	10
System Design	5	4
Test Design	10	10.75
Documentation	10	13
Project Meeting and Communication	66	67.5
Implementation	20	21.75
Testing	10	24.5
Other	0	25
TOTAL HOURS	**144**	**202.75**

Explanations of Estimates and Actual time:

Learning Techniques and tasks
The estimation is exactly the same as the actual time. I constructed my estimate based on two people (the software developers) spending an hour each learning on four techniques: PHP programming, git, Moodle, and setting up servers.

Research and Investigation
The research and investigation was to do with looking for existing systems to modify and suit our needs. I assumed that it would be rather quick with two people spending an hour each on it. However, my estimate was proved to be a big underestimation (4x less than actual). It took much longer since there were many specific requirements in the system that needed to be tested and compared.

Requirements Gathering

My estimation for requirements gathering was arbitrary as I did not know very well what this task entailed. I based it on two people (the analysts) spending two hours each but this was shown to be another big underestimation (2x less than actual).

Requirements Analysis

My estimation for "Requirements Analysis" and "System Design" were both also arbitrary but this time they were similar to the actual time, only one hour less for requirements analysis and one hour more for system design.

Test Design

I estimated test design to be 10 hours based on 1 hour being spent on each requirement. This was shown to be very accurate as the actual time was only 0.75 hours more than the estimate.

Documentation

My estimate for documentation was 10 hours based on about 3.25 hours spent on each of the 3 sets of user documentation (exam taking, exam making, and exam marking). This estimate was moderately accurate with the actual hours being 3 hours more.

Project Meeting and Communication

I estimated 66 hours for project meeting and communication based on 6 people spending an hour a week for 11 weeks. The actual time was only 1.5 hours more making this a very accurate estimation considering the large number of hours and possible variations (such as group members not turning up and additional client meetings).

Implementation

I estimated implementation to be 20 hours based on 10 tasks taking 2 hours each. This proved to be fairly accurate with the actual time being only 1.75 hours more.

Testing

I estimated testing to be 10 hours based on 10 tasks taking an hour each. This proved to be very inaccurate with the actual time taking more than twice as long. 20 hours would have been a better estimate since about one hour per task was spent on planning and another hour spent on performing the test (for 10 tasks).

Other

The "other" category are for times spent on uncategorized miscellaneous tasks such as work on timesheets and other documentation. This was something I did not foresee at the start and should have made an estimation for.