AUSTRALIAN LEARNING & TEACHING COUNCIL

Promoting excellence in higher education

Report - 2010

COMPUTER AIDED FEEDBACK & ASSESSMENT SYSTEM

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Project Website
http://cafas.pbworks.com/Home

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2010

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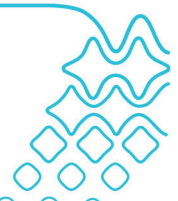


1.0 Executive Summary

The primary objective of this project was to research and develop an open-source computer assisted assessment system (CAA) and to disseminate and embed this system within tertiary education institutions.

The project built on previous work by the team members in which a prototype CAA system called the Computer Aided Feedback & Assessment System (CAFAS) was developed and trialled. The initial prototype demonstrated many positive outcomes, in particular, students appreciated the convenience of receiving feedback forms via email, and the quality and structure of the feedback. Staff benefited from reduced administrative tasks and the ability to develop a database of formative feedback comments that could be quickly inserted onto feedback forms, thereby increasing efficiency by avoiding repetitive tasks through the use of information technology. These positive outcomes, combined with frustrations with some of its limitations, stimulated the desire for further research and development which was made possible through funding provided by the Australian Learning and Teaching Council (ALTC) in November 2006.

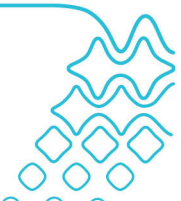
An initial research phase was beneficial in collating information and opinions about the form the system should take in terms of Information and Communication Technology (ICT) and Learning and Teaching (L&T). The outcome of this phase was a specifications document which was used to guide the design of the system in terms of its functionality and technical specifications. The research phase was also useful in establishing contacts and starting discussions regarding the possibility of trialling the system in other institutions.

The challenges associated with such an ambitious project and limited budget, combined with unexpected issues with the proposed authentication system meant that more extensive external trials of the system were not able to be conducted. Moreover, the timelines for the project had to be extended due to an underestimation of the time needed for programming tasks and the loss of key staff resulting from a restructure within the lead institution part way through the project.

Despite these challenges, the project was able to deliver a high quality open-source feedback and assessment system that fulfils the design specifications. During the internal trial period approximately 1000 feedback forms were issued online and 8 academic staff participated in these trials.

The system has been evaluated in a formative and summative manner, and students who participated in the trials reported via anonymous online surveys that they liked to receive feedback and assessment results online due to the improved convenience that this offered. Further, they agreed that the feedback they received via this system was helpful, although in some cases they were critical of the lack of detail provided by some assessors in their written feedback.

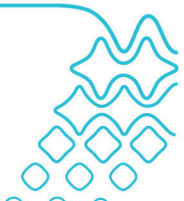
Staff involved in trials of the new system reported that they were able to be more consistent with their assessments, that they could see many benefits to the online system, and that they would like to continue using it in future. Indeed, colleagues who decided not to try the new system continued to use the preceding (prototype) system. This was due to their familiarity with the prototype system and their preference for working in an offline environment, demonstrating that a future enhancement to the system should include the capability for working offline, and then synchronising with



the results from other colleagues online. While the full functionality of the proposed desktop solution was not achievable within the resource limitations of this project, an alternative desktop system was able to be completed as a stand alone option.

Five peer reviewed publications have resulted from the project and a public access website has been created to provide access to, and discussion of, the system. The website is designed to encourage discussion and feedback about the project and to provide a forum for advancing knowledge regarding online assessment and feedback.

Although the uptake of the system was limited due to technical difficulties during trials, these issues have been addressed and login access has been confirmed in two external institutions. The open-source approach to this project provides the opportunity for the tertiary education community to engage with this new technology and evolve it further thereby offering the benefits of computer assisted assessment systems more extensively.



2.0 Outcomes

As stated in the original project proposal, the main outcome of the project was:

To create an efficient, easy-to-use 'Advanced Marking Assistant' software application that will enable teachers to use best practice feedback and assessment methodologies. As a result of receiving higher quality feedback and assessment via innovative online mechanisms, students will benefit from improved learning outcomes.

The main artefact of this project, a new web based advanced marking assistant (CAFAS Online), has substantially achieved this goal as demonstrated by the response from students and staff involved in the trials of the system in 2008 and 2009. In addition to the online system originally proposed, the project has further developed and extended the functionality of the original prototype (CAFAS Excel) into a more user-friendly and functional desktop solution that provides a viable option for academics who prefer to use an offline system.

Both of these systems are accessible via a public access website, which has been designed with wiki functionality, to enable discussion and dissemination of deliverables from the project.

The open-source licence and provision of source code via the project website facilitates future research, development, and uptake of the system. These opportunities will continue to be promoted throughout the Australian tertiary education community in 2010.

Access to CAFAS Online has been established in two external institutions (Queensland University of Technology and The University of Adelaide) demonstrating the capacity for greater uptake of the system via the open-source authentication system Shibboleth.

These systems have become popular with the colleagues of team members Martin Freney and Denise Wood demonstrating that academic staff are finding these new tools to be useful. Students have also appreciated these systems reporting a desire for continued and more widespread usage.

The web based nature of CAFAS Online enables greater scope for collaboration between colleagues, enabling them to review and share each other's grades, marks and formative feedback comments throughout and after the assessment process. This facilitates a more consistent approach to assessment, provides the ability to provide detailed feedback comments in an efficient manner, and enables results to be easily reviewed and moderated via digital means. In response to feedback from stakeholders, Rubric functionality has been included, offering the possibility of providing formative and summative feedback via this popular method. New functionality automates error prone administrative tasks, for example, a Mark Book feature automatically tallies the marks from all assessment tasks and calculates a final grade for the course/unit/subject. This data can be exported to spreadsheet software such as Microsoft Word (in CSV format) thereby enabling final results to be reported within the institution.

In response to a finding that some staff preferred to undertake assessment in an offline environment, CAFAS Excel has also been developed to address some of the main criticisms of the prototype system.

Evaluation of the systems indicates that staff felt that they were better able to provide detailed formative feedback comments, and more consistent summative assessment. Students agreed that the feedback they were receiving was helpful and detailed, and they appreciated the convenience of receiving feedback via email.

Due to resource limitations, some proposed functionality was not achievable. The ability to display an analysis (e.g. graphs) of the class' performance for each individual assessment criterion and the ability to attach audio files (in lieu of typed feedback comments) were not achieved, however the CAFAS Excel version does provide audio recording functionality. These objectives were pursued but ultimately it was necessary to abandon them to ensure that higher priority functionality was operating correctly prior to trials. This functionality has been listed as future improvements on the Enhancement Requests page of the project website.

3.0 CAFAS Objectives

Both the CAFAS Online (web based) and CAFAS Excel (offline/desktop) systems guide academics through the process of designing a feedback form, which can then be emailed to students prior to them undertaking the assessment task. This approach provides the student with detailed information about the assessment scheme including: weighted assessment criteria; graduate attributes that will be developed by the assessment task; and grade descriptors of performance levels and indicators for each particular grade. This ensures that students are provided with clear communication about the criteria prior to them undertaking the assessment task.

Having designed the feedback form, academics use the system to assess and provide feedback on the students' assignment submissions. A copy of the feedback form is generated for each student so that formative and summative assessment and feedback can be entered by the academic(s) and then emailed to each student. Thus each student receives a feedback report via email, which clearly indicates how their assignment has been assessed, listing all assessment criteria with grades/marks and feedback comments for each criterion. The form also contains a graph that displays grade distribution for the assignment and a graph for each assessment criterion that compares the student's performance in a particular assessment criterion to the class average for that criterion. This helps students gauge their performance in relation to their peers while preserving the confidentiality of each student's individual result.

All marks and grades entered into the system are tabled in a "Mark Book" clearly displaying results for all assessment tasks in sortable columns. At the conclusion of the course/unit/subject a final mark is calculated (based on the weightings of the assessment tasks) and displayed in the Table. The Table can then be exported from the system (in CSV format) and opened in spreadsheet software such as Microsoft Excel. This enables transfer of the data into other systems used for reporting final results within the institution.

While both CAFAS Online and Excel versions provide the same feedback and assessment functionality described above, the online version provides a more intuitive user interface and improved collaborative tools (due to the online nature of the system). Despite these advantages, the online system requires that institutions cooperate with the lead university in establishing the correct protocols for authentication. The limitations of current authentication system protocols created significant difficulties during trials with external institutions. Eventually, the issues were able to be overcome with two institutions, and further improvements of the Shibboleth

system over time will minimise these challenges in future. Despite these difficulties, the open-source license agreement enables institutions to overcome this problem by hosting CAFAS on their own servers and using their own authentication systems.

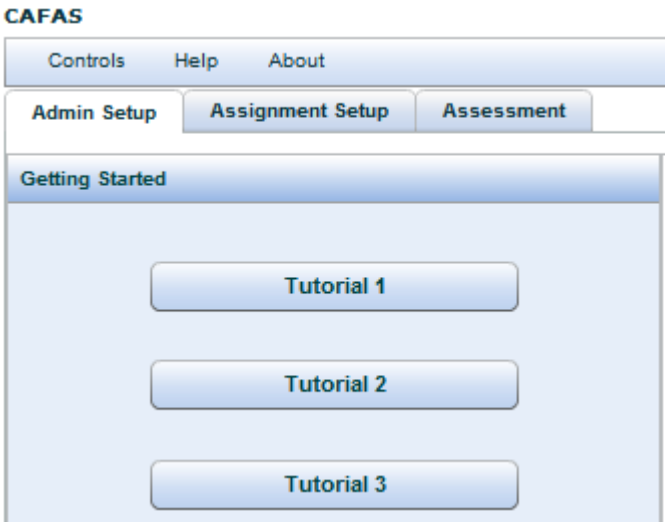
Extensive Help resources have been developed for CAFAS Online to assist academics in learning the system. Illustrated text and video clips are accessible via the Help menu in the application. This information is organised under searchable task-based headings so that academics can quickly find all the information they need to complete a certain task. Additionally, a contextual on-screen Help Box appears on each screen summarising the objectives and main controls of each section of the system and pop-up messages alert staff to oversights and errors.

Instructions in text format are provided for CAFAS Excel and it is intended that these will be developed by the project team to encompass the new functionality arising from this project.

4.0 CAFAS Online: Overview of the User Interface

A description of the functionality of CAFAS follows outlining how the system is used and how this benefits the learning process and assists the academic with administrative tasks.

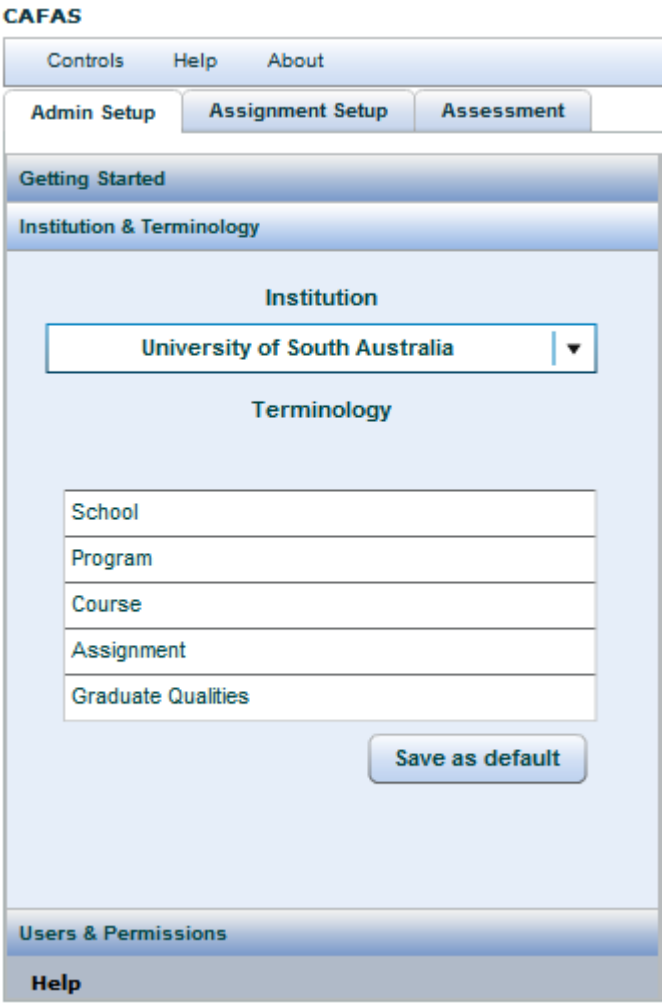
CAFAS is divided into three discrete areas, accessed by three corresponding Tabs at the top of the graphical user interface (GUI). This logically groups the functions, and hides and prevents access to certain areas of the system. In this way the system helps to reduce the learning curve for new users by only presenting them with the controls that they need.



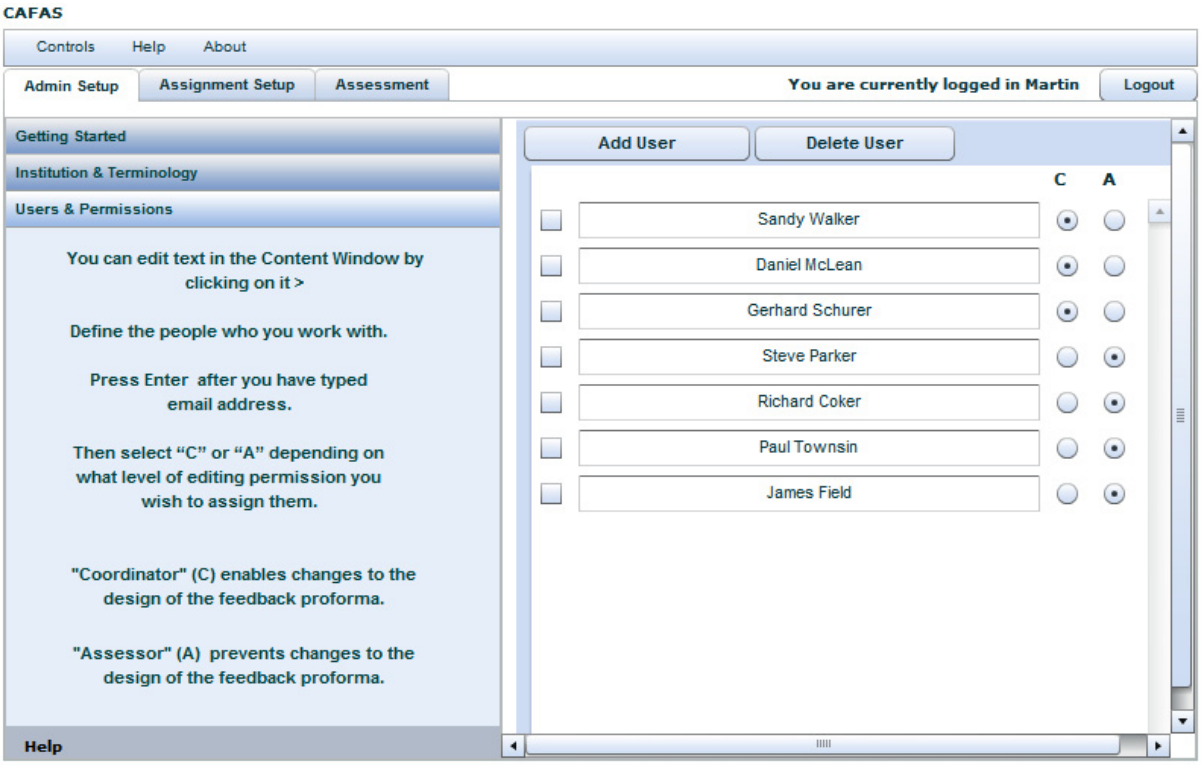
Configuring CAFAS

The first Tab, called Admin Setup, enables academics to quickly configure the system to their institution's assessment scheme. Users simply select their institution from a list, which loads the appropriate grade/mark scheme, graduate attributes, and learning and teaching terminology into the system (for example "course" may be referred to as a "unit" or a "subject" depending on the institution). This avoids the need for academics to manually enter this information, thereby overcoming the potential for errors and inconsistencies, and, with reference to the updated terminology, it makes the system

more understandable to the user. Currently the system contains assessment scheme data for five institutions, and this can be expanded to include more institutions by providing the assessment scheme data to the project leader.

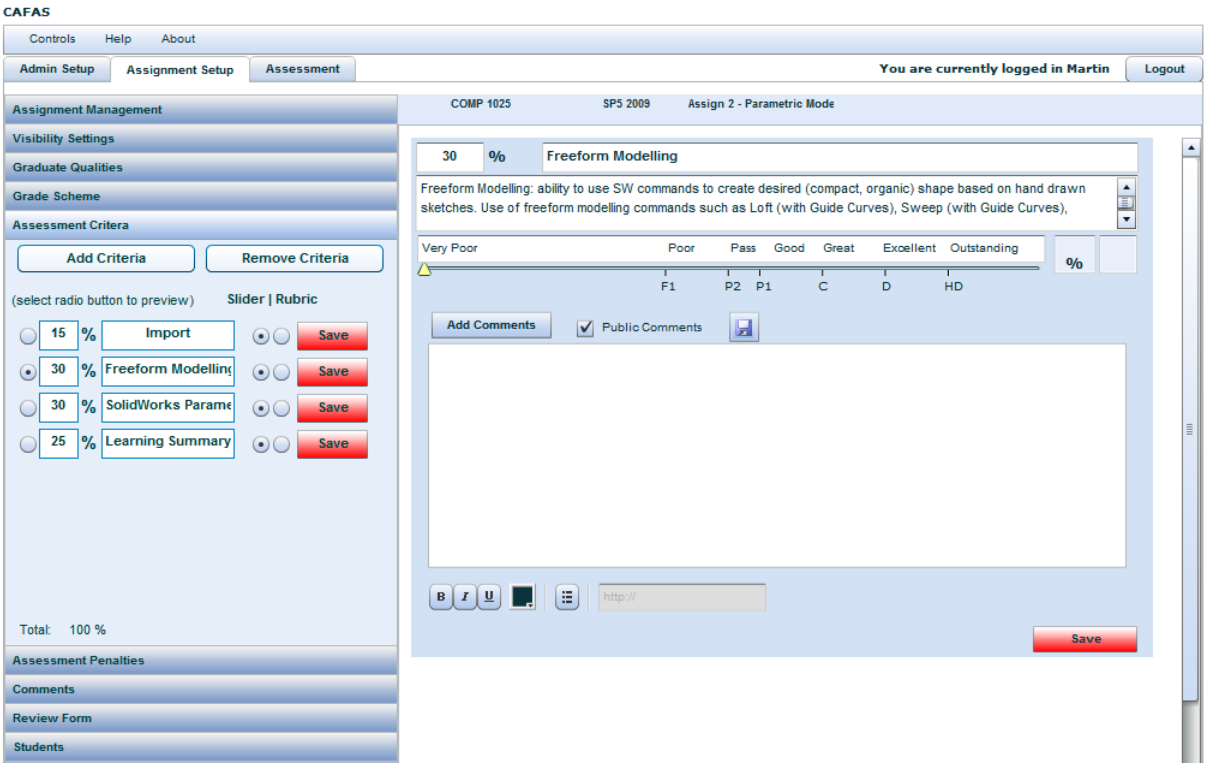


Colleagues assisting with assessment are specified and allocated the appropriate permission level during this stage. This is done by simply typing each colleague's email address. As long as those academics have already pre-registered to use CAFAS via the public access website, their name is instantly listed. Each person is then assigned to either Coordinator or Assessor permission level, thereby limiting their access to an appropriate level of control over the system. The rationale for this is that colleagues who will be involved only in assessment (rather than the design of the feedback form) can be given Assessor permission level, which prevents them from accidentally altering the feedback form, and limits their exposure to the more complex aspects of the system.



Designing a Feedback Form

The second Tab, Assignment Setup, guides academics through a design process in which a feedback form is developed. During this process assessment criteria are named, explained and weighted, thereby clearly communicating to the student their objective and relative importance in the assessment scheme.

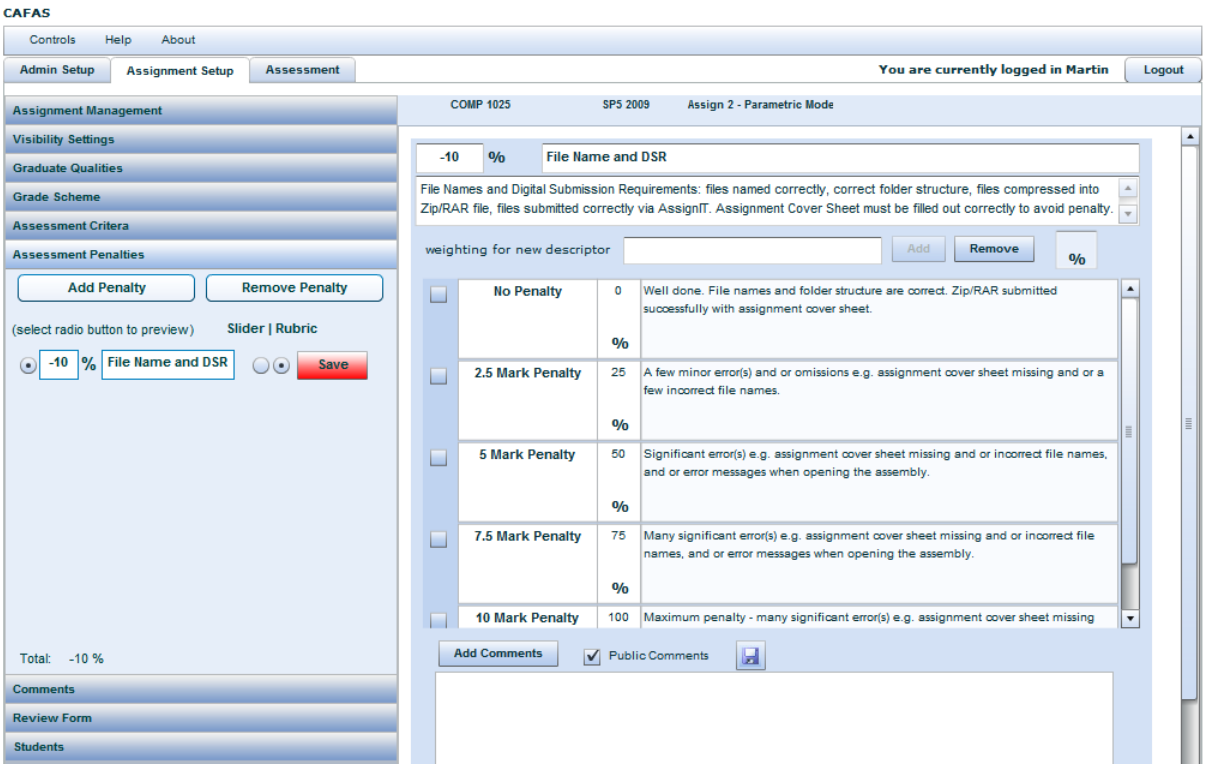


Each assessment criterion can be evaluated using either a Rubric or Slider mechanism offering options about how summative and formative feedback will be communicated to the student.

The Rubric option presents a list of performance levels each with a detailed descriptor (text box) and mark (score out of 100), for each assessment criterion. Typically there would be 4 – 7 performance levels that correlate roughly, or exactly, to the grade levels. Thus the academic can clearly define each performance level in terms of indicators, or examples, of what is required to achieve that level, and how many marks are associated with each level.

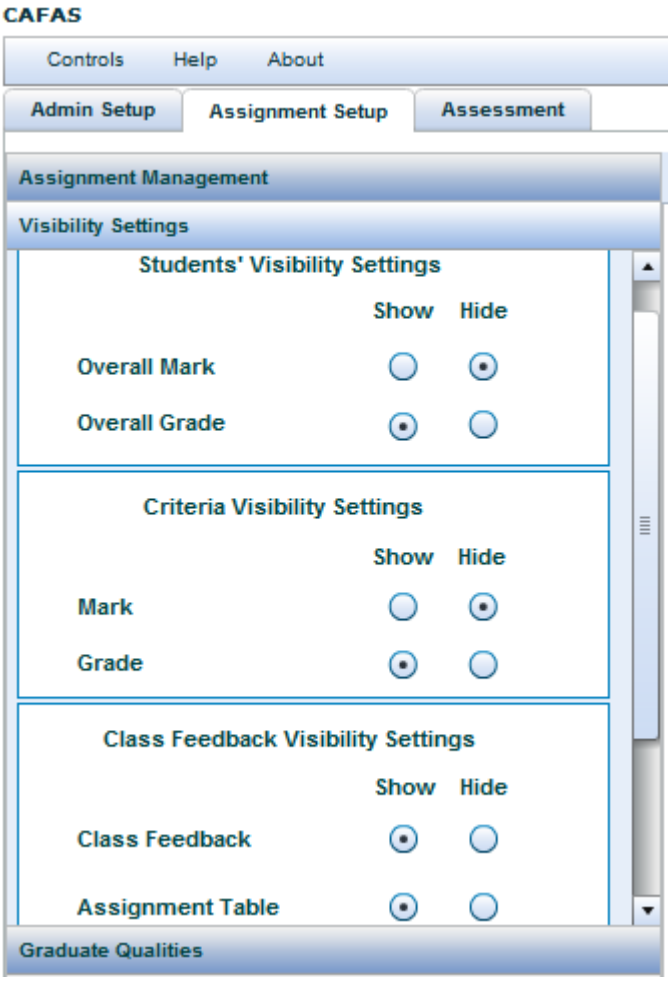
In contrast to the Rubric, which limits allocation of marks to a pre-defined series of performance levels, Sliders enable the academic to specify a mark from a full range of 0 to 100 for each assessment criterion. Minimum cut-off points for each grade level are displayed on the sliding scale. A pointer on the sliding scale is used during assessment to indicate the mark and/or grade to the student. A text box immediately above the Slider can be edited to help define the assessment scheme.

Both Sliders and Rubrics can also be defined as Penalty criteria in which marks are subtracted rather than gained. This allows the academic to design an assessment scheme that clearly indicates the expectations of the assignment. A common example of this is late submission of assignments, which typically attracts the loss of a certain amount of marks per day late.



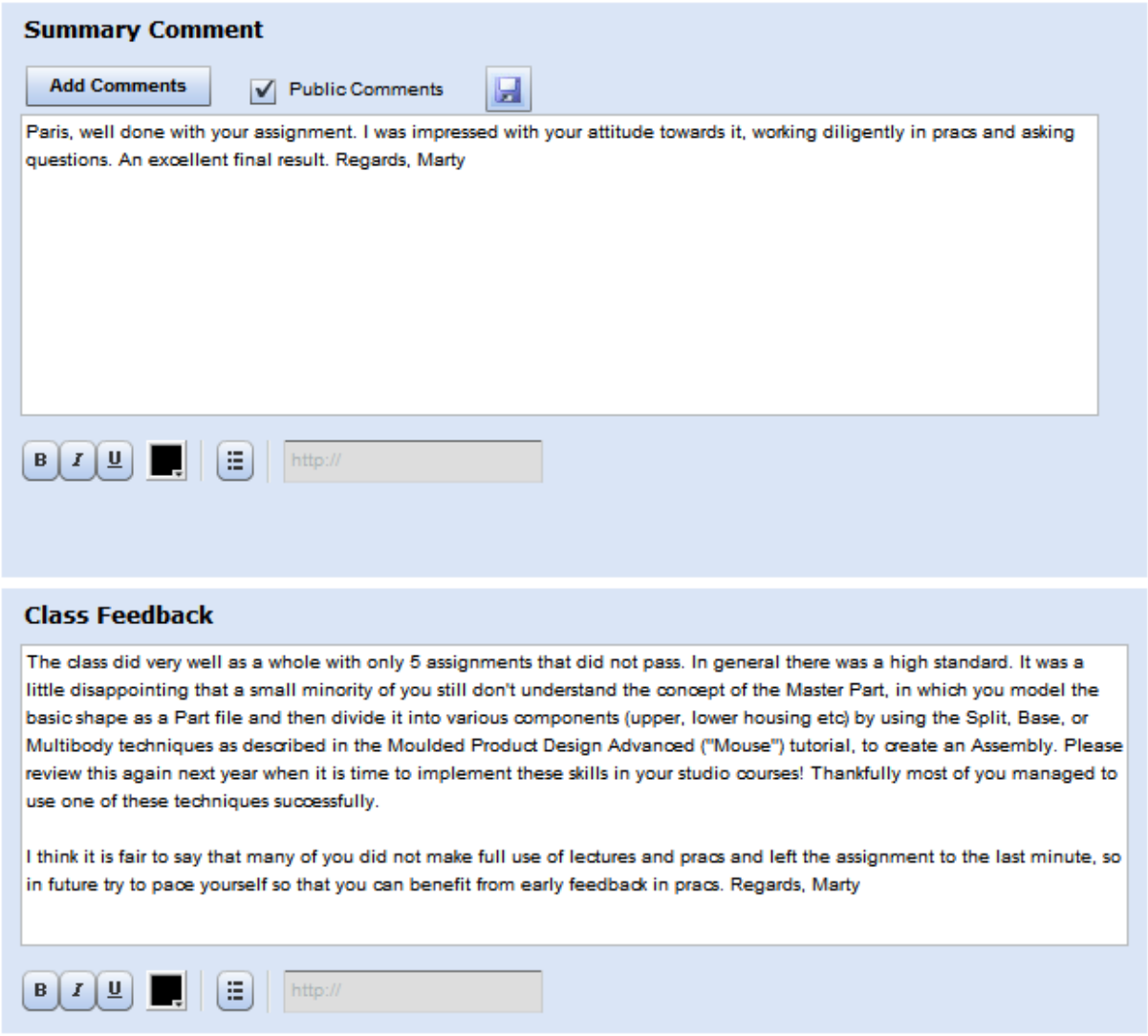
Visibility Settings provide controls that enable the academic to hide or display various elements of the feedback form. For example, the academic can decide to hide marks so that only a grade is displayed. It is also possible to hide both marks and grades, thereby displaying only formative feedback comments. This has been shown to be useful for providing formative feedback on drafts, with summative assessment included

later (in conjunction with formative feedback) on a final submission of the assessment task[1].

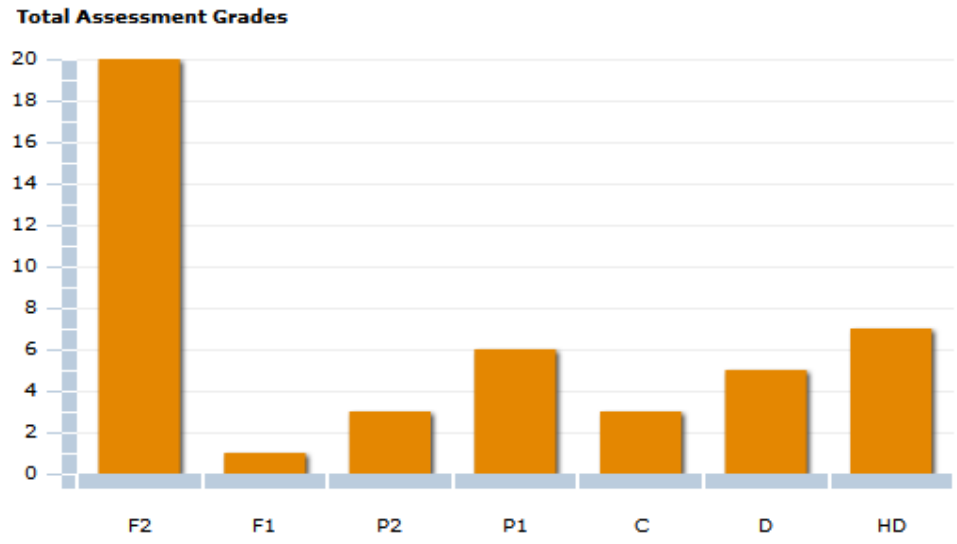


Comments Boxes for formative feedback are associated by default with both Sliders and Rubrics. An overall Summary Comment Box is also included prompting the academic to give a summation on the overall outcome of the assignment for example, conclusions and/or recommendations. Using the Visibility Settings it is possible to invoke yet another comment box named Class Feedback. This gives the option of including another summarising comment that is appropriate for the whole class, and if included, it will appear on every student's feedback form. This function provides the opportunity to easily communicate issues affecting the whole class and would typically include a commentary on the overall performance of the class in terms of the distribution of grades and performance with certain aspects of the task – especially those that were attended to poorly and need further work or revision.

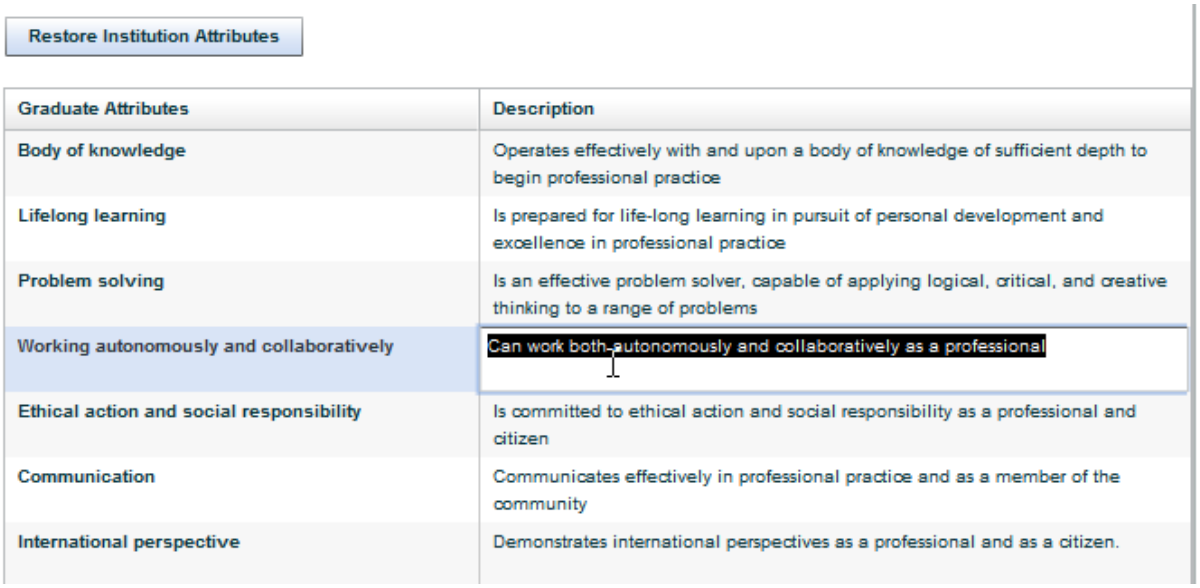
[1] Wood, D. & Freney, M. "Collaborative peer review: a model for promoting reflective practice, improving quality of feedback and enhancing learning outcomes", *HERDSA conference* 8-11 July 2007, Adelaide, Australia.



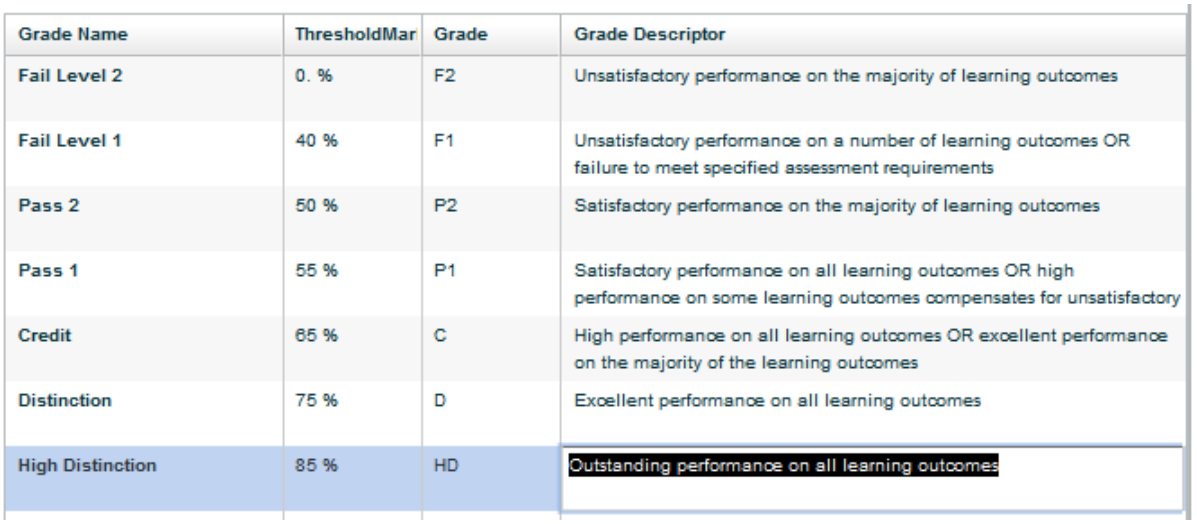
An option to include a Grade Graph complements the Class Feedback Comments Box. It tallies and displays the distribution of grades for the assessment task in a column graph, helping students to appreciate how they performed relative to their peers, and helping the academic evaluate the overall performance of the class.



Generic descriptors of the institution's Graduate Attributes are automatically included in the feedback form by default and can be edited during the design process, enabling the academic to clearly articulate how the assessment task develops each attribute.



Likewise, generic Grade Descriptors are included and can be edited by the academic so that performance characteristics required to achieve a particular grade can be clearly defined.



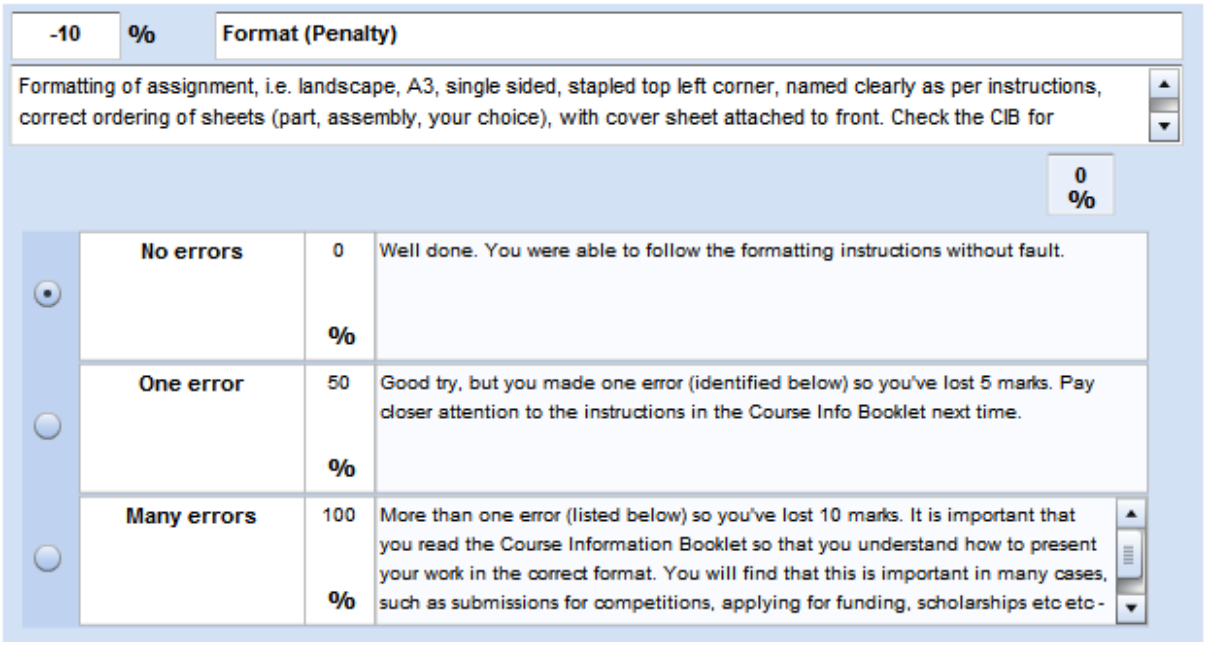
The final step of Assignment Setup is to import a list of students. CAFAS has an interface designed to enable the importation of data from various institutions which inevitably have different standard formats for lists of students. At a minimum the list must include first name, family name and email address in Comma Separated Value (CSV) format.

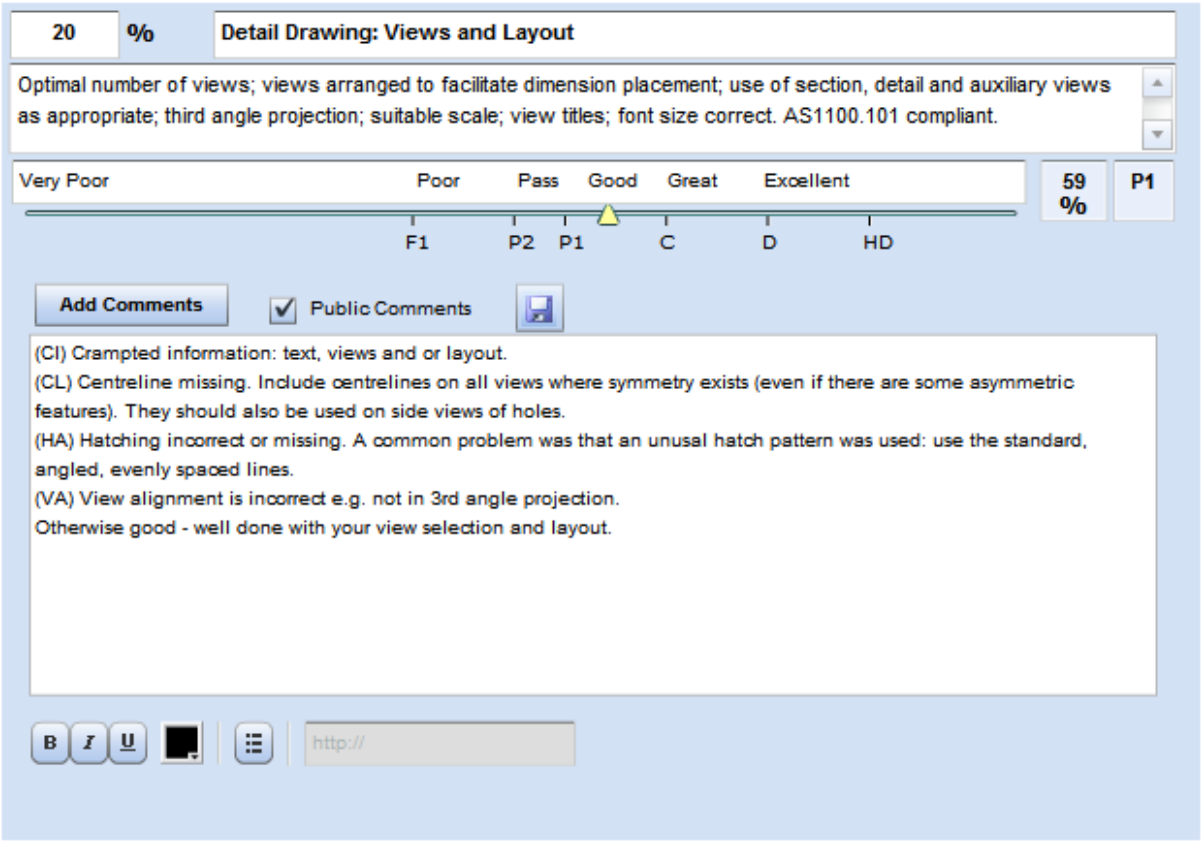
At the end of the design process the academic can review the feedback form and email it to him/herself (in HTML format) for distribution to students prior to the assessment task. As mentioned previously, this is an important function as it ensures that students, by seeing the feedback form that will be used to assess their work, will have a better understanding of what is required of them for a particular assessment task.

Providing Assessment and Feedback to Students

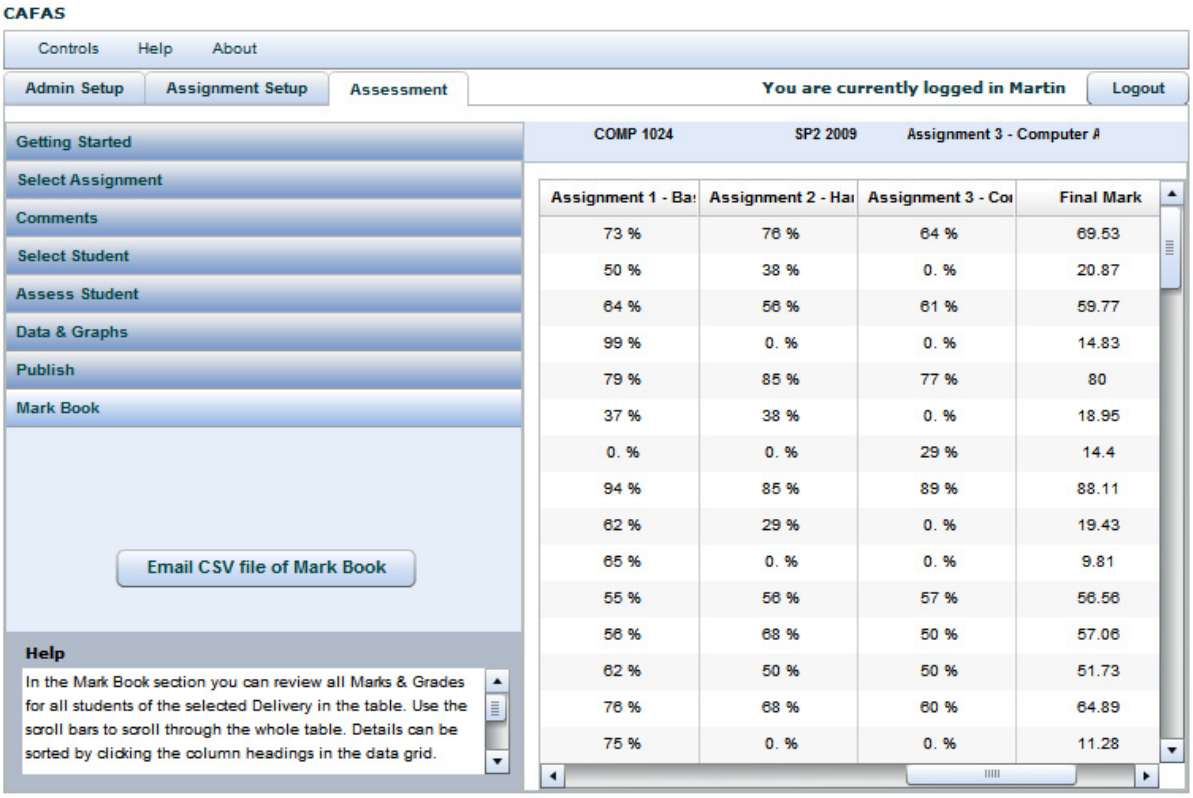
The third (final) Tab is called Assessment. It displays the feedback form created in the previous Assignment Setup Tab so that formative and summative assessment can be provided to each student using the form. This Tab is the only one accessible to users with Assessor permission level, thereby hiding unnecessary parts of the user interface which are not relevant to their objectives. This also prevents alterations to the design of the feedback form.

The basic workflow is as follows. A list of assignments is presented and one is selected. Generic formative feedback comments can then be added or, in the event that the course coordinator generated comments in previous sessions, they can be reviewed. A list of students is then presented and one is selected for immediate assessment (Select Student Section). This presents a copy of the feedback form for the selected student (Assess Student Section). The academic then uses the form to record grades, marks and feedback comments using the Slider, Rubric and Comment Box mechanisms that facilitate and expedite this process.

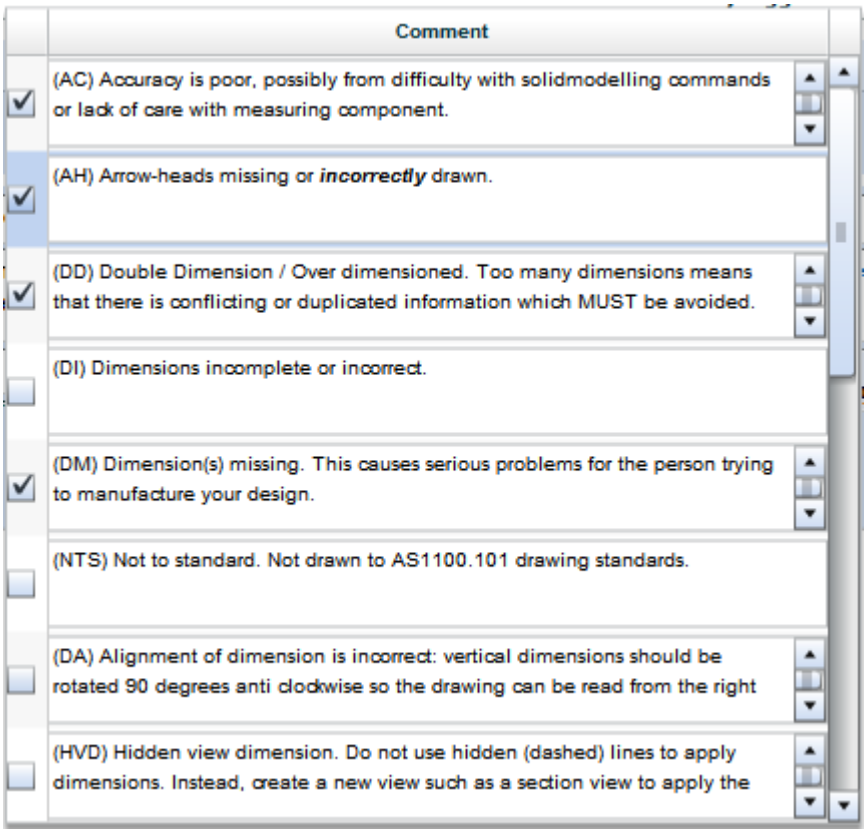




At the conclusion of the assessment process, a summary of results is displayed in tabular and graphical format (Data & Graphs Section). This clearly displays the grade distribution for the class helping the academic reflect on the students' performance. Finally, the completed feedback forms are published and distributed via email to the students and copied to the academic (Publish Section). Marks and grades are also automatically tallied in a table, which calculates an overall mark and grade based on the results for individual assessment tasks (Mark Book Section).



An important feature in the assessment stage is the ability to generate a list of formative feedback comments, which can be quickly inserted into the Comment Boxes of the feedback forms (refer to Appendix E for an illustration and explanation of this process). This enables the assessor to draft detailed feedback, including hyperlinks to websites for further information, which can be quickly inserted onto students' feedback forms whenever it is applicable. Once the feedback comment has been inserted onto the feedback form it can be edited further to contextualise the comment according to the particulars of the student's assignment.



Thus there is the potential to build up a database of very rich formative comments, which can be created prior to or during the assessment process and, due to the online nature of the system, can then be utilised by the whole assessment team (tutors). Alternatively, the Public Comments tick box can be un-ticked thereby making the comment only accessible to its creator. This functionality creates the capacity for detailed feedback to be inserted quickly onto feedback forms to ensure that students are provided with the critical feedback information they need to learn more effectively.

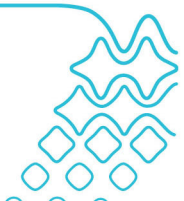
Each section of CAFAS has an on-screen Help Box in the lower left corner of the screen, which gives brief tips on how to use the controls in each Section. More detailed Help resources can be accessed via the Getting Started Sections in CAFAS and the Help menu. The Getting Started sections are the first Sections of CAFAS which prominently locates these training resources (three video clips that describe the basic workflow of each Tab) thereby encouraging new users to engage with the training material.

5.0 Approach & Methodology

The approach and methodology was defined in the original project proposal as described in the following table. Comments are made under each milestone to report on how each was achieved. Further explanation and discussion regarding alterations to the approach and methodology are included immediately after this table.

Stage	Aims & Objectives
Stage 1 Research & Product Definition	
Administration & Collaboration	*Finalise Team Members.* *Establish links with TALC staff in various institutions: to ensure the system accommodates institutional policies etc.*

	Setup structures for communication and administration: to ensure that the project is effective.
Outcome	The project commenced in February 2007. The appointment of team members was finalised in August 2007 when it was determined that additional programming resources would be required – this was a contingency included in the budget and proposed team structure. The "Programmer 2" position in the team was fulfilled by two staff in the Flexible Learning Centre of the lead institution – one to program the front-end user interface and one to program the back-end database. Contact with experts in learning and teaching and IT were established in the second month of the project (March 2007). First the team had to agree on a questionnaire and establish a list of contacts. Communication and administration structures were established and agreed upon by the team in the first month. These are discussed in more depth in the Analysis of Critical Factors section below.
Research	*Conduct an extensive literature review relating to feedback and assessment and to IT systems for delivering online feedback and assessment.* *Conduct an extensive survey of Australian higher education institutes to determine their particular requirements.* *Further investigate competitive products.* *Benchmark competitive products (in terms of features, cost, efficacy etc.)* *Investigate options for software development e.g. via honours students studying software engineering, UniSA staff, private software development companies etc.*
Outcome	The literature review was underway prior to the project, which was beneficial in terms of establishing questionnaires aimed at learning and teaching and ICT experts. The literature review continued throughout the project and was disseminated via five peer reviewed publications. A summary of the results of the Learning and Teaching, and ICT questionnaires are reported on in journal article and are reported in the Details of Research Study section of this document. Competing products were investigated and where possible they were accessed and trialled. This included *Electronic Feedback*, *Assessment@YourFingerTips, ReView*, and *Mindtrail*. Key features of these products were listed and ranked in terms of their importance in a Product Specifications document that was used by the team in the design of the user interface and the database. Exploration into options for software development were curtailed by an offer from the lead institution's Flexible Learning Centre to fulfil the Programmer 2 role in the team. This offer was quickly accepted due to the strategic benefits of this commitment from the lead



	institution.
Product Definition	*Collate research findings into a product specification ("design brief") for the software application: this document will be used by multi-media designers and software engineers to develop an improved CAFAS application.*
Outcome	The product specification document was developed in discussion with the team and posted on the project SharePoint site for further reference during the development of the user interface and database. (See Appendix G)
Stage 2 Development A (UniSA Only)	
Development	*This first (A) development stage will focus on creating a new application that will satisfy the specifications, particularly in terms of UniSA institutional practices (e.g. grading schemes).*
Outcome	In consultation with the ALTC this stage was omitted with a view to reducing the timeframe for the project to 12 months. Subsequently it was reinstated and instead Stage 3 (trials in other institutions) were not undertaken Having received data regarding grading schemes (and other learning and teaching issues) from nine institutions via the Learning and Teaching questionnaire it was decided that this development stage could be skipped. By focusing on the end goal of providing a system that would address the needs of all institutions the development process would be accelerated. Design of the user interface and database was substantially completed and "frozen" (no further major changes) in December 2007.
Testing & Evaluation @ UniSA	*A trial of the new CAFAS application will be conducted at UniSA throughout a variety of disciplines and schools. This trial will be evaluated primarily by focus groups and online surveys of staff and students. The project's Reference Group will also be involved in the evaluation process.*
Outcome	The first trial of CAFAS Online was conducted in November 2008. The significant delay was due to a variety of factors, which are described in detail in other sections of this report. The trial continued at the lead institution throughout 2009 and was evaluated via anonymous online questionnaires. A focus group with staff was held in July 2008 to: a) explain the workings of the system and provide hands-on training, and b) to seek feedback on the design and functionality of the system.
Reporting	*A report will be created to update stakeholders on progress and findings.*
Outcome	The first interim report on the project was provided to the ALTC in July 2007. Due to the extended timeline, additional interim reports were made in February 2008 and March 2009. Results from the Learning and Teaching, and ICT questionnaires were reported to ALTC in the first interim report and published in the International Journal of Learning and presented at the eLearning Symposium, RMIT, 2007.

Product Redefinition	*The specifications document will be revised and updated to reflect any new requirements that emerged as a result of the first (stage 2) trial.*
Outcome	Alterations to the specifications of the system were not possible due to technical difficulties and lack of resources, which limited trials to the lead institution.
Stage 3 Development B (Other Unis)	
Development	*This second (B) development stage will focus on incrementally changing the application to address any new requirements documented in the revised specifications document. More focus will be given to the requirements of other institutions.*
Outcome	As mentioned elsewhere, it was envisaged that this stage would be the main development and trial stage of the project. However technical difficulties and resource issues demanded that this stage be postponed (and eventually omitted). Instead of the incremental approach to developing the system the team attempted to address the needs of all institutions from the outset.
Testing & Evaluation @ Other Universities	*A trial of the next iteration of the CAFAS application will be conducted at UniSA and other selected Universities throughout a wide variety of disciplines. This trial will be evaluated primarily by focus groups and online surveys of staff and students. Reference Group will be involved.*
Outcome	As this stage of the project was curtailed other options were explored for evaluating the project in other universities. These are reported in Applicability of Outcomes section of the report.
Reporting	*A report will be created to update stakeholders on progress and findings.*
Outcome	This project website and this final report document serve this purpose.
Product Redefinition	*The specifications document will be revised and updated to reflect any new requirements that emerged as a result of the second (stage 3) trial.*
Outcome	The project website has been designed with wiki functionality to enable users from other institutions to document enhancement requests that arise from their use of the system.
Stage 4 Implementation and Dissemination	
Implementation and Dissemination	*The final version of the software application will be demonstrated to TALC staff nationally via Centra (online meeting software). This will maximise dissemination at minimal cost (no travel costs). It will also be presented at conferences such as HERDSA, Australian Computers in Education and ATLAANZ (Association of Tertiary Learning Advisors of Aotearoa/New Zealand). Proposed journals for publication include;* *Education and Development using Information and Communication Technology, International Journal of (IJEDICT)* *University Teaching and Learning Practice, Journal of* *Higher Education Research and Development, Journal of* *A website will host tutorials, proforma examples, FAQs and provide access to the software (download). An independent, professional evaluation of the project will be conducted.*
Outcome	The outcomes of the project have been disseminated via:

	• A presentation at the ALTC Assessment Forum 2008 • Two Papers in peer reviewed journals • Three conference papers • Two poster presentations • A project website (with wiki functionality) • Extensive Help resources including videos and written documentation. Refer to the Dissemination Throughout the Higher Education Sector section for further details. The independent professional evaluation of the project was not conducted as this was not a requirement of a one year project and therefore was not included in the budget.

Initial Negotiations and Modifications

It was originally proposed that this approach would require a 2 year time frame and a budget of $198,000. However, ALTC requested that the project be modified to address the following:

Being willing and open to use an open-source approach or broadening the accessibility to other institutions.

Resubmit a more realistic budget.

The original project proposal requested the option of commercialising the software, however this was not consistent with the goals of the ALTC, hence the request to use an open-source approach.

A resubmission was made to ALTC to address these issues. This entailed reducing the timeframe to a 12 month project, cutting the total cost to $113,216 and adopting an "open-source" approach.

The timeframe was reduced by omitting Stage 2 (Testing at UniSA) which created a challenging testing regime (this proved to be impractical and is discussed later). Further reductions to the timeframe were proposed by compressing the duration for dissemination tasks.

The budget reduction was achieved by reducing the amount of input by the Project Leader, removing the requirement for a Research Assistant, and reducing the main Programmer's involvement. Due to the reduced duration of the project the requirement for a formal independent evaluation was avoided which also reduced costs. Provision of IT resources such as website maintenance and design was offered in-kind by team members and the lead institution further reducing the cost.

This resubmission was accepted and confirmed by the ALTC in November 2006. The project commenced in February 2007 and was due for completion in February 2008.

Extensions to the Timeline

The timeline was extended three times from the original date of 15 February 2008, to 28 July 2008, to 20 March 2009, to 31 December 2009. This was necessitated mainly by the complexities of the programming task and unanticipated issues with the authentication system combined with difficulties arising from staffing changes following

restructure within the lead institution. These issues are discussed more thoroughly in the Analysis of Critical Factors section.

Alterations to the Approach

As stated above, limitations on current methods for cross-institutional authentication limited the anticipated external trials.

Although login access was eventually established for two external institutions, the technical issues with authentication were not resolved early enough for formal trials to be conducted in these institutions. Another reason for not pursuing trials in other institutions was that there were intermittent problems with the system that, while not rendering the system unusable, did create some frustration to users, and work-around solutions had to be developed and communicated to the users (staff participating in trials).

Thus to minimise risk during formative stages of development it was appropriate to manage trials internally. The possibility of this outcome was discussed with a senior ALTC staff member to seek approval and advice, which was to aim for the external trials if it was feasible.

As mentioned previously, another compromise was the decision not to include audio recording functionality due to technical difficulties involved. However, CAFAS Excel retains this functionality so academics wanting to experiment with this can still do so.

Other compromises relate to minor problems with the graphical user interface that were identified by the testers during trials of the system, but due to lack of resources and time constraints, not all of these issues could be addressed. Any issues that were critical were addressed promptly to ensure that the system was operable. However, those that remain continue to cause minor frustration or confusion to users. These issues have been logged on the Bug Reports page of the public access website to clearly identify any limitations of the system so that they can be addressed by future developers of the system. A list of work-around solutions and proposed improvements that were identified by the testers, but were unable to be addressed during this project, are listed on the Enhancement Requests page of the website. The system's open-source licence, and provision of source code via the project website, ensures that future developments are facilitated as much as possible.

It became necessary to complete the programming tasks in discrete phases to facilitate staged testing of the system. For example, the Assignment Management Section (in which the academic designs the feedback form) was completed as a priority so that feedback on the design of the graphics user interface could be obtained before proceeding with the subsequent Assessment Section of the system. This ensured that feedback could feed into the development cycle enabling the programmer to address criticisms in subsequent iterations of the software.

During some trials in which non-critical functionality was not working properly, pop-up messages were used to warn users of the limitation and describe an alternate work-around solution, to ensure that users would not be confounded. These messages were progressively removed as problematic aspects of the system were developed and perfected. This was an advantage of the web based approach as it avoided the need for users to install new versions of software; every time they logged into CAFAS Online, they were automatically accessing the most current version.

These adjustments to the approach enabled the project trials to proceed within UniSA, However the absence of formal external trials undertaken in external institutions has meant that no definitive conclusions can yet be drawn about its applicability in other institutional contexts. This concern is addressed to some degree by appraisals from colleagues who have reviewed the system and indicated willingness to trial the system in 2010. This is reported on in the Applicability of Outcomes section.

Administration and Communication

The team met approximately every 6 weeks for the first year of the project. For the remainder of the project, meetings were called as needed to address any issues arising. The interstate team member participated in meetings online via Centra, which enabled more fluent discussions via real-time viewing of the project leader's computer screen.

Meeting minutes were stored on a SharePoint website as were other important documents. This provided a central location for current versions of files to all team members.

Finances were monitored by the project leader with the help of administrative staff in the project leader's school.

Legal advice regarding the contract for the external contractor (multimedia programmer) was provided (free of charge) by staff in the lead institution.

6.0 Research Study

The research study was undertaken in two stages. The first stage involved engaging experts in the field of Learning & Teaching (L&T) and in Information and Communication Technology (ICT) who were invited to complete a questionnaire designed to inform the development of functional and technical specifications for CAFAS.

The second stage of the research study involved evaluation student and staff perceptions of the system after trials had been conducted. Similar evaluations could not be undertaken in external institutions due to the technical difficulties with authentication described elsewhere in this report.

Part 1: ICT and L&T Questionnaires

Objectives & Methodology

The ICT questionnaire (refer Appendix A) sought feedback on the most appropriate technical approach to delivering a Computer Assisted Assessment (CAA) system in as many institutions as possible.

Two options were proposed: a desktop based system that would require installation on academics' desktop computers, or a web based system that could be accessed from any computer attached to the internet, via a web browser. The questionnaire focused on issues surrounding these options, such as whether or not the institution would have any concerns about storage of confidential information (students' marks & feedback) on another institution's server, and technical issues such as the type of software used by the institution for their database management.

The main objective was to establish a software platform for CAFAS that would be widely applicable and acceptable. The solution proposed comprised Flex 2, ASP.Net and SQL Server 2005.

The Learning & Teaching questionnaire (refer Appendix B) sought information relating to institutional procedures for assessment and feedback. It requested a definition of the grading system, graduate attributes and terminology used by the institution, and asked about mechanisms for providing feedback such as feedback forms.

The main objective was to develop a better understanding of assessment practices, especially in relation to the provision of written feedback via feedback forms, so that CAFAS could cater to a wide variety of assessment practices related to the use of feedback forms.

Both questionnaires invited participation in trials of the system.

Summary of Results: ICT Questionnaire

Nineteen questionnaires were distributed to ICT staff in leadership positions across the higher education sector. There were nine responses (47%) to the ICT questionnaire. Seven out of nine participants responded that there would be problems with the desktop/software installation approach. They mentioned concerns about the level of maintenance and support required and preferred the web based option.

Eight of the nine respondents raised concerns about the issue of confidential information being stored on a server that was not under their direct control. These ranged from an absolute rejection of the idea to wanting assurances that information would be kept private, be backed-up, and be accessible at all times.

In response to questions relating to the type of operating system, database software and web browsers used in the institution, a pertinent comment was made by one respondent, who pointed out that modern web based applications should be able to transcend any limitations posed by these factors, i.e. these issues should be irrelevant.

Only one institution indicated a willingness to participate in trials.

In terms of the technology platform the proposed (Flex 2, ASP.Net, SQL Server 2005) 33% of respondents were satisfied with this approach, the remainder raising concerns about the difficulties they would face in deploying CAFAS locally on their servers. There was no consensus on a common approach. Subsequently the project team decided that the solution that would best accommodate the varying needs of each institution was to host the system on a UniSA server for a period of three years. During this time other institutions could evaluate the system and decide whether it was worth the effort of hosting it internally on their own server. Those overly concerned about confidentiality could choose to host locally from the outset.[2] The addition of Cairngorm micro-architecture, which is an open-source pattern-based framework developed by Adobe for Flex and Flash, was decided upon as it is beneficial to rich internet application development.

[2] Freney, M & Wood, D. “The Delivery and Management of Feedback and Assessment in an e-Learning Environment”, *International Journal of Learning*, vol 15, Common Ground, Melbourne, 2008.

Summary of Results: L&T Questionnaire

Twenty-four academic staff in learning and teaching leadership positions were invited to complete an online questionnaire. There were ten responses (42%) to the L&T questionnaire. Only one institution reported that use of feedback forms is mandatory (as it is in the lead institution). An important finding was that five respondents (50%) reported the use of rubrics (performance matrix). The typical number of assignments (three) and assessment criteria (five) were established which assisted with design of the user interface and database.[3] There were three institutions willing to participate in trials however these did not coincide with the institution whose IT staff had indicated willingness to participate.

This was a very useful exercise with regard to collecting information about the grade schemes, graduate attributes, and terminology used across the participating institutions.

The findings were also useful in driving the specifications for the system, most notably, the need to have Rubric functionality as an option.

Part 2: CAFAS Online User Survey 2009 – Staff and Students

Objectives & Methodology

Two questionnaires were developed to obtain feedback from academics and students who had participated in the trials of CAFAS Online (as opposed to CAFAS Excel which is reported on subsequently). One was aimed at academics with questions relating to the extent of their use of the system, the level of competency they achieved, and seeking their suggestions and comments on how the system might be improved. The other was aimed at students with a focus on the quality of feedback they received via the system, and the online delivery method. The questionnaires and a summary of the responses are contained in Appendix C and D. The questionnaires were delivered online providing anonymity to respondents using the Survey Monkey website[4].

Extent of Trial

In November 2008 the first trial of the system was undertaken in one course in the Industrial Design program. Two assignments were assessed using CAFAS (78 feedback forms dispatched to students). Suggestions for improvements to functionality and the user interface were logged and discussed with the programmer for implementation prior to further trials in 2009.

In the first half of 2009 trials were conducted in three courses[5] which involved four staff and approximately 112 students. This involved the majority of students in the first, second and fourth year in the Industrial Design program.

In the second half of 2009, trials were conducted in five courses[6] which involved seven staff including four part time staff. This covered first, second and fourth year in the Industrial Design program – the same cohort of students.

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[3] Freney, M & Wood, D. "The Delivery and Management of Feedback and Assessment in an e-Learning Environment", *International Journal of Learning*, vol 15, Common Ground, Melbourne, 2008.

[4] Survey Monkey website, www.surveymonkey.com accessed 13/01/10.

[5] Industrial Design Studio 3, Industrial Design Studio 7 and Engineering Drawing and CAD.

Overall there were eight different staff involved in the trials, all from the Industrial Design program, four full time staff and four part time staff. There were approximately 112 students in first, second and final (fourth) year of the Industrial Design program who received feedback forms via CAFAS. In total approximately 992 feedback forms were dispatched during the trials.

Trials with the prototype version of CAFAS (based in Microsoft Excel) were continued by one team member and various other staff due to difficulties with accessing the new online version. The following results are exclusively for the new online version which was the main focus of this project and research study.

Table 1 – Summary of Usage During Trials at UniSA 2008 - 2009

Course	Date	No. Staff	No. Students / yr level	No. Assignments	Total Feedback Forms Dispatched
Computer Aided Modelling and Hand Rendering	Sem 2, 2008	1 (1 part time)	39 / 1	2	78
Engineering Drawing & CAD	Sem 1, 2009	1	39 / 1	3	117
Industrial Design Studio 3	Sem 1, 2009	2	34 / 2	3	102
Industrial Design Studio 7	Sem 1, 2009	2 (1 part time)	39 / 4	4	156
Parametric Modelling and Hand Rendering	Sem 2, 2009	1	31 / 1	2	62
Introduction to Ergonomics	Sem 2, 2009	2 (1 part time)	36 / 1	4	144
Design Communication 2A	Sem 2, 2009	2 (2 part time)	33 / 2	3	99
Industrial Design Studio 4	Sem 2, 2009	2 (1 part time)	30 / 2	3	90
Industrial Design Studio 8	Sem 2, 2009	2 (1 part time)	36 / 4	4	144
TOTAL	**NA**	**8 (inc. 4 part time)**	**39 / yr 1 34 / yr 2 0 / yr 3 39 / yr 4**	**28**	**992**

[6] Parametric Modelling and Hand Rendering, Design Communication 2A, Introduction to Ergonomics, Industrial Design Studio 4 and Industrial Design Studio 8.

Summary and Analysis of Results: Student Questionnaire

A total of nine students responded to the survey conducted in semester 1, 2009, and 31 students responded to the survey conducted in semester 2, 2009. This represents approximately 36% of the students who were invited to respond.

The overwhelming majority of responses were very positive regarding all aspects of the system. Of note was a very positive response to the question regarding the online delivery method: *"I like to receive my feedback and assessment online (e.g. via email, website etc)."* 82% of students (33) responded "strongly agree", 12.5% (5) "agree", 2.5% (1) "neutral", 0% "disagree" and 2.5% (1) "strongly disagree". A selection of positive and negative comments from students follows;

"It is really good being sent online results as they are usually quicker then having to pick up hard copies, however I think that hard copies should also be given out."

"As long as the assessment comes in we are happy. The only issue that sometimes comes about is when the majesty of the digital age crumbles."

"Gives more privacy as opposed to paper where you are with your peers."

"Less paper used is always a good thing."

"Email results are great."

Likewise, students responded favourably to the statement *"The feedback comments I received were helpful"*; 50% of students (20) responded "strongly agree", 35% (14) "agree", 7.5% (3) "neutral", 2.5% (1) "disagree", 2.5% (1) "strongly disagree" and 2.5% (1) "not applicable". A selection of positive and negative comments follows;

"Depends on the lecturer if they want to give feedback or not."

"The additional comment boxes helpful if employed by the marker."

"Sometimes lecturers write little or no comments."

"The feedback is really good, however some comments were slightly on the brief side, would be better if all comments were explain in large amounts of detail."

"It was great to have feedback and comments to help with where to make changes for future assignments."

One exception to the positive responses related to whether the digital nature of the system helped with a learning disability to which most students replied "Not Applicable" 37.5% (15), followed by "Neutral" 27.5% (11). Nevertheless 17.5% (7) "agreed" and 12.5% (5) "strongly agreed" with only 2.5% (1) for "strongly disagree" and 2.5% (1) "disagree".

The very positive student response to the online delivery method was consistent with earlier research conducted using the prototype, desktop version (Excel-based) of

CAFAS[7]. The students appreciated the convenience of collecting grades and feedback online. Indeed it may be concluded that many students demand this convenience, as it has been found that a large minority of students never collect their assignments and written feedback when they are required to collect it themselves – in one study 40% were not collecting their feedback[8]. One comment regarding the lack of use of paper seems to indicate a perception that this system is also good for the environment.

It is not surprising that the level of detail in formative feedback comments varies amongst the assessors, and it is interesting that students were critical of a lack of detail in many cases – obviously they expect some detailed comments. Quantifying how much detail students consider to be optimal may be an interesting topic for further research. As CAFAS provides built-in functionality for including detailed comments, it is of concern that some academics did not avail themselves of this functionality. However, while it is not possible or desirable to enforce written feedback, the capacity of the system to enable academics to construct commonly used feedback and reusing where appropriate encourages academics to provide more detailed written feedback in a time efficient manner.

Given the effort involved in providing written feedback, plus the importance of timely feedback to the learning process, the use of online delivery methods seems to increase the likelihood that students will receive their written feedback thereby fulfilling a key requirement to the learning process – the provision of high quality feedback in a short turnaround time[9].

Summary and Analysis of Results: Staff Questionnaire

Only two staff members (25%) responded to the questionnaire although it should be noted that the project leader who was also a participant in the trials did not respond to the questionnaire to avoid any bias in the results.

The responses were positive, which was consistent with feedback gleaned through casual conversations with staff involved in the trial and with previous research studies with the desktop based prototype CAFAS version.[10]

Of note was one comment in response to the statement *"CAFAS enabled me to conduct assessment more consistently and rigorously."*

"The ability to refer to students already assessed at the click of a button to check consistency was most useful."

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[7] Freney & Wood, D. "CAFAS: An automated computer aided assessment tool for providing student feedback and managing assessment information", *Proceedings of the Evaluations and Assessment Conference*, Curtin University of Technology, Perth, Australia, 2006.

[8] Thompson p. 237.

[9] Hounsell, D. (1997). Contrasting conceptions of essay-writing. In F. Marton, D. Hounsell and N. Entwistle (eds.), *The experience of learning.* Edinburgh: Scottish Academic Press.

[10] Freney, M. & Wood, D. "CAFAS: An automated computer aided assessment tool for providing student feedback and managing assessment information", *Proceedings of the Evaluations and Assessment Conference*, Curtin University of Technology, Perth, Australia, 2006.

Both respondents "strongly agreed" with the statement *"Now that I have experienced CAFAS I see it as a viable option to paper-based feedback."* Likewise, both respondents indicated that in future they would prefer to use CAFAS as a replacement to paper-based feedback.

Some criticisms included a lack of a spell checking function and some confusion about the correct procedure for adding and editing comments in the database.

Minor criticisms regarding functionality issues were also reported informally to the project leader. These suggestions for functionality improvements have been logged on the "Enhancement Request" page of the CAFAS Project website[11] and it is anticipated and hoped that these minor problems will eventually be overcome through collaborative efforts by the open-source programming community, or through support from another tertiary institution.

The poor response rate (sample of only two) makes it difficult to draw strong conclusions, however, the fact that all staff involved in the trials persisted with CAFAS for at least two assignments and one (not including the project leader) persisted for over a year, indicates that they could all see some merits in continuing to use it despite some of the frustrations of some lacking functionality such as a spell checker. Also supporting this argument is the fact that approximately 10 staff are still using the prototype (Excel based) version of CAFAS.

Discussion of Approach

The use of a public online survey system, Survey Monkey, was chosen for the evaluation as it offered the possibility of creating a central repository for all responses regardless of which course/unit/subject or institution was involved. This facilitated data collection and simplified and standardised the means for administering the survey in other institutions, overcoming the need for colleagues to attend to this administrative task (although this benefit was not realised due to lack of external trials, it is mentioned to rationalise the decision to use it). Another benefit of Survey Monkey was the many options for responding to questions, no limitation on the number of questions and freedom with scheduling the questionnaire.

A low response rate from staff indicates the need to review the approach for obtaining their feedback. A catered meeting at which morning tea is served might improve attendance and would be an excellent forum for brainstorming innovations to the system. A paper based questionnaire could be handed out for completion at the meeting to ensure a high response rate. Thus funds for catering at meetings and for data entry of paper based questionnaires should be included in budgets.

A difficulty with the questionnaires was establishing a protocol for cooperating with other institutions in terms of running trials and the associated external evaluation. Initially the team's discussions revolved around whether or not the respective PVC/DVC Academic needed to give authorisation or whether individual academics could be contacted directly and supplied with the approved Human Research Ethics Committee documentation (from the lead institution) for consideration by their respective ethics committees. It was decided that the later approach would be acceptable and would encourage participants from other institutions to become involved due to the minimisation of paperwork. Ultimately however, due to the

[11] CAFAS Website http://cafas.pbworks.com/Enhancement-Requests accessed 12/1/10.

difficulties described previously, the objective to trial CAFAS in other institutions and to survey participants did not come to fruition.

Part 2: CAFAS Excel Student Survey 2006-2009

Objectives & Methodology

This study commenced prior to the project and continued throughout and is reported here briefly as the results are relevant and reinforce the findings of the new study (which is focused on CAFAS Online). This study spans from 2006 until 2009. A question regarding CAFAS Excel was embedded into end of course questionnaires in selected courses. The focus of this study was to gather qualitative data regarding student perceptions of the system.

A total of approximately 30 undergraduate courses, and a total of 10 academic staff, in the School of Architecture & Design and the School of Communication utilised CAFAS Excel during this period, and many still continue to use it. Details of these studies have been published by Wood and Freney[12].

CAFAS Excel was evaluated via end of course surveys in which an additional question regarding CAFAS was embedded into the standard set of questions relating to the course/unit/subject. Care was taken to ensure that students were not asked to respond to both questionnaires (CAFAS Online via Survey Monkey and CAFAS Excel via end of course evaluation survey) to avoid duplication of the data and survey fatigue of students.

Summary of Results

In response to the question *"Digital Feedback and Assessment Sheets were emailed to you (PDF file) for each assessment. What are the benefits/disadvantages of this new system for providing feedback and calculating assessment?"* students commented on:

- the convenience of receiving feedback in an accessible electronic format (*"Convenience — I can receive them at home instead of going to Uni."*);
- the value of an assessment approach in which the criteria and marking scheme is made explicit ("*can see exactly where you lost marks, which is helpful to know what you need to improve on"*);
- the benefit of receiving feedback that could help them to improve on identified areas of weakness *("this was very beneficial and excellent feedback! Just having a single comment and a score isn't very helpful, but having this digital feedback explains every assessment criteria, as well as percentage weightings, the grade and comments. This feedback should be kept this way"; "this was genuinely useful in seeing where criteria was and wasn't met and what to improve or look out for in future assessments"*);

[12] Freney, M. & Wood, D. "CAFAS: An automated computer aided assessment tool for providing student feedback and managing assessment information", *Proceedings of the Evaluations and Assessment Conference*, Curtin University of Technology, Perth, Australia, 2006.
Wood, D. & Freney, M. "Collaborative peer review: a model for promoting reflective practice, improving quality of feedback and enhancing learning outcomes", *HERDSA conference*, Adelaide, Australia, 8-11 July 2007.

- the time and effort teaching staff put into the assessment process *("it was fantastic to receive such comprehensive feedback. Since I spent a lot of time on ensuring my assignments were at a high standard, it was nice to know that course staff made the effort to undertake a detailed review of my assignments and provide valuable feedback"*).[13]

Analysis of Results

Students are very enthusiastic about online delivery of feedback and assessment results. They appreciate that high quality feedback gives them a greater opportunity to learn and they comment favourably on the efforts of staff in providing this feedback.

Staff liked the ability to easily alter marks/grades using the Slider mechanism (performance continuum), compose and edit feedback digitally, and reuse feedback comments stored in the database. The fact that staff continue to use the system reinforces the argument for CAA systems.

These positive results, which were replicated consistently in approximately 30 undergraduate courses in which the system was trialled, were the impetus for developing the system further and for applying for funding from the ALTC.

7.0 Advancing Existing Knowledge

The use of ICTs to assist with the provision of feedback and assessment is a growing trend, which seems logical given the increasing use of eLearning in tertiary education. The CAFAS project contributes and advances the growing body of knowledge reported in the literature regarding "computer aided marking"[14], or "computer aided assessment" (CAA)[15] as it is sometimes known. Note that CAFAS is the name (acronym) for the particular system related to this project, whereas CAA is the generic term used in the literature to discuss a broad range of ICT systems that attempt to aid the assessment process.

This project has resulted in a variety of dissemination activities that have advanced the existing knowledge regarding CAA. The outcomes of the project align with the 2006 ALTC program priority of Assessment Practices, in particular: online assessment; assessing large classes; developmental, diagnostic and summative assessment and feedback to students; and assessing students unfamiliar with assessment practices in Australian higher education.

In 2006 Freney and Wood presented evidence to support the argument that provision of feedback and assessment in digital format (e.g. via email) improves learning and teaching outcomes[16]. Initial trials using a prototype system of CAFAS, (prior to the

[13] Wood, D. & Freney, M. 2007, pp. 696-697.
[14] Sondergaard, H & Thomas, D, "Effective feedback to small and large classes", *Proceedings of 34th ASEE/IEEE Frontiers in Education Conference*, Session F1E, Savannah: ITEE, 2004.
[15] Denton, P. "Returning feedback to students via email using electronic feedback", *Learning and Teaching in Action*, 2(1), 2003.
[16] Freney, M. & Wood, D. "CAFAS: An automated computer aided assessment tool for providing student feedback and managing assessment information", *Proceedings of the Evaluations and Assessment Conference*, Curtin University of Technology, Perth, Australia, 2006.

ALTC funded project), demonstrated many advantages. In agreement with Denton[17], Freney & Wood's study reinforced the finding that students appreciate the convenience of receiving feedback and assessment results online. Students also reported improved comprehension of their feedback, for example:

"This was very beneficial and excellent feedback! Just having a single comment and a score isn't very helpful, but having this digital feedback explains every assessment criteria, as well as percentage weightings, the grade and comments. This feedback should be kept this way".[18]

Trials by Wood in 2007 in which CAFAS was used to provide formative feedback (i.e. comments without grades) to enable students to respond to feedback prior to a final submission, indicated benefits to both students and staff[19]. The criterion-based system inherent in CAFAS assisted the staff member to systematically provide comprehensive feedback, and the evaluation findings suggested that students felt less threatened by criticisms and more likely to make improvements based on the formative feedback. In the context of this project, what is important about this, is that while the use of CAFAS was not driving these findings – similar results are likely with a paper-based, criterion-based feedback form – the possibility of easily modifying feedback forms through digital means, in this case to add a final grade subsequent to initial formative feedback comments, was the enabling factor that made the experiment feasible. This illustrates the capacity for CAA to facilitate innovative approaches towards assessment practices.

Another example of this is the use of Tablet PCs to provide feedback results in design studio courses[20]. Tablet PCs have a stylus (a pen-like device that replaces the mouse) and a screen that can be reoriented in tablet format which enables the user to freely move about while using the computer. This has been found to greatly facilitate the provision of grades and feedback in design studio settings in which assignments are displayed on walls in poster format. Staff can walk about the studio, reviewing the work and making their assessments using CAFAS to quickly enter standard feedback comments from a database (or perhaps taking the time to type something specific) and using the Sliders or Rubrics for each assessment criterion to quickly and conveniently record their summative assessments. While much of this can also be achieved by conventional (paper-based) means, this digital approach accelerates the process and facilitates discussion and moderation of the results due to the ease with which grades and comments can be altered and shared amongst the assessment team at a later stage.

It should be noted that academics are under considerable pressure from duties other than teaching, therefore a system that facilitates assessment increases the likelihood that important but easily overlooked tasks such as moderation take place.

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[17] Denton, P, 2003.

[18] Freney, M & Wood, D. "The Delivery and Management of Feedback and Assessment in an e-Learning Environment", *International Journal of Learning*, vol 15, Common Ground, Melbourne, 2008.

[19] Wood, D. & Freney, M. "Collaborative peer review: a model for promoting reflective practice, improving quality of feedback and enhancing learning outcomes", *HERDSA conference* 8-11 July 2007, Adelaide, Australia.

[20] Freney, M. & Williams, T. "Computer Aided Assessment, Tablet PCs and 'Clickers' in Design Education", *ConnectED 2007 International Conference on Design Education*, 9–12 July 2007, The University of New South Wales, Sydney, Australia.

Although Freney and Williams' [21] study was limited to design studios, similar situations in which the venue for assessment is not the academic's desk, such as practicals, may also find this approach to be beneficial.

A similar ALTC project also utilised a new online criteria-based assessment system called ReView. The main focus of ReView is on linking graduate attributes to assessment criteria, and it has the facility for self assessment whereby students rate their performance on a sliding scale prior to their assessment. Of note is the fact that tutors (the assessors) are not able to view the students' self assessment until they have made their own assessment, thereby overcoming any prejudice that the self assessment might induce[22]. Class averages for each assessment criterion are also displayed, a feature shared with CAFAS.

An interesting possibility for an innovative assessment practice, based on the digital storage of feedback forms provided by CAFAS is proposed here for future experimentation. If the same assessment criteria were utilised across all assessment tasks in a course/unit/subject (they must be the same but could be weighted differently), it would be possible to map the development of a student's progress in a particular criterion in terms of a summative mark and formative comments across a series of assessment tasks (i.e. the whole course/unit/subject). Thus, rather than creating a new feedback form for subsequent assessment tasks, the original feedback form could be appended, thereby clearly displaying the history of comments and marks that a student received in that course. At the culmination of the course, the feedback form having been appended for each assessment task, would show the evolution of the student's learning and highlight whether they were responding to feedback and improving in each assessment criterion.

There is potential for the Rubric functionality to easily become a "checklist" in which rather than a limited list of performance levels – typically there are four to seven levels which roughly correspond to the grade levels – there would be an extensive list of attributes each carrying a certain number of marks. The academic would "tick" each applicable attribute to communicate what had and had not been addressed in the student's assignment submission. Marks would be tallied automatically giving an overall score for a particular assessment criterion. This checklist format could become another option for assessing a particular assessment criterion, thus three options could be possible: Slider, Rubric or Checklist.

The issue of the validity of weighted assessment criteria arose during presentations of the system. Colleagues from various disciplines argued that weightings limited their capacity to allocate the final grade that they wanted to award. A rigorous system such as CAFAS, which relies on weighted assessment criteria to calculate an overall grade and mark for the assignment sometimes tends to override one's intuition regarding the grade a student should be awarded. However, it was suggested to these colleagues that they could overcome this problem by specifying very small weightings for the majority of assessment criteria, reserving the largest weighting, for example, 80-90% for an "overall performance" criterion. This would give them the freedom to award

[21] Freney, M & Williams, T. 2007.

[22] Thompson, D.G. 2008, "Software as a facilitator of graduate attribute integration and student self-assessment", *ATN Assessment Conference 2008: Engaging Students in Assessment.*, University of South Australia, November 2008 in ATN Assessment Conference 2008: Engaging Students in Assessment., ed Duff, A., Quinn,D., Green, M. Andre, K., Ferris, T., Copeland, S., Australian Technology Network, South Australia, pp. 234-246.

grades based on their professional opinion, while communicating to students that all the assessment criteria are important but, in some disciplines, it is the holistic view of the work that counts the most.

Another frustration with the weighting issue is that if an assessment has many (i.e. greater than four) weighted assessment criteria all with similar weightings, poor performance in one or two criteria can easily be overcome by high performance in others. It is conjectured here that it would be beneficial if certain assessment criteria were designated as “must pass” criteria, even though they may not carry a heavy weighting. This would clearly communicate to students the importance of gaining competency in a certain area, and would solve the frustration mentioned above.

A scheme such as this creates a powerful mechanism for “failing” a student, and therefore it raises the issue of what to do when a student fails an assignment. A common procedure in higher education is to offer the student an opportunity to resubmit the assignment, often with a limit on the number of marks that can be awarded for the resubmission. It was the experience of the project leader that CAFAS was very useful for assessing such resubmissions. The methodology used was to simply edit the original feedback form (digitally), clearly identifying new feedback comments with the prefix “resubmission”. Thus it was evident if assessment criteria had/had not been addressed by the resubmission as the original and subsequent (“resubmission”) comments were contained in each feedback text box. Contrasting this with the conventional paper based system, in which the feedback form may be lost or not resubmitted with the resubmitted assignment, the ability to easily store and access digital copies of feedback forms, and edit them for resubmissions greatly helps to keep track of a student’s progress.

The ability to digitally edit the feedback form is the essence of all these proposed innovations. Attempting these types of schemes using the current paper-based paradigm is impractical if not impossible, but CAA technology makes such schemes easily achievable-once the initial “learning curve” of becoming familiar with a new software system is over.

These proposals highlight the possibility that systems such as ReView, CAFAS, and subsequent generations of CAA systems, will stimulate and enable innovative approaches to assessment practice.

8.0 Analysis of Critical Factors

Communication Strategy

A critical factor in the success of the project was regular communication with team members, especially during important stages of the project (e.g. in the lead up to trials). This was achieved via the usual means of meetings, email and telephone. Use of voice over internet technology (via Centra virtual classroom software) and development of a SharePoint website were also important elements of the communication, and project management strategy, as this enabled team members who were dispersed over many campuses, and interstate, to view and discuss documents/websites online during meetings. Meeting minutes and specification documents were posted on the SharePoint website to provide a central repository for important documents that all team members could access.

During the later half of the project, the frequency of communication reduced due to other commitments of the team members and this adversely affected the cohesion and effectiveness of the team. It was very difficult to maintain the high levels of communication required over the extended timeframe. The project leader maintained frequent communication with the programming team throughout the project to ensure a successful outcome. This entailed regular emails and, when necessary, meetings to discuss issues arising from trials. At this later stage of the project communication with other team members and stakeholders was limited to occasional emails and phone calls to update them on critical developments.

A higher level of communication with a greater number of external institutions would have been beneficial in terms of greater dissemination and validation of the project. Instead the project leader concentrated efforts on a few key colleagues who had shown great enthusiasm for the project. This was partially due to difficulties with managing workload over the extended time frame and with the fore mentioned technical difficulties which prevented external trials and added weight to the decision not to engage with a large number of external institutions.

Team Members

The success of the project can be attributed to high levels of engagement, and commitment by the team members despite many challenges during the extended timeline of the project.

A critical factor was the significant commitment given by senior online learning experts, administrators and managers within the university. Their expertise in the development of educational software systems was essential to the project leader in terms of highlighting critical issues that might otherwise have been overlooked. Their willingness to become directly involved with the project via offering in kind services, and accepting the Programmer 2 position (funded by the project) and therefore dedicating resources (staff) to the programming task was essential to the successful completion of the project.

Another success was the working relationship between the external programmer and the programming staff within the university. Although each had clearly defined roles, there was a high degree of willingness to adjust the roles to meet new technical challenges. A high level of cooperation and communication was necessary to ensure that their work integrated correctly as a whole, and a positive outcome was always achieved albeit with some compromises where necessary.

At one point, due to restructuring of the online learning unit in the lead institution, there was considerable upheaval and delays to the project brought about by staffing changes and this was the basis for one of the timeline extensions. A change of management within the unit necessitated new arrangements for resourcing the project which lead to some interruption to the programming task, however an agreement was reached that was amenable to all concerned. This required some presentations and discussions with the new management who were very supportive and cooperative in providing the resources required.

Having a team member with an extensive network of contacts in learning and teaching, experience with online learning methods, and general know-how regarding the machinations of research projects, was extremely beneficial in terms of developing strategies to the approach of the project.

Quantification of the Programming Task

A significant challenge was posed by the programming task which was difficult to quantify despite some very thorough attempts in which a detailed list of remaining programming tasks was generated and each task assigned a duration for completion. This uncertainty is attributed to the use of new technology (for programming) and the high level of functionality and innovation of the system. Delays with meeting programming milestones inevitably lead to the postponement or cancellation of trials and it was necessary to develop fallback plans which sometimes meant requesting an extension to the timeline or compromising some functionality.

Timeline Extension Negotiation

The willingness of ALTC staff to engage in a dialogue regarding extensions to the timeline was central to the success of the project. Their conciliatory and supportive approach was highly beneficial, enabling the project and the team to continue their work and achieve a useful final outcome. For example, advice that other ICT based projects had suffered similar problems was very reassuring and helped improve morale which at times was difficult to maintain due to the prolonged timeframe and staffing changes.

Although the extensions were very welcome and necessary, without additional funding it was necessary to make compromises especially in the later half of the project.

Authentication System

Choosing and implementing a system for authenticating users was a very significant challenge to the project. The solution aimed to make login to the system simple for academics from a wide variety of tertiary education institutions. During the early stages of the project a considerable amount of discussion revolved around the question of whether the system should be web based or desktop (local software installation) based. Ultimately it was decided that a web based system would provide the most benefits in terms of functionality and in enabling wide distribution of the system. It was thought that software — that needed to be installed on individual computers — would be a deterrent due to the difficulties in some institutions with getting new software installed. Furthermore, the improved collaborative functionality that would be gained from a web based system was desired. Eventually these assumptions were confirmed via a questionnaire sent to key ICT staff in various institutions.

However, since there was demand for a desktop (offline) version, which overcomes authentication and confidentiality issues, the prototype system was developed concurrently and released as an outcome of the project with the title CAFAS Excel.

From a fairly early stage a relatively new authentication system called Shibboleth was selected, due to its growing uptake in tertiary education institutions, both in Australia and internationally[23]. In the context of this project, it enables the academic to login using their standard (institutional) password and username, thus avoiding the need to remember another password/username. It also circumvents the need for someone to administrate the provision of passwords to new users thereby reducing the cost of maintaining the system in the long term.

[23] Official Shibboleth website http://shibboleth.internet2.edu/shib-in-use.html accessed 10/12/09.

Despite working towards the Shibboleth solution from an early stage in the project, it proved to be difficult to configure correctly for institutions other than UniSA as this required cooperation between the lead institution and the external institutions. Fortunately, there was a project within the lead institution to implement Shibboleth for other projects, so the CAFAS project was able to capitalise on this via the expertise of staff working on this project[24]. Staff in the Information Strategy and Technology Services (ISTS), UniSA, liaised with their counterparts in external institutions to ensure that Shibboleth was configured so that it was providing the necessary data for authentication to CAFAS.

Although access to CAFAS Online for The University of Adelaide and the Queensland University of Technology was eventually confirmed, no trials of CAFAS were conducted externally due to many delays caused by repeated problems with Shibboleth and intermittent problems with CAFAS itself.

With the benefit of hindsight, a different authentication system might have facilitated access for academics from other institutions. Indeed a work-around solution was developed by the CAFAS team to bypass Shibboleth when it was clear that Shibboleth issues were going to delay a critical trial. However, in the long term, the open-source Shibboleth system should prove to be an effective authentication system as it gains use throughout the tertiary education sector nationally and internationally. What has been realised is that it is very useful to have the ability to offer different solutions when one solution fails and that engagement with key ICT staff in collaborating institutions is essential and these links should be fostered early in the project to ensure early identification of issues and rapid resolution thereof.

9.0 Applicability to Other Institutions

Applicability of Outcomes

The main outcome of the project, the open-source online feedback & assessment system, is specifically designed to meet the needs of a variety of institutions and locations.

The functionality of CAFAS Online caters to the assessment and feedback requirements of a wide variety of disciplines and institutions via various options in the way it is configured for a certain institution and the options available to academics in designing a feedback form. For example, the first action a first time user of CAFAS Online must take is to specify which institution they are from via a drop down list of institutions (refer Appendix F). Accordingly, the user interface is reconfigured so that the terminology of the user's institution is used, thus the term "course" would change to "unit" or "subject" as appropriate for the institution selected. More importantly, the grade/mark scheme and graduate attributes specific to the institution are referenced from the CAFAS database and utilised and remembered for each user. Currently CAFAS Online is configured for use in five institutions.

Consultation with learning and teaching experts in 10 institutions[25] established the key functionality required by the system. As a result, there are a variety of options available

[24] Authentication and Authorisation Infrastructure http://wiki.unisa.edu.au/display/AAI/Sites accessed 10/12/09.
[25] Australian Catholic University, Central Queensland University, Charles Darwin University, James Cook University, Macquarie University, Royal Melbourne Institute of

to the academic when designing a feedback form, which widens the applicability of the system to a great variety of disciplines, assessment regimes and personal preferences. CAFAS is a criterion referenced system that is typical assessment regime in many disciplines. It uses weighted assessment criteria to provide a summative assessment (mark/grade) in conjunction with formative feedback comments associated with each assessment criterion. This combination of summative and formative feedback mechanisms can be displayed as a Slider (sliding scale mechanism) or a Rubric (matrix/table) to communicate to the student their performance level/outcome in a particular assessment criterion. This mimics the format and mechanisms used in traditional paper based feedback forms[26] but adds the functionality and efficiency of a digital system.

A review of the system by Professor Geoffrey Crisp, Director Online Education, The University of Adelaide, indicates that the basic premise of the system is valid and that difficulties with the authentication system (Shibboleth) was the main impediment during his evaluation of the system:

The CAFAS system developed at UniSA is a potentially useful tool for course coordinators, teachers and students. There is an extensive series of training videos that make it very clear how one might effectively use the system. This system would be particularly useful for large classes and would facilitate the provision of timely feedback to students. It allows quite a bit of freedom for teachers to include custom Rubrics, criteria, weightings, as well as links to resources as part of the feedback to students. The system incorporates good tools for the analysis of student responses so that teachers can make informed judgements about the efficacy of their assessment tasks. I would recommend this system to teachers for trials, especially where large classes are involved. The main problem I had with using the system was the Shibboleth authentication system, which was not CAFAS itself, but the ability of different university systems to communicate and pass on authentication information. Although this was not CAFAS itself, it did affect use of the system as it was configured during my trials.

Professor Geoffrey Crisp
Director, CLPD; Director, Online Education
2009 ALTC National Teaching Fellow; HERDSA President and HERDSA Fellow;
2009 ASCILITE Fellow

Two colleagues who had agreed to trial the system, but were prevented due to technical problems, have indicated that they plan to use the system in 2010. Tim Williams, Lecturer Industrial Design, Queensland University of Technology and Joy McEntee, Lecturer, Discipline of English, The University of Adelaide, have been in regular communication with the project leader regarding trials of the system. The key functionality of the system has been communicated to these colleagues, via video clips and written documentation, who have ascertained that it will be suitable for their requirements.

Technology, Southern Cross University, Swinburne University of Technology, The University of Adelaide, University of Notre Dame Australia.

[26] Learning and Teaching Unit, UniSA, Examples of Assessment Feedback Forms, http://www.unisanet.unisa.edu.au/learn/learningconnection/?PATH=/Resources/PD-OT/Assessment+feedback+forms/&default=Introduction.htm accessed 10/12/09.

Shibboleth, the authentication system for accessing the CAFAS Online service is in use world-wide[27] and is already in place in many Australian tertiary education institutions. It is the responsibility of each institution to provide the correct data via Shibboleth to ensure that web applications such as CAFAS can be accessed. To date access to CAFAS Online via Shibboleth has been achieved by the Queensland University of Technology, The University of Adelaide and the University of South Australia. Information aimed at IT staff in other institutions regarding how to configure Shibboleth for correct operation with CAFAS is posted on the CAFAS project website. Essentially, what is required is that the email address of the academic who wants to use CAFAS is provided by the Shibboleth service in the respective institution.

Currently, CAFAS Online is stable albeit with some minor limitations that should *not* prevent efficient use of the system. If access to CAFAS Online is not technically feasible, or if internet access is not available, CAFAS Excel is the alternative, which although lacking in some of the online functionality, overcomes any difficulties with authentication.

Applicability of Approach

An email based questionnaire was the approach taken for consultations with learning and teaching experts at the beginning of the project. The same approach was taken with ICT administrators to understand their preferences and requirements. Although this method provided some useful information, and it was often followed up by an email or phone conversation for clarification, in future it is suggested that a meeting or forum would be of benefit as a follow up activity. Expenses for this should be included in the budget.

The web based system (as opposed to software installed on individual computers) offers the convenience and flexibility of accessing CAFAS from anywhere in the world. However, it is reliant upon a central server to store the data. Currently UniSA is hosting the service for all participating institutions until the end of 2011 as part of the agreement with the ALTC. Thereafter, it will be the responsibility of individual institutions to host CAFAS locally on their own server infrastructure.

An issue arising from this is the issue of confidentiality and security of data. Although institutions are free to install CAFAS on their own ICT infrastructure (servers), those opting to utilise the service provided by UniSA are delegating responsibility for storing confidential student information (grades/marks) to another institution. Confidentiality and security issues have been addressed in the approach to the programming of the system however this does not rule out the possibility of malicious hacking.

The open-source approach (Creative Commons Attribution-Noncommercial-ShareAlike 2.5 Australia Licence) ensures that other institutions and organisations can develop and share[28] new versions of the system thus greatly facilitating its future development and uptake. Programming code can be downloaded from the Source Code page of the CAFAS public website[29].

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[27] Official Shibboleth website http://shibboleth.internet2.edu/shib-in-use.html accessed 10/12/09.
[28] P Gandel & B Wheeler, “Of Birkenstocks and Wingtips: Open Source Licenses”, *Educause Review,* January/February, 2005, p. 11.
[29] CAFAS website, Source Code page, http://cafas.pbworks.com/Source-Code accessed 5/01/10.

The staged trials of the system were beneficial in terms of limiting the inevitable frustrations and problems evident in early versions of the system to a couple of staff within the lead institution who were willing to tolerate the imperfections. Gradually, as problems were resolved, more staff became involved. The final goal was to trial with staff from other universities once it was working effectively within the lead institution. However, as outlined above, the authentication issues meant that this goal could not be realised within the life cycle of the project.

10.0 Dissemination

A variety of methods were employed to disseminate information and engage academics directly in the project. The leadership of team members Martin Freney and Denise Wood has resulted in many of their colleagues embedding CAFAS into their practice. For example, the majority of staff (seven out of eight) in the Industrial Design program, School of Art, Architecture and Design, are now using CAFAS regularly, demonstrating a high level of acceptance of the system by Freney's colleagues.

A website has been created to disseminate information about the project throughout the tertiary education community. The site contains links to conference papers, journal articles and posters that have been presented throughout the course of the project. It also contains over an hour of video tutorials on how to use the system (categorised into discrete lessons of approx 10 minutes each) and a wiki facility to enable feedback in relation to enhancement requests and bug reporting. Links to both systems (Online and Excel versions) enables visitors to use CAFAS and download the source code for further development under the open-source licence agreement. The URL for the CAFAS Project website is: http://cafas.pbworks.com/Home

During the three year term of the project there were a number of publications and presentations, which are listed below. More are planned to disseminate findings arising from continuing research into the system as the current ethics approval within the lead institution is valid until December 2010 giving ample opportunity to extend the research study.

Poster Presentation at the ALTC Assessment Forum 2009

A poster presentation was on display at this event, 18 November 2009.

Poster Presentation at the ATN Assessment conference 2009

A poster presentation was on display at this event, 19-20 November 2009.

Poster Presentation during the UniSA Celebration of Teaching Week, 2009

A poster presentation was on display at this UniSA event, 10-13 November 2009.

Presentation to staff in the Division of Education, Arts and Social Sciences, UniSA, 2009

On 20 July 2009, the project leader presented to approximately 15 academic staff from the Division of Education, Arts and Social Sciences to demonstrate the system and offer an invitation to participate in trials of the system.

Presentation to ALTC Assessment Forum, 2008

On 19 November 2008 the project leader presented to 48 people representing 24 institutions at the ALTC Assessment Forum at UniSA. The presentation focused on

how the functionality of CAFAS addresses the pedagogical aims and objectives of feedback and assessment. A poster presentation of CAFAS was also on display during the Assessment Forum and the concurrent ATN Assessment conference.

Focus Group & Training Session, 2008

On 23 July 2008, the project leader held a focus group and training session at UniSA to seek feedback and provide hands-on experience with the system. Nine academic staff from UniSA attended.

Journal Paper + Presentation, 2008

Freney, M & Wood, D. "The Delivery and Management of Feedback and Assessment in an e-Learning Environment", *International Journal of Learning*, vol. 15, Common Ground, Melbourne, 2008.

Conference Paper, 2007

Freney, M. & Williams, T. "Computer Aided Assessment, Tablet PCs and 'Clickers' in Design Education", *ConnectED 2007 International Conference on Design Education*, The University of New South Wales, Sydney, Australia, 9–12 July 2007.

Journal Paper + Presentation, 2007

Wood, D. & Freney, M. "Collaborative peer review: a model for promoting reflective practice, improving quality of feedback and enhancing learning outcomes", *HERDSA conference*, Adelaide, Australia, 8-11 July 2007.

Conference Paper, 2006

Freney, M. & Wood, D. "CAFAS: An automated computer aided assessment tool for providing student feedback and managing assessment information", *Proceedings of the Evaluations and Assessment Conference*, Curtin University of Technology, Perth, Australia, 2006.

Conference Paper, 2006

Freney, M. & Wood, D. "Computer Aided Feedback and Assessment Systems: a tool for Learning Advisors", *proceedings of the Alliance of Teaching and Learning Advisors of Aotearoa New Zealand*, Bay of Plenty Polytechnic, Tauranga, New Zealand, 21-23 November 2006.

EASS Teaching and Learning Colloquium, Adelaide, 2006

On 17 November 2006, a presentation by the project leader was given to approximately 40 staff to promote the project in the Division of Education Arts and Social Sciences, UniSA.

Engaged Dissemination Strategies

Engaged dissemination strategies have been in progress throughout the project and will continue beyond the end of the project. For example, it will be necessary to respond to expressions of interest registered via the project website.

Two team members have been involved with presenting the system at conferences and forums.

Colleagues from the Queensland University of Technology and The University of Adelaide who have previously expressed interest in participating in trials have been contacted and encouraged to trial CAFAS in 2010.

During the final stages of the project the project leader initiated correspondence with the lead institution's Teaching Technology Advisory Group (TTAG) with a view to developing the system further and increasing the usage of CAFAS within the lead institution. A presentation to the TTAG is scheduled for early in 2010. The objective of this is to raise awareness of the benefits of computer assisted assessment amongst the TTAG members and to garner support from senior managers, ultimately leading to a much wider uptake of the system throughout the institution and establishing strong leadership and commitment from key staff within the institution.

An opportunity to develop the project with international colleagues has recently arisen through a contact made by team member Dr Denise Wood. Stephen Ehrmann, Vice President of the Teaching and Learning Technology Group[30] affiliated with Washington State University, is interested in developing the system further using their Flashlight Technology[31].

The artefacts of this project have been formally registered on the Creative Commons Network under the titles of CAFAS Online and CAFAS Excel. As mentioned elsewhere, these artefacts have been developed under the Creative Commons Attribution-Noncommercial-ShareAlike 2.5 Australia Licence which enables others to use and develop the system so long as they attribute the origins of the system, do not use it for commercial purposes, and share any derivative versions under these same licence terms.

The project is outlined on the ALTC Exchange website[32] and includes links to the project website where more extensive information, and access to the system, is available.

[30] The TLT Group website, Home page, http://www.tltgroup.org/ accessed 04/01/2010.
[31] The TLT Group website, About Flashlight Online page, http://www.tltgroup.org/Flashlight/flashlightonline.htm accessed 04/01/2010.
[32] Freney, M, ALTC Exchange website, *Computer Aided Feedback & Assessment System (CAFAS)* web page, http://www.altcexchange.edu.au/computer-aided-feedback-assessment-system-cafas accessed 5/01/10.

11.0 Links to Other ALTC Projects

The project leader was also involved as a team member with another ALTC Project, the *Peer Review of Online Teaching*. This provided opportunities to discuss issues relating to project management and the research study and also provided insights into some technical (ICT) issues as both projects were web based.

The Assessment Forums organised by the ALTC raised awareness of similar projects such as the ReView project.

With the benefit of hindsight, more engagement with other projects may have assisted the project leader with tackling the various challenges that arose.

12.0 Further Actions

The project leader intends to continue to promote CAFAS within the lead institution and external institutions to increase the number of users. It is hoped that this will help drive commitment to further develop the system to address identified areas for improvement. The project leader has initiated discussions within the Teaching Technology Advisory Group in the lead institution in relation to redeveloping CAFAS so that it is compatible with the Moodle[33] online learning platform, which is open-source and used in many tertiary education institutions. Moodle will be fully implemented at UniSA in 2011 and it currently does not contain the functionality that CAFAS provides. A CAFAS "plug-in" application for Moodle would enable a more integrated approach to assessment that is currently not possible with the current configuration of CAFAS and may be applicable to other institutions that use Moodle.

The research study will continue throughout 2010 at UniSA and beyond, with the intention of evolving CAFAS further and revisions released to the open-source community.

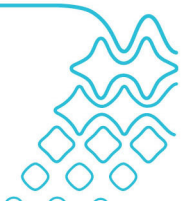
13.0 Conclusions & Recommendations

Despite the challenges noted in preceding sections of this report, the outcomes from the project have largely been met and in some cases exceeded by the development and release of a desktop version of CAFAS for offline application.

The system has been highly successful at UniSA, particularly within the project leader's program (Industrial Design, School of Art, Architecture and Design) and further dissemination activities are planned using the engaged dissemination strategy adopted throughout the lifecycle of the project.

However, there were some limitations to the project that could not be addressed given the tight timeline, reduced budget, and technical challenges encountered with the authentication system. This meant that trials could not be conducted externally and not all the functions could be incorporated in the final artefact. With the benefit of hindsight it would have been appropriate to scale back the level of functionality planned for the system to ensure that the programming task was more manageable and achievable

[33] Moodle website, About page, http://docs.moodle.org/en/About_Moodle accessed 17/12/09.



within the timeframe and the available resources that were renegotiated at the outset of the project.

Although trials were limited to the lead institution, successful authentication in two external institutions was confirmed recently, and positive responses from colleagues in these institutions, demonstrates the applicability of the system to other institutions. The open-source licence, provision of source code, and wiki functionality of the project website encourages wider uptake, and collaborative research and development of the system.

More consistent and frequent communication and engagement with stakeholders, despite the technical difficulties and delays, may have helped to persuade more academics to become involved in trials. However, further research is required to develop effective strategies for engaging busy academics in new eLearning systems.

Although the CAFAS Online serviced hosted by UniSA has an expiry date at the end of 2011, discussions with the UniSA TTAG may secure longer term commitment and ensure the sustainability of this system. The open-source nature of the project will facilitate and encourage other institutions to develop the system and host it locally for their own use and the CAFAS Excel system will continue to be an option beyond 2011.

The findings from this study, combined with the evidence documented from previous studies indicate that this type of system has many benefits and is a fertile area for further research. This project has contributed in a significant way to the growing body of knowledge about effective use of ICTs for delivering innovative feedback and assessment practices.

It is recommended that the ALTC continues to fund ICT projects such as this, despite the challenges identified in this report, as it is through such innovation that new approaches to teaching and learning can develop. Projects aimed at researching and developing CAA systems that address the needs of specific disciplines or assessment tasks may be beneficial. While CAFAS addresses the “feedback form” (proforma) method of delivering feedback and assessment results, different systems may be more applicable to providing feedback in different contexts such as annotation of assignments or exams.

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Assessment, University of South Australia, November 2008 in ATN Assessment Conference 2008: Engaging Students in Assessment., ed. Duff, A., Quinn,D., Green, M. Andre, K., Ferris, T., Copeland, S., Australian Technology Network, South Australia, pp. 234-246.

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15.0 Appendices

Appendix A – ICT Questionnaire Proforma

CAFAS Information Technology Questionnaire

CAFAS (Computer Aided Feedback and Assessment System) is a project funded by the Carrick Institute. The aim of the project is to develop an online (preferably web-based) feedback and assessment system for the benefit of staff and students in Australian tertiary education institutions. The purpose of this questionnaire is to gather information regarding your educational institution so that CAFAS can be designed to accommodate your institution's specific requirements. Please contact Martin Freney, Project Leader, if you have any queries: martin.freney@unisa.edu.au P: 8302 0271.

How to Use this Form

The areas that require input are shaded grey. Clicking in a box will put a cross in it. Clicking a crossed box will remove the cross. You can cross multiple boxes if necessary. Clicking in a grey area enables you to type. *Although the box is small you can type an unlimited amount of information in it (it will expand).*
Please email completed forms to martin.freney@unisa.edu.au as soon as possible.

Questions

Your Details

What is the name of your institution?
What is your name?
What is your position or job title?

1. Proposed Development Scheme

Production Server and Database: **SQL Server 2005**
Front-end/Database Connection: **ASP.Net**
Front-end user interface: **Flex**
The software proposal for building CAFAS includes using Flex 2, ASP.Net and SQL Server 2005. This will enable a simpler server setup for UniSA and provide better .Net integration using the popular ASP.Net language. The CAFAS application will be deployed on the UniSA IIS server with secure access for all Australian universities from that server. Open-source code and thorough documentation will ensure that CAFAS can be easily adapted to the production environment of other institutions.

What are your comments on this approach?

2. Storage of Confidential Information

In your opinion, will there be any problem with academic staff from your institution storing confidential feedback/assessment records on a secure UniSA server?

☐ No problem

☐ Some concerns (describe):

3. Installation of Software

With reference to the previous question, if you had some concerns, would a desktop based approach (rather than web-based) be more desirable and would there be any problem with academic staff installing the software?

☐ Desktop system is preferred to a Web-based system (explain why):

☐ Installation of software **would not** be a problem (comment if necessary):

☐ Installation of software **would be** a problem (explain why):

4. Operating System

What is the typical OS in your institution?

☐ Windows XP/2000 Comments:

☐ Windows Vista Comments:

☐ Mac Comments:

☐ Linux Comments:

☐ Unix Comments:

☐ Other - specify:

5. Internet Browser

What is the typical Internet Browser used in your institution?

☐ Internet Explorer Version:

☐ Netscape Version:

☐ Firefox Version:

☐ Solaris Version:

☐ Other - specify:

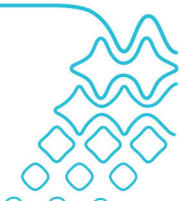
6. Flash Player 9.0

It is highly likely that CAFAS will require Flash Player 9.0 for its use. Does your Internet browser have Flash Player 9.0 or a previous version of Flash Player installed?

☐ Yes ☐ No Comment:

7. Server Setup

What server and database does your institution run?



☐ SQL Server 2005 ☐ Oracle

☐ IBM DB2 ☐ Access

☐ MySQL ☐ Other - specify:

☐ Unknown

Comment:

8. Export Format

.XLS files are the proposed format for exporting Marks and the corresponding Student ID Numbers out of CAFAS and into the institutions' mark/grade database.

What type of files can it import?

Comment:

9. Student Identification

Please specify the format of Student ID Numbers and type an example e.g. Format: *9 characters, last can be a letter or a number. Example: 12345678Z or 123456789*

Format:

Example:

10. Student Email

Please specify the format of Student Network Addresses (i.e. email address) and type an example e.g. *AAAAA001@students.unisa.edu.au e.g. FREMH001@students.unisa.edu.au*

Format:

Example:

11. Reference Group

Would you be interested in being a member of a reference group to review progress of the project at various stages of completion?

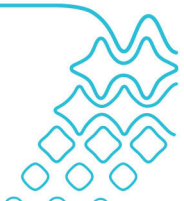
☐Yes ☐No Comments:

12. Trials

Would you be interested in participating in trials of the system (scheduled for July August 2007)?

☐Yes ☐No Comments:

13. Any Comments or Suggestions?



If you have any comments or suggestions please include them here;

Thanks for your help with providing this insight into your institution's IT environment. This will help to ensure that the CAFAS project is able to deliver a system that is useful in your institution. If you have indicated that you would like to contribute to the project either as a member of the reference group, or to participate in trials, we will be back in touch again shortly.

Please email completed forms to martin.freney@unisa.edu.au as soon as possible.

Best regards,

Martin Freney

CAFAS Project Leader
Lecturer Industrial Design
University of South Australia
Ph: 08 8302 0271
martin.freney@unisa.edu.au

Appendix B – Learning & Teaching Questionnaire Proforma

CAFAS Teaching and Learning Questionnaire

CAFAS (Computer Aided Feedback and Assessment System) is a project funded by the Carrick Institute. The aim of the project is to develop an online feedback and assessment system for the benefit of staff and students in Australian tertiary education institutions. The purpose of this questionnaire is to gather information regarding your educational institution so that CAFAS can be designed to accommodate your institution's specific requirements.

Please contact Martin Freney, Project Leader, if you have any queries: martin.freney@unisa.edu.au P: 8302 0271.

How to Use this Form

The areas that require input are shaded grey. Clicking in a box will put a cross in it. Clicking a crossed box will remove the cross. You can tick multiple boxes if necessary. Clicking in a grey area enables you to type. *Although the box is small you can type an unlimited amount of information in it (it will expand).*

Please email completed forms plus any attachments to martin.freney@unisa.edu.au as soon as possible.

Questions

Identification

What is the name of your institution?
What is your name?
What is your position or job title?

1.0 Terminology

Please indicate the terminology which is applicable in your institution (click in the appropriate box and if "other" provide a description).

1.1 A group of "schools" with strategic relationships or commonalities
e.g. *Division of Education Arts and Social Sciences*
☐ Division ☐ Department ☐ Faculty ☐ Other (describe):

1.2 A group of "programs" with strategic inter-relationships
e.g. *Louis Laybourne Smith School of Architecture & Design*
☐ School ☐ Other (describe):

1.3 A series of "courses" usually presented over 2-5 years
e.g. *Architecture*
☐ Program ☐ Course ☐ Other (describe):

1.4 A small set of closely related topics usually presented over 10-14 weeks
e.g. *History of Architecture*
☐ Course ☐ Subject ☐ Unit ☐ Other (describe):

1.5 A specific task (or tasks) that the student must attempt.

e.g. *Literature Review – Assignment 1*
☐ Assignment ☐Assessment ☐Project ☐Other (describe):

1.6 A sub-group of students from the main "course" group.
e.g. *Class # 121938*
☐ Class ☐Tutorial Group ☐Other (describe):

1.7 Person who organises resources for a course and also teaches the course.
☐ Course Coordinator ☐Subject Coordinator ☐Unit Coordinator ☐Other (describe):

1.8 Person who assists with assessment and teaching but does little if any administration or organisation of resources.
☐ Tutor ☐Assistant ☐Demonstrator ☐Other (describe):

1.9 Period of time in the academic calendar
☐ Semester ☐Study Period ☐Other (describe):

2.0 Grade and Mark Scheme

Please include an attachment that describes your Grade and Mark scheme,
Or enter information in Table below.

2.1 Your institution's Grade/Mark scheme

Grade	Abbreviation	Mark

e.g. the UniSA scheme is;

Grade	Abbreviation	Mark
High Distinction	HD	85-100%
Distinction	D	75-84%
Credit	C	65-74%
Pass Level 1	P1	55-64%
Pass Level 2	P2	50-54%
Fail Level 1	F1	40-49%
Fail Level 2	F2	0-39%

2.2 Is it common practice to provide students with marks (a numerical "score") as part of their assessment feedback?
☐Yes ☐No Comments:

2.3 Do staff use a plus/minus suffix with grades? E.g. "Credit +"
☐Yes ☐No

3.0 Grade Descriptors

3.1 Has your institution developed "grade descriptors"?

☐Yes ☐No

If Yes please attach Descriptors in separate document.

e.g. UniSA Descriptors are;

High Distinction	85 – 100%	Outstanding performance on all learning outcomes.
Distinction	75 – 84%	Excellent performance on all learning outcomes.
Credit	65 – 74%	High performance on all learning outcomes OR excellent performance on the majority of the learning outcomes.
Pass 1	55 – 64%	Satisfactory performance on all learning outcomes OR high performance on some learning outcomes compensates for unsatisfactory performance on others, resulting in overall satisfactory performance.
Pass 2	50 – 54%	Satisfactory performance on the majority of learning outcomes.
Fail 1	40 - 49%	Unsatisfactory performance on a number of learning outcomes OR failure to meet specified assessment requirements.
Fail 2	0 – 39%	Unsatisfactory performance on the majority of learning outcomes.

4.0 Graduate Qualities

UniSA has a scheme called “Graduate Qualities” (GQs). Some or all of these qualities are developed by assessment tasks (assignments) and those that are relevant are emphasised to students so they get a sense of how the assignment is developing these attributes/qualities. At UniSA there are 7 GQs: Body of Knowledge, Lifelong Learning, Problem Solving, Group and Individual Work, Ethical Action, Communication and International Perspective.

4.1 Does your institution have a scheme like this?
☐Yes ☐No

4.2 If Yes what is it called?
Please describe the system or attach information

5.0 Feedback Forms

Feedback Forms are typically an A4 photocopied template used by staff to record and communicate assessment (grades and marks) and feedback comments to students. Use of Feedback Forms are mandatory at UniSA.

5.1 Are they mandatory in your institution?
☐Yes ☐No Comments:

If possible please provide samples (as attachments) of “Feedback Forms” (a.k.a. Assessment Forms, Assessment Proformas, Feedback Proformas, Assessment Templates etc.) that are used by staff to record marks/grades/comments etc and given

to students to inform them of their performance and indicate how they can improve their work.

5.2 Is the use of “Rubric” Feedback Forms common in your institution?
☐Yes ☐No Comments:

5.3 What do you estimate to be the maximum number of assignments/assessments/projects in any one course/subject/unit? For example, UniSA policy sets a general limit of 3 assignments for any one course.
Maximum number of assignments per course:

5.4 What do you estimate to be the maximum number of assessment criteria typically used when assessing an assignment?
Maximum number of assessment criteria per assignment:

5.5 Would you be interested in being a member of a reference group to review progress of the project at various stages of completion?
☐Yes ☐No Comments:

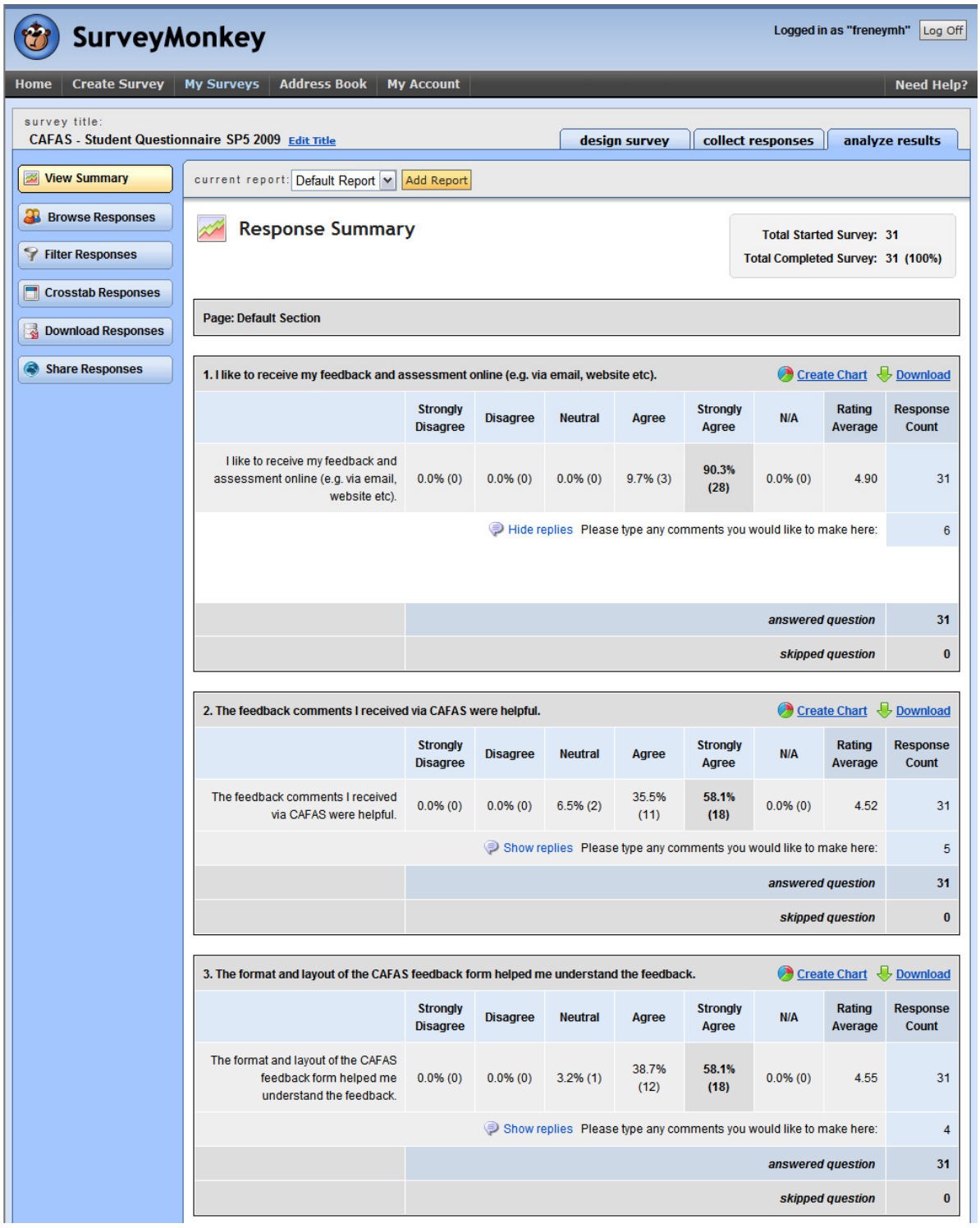
5.6 Would you be interested in participating in trials of the system (scheduled for July August 2007)?
☐Yes ☐No Comments:

Thanks for your help with providing this insight into your institution’s feedback and assessment approach. This will help to ensure that the CAFAS project is able to deliver a system that is useful in your institution. If you have indicated that you would like to contribute to the project either as a member of the reference group, or to participate in trials, we will be back in touch again shortly.
Please email completed forms plus any attachments to martin.freney@unisa.edu.au as soon as possible.

Best regards,

Martin Freney
CAFAS Project Leader
University of South Australia
Ph: 08 8302 0271
martin.freney@unisa.edu.au

Appendix C – Student Questionnaire Responses, (SP5, 2009 only)



SurveyMonkey

Logged in as "freneymh" Log Off

Home | Create Survey | My Surveys | Address Book | My Account | Need Help?

survey title:
CAFAS - Student Questionnaire SP5 2009 Edit Title

design survey | collect responses | analyze results

View Summary
Browse Responses
Filter Responses
Crosstab Responses
Download Responses
Share Responses

current report: Default Report Add Report

Response Summary

Total Started Survey: 31
Total Completed Survey: 31 (100%)

Page: Default Section

1. I like to receive my feedback and assessment online (e.g. via email, website etc). Create Chart Download

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A	Rating Average	Response Count
I like to receive my feedback and assessment online (e.g. via email, website etc).	0.0% (0)	0.0% (0)	0.0% (0)	9.7% (3)	**90.3% (28)**	0.0% (0)	4.90	31
Hide replies Please type any comments you would like to make here:								6
							answered question	31
							skipped question	0

2. The feedback comments I received via CAFAS were helpful. Create Chart Download

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A	Rating Average	Response Count
The feedback comments I received via CAFAS were helpful.	0.0% (0)	0.0% (0)	6.5% (2)	35.5% (11)	**58.1% (18)**	0.0% (0)	4.52	31
Show replies Please type any comments you would like to make here:								5
							answered question	31
							skipped question	0

3. The format and layout of the CAFAS feedback form helped me understand the feedback. Create Chart Download

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A	Rating Average	Response Count
The format and layout of the CAFAS feedback form helped me understand the feedback.	0.0% (0)	0.0% (0)	3.2% (1)	38.7% (12)	**58.1% (18)**	0.0% (0)	4.55	31
Show replies Please type any comments you would like to make here:								4
							answered question	31
							skipped question	0

4. The format and layout of the CAFAS feedback form helped me understand how the grades/marks were calculated. Create Chart Download

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A	Rating Average	Response Count
The format and layout of the CAFAS feedback form helped me understand how the grades/marks were calculated.	0.0% (0)	0.0% (0)	10.0% (3)	43.3% (13)	**46.7% (14)**	0.0% (0)	4.37	30
Show replies Please type any comments you would like to make here:								4
							answered question	**30**
							skipped question	**1**

5. The digital nature of CAFAS helped me with a specific learning difficulty that I have (e.g. using Zoom to increase the size of text - for people with impaired vision) Create Chart Download

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A	Rating Average	Response Count
The digital nature of CAFAS helped me with a specific learning difficulty that I have (e.g. using Zoom to increase the size of text - for people with impaired vision)	0.0% (0)	3.2% (1)	22.6% (7)	22.6% (7)	12.9% (4)	**38.7% (12)**	3.74	31
Show replies Please type any comments you would like to make here:								2
							answered question	**31**
							skipped question	**0**

6. The information about the Graduate Qualities/Attributes helped me understand the aims of the assignment. Create Chart Download

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A	Rating Average	Response Count
The information about the Graduate Qualities/Attributes helped me understand the aims of the assignment.	0.0% (0)	0.0% (0)	29.0% (9)	**54.8% (17)**	16.1% (5)	0.0% (0)	3.87	31
Show replies Please type any comments you would like to make here:								2
							answered question	**31**
							skipped question	**0**

7. The information about Grade Descriptors helped me understand what I needed to do to achieve a particular grade. Create Chart Download

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A	Rating Average	Response Count
The information about Grade Descriptors helped me understand what I needed to do to achieve a particular grade.	0.0% (0)	0.0% (0)	23.3% (7)	**46.7% (14)**	30.0% (9)	0.0% (0)	4.07	30
Please type any comments you would like to make here:								0
							answered question	**30**
							skipped question	**1**

8. The graph showing the distribution of grades was useful. Create Chart Download

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	N/A	Rating Average	Response Count
The graph showing the distribution of grades was useful.	0.0% (0)	0.0% (0)	3.2% (1)	38.7% (12)	**54.8% (17)**	3.2% (1)	4.53	31
Show replies Please type any comments you would like to make here:								6
							answered question	**31**
							skipped question	**0**

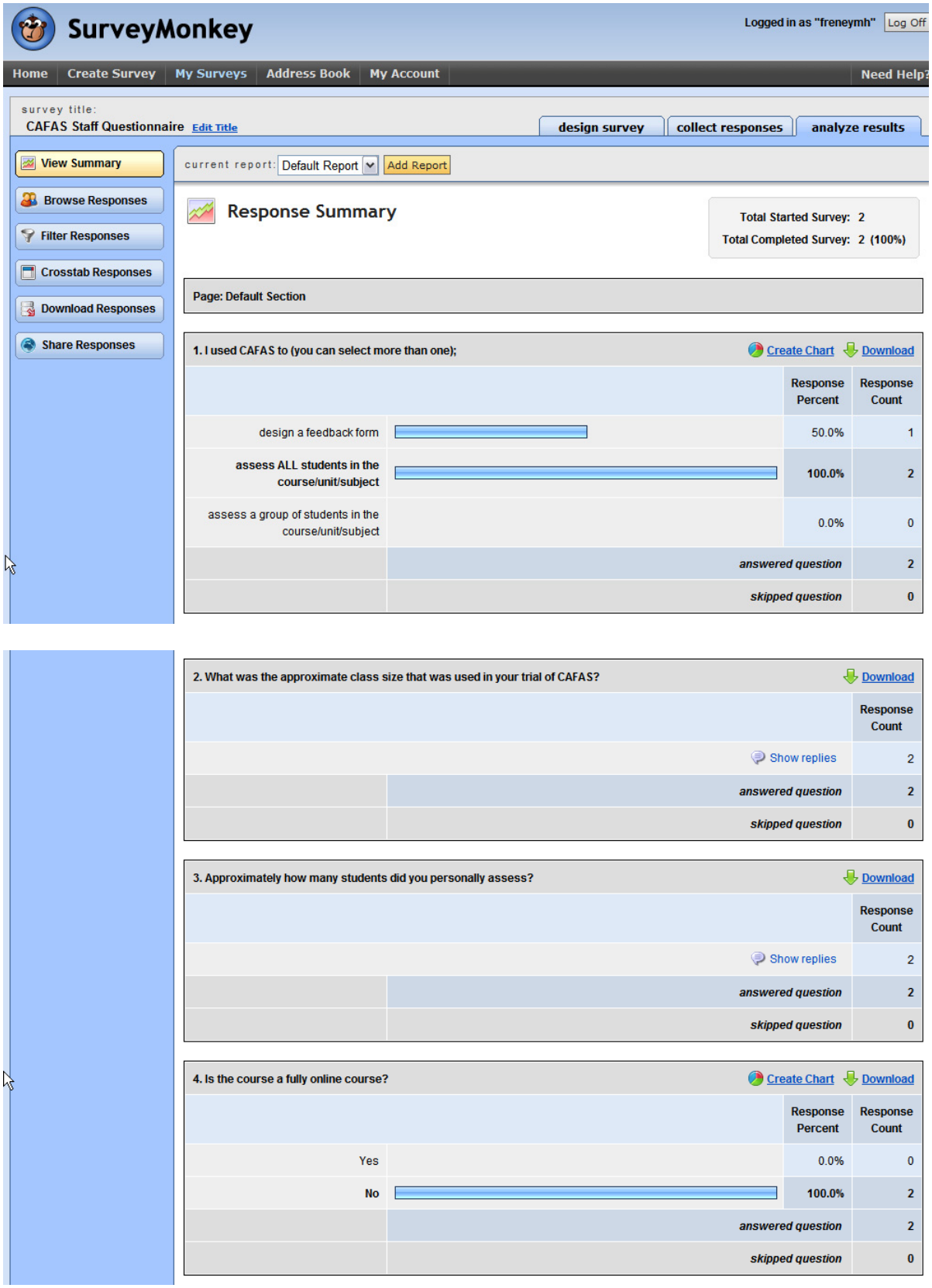
9. Do you have any comments regarding this new system for providing feedback and assessment? Download

	Response Count
Show replies	7
answered question	**7**
skipped question	**24**

10. What is the name of the relevant course/unit/subject you are studying? (i.e. the one that used CAFAS to provide your online feedback form) Create Chart Download

	Response Percent	Response Count
Computer Aided Modelling and Hand Rendering	22.6%	7
Design Communication 2A	35.5%	11
ID Studio 4	3.2%	1
ID Studio 8	**38.7%**	**12**
Introduction to Ergonomics	0.0%	0
Show replies Other (please specify)		2
answered question		**31**
skipped question		**0**

Appendix D – Staff Questionnaire Responses



SurveyMonkey

Logged in as "freneymh" Log Off

Home | Create Survey | My Surveys | Address Book | My Account | Need Help?

survey title:
CAFAS Staff Questionnaire Edit Title

design survey | collect responses | analyze results

View Summary
Browse Responses
Filter Responses
Crosstab Responses
Download Responses
Share Responses

current report: Default Report Add Report

Response Summary

Total Started Survey: 2
Total Completed Survey: 2 (100%)

Page: Default Section

1. I used CAFAS to (you can select more than one); Create Chart Download

	Response Percent	Response Count
design a feedback form	50.0%	1
assess ALL students in the course/unit/subject	100.0%	2
assess a group of students in the course/unit/subject	0.0%	0
answered question		2
skipped question		0

2. What was the approximate class size that was used in your trial of CAFAS? Download

	Response Count
Show replies	2
answered question	2
skipped question	0

3. Approximately how many students did you personally assess? Download

	Response Count
Show replies	2
answered question	2
skipped question	0

4. Is the course a fully online course? Create Chart Download

	Response Percent	Response Count
Yes	0.0%	0
No	100.0%	2
answered question		2
skipped question		0

5. Did you use CAFAS to adapt a paper based form or did you use CAFAS to design a feedback form from scratch? Create Chart Download

	Response Percent	Response Count
Adapted a paper based feedback form	0.0%	0
Designed a feedback form from scratch	**100.0%**	**2**
Not Applicable (I only used CAFAS to assess students)	0.0%	0
	answered question	**2**
	skipped question	**0**

6. The feedback form I used the following feedback mechanisms (you can select more than one); Create Chart Download

	Response Percent	Response Count
rubric	0.0%	0
slider	**100.0%**	**2**
qualitative comments	**100.0%**	**2**
	answered question	**2**
	skipped question	**0**

7. I used CAFAS to assess the following types of assessment tasks (you can select more than one); Create Chart Download

	Response Percent	Response Count
Text based (e.g. essay)	0.0%	0
Graphics based (e.g. print/web)	**100.0%**	**2**
Artefact (e.g. model, prototype, animation, sculpture)	50.0%	1
Film or audio production	0.0%	0
Aural presentation	0.0%	0
Participation in group discussion	0.0%	0
Debate	0.0%	0
Other	0.0%	0
If "Other" please describe:	0.0%	0
	Other (please specify)	0
	answered question	**2**
	skipped question	**0**

8. CAFAS is easy to use and understand (I can find the controls I need quickly and the workflow is logical). Create Chart Download

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Rating Average	Response Count
CAFAS is easy to use and understand (I can find the controls I need quickly and the workflow is logical).	0.0% (0)	0.0% (0)	0.0% (0)	**100.0% (2)**	0.0% (0)	4.00	2
Show replies Please type any comments you would like to make here:							1
						answered question	**2**
						skipped question	**0**

9. How long did it take before you felt skilful using CAFAS? Create Chart Download

	Response Percent	Response Count
Less than an hour	0.0%	0
1-3 hours	**50.0%**	**1**
4-8 hours	**50.0%**	**1**
More than a day	0.0%	0
Still not confident	0.0%	0
Show replies Please type any comments you would like to make here		1
	answered question	**2**
	skipped question	**0**

10. CAFAS enabled me to give students high quality feedback. Create Chart Download

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Rating Average	Response Count
CAFAS enabled me to give students high quality feedback.	0.0% (0)	0.0% (0)	0.0% (0)	**50.0% (1)**	**50.0% (1)**	4.50	2
Please type any comments you would like to make here							0
						answered question	**2**
						skipped question	**0**

11. CAFAS enabled me to conduct assessment more consistently and rigorously. Create Chart Download

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Rating Average	Response Count
CAFAS enabled me to conduct assessment more consistently and rigorously.	0.0% (0)	0.0% (0)	0.0% (0)	**100.0% (2)**	0.0% (0)	4.00	2
Show replies Please type any comments you would like to make here							1
						answered question	**2**
						skipped question	**0**

12. As a Coordinator I noticed that I was better able to review and moderate the assessment results given by members of the assessment team. Create Chart Download

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Rating Average	Response Count
As a Coordinator I noticed that I was better able to review and moderate the assessment results given by members of the assessment team.	0.0% (0)	0.0% (0)	**50.0% (1)**	**50.0% (1)**	0.0% (0)	3.50	2
			Show replies Please type any comments you would like to make here				1
						answered question	**2**
						skipped question	**0**

13. CAFAS enabled me to return feedback to students quicker than the methods that I typically use. Create Chart Download

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Rating Average	Response Count
CAFAS enabled me to return feedback to students quicker than the methods that I typically use.	0.0% (0)	0.0% (0)	0.0% (0)	**50.0% (1)**	**50.0% (1)**	4.50	2
					Please type any comments you would like to make here		0
						answered question	**2**
						skipped question	**0**

14. I can see a lot of potential in CAFAS but feel that I would need to invest more time using it before I could benefit from it. Create Chart Download

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Rating Average	Response Count
I can see a lot of potential in CAFAS but feel that I would need to invest more time using it before I could benefit from it.	0.0% (0)	**100.0% (2)**	0.0% (0)	0.0% (0)	0.0% (0)	2.00	2
		Hide replies Please type any comments you would like to make here					1

1. I can see benefit immediately, however more time would be required to understand the creation of assessments. Mon, Dec 14, 2009 3:32 PM Find...

						answered question	**2**
						skipped question	**0**

15. Now that I have experienced CAFAS I see it as a viable option to paper-based feedback. Create Chart Download

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Rating Average	Response Count
Now that I have experienced CAFAS I see it as a viable option to paper-based feedback.	0.0% (0)	0.0% (0)	0.0% (0)	0.0% (0)	**100.0% (2)**	5.00	2
			Show replies Please type any comments you would like to make here				1
						answered question	**2**
						skipped question	**0**

16. In future I plan to use CAFAS; Create Chart | Download

	Response Percent	Response Count
Sometimes - to provide feedback in conjunction with paper-based feedback	0.0%	0
Always - as a replacement to paper-based feedback	**100.0%**	**2**
Never again	0.0%	0
Please type any comments you would like to make here		0
answered question		**2**
skipped question		**0**

17. I would prefer to use CAFAS (you can select more than one); Create Chart | Download

	Response Percent	Response Count
Online (Web based – all data is stored on the secure CAFAS website)	**100.0%**	**2**
Offline (Installed on my computer – all data is held on my computer)	**100.0%**	**2**
Show replies Please type any comments you would like to make here		1
answered question		**2**
skipped question		**0**

18. What improvements should be made to CAFAS? What features is it missing? E.g. self assessment functionality. Download

	Response Count
Show replies	1
answered question	**1**
skipped question	**1**

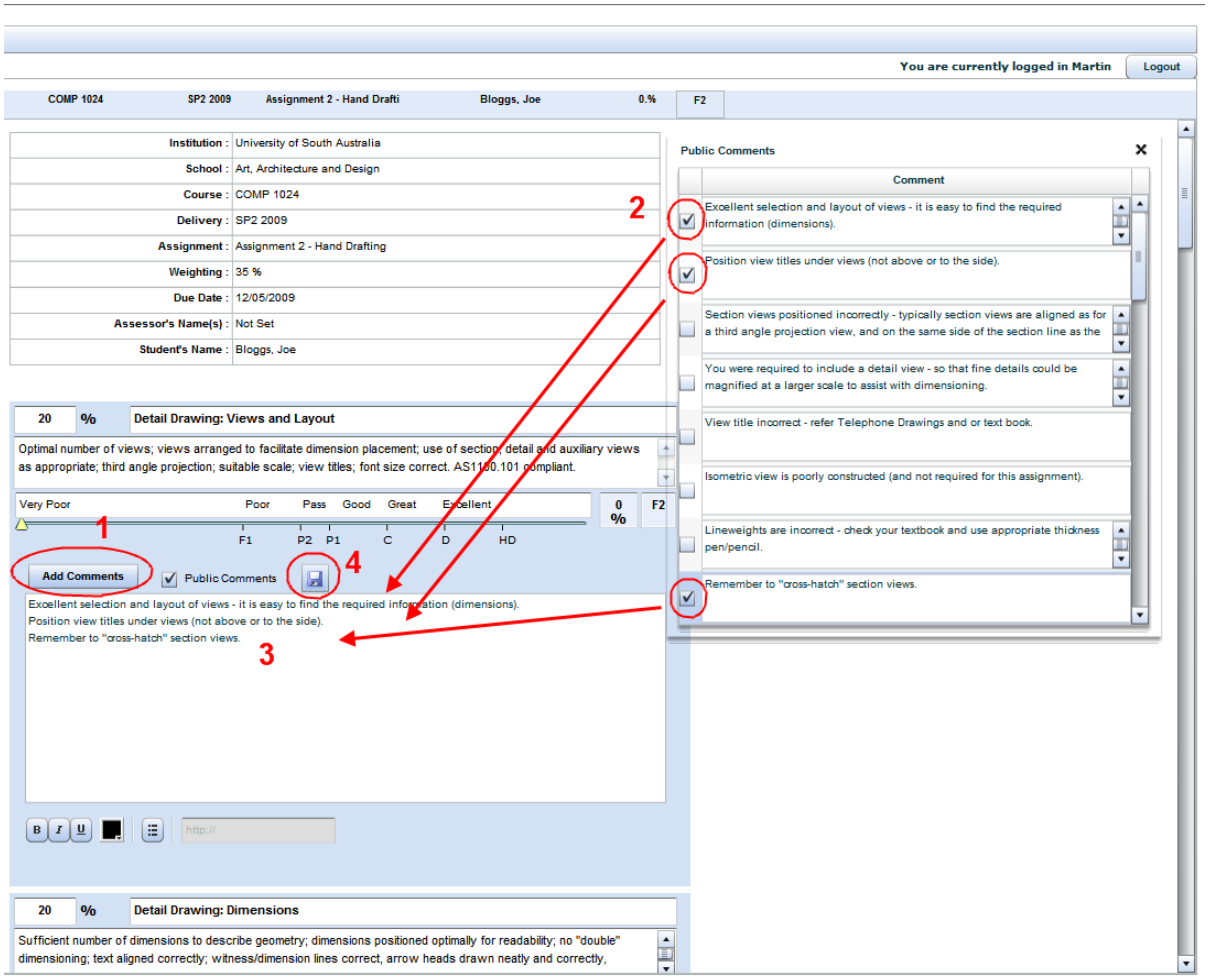
19. Do you have any other comments or suggestions for the developers of CAFAS?

	Response Count
	0
answered question	**0**
skipped question	**2**

20. Do you have any prior experience with CAFAS? (you can select more than one)		Create Chart	Download
		Response Percent	Response Count
No this was my first experience with CAFAS		50.0%	1
Yes I've used the Excel based spreadsheet prototype version of CAFAS		50.0%	1
Yes I've used CAFAS recently in an earlier trial of the new web-based CAFAS		50.0%	1
	Please type any comments you would like to make here		0
	answered question		2
	skipped question		0

21. Is the new version of CAFAS more useful than the Excel based CAFAS?		Create Chart	Download
		Response Percent	Response Count
Not applicable (I haven't used the Excel based CAFAS)		50.0%	1
Yes		50.0%	1
No		0.0%	0
	Please type any comments you would like to make here		0
	answered question		2
	skipped question		0

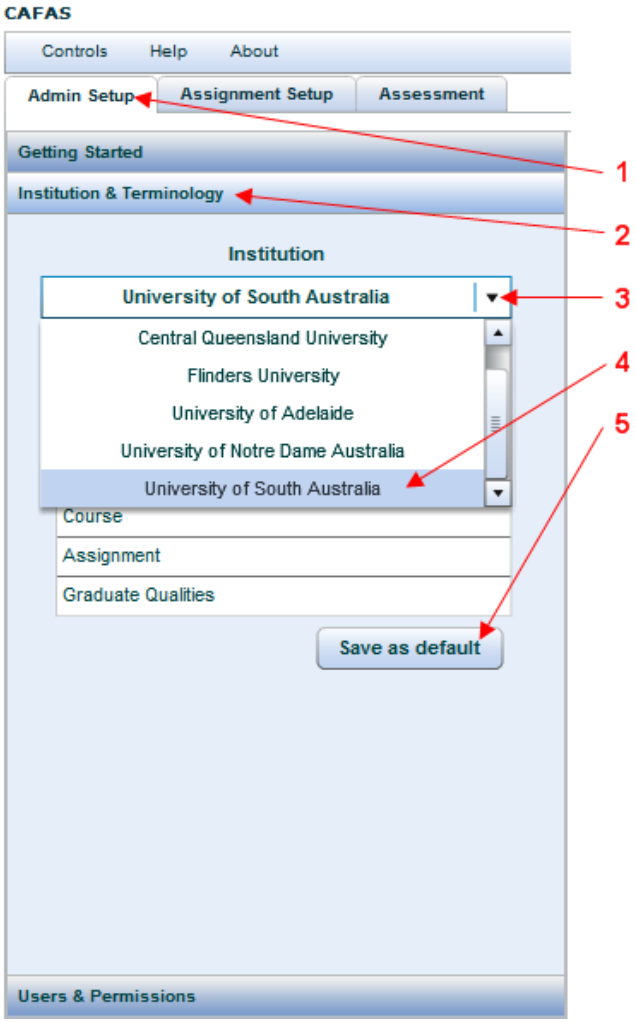
Appendix E – Comments Database Screen Shot Example



This screen shot shows the Assess Student section which is a digital representation of a typical paper based, criterion referenced feedback form. The following procedure is used by the academic to quickly add comments from a database (the numbered steps below match the numbered areas in the image above);

1. Clicking the Add Comments button invokes a pop up box of comments for this particular assessment criterion.
2. Ticking the box next to the various comments adds them into the feedback box.
3. The feedback box (white) now contains the comments that were ticked.
4. New comments can be typed in the feedback box and then saved into the list for future reuse by highlighting the new comment and clicking the save button (disc icon).

Appendix F – Configuring CAFAS to a particular institution



To Configure CAFAS begin in the Admin Setup Tab.

1. Click the **Admin Setup** Tab
2. Click the **Institution & Terminology** Section
3. Click on the drop down menu arrow to see a list of institutions (if your institution is not listed email martin.freney@unisa.edu.au
4. Click on your institution from the drop down list – it will now be displayed in the drop down box.
5. Click the **Save as default** button so that CAFAS remembers this setting the next time you login (you won't need to use this Section of CAFAS again unless you work in multiple institutions).

Appendix G – System Specifications

CAFAS Specifications – Version 3

Introduction

This document specifies the functional requirements of a new Computer Aided Assessment (Marking Assistant) software application being developed with funding from the Carrick Institute. The working name of the application is CAFAS (Computer Aided Feedback & Assessment System). It has been prepared primarily to guide the software programming team members but will also be useful to reference group members who need to understand the main (functional) objectives of the project.

This document should be read in conjunction with the CAFAS Process document.

Various assessment schemes e.g. for self and peer assessment are discussed at the end of this document. The project team must decide which schemes are within the scope of this project and adjust the following specifications accordingly.

Definitions & Abbreviations

Feedback Form: aka; Feedback & Assessment Proforma, Assessment Proforma, Assessment Form etc. Note: Feedback Form seems to be the new terminology at UniSA. It is a form (usually printed) created by staff that contains critical information that needs to be communicated to the student in terms of assessment and feedback on assignments.

Course Coordinator (CC) Person who organises resources (staff, assignment design, feedback form design etc) for a course.

Mark: score out of 100 used by academic staff to accurately calculate an overall mark and grade at the end of a course.

Grade: name given to a range of Marks e.g. at UniSA 65-74% Mark equals a Grade of "Credit".

Assessment: in this document it is used as a verb to describe the action of assessing a student's work (evaluating it). It is often used as a noun to describe a particular task that a student must complete, however this will be referred to as an assignment in this document.

Assignment: a particular task or series of tasks that the student must complete. The assignment undergoes a process of assessment by academic staff with reference to particular assessment criteria. Also known as an "assessment task" or an "assessment".

Summary Comment: a concluding comment often containing specific instructions that a student should follow to improve their academic performance.

Assessment Criteria (AC): typically 3-7 specific criteria that academic staff use to evaluate students' work. Students use the assessment criteria to focus their activities; a weighting is often associated with each assessment criteria giving students a better indication of where to focus their energy.

Weighting: a score out of 100 (usually expressed as a percentage) to indicate to a student how important a particular assessment criterion is. Also to indicate how important a particular assignment is.

Functionality
Forms must include the following elements in the Feedback Form;

- Graduate Qualities that are developed by the assignment (optional – some institutions don't use this scheme)
- List of Assessment Criteria (including criteria which attract a Penalty or Bonus mark)
- Feedback Mechanisms for Assessment Criteria (i.e. Rubric or Slider – described below)
- Summary Comment
- Grade Definitions
- Grade for Assignment

CAFAS aims to provide two types of feedback mechanisms: Slider and Rubric.

The Slider provides space for "marks" (horizontal scroll bar: "Slider") and comments for each assessment criterion, plus space for an overall summary comment. The CAFAS concept uses a "Slider" to indicate the students performance (usually via a grade), which in turn relates to a mark which is automatically totalled but hidden from the students' view.

The Rubric feedback mechanism is a series of predetermined standard comments for each assessment criterion which range from poor to excellent. Rubric's tend to take more time to setup because of the numerous performance descriptors, however this upfront work can speed up the actual assessment process.

Research & Consultation
The specifications in this document reflect the findings of research involving the "Excel Prototype" which has been continuously trialled from June 2005. A questionnaire has been developed to gather information from other institutions regarding their needs for this system. Hence this document may be altered slightly when the results from the questionnaire are available.

Various other Computer Aided Assessment (CAA) systems have been investigated and trialled although to a limited degree. These are Electronic Feedback (Phil Denton), Mindtrail (Mindtrail Pty Ltd – now defunct) & Assessment@yourfingertips (Alistair Campell). The pros and cons of these systems have been evaluated and this has informed the development of the specifications in this document.

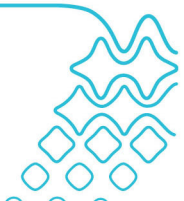
Specifications - Slider & Rubric
Importance column is rated from 1 (low) to 3 (high). Score of 3 is critical to the success of the project.

Staff

	Functional Requirements	Imp.
	To enable institution specific descriptors for various fields listed below. These will be known as the ID fields (identification fields). Different institutions use different terminology. The essential fields are; **Institution** (e.g. University of South Australia) **Division** (e.g. Education Arts and Social Sciences) **School** (e.g. Louis Laybourne Smith School of Architecture & Design **Program** a.k.a. Course/Department (e.g. Industrial Design) **Course** a.k.a. Subject/Unit (e.g. Engineering Drawing and CAD) **Class** a.k.a. Tutorial Group (e.g. Class # 123234) **Assignment** a.k.a Assessment/Project/Task (e.g. Hand Drafting - Assignment 1) **Weighting** (e.g. 15%) **Due Date** (e.g. 18 March 2007) **Assessor's Name(s)** (e.g. Martin Freney and David Gordon) – need the ability to list up to 10 in the event that a panel of assessors are participating in the assessment process. **Group Members** (e.g. Jeff Bloggs, Joe Smith) – often this will be not applicable so it needs the ability to be turned off. **Graduate Qualities** a.k.a. Graduate Attributes. Need a mechanism by which staff can setup the software by entering institution specific terminology and save it for the next time they use the software. E.g. UniSA staff member would want to save "Course" rather than "Subject" or "Unit".	3
	Grades and Marks: To enable institution specific grading and marking schemes to be employed. A range of marks is typically associated with a grade e.g. 56-64% = Credit. Need a mechanism by which staff can setup the software by entering institution specific grading scheme and save it for the next time they use the software..	3
	Elements: To enable flexibility with the types of "elements" included. The elements are; **Identification fields**; (refer Setup Phase above). **"Graduate Qualities"**; name/descriptor/tick-box. **List of Penalties**; name/descriptor/weighting/tick-box with penalty mark. **List of Deliverables**; name/descriptor/weighting/tick-box with penalty mark. **List of Bonus Marks**; name/descriptor/weighting/tick-box with penalty mark. **Number of Assessment Criteria**; needs to be possible to specify from 1-12 assessment criteria. **Type of feedback mechanism** (Rubric/Slider) for each assessment criteria; needs to be possible to specify the type of feedback for each assessment criteria. **Summary Comment**; a text box with the ability to quickly input and concatenate standard comments and to be able to add ad-lib comments. This is mandatory on all Comment fields. **Grade Descriptors**; name/descriptor/mark range/grade abbreviation. **Final Grade**; typically the grade is displayed rather than the mark.	3

	Final Mark; some institutions may wish to display the students' mark (numerical score) For example, some institutions will not use the "Graduate Qualities" element or the "List of Deliverables" element. There needs to be a choice about whether "Rubric" or "Slider" feedback is given for a particular assessment criteria.	
	Format: To enable some flexibility with the arrangement of information on the form, e.g. Institution, Division and School included in a header on each sheet of the form. Other fields included once at the top of page 1 of the form. Caution: there must be logical groupings of fields that cannot be violated.	1
	Graduate Quality: CC must have the ability to indicate which GQs are applicable to the particular assignment.	3
	Graduate Quality: CC must have the ability to enter a GQ descriptor of approx 4 lines maximum for each GQ both manually or by accessing a pre-defined descriptor from a database (e.g. drop down menu).	
	List of Penalties: CC must have the ability to enter; The name of the penalty. E.g. Late Submission A short description of what will incur a penalty. E.g. failure to submit your assignment on time will incur a penalty. The "weighting" i.e. the mark that will be deducted if a penalty is incurred. A mechanism by which a penalty is indicated e.g. a tick-box. (during the "Use" phase) Note: Multiple penalties may be recorded, hence it is a "list of penalties".	
	List of Deliverables: CC must have the ability to enter; The name of the deliverable. E.g. "Essay in Word doc format" A short description of what will incur a penalty e.g. Your essay must be submitted in Word doc format The "weighting" i.e. the mark that will be deducted if the deliverable is not submitted. A mechanism by which a penalty for not submitting a deliverable can be indicated e.g. a tick-box. (during the "Use" phase) Note: Multiple deliverables may be recorded (or none), hence it is a "list of deliverables".	
	List of Bonus Marks: this is the same as for List of Penalties, however marks are added (instead of subtracted) on top of the overall score calculated by the Sliders or the Rubrics.	
	Assessment Criteria: To enable different numbers of assessment criteria (AC) to be used. Target: Maximum of 12 AC. Ideally there would be no limit but maximum of 12 is acceptable. 1 is the minimum.	3
	Assessment Criteria Fields: Each assessment criterion has the following associated fields which must be clearly displayed; AC Weighting e.g. 30% AC Title e.g. Knowledge of Subject AC Descriptor AC Performance Indicator: i.e. "Slider Bar" with associated descriptors OR "Rubric" with associated descriptors. AC Feedback Comment area: where staff can enter comments (optional for Rubrics).	3
	AC Weighting: To enable a weighting to be assigned to each assessment criteria. Range of 1-100%	3
	AC Title: One line (i.e. equivalent to 12 point font, Times New Roman on an A4 Portrait page layout)	3
	AC Descriptor: ideally with no limit to the number of characters and the	

	possibility of including hyperlinks	
	(Slider Only) AC Performance Indicator (Slider bar) needs the ability to associate grades' abbreviations or other descriptors. Thus when entering institution's grade/mark scheme an abbreviation for each grade must be entered if it is to be included next to the Slider bar. An alternative would be to use a descriptor such as "good", "poor", "excellent". Ideally this would be something that could be altered from one Feedback Form to another, i.e. on one form the grade abbreviations could be displayed and on a different form (for a different assignment) good/poor/excellent descriptors could be used.	3
	(Slider Only) AC Feedback Comment area: with no limit to the number of characters that can be entered. It must start out small and then "self-expand" as more comments are entered.	3
	(Slider Only) AC Feedback Comment area: with the ability to quickly access and enter comments from a database of standard feedback comments.	3
	(Slider Only) AC Feedback Comment area: with the ability to concatenate (join together) comments from the database so that sentences and paragraphs can be "built" by picking from the comments database.	3
	(Slider Only) AC Feedback Comment area: the ability to record and enter an audio recording (with icon to indicate to student that an audio file can be listened to for that specific assessment criterion).	2
	(Rubric Only) Rubric AC Performance Indicator needs the ability to enter a series of comments and a mechanism (e.g. tick box for each comment) to indicate which comment is applicable to the student's performance. The number of comments possible must be from 2-7. Note that an AC Feedback Comment area is optional, although a Summary Comment area is essential.	3
	Summary Comment area: must be located directly after all the Assessment Criteria Feedback Comment areas.	3
	Summary Comment area: with no limit to the number of characters that can be entered.	3
	Summary Comment area: with the ability to quickly access and enter comments from a database of standard feedback comments.	3
	Summary Comment area: with the ability to record and enter an audio recording (with icon to indicate to student that an audio file can be listened to for that specific assessment criterion). Note that importance rating for AC Feedback Comment area is only 2. Thus as long as there is the opportunity to enter one audio recording in the Summary Comment this will suffice.	3
	AC Weighting Error Checking: To indicate to the staff member if weighting of standard assessment criteria does not add up to 100%	2
	Mark Scheme: To enable assessment criteria to be allocated as either "standard", "bonus" or "penalty" criteria. Note: standard criteria must add up to 100%. Penalty and Bonus criteria, can add up to any number. Weighted Mark for each Standard AC must be totalled, then the weighted Mark for each Penalty AC must be totalled and subtracted from the total Standard AC Mark. Bonus marks are added to the totalled mark.	3
	Grade Penalty List (some staff won't want this feature) that can be turned on and off for each Feedback Form. It is a list with check boxes to indicate to the student if they have been penalised for a specific error (which is not included in the assessment criteria) e.g. Late Submission, Incorrect Format.	3
	Grade Penalty List: ideally no limit to the number of Penalties that can be contained in the list, however a maximum of 12 would be acceptable.	3
	Grade Penalty List: Half line descriptor e.g. Late Submission without approved extension	3
	Grade Penalty List: Weighting e.g. -10%	3



	Grade Penalty List: Tickable Checkbox (or Rubric) that subtracts the weighting (penalty marks) from the overall mark.	3
	Import from Word: Enable quick entry of text when setting up Feedback Form (e.g. copy and paste info from Word into CAFAS. Many staff have developed "Assessment Proformas" which will need to be "imported" into CAFAS). Cut and Paste-ability (or similar) for as many fields as possible.	3
	Comments Database: ability to provide quick (typed) feedback comments in relation to each assessment criterion and Summary Comment from a standard list of comments/comments database.	3
	Comments Database: To enable categorisation of (typed) feedback comments (e.g. each comment to be coded or allocated to a particular assessment criterion or Summary Comment).	3
	Comment Driven Penalties: ability to allocate a penalty (mark) to specific comments in the Comments Database so that when a particular comment is entered into an AC Feedback Comment Box the Slider moves (to the left) accordingly, based on the associated penalty. It would be excellent to have the ability to over-ride and position the Slider where ever you want, plus a "reset" function to apply the Comment Driven Penalty again.	1
	Comment Codes: ability to allocate a code (automatically) to a comment. The purpose of this is to enable staff to use the code to quickly enter a particular comment (from database) into a Comment Box. Another purpose is to enable the software to track the number of times a specific comment has been entered. This would enable staff to analyse where students are making common errors.	1
	Grade Calculation: the weighted marks from all assessment criteria must be summed, penalty marks must be subtracted (two types of penalty marks are available: Penalty Assessment Criteria and items in the Grade Penalty List) and an overall mark reported so that it is visible to staff only*. An overall grade must then be allocated based on the mark and this must be clearly visible to the student and the staff member. * might need to be able to make the marks visible as some universities/staff members may like to display this information to students (survey question)	3
	Grade and Mark Calculation: the overall mark and grade must dynamically update during the assessment process, i.e. when Slider bars are manipulated the overall mark and grade should dynamically update.	3
	Grade and Mark Display: the overall mark and grade must be clearly visible, in a prominent place (e.g. top of screen) during the assessment process. This is so the assessor can quickly see the effect of modifications to position of Slider bars etc.	3
	Grade Definitions: Grade definitions must be clearly displayed at the end of the Feedback Form. The definitions need to be editable so that academic staff (course coordinator) can redefine them in the context of a particular assignment – this helps students to understand what needs to be done to achieve a particular grade. The range of marks associated with the grade needs to be clearly displayed.	3
	Spreadsheet: ability to easily access a spreadsheet which organises the following information in Tabular format; Student Name (last name, first name, second names) Student ID Number (typically approx 10 characters alpha numeric) Status of Assessment: Not Started, Incomplete, Complete (but not emailed), Emailed Tutor: the person assigned to mark the assignment – refer to Assessment Scheme section of this document.	3

	Grade and Mark for Assignment 1 Grade and Mark for Assignment 2 Grade and Mark for Assignment 3… up to a maximum of 10 Assignments. Final Grade and Mark (sums all marks taking into account the weightings for each assignment). Resorting the data e.g. by clicking on column headers is essential.	
	Print Preview: ability to preview a Form before it is used for assessment and again when the Form has been completed and is ready to email to students.	3
	Export to other formats: the ability to export the Form as shown in the Print Preview is necessary so that the Form can be incorporated into other documents such as UniSA's Course Information Booklet – it is mandatory that Feedback Forms be included in Course Information Booklets. The ability to embed the Form in a Word document or the ability to create a PDF file would satisfy this specification – other methods may exist (Save Complete Webpage?).	3
	Dissemination: students need to be alerted when their Feedback and Assessment Form has been completed and is ready for them to view. An email which contains either a hyperlink to a website (which automatically displays the form) or an attached file is suggested as possible options. Ultimately the student needs to be able to view and print the form with a minimum of effort e.g. fewer than 3 clicks.	3
	Print Hardcopy: staff and students need to be able to print the forms. Staff need to be able to print the uncompleted form and the completed form, and students need to be able to print the form that is emailed to them.	3
	Zoomability: to ensure that the system is accessible to students and staff it is necessary that a degree of zoomability is possible. Hence staff will be able to increase the font sizes of the Graphics User Interface and likewise students will be able to increase the font sizes of the Feedback Form that they receive.	
	Moderation Function: it is highly desirable that a system exists whereby the course coordinator can review the results from various tutors and then moderate the grades awarded by the tutors to a particular cohort of students. For example if each Feedback Form were to include a section called "Moderation" which was a simple Slider bar which indicated how much (in terms of a marks) the course coordinator had adjusted the grade.	2
	Formative Feedback Only function: ability to turn off Slider bars (mark allocation) to ensure that comment only feedback (formative) can be given. Ideally the ability to turn them back on would be great!	

Assessment Scheme

These specifications have been developed with a fairly simple, typical assessment scheme in mind – refer Figs 1 and 2 below. One tutor is responsible for marking a defined set of students' assignments. The dotted line in Fig 2 indicates "blind marking" used for moderation purposes.

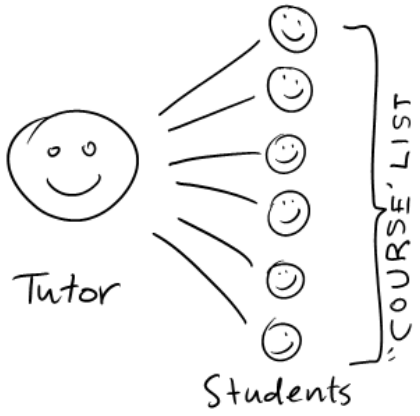


Fig 1

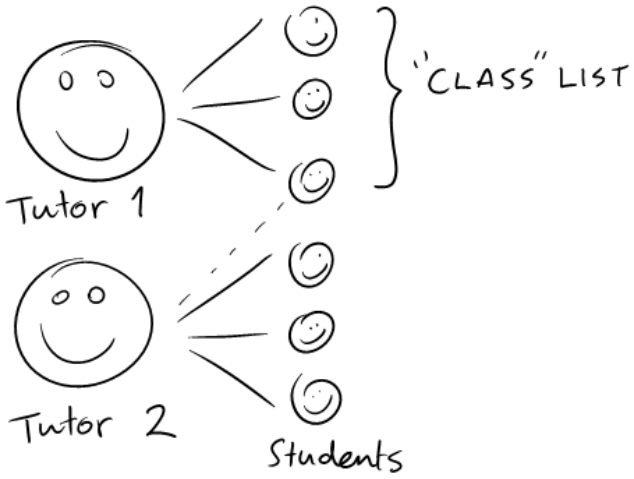


Fig 2

In Fig 3 a more complicated system is depicted. Arguably it would result in a more consistent and "fair" outcome. Tutor 1 assesses Assessment Criteria 1 and Tutor 2 (red) assesses Assessment Criteria 2 (red).

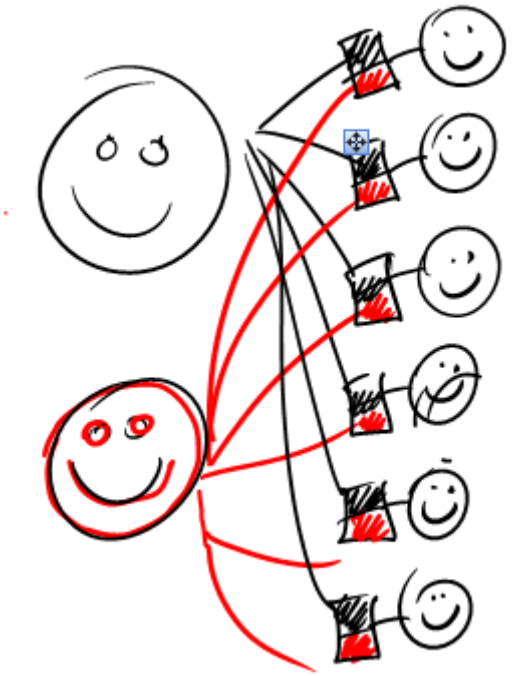


Fig 3

In Fig 4 both Tutors mark all assessment criteria and the marks are averaged. Comments could be identified to show which tutor said what. This is similar to a judging panel common in the Olympic Games.

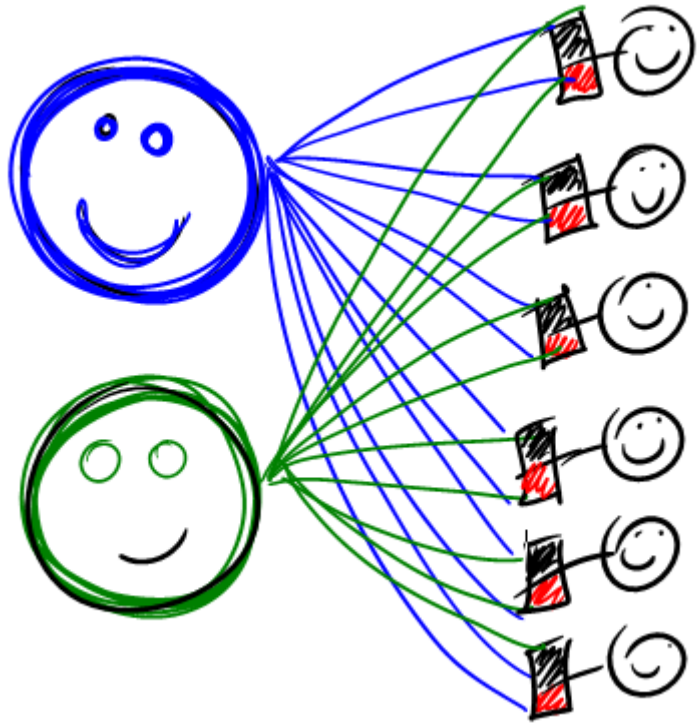


Fig 4

Building on the previous assessment scheme, Fig 5 shows a scheme which is the same with the exception that students can assess each other (peer assessment) and themselves (self assessment).

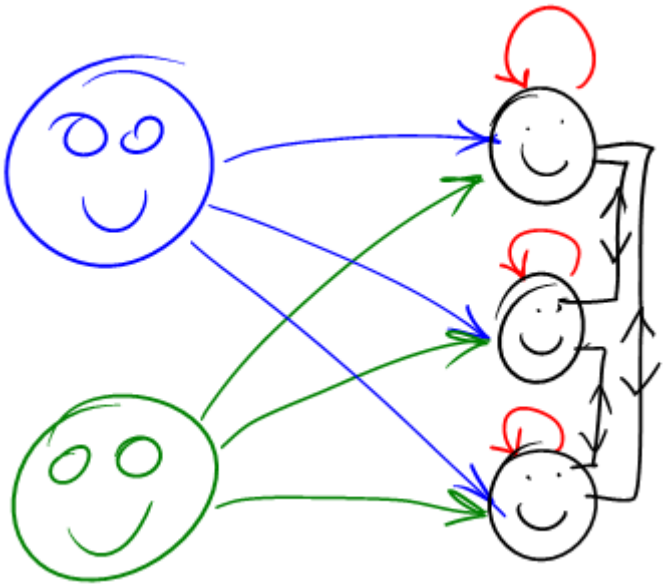


Fig 5

Conclusion
The Project Team must decide whether the more complicated assessment schemes (depicted in Fig 3,4,5) are within the scope of this project and then develop further specifications.