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Supporting student academic literacy in the disciplines using genre-based online pedagogy

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This paper reports the design, implementation and evaluation of a discipline specific online report writing resource for undergraduate science and engineering students, known as "Write Reports in Science and Engineering" (WRiSE). The aim of the ALTC funded project was to provide a free open-source resource on discipline specific writing and to assess the impact of this online learning and teaching environment on students' report writing. WRiSE was developed over two and a half years by a cross-institutional and cross-disciplinary collaborative team made up of subject specialists, learning advisors and eLearning specialists. Conceptual design was informed by Constructivist Learning Theory and genre pedagogy in the Systemic Functional Linguistics tradition. The resource contains nine modules from seven disciplines. Each module has a "Help with Report Writing" section which details the structure, conventions and technical language for each report type, as well as a "Help with Understanding Content" section which contains exercises on key concepts related to the report. The site also contains audio files which address the process of report writing and lecturers' expectations. Evaluations showed that WRiSE users attained higher marks than non-users in their report assignments. Users also rated WRiSE highly for: developing understanding of the report writing requirements in their discipline; increasing awareness of strengths and weaknesses in their report writing; and, for deciding what changes to make to their report. WRiSE works best when integrated into the curriculum and when it is consistently promoted and demonstrated by lectures, tutors and learning advisors.

Key Words: online learning, genre pedagogy, report writing, science, engineering.

1. Introduction

As university teaching and learning increasingly moves to incorporate online delivery and instruction, academic skills advisors are also restructuring their teaching and resources for an online medium. Online learning environments are used in academic skill units as a student management tool (for example, online booking of consultations) and as an alternative or an adjunct to traditional face-to-face learning situations (for example, online academic skills resources). These environments provide a strategic way to address today's increasingly diverse student body, as many students will access online learning resources according to their varied

needs as well as in their own time and at their own pace. Since today's students use online tools for social and learning purposes, academic skills units can exploit this engagement by offering rich discipline-specific online resources that can assist students in developing their academic skills as they move through the curriculum.

Developing university students' writing in the disciplines is a key activity for academic skills advisors. In the science and engineering disciplines, many students struggle with written assessment tasks and may have elected to study these disciplines precisely because they perceive them as relatively "writing free". However, both academics and employers require highly-developed written communication skills (Nguyen 1998; Hagan 2004; Gray, Emerson, & Mackay, 2005) and deficiencies in this area are of ongoing concern (AC Nielson Research Services, 2000). Students entering science and engineering degree programs are soon confronted with the reality that to perform well in their studies and as a professional they must develop a high standard of writing for different purposes and different audiences.

Learning resources and approaches to support such students in developing their writing skills need to address both the purpose and context of the writing task as well as the structure and language of the text. Genre analysis and genre-based pedagogies have been influential in developing these resources and approaches. Genre-based pedagogies offer students, "explicit and systematic explanations of the ways language functions in social contexts" (Hyland, 2007, p. 18). For the online learning project described in this paper, genre analysis and pedagogy in the Systemic Functional Linguistic (SFL) tradition (Halliday, 1985; Butt et al., 2000; Swales, 2004) was used as the basis for conceptual development. SFL sees discipline specific texts as socially mediated writing where the features and conventions that have developed over time become the standard by which novice writers are assessed. SFL has proved to be an effective tool for academic skills advisors to gain insight into discipline-specific writing and to develop instructional materials and resources for their students (Jones, 2004; University of Sydney, 2010).

When moving to an online learning environment, it is important to develop a teaching approach that encourages students to engage in an interaction with the educational media (Prosser & Trigwell, 1999; Laurillard, 2002). Active engagement and learning, where students take responsibility for their learning, is a key component of a constructivist approach to learning (Vygotsky, 1978; Brown, Collins, & Duguid, 1989) and this theory has provided the framework for many online learning environments. Active learning situations are authentic and challenging (Lombardi, 2007), but in an online environment they need to be supported by more explicit guidance and structuring of tasks for effective learning to take place (Mayer, 2002). This means that online resources for developing student writing need to be contextualised in a discipline and aligned with assessment tasks while, at the same time, providing scaffolded examples and exercises to reveal the structure and language of discipline genres.

Collaboration between language and learning advisors and subject area specialists in the development of learning resources to support student writing in the disciplines is well established and has been shown to be highly effective (see for example, Dudley-Evans, 1984; Ballard, 1994; Webb, English, & Bonnano, 1995; Jones, 2004). For many subject specialists, knowledge about how to write in their disciplines is often tacit and this means they may not be confident to offer students guidance on their writing. On the other hand, learning advisors have the expertise to analyse the genres of the discipline and support subject specialists in developing insights into the structure and language of these genres and advise on how they could be taught. Subject specialists in turn can provide insights into discipline knowledge and why certain genres are appropriate for presenting this content. Thus collaborative partnerships can be successful in improving students' writing in the disciplines in both face-to-face and online settings.

Most online writing resources in Australian universities offer sound advice and guidelines for writing in science and engineering disciplines. Many of these resources are versions of print based reference materials (for example, Winckel & Hart, 2002; Hagan & Mort, 2006). Other resources offer a degree of interactivity using the computer-based medium to provide on-screen examples and exercises that target report writing (for example, Study & Learning Centre, RMIT, 2005; Learning Development UoW, 2006). However, in general, there is still little

available for students writing in science and engineering that is discipline-specific, contextualised, and enables students to be active learners. An online resource, WRiSE (Write Reports in Science and Engineering), has been created to fill this gap. It is a unique resource providing an integrated, open source, student-centred, online learning and teaching environment to support learning of report writing by undergraduate students in engineering and science. Subject area staff can embed the discipline specific resources into a course or offer them as an adjunct to support writing in the discipline.

This paper reports on the design, implementation and evaluation of WRiSE, and aims to answer the question whether technology-based delivery of both discipline-specific and contextualised resources to support writing development can assist students to improve their report writing.

2. Design and project development

The design of WRiSE was developed through collaboration among specialists in language and academic skills, subject specialists, eLearning developers and student users. Conceptual design was built on the team members' knowledge of research into computer-based learning, linguistic and ethnographic research into report writing in engineering and science, and pedagogical research and practice in the teaching of report writing both online and face-to-face. A student/user-centred approach was emphasized throughout in the design process and in the design itself. Overall, the project followed a rigorous management plan with defined milestones for project deliverables and a spiral/feedback approach to design and development.

2.1. Project development

The development cycle consisted of two main phases over two and a half years. The first phase included: the collection and analysis of over 150 sample student reports; interviews of academic staff and students to include as sound files in the WRiSE site; content development and design; and technical development of the WRiSE site. Five of the nine report writing modules (biology, chemistry, microbiology, civil engineering, mining engineering) were designed and developed as new modules while the remaining four modules which already existed as online report writing resources were redesigned to fit in with the new site. These earlier modules have all served as prototypes for design, development, implementation and evaluation of WRiSE (see for example, Drury, Langrish, & O'Carroll, 2004). In particular, the Physiology module was the prototype for design and was extensively trialled and evaluated in 2008.

For the second phase of development of WRiSE, implementation included informal trials with volunteers (i.e. students, learning advisors and discipline academics) to identify bugs and errors in the design/programming. This was followed by the introduction and promotion of WRiSE in targeted courses and for specific assessment tasks; and finally, evaluation by qualitative (survey and focus group interviews of students; survey of discipline academics and the project team) and quantitative measures (comparison of report assignment grades for students who had used WRiSE to those who had not; data tracking and analysis of WRiSE usage).

2.2. WRiSE site overview

WRiSE may be viewed at: http://www.usyd.edu.au/learningcentre/wrise. It has been published for use and adaptation under the terms of the Creative Commons Attribution- Noncommercial-ShareAlike 2.5 Australia License. Under this license users are free to copy, distribute, display and perform the work and to make derivative works.

There are nine report writing modules in WRiSE; each covering discipline specific undergraduate reports for molecular biology, biology, chemistry, physiology, microbiology, chemical engineering, civil engineering and mining engineering (Figure 1). The types of reports explained include laboratory reports, field trip reports and research papers.

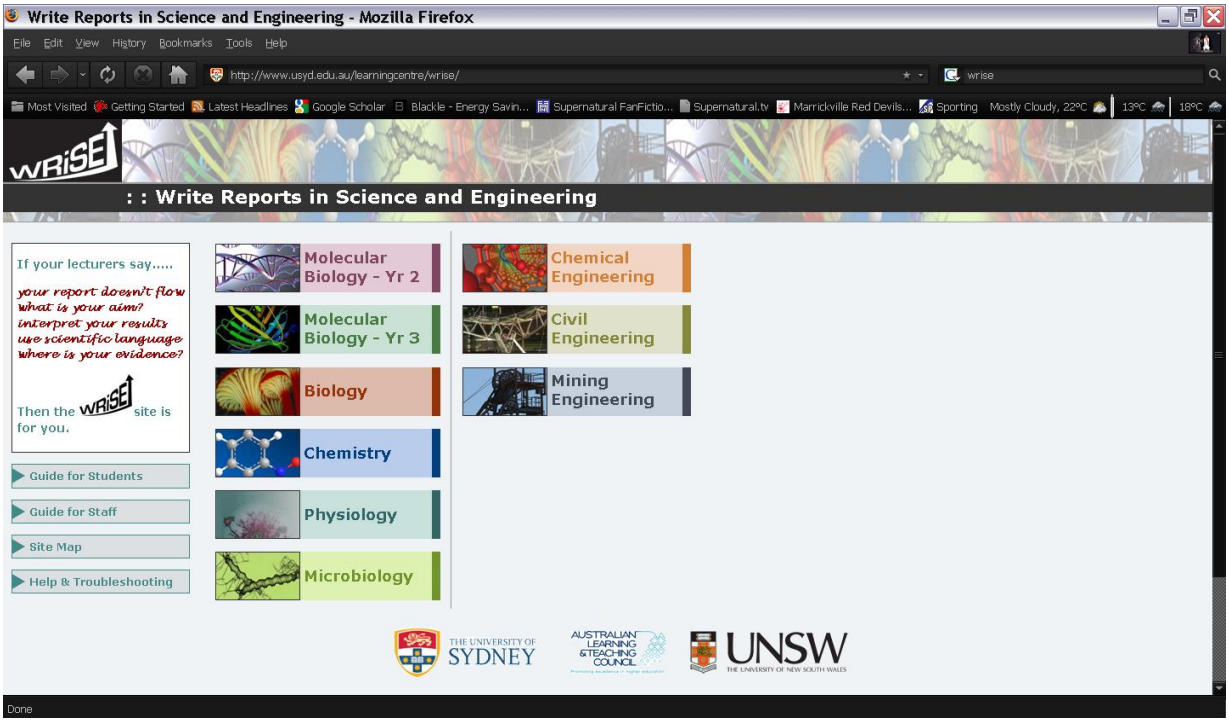

Figure 1. Screen shot of WRiSE home page showing links to the report writing modules and guides for staff and students.

Each module contains two key areas: *Help with Report Writing* and *Help with Understanding Content*. All modules have a similar design and structure so that once a user is familiar with one module, navigation of further modules is relatively easy (Figure 2).

According to Mayer (2002), students learn more deeply from a multimedia explanation than from a verbal explanation, from simultaneous presentation rather than successive presentation, and, from opportunities to control how they navigate multimedia instruction. WRiSE incorporates these principles by use of animation, signaling, immediate feedback, unlimited attempts, and multidirectional navigation. Within each module, *Help with Report Writing* integrates text, colour, animation and sound and contextualises the report type in three ways:

1. The report is presented as a textual image to make explicit the content, structure and language of the report in each of the particular disciplines. This is achieved through highlighted and annotated examples of student reports, interactive and animated explanations, interactive quizzes and exercises with feedback (Figure 3).
2. A student's perspective on the process of writing a specific report is presented by an edited audio interview with a volunteer student. Interviews are from a selection of discipline areas to clarify the specific requirements of each.
3. A lecturer's perspective on a student's report from that discipline area is presented in edited audio interview and also throughout each module there are more details on the lecturer's expectations (in text and oral format) about writing in the discipline.

Within each module, *Help with Understanding Content* is where lecturers can upload information and create interactive exercises on a particular assignment topic. They can refer students to this space and further recommend other areas in the report writing space for students to visit. In this way, the site has been customized to specific contexts, specific assessment tasks, and feedback on these tasks. This area uses free software known as "Question Tools" (Question Tools, 2011) and is intended to be dynamic by allowing permitted users to change the current information and exercises (Figure 4).

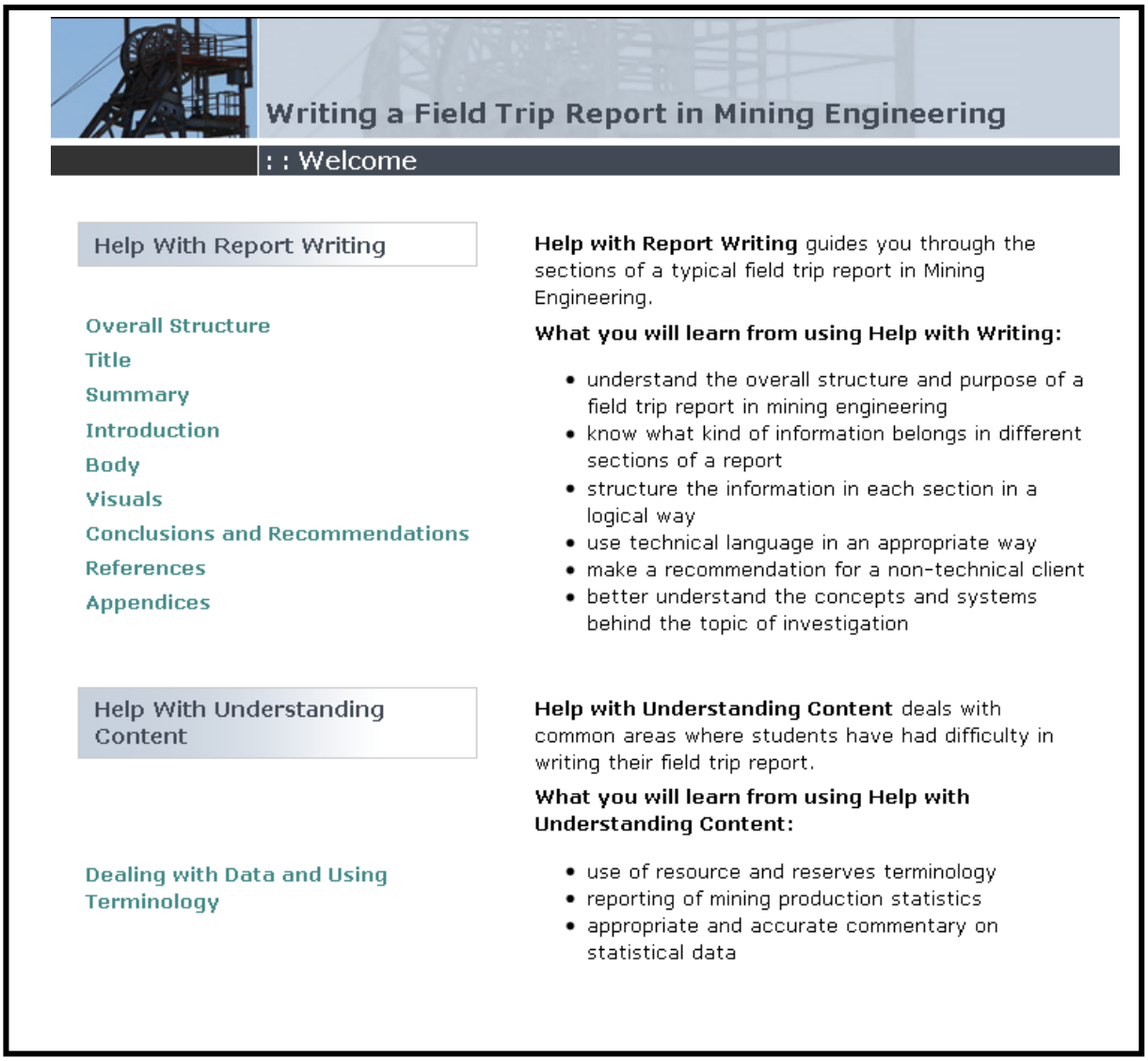

Figure 2. Screen shot of a report writing module welcome page.

In addition to the report writing modules, the site contains a guide for students, a guide for staff, a site map, and a help and troubleshooting area. The guide for students explains how to navigate across WRiSE and within the modules. Advice on how and when to work through the modules is also provided to ensure students gain the most from their use of WRiSE. The guide for staff explains the design, rationale and anticipated outcomes of WRiSE for undergraduate writers. Importantly, advice on how and when to introduce WRiSE to students is provided to ensure the successful integration of WRiSE in the curriculum.

Ultimately the individual student decides how, when, and how long they navigate WRiSE. Depending on the size of the report module, it may take up to 3 hours to complete all the reading and activities for a specific module.

2.3. Evaluation methods

Evaluation was a necessary part of the funding agreement but we also wanted to know how students were using the site and most importantly what they were learning. In particular, we wanted to assess whether an online approach to teaching report writing would bring about effective learning and also whether a discipline-based, contextualised approach would enhance this learning. If students did not use the site, we also needed to know why this was the case. Feedback from staff was also collected on whether the site supports learning about report

writing in their discipline and their impressions of improvements in students' reports. Another important area of enquiry was to compare the performance and characteristics of students using the site to non-users. Questionnaires and site tracking were used to gather data on student use and learning. Focus groups were also used to obtain further insight into these areas. In addition, marks from students who completed questionnaires were recorded so that performance comparisons could be made. Staff feedback was gained both informally (meetings and email) and formally (end of project survey).

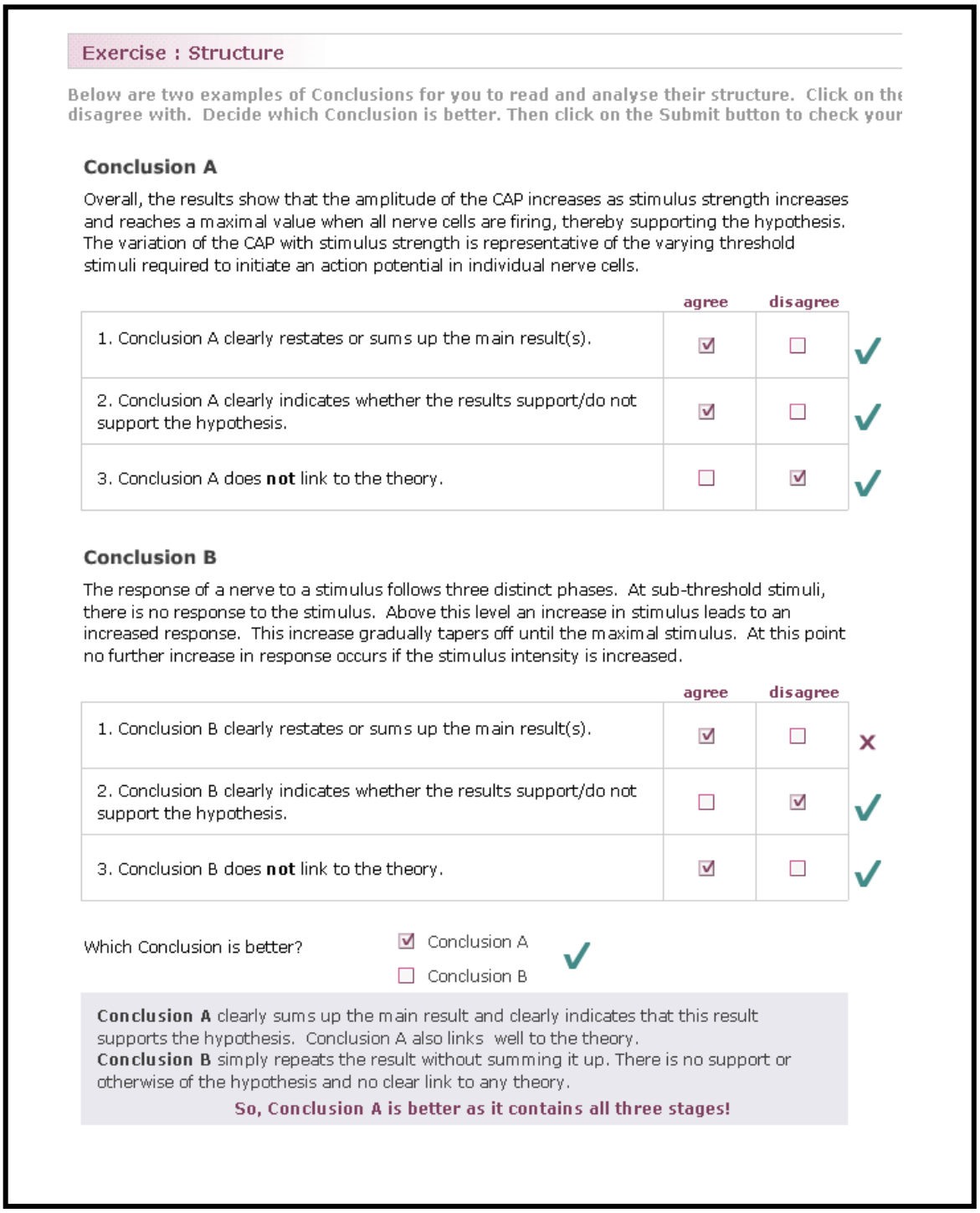

Figure 3. Partial screen shot of report writing exercise with feedback.

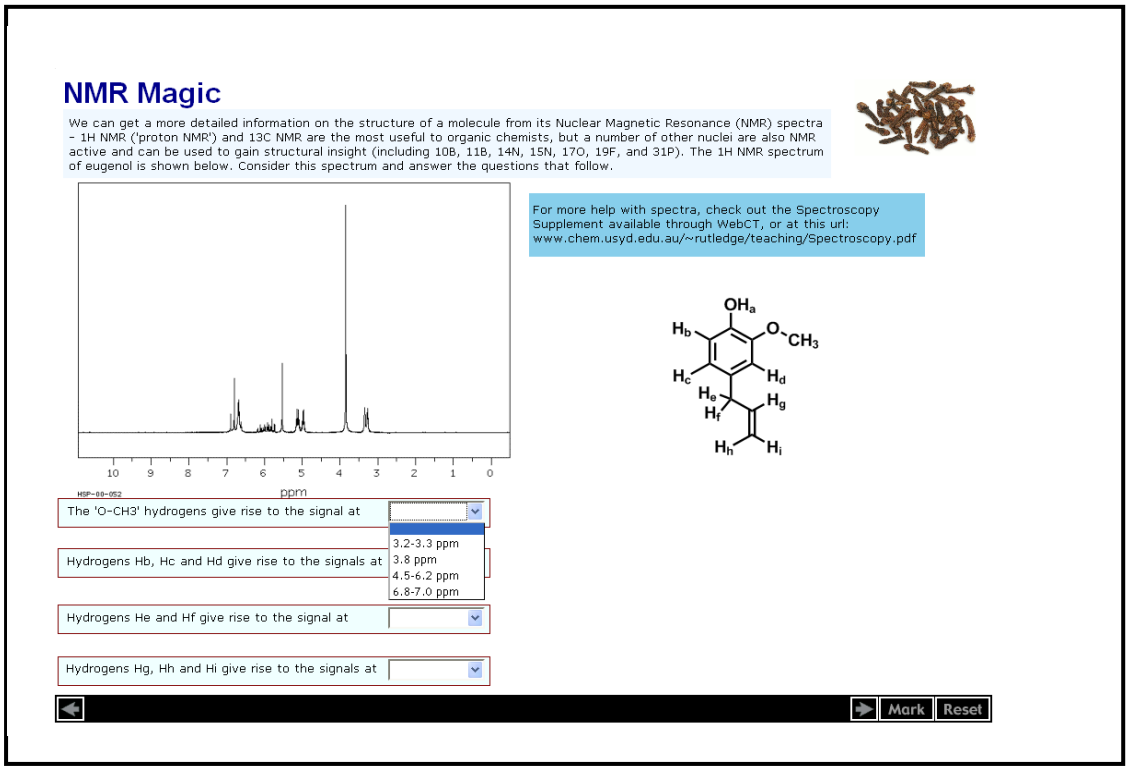

Figure 4. Screen shot of an exercise in the Molecular Biology '*Help with Understanding Content'* module.

Tracking data was used to identify the number of visitors and page/screen views to the site over the implementation period, semester 1, 2009. The potential number of student users was approximately 2000 over six of the discipline areas as Physiology and Second year Molecular Biology were not included since they had not been fully integrated into the site at this stage. In addition, potential users for the civil engineering module were not included in this approximate figure as this module was implemented in semester 2, 2009, when the targeted unit of study was offered and evaluated (Drury, Airey, & O'Carroll, 2010).

The questionnaire used in the survey had already been extensively trialled and refined over a number of years with the evaluation of the individual report writing modules in four of the discipline areas. Data was collected in ten areas as follows:

- students' identity number, degree course and year of study
- background information on age, gender, first language and fluency in English
- writing history, experience and confidence
- self evaluation of performance in preparing and writing reports
- use or non-use of WRiSE
- feedback on WRiSE as a whole
- parts of WRiSE used and method of use
- perception of usefulness of and learning from the *Help with Report Writing* module
- perception of usefulness of and learning from the *Help with Understanding Content* module
- open ended comments on changes made to writing their report after using WRiSE, and most/least helpful parts of WRiSE.

The questionnaire was administered in person to students (n = 417) attending randomly chosen tutorial sessions across discipline areas. This meant that informal feedback could be obtained during the tutorial session while students completed the questionnaire. This method also ensured

a higher return rate. Questionnaire data were statistically analysed to obtain descriptive data and Chi-square tests of independence were applied to compare users and non-users of the site as well as an independent samples t-test to compare marks of users and non-users. Since students provided their student identity number (with proper ethical consent), student marks for the user and non-user groups could be recorded.

Student users were invited via email to attend focus groups of approximately 45 minutes in duration and a reward (book/movie token) was offered as an incentive. Despite this incentive, only 4 groups were held (n = 20 in total). However this data was supplemented by the open ended responses on the questionnaire and the informal student feedback in tutorial sessions. Focus group questions explored what students found most and least helpful about the site, technical problems, whether they preferred paper-based support materials or online resources and what other kind of support they thought would help them to improve their writing.

3. Results and discussion

3.1. Site usage

Tracking data in 2009 showed strong site usage over the first semester of implementation with approximately 1000 unique visitors (approximately half of the targeted cohort) and 60,000 pages/screens viewed. Visitors peaked in mid-May reflecting due dates for report assignments. Tracking data over the same period in 2011 showed a 90% increase in visitors, most of whom (93%) were new to the site. Visitors peaked during this period in both mid-April and mid-May. Recent data for 2012 continues to show an increasing trend of new visitors to the site (approximately 1,200 out of a total of 1,300 unique visitors).This more recent data also indicates a wider national and international usage pattern as the site becomes better known, with international visitors coming largely from the United States, New Zealand and the United Kingdom. More ways of promoting the site both nationally and internationally need to be found as feedback suggests that this approach to supporting report writing in science and engineering is unique and we would like the site to reach its full usage potential before technology moves forward yet again.

3.2. Student feedback on WRiSE

The questionnaire data was collected across seven discipline areas (Physiology and Second year Molecular Biology were not included as they had not been fully integrated into the site at the time of implementation). The data consisted of 417 completed questionnaires from both institutions, of which 242 (58%) were user questionnaires – 170 (University of Sydney) and 72 (UNSW).

Those students who used the site (242) provided information on their usage of the site, their evaluation of the user-interface, and the perceived effect that it had on their report writing skills. The majority of users had an in-depth approach to using the site, visiting it on a number of occasions and spending at least an hour on the site. About half of the users moved from screen to screen, scanning explanations and exercises before choosing an explanation and /or exercise to work on in depth. A further third moved systematically through a whole section while other users focused on the examples or simply read the information available without doing the exercises.

Overall, students rated WRiSE highly. They reported improved understanding of the structure and language of reports through their interactions with the site and increased confidence in their report writing skills. Specifically, they were asked to rate the effect of the *Help with Report Writing* module on their report writing skills in twelve areas (Figure 5) using a Likert scale that ranged from 1, which indicated “Strongly disagree”, to 5, which indicated “Strongly agree”. Overall, participants agreed that the diagrams, animations, example reports, exercises and feedback on exercises helped them to understand the report structure. They agreed that it helped them understand the kinds of language appropriate for a report, that they were now more confident that they understood the structure of a report and scientific language. In particular, they rated the example reports and diagrams most highly and the audio least, although opinions

were more divided on this aspect (Figure 5). In addition, they reported that their understanding of content in their discipline improved as well as their confidence in knowing what content to put in their report.

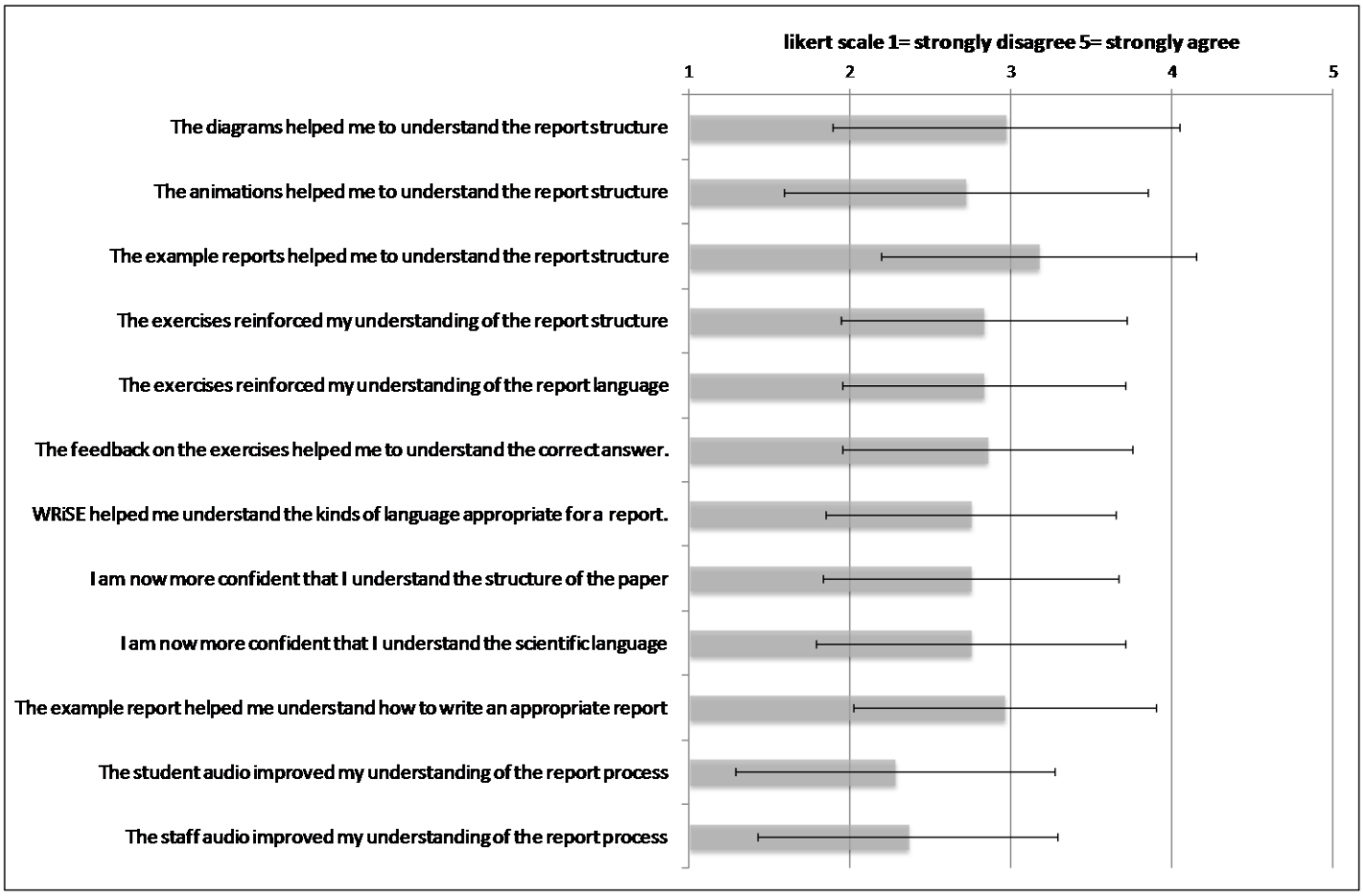

Figure 5. Student evaluation of the Help with Report Writing Module in WRiSE (N=242), showing mean rating (shadow bar) and standard deviation of all ratings (line bar).

Open ended comments from the questionnaire and the focus group comments also supported the fact that from their interactions with the website, the majority of students experienced positive learning outcomes about the structure and the language of reports, as well as the discipline context of report writing. For example:

> *WriSE helped me to think more clearly and concisely about what a scientific report should be like.*
>
> *By providing a model on which to base my first report it assisted me with writing my later report from that guide.*
>
> *I had never seen a report before, I had no idea what was expected.*
>
> *WRiSE gave me the basic structure of what reports are accepted at uni as opposed to high school.*
>
> *I tend to be wordy and the module taught me what to cut off and make succinct.*
>
> *The things I wrote were more relevant, more succinct & less junk.*
>
> *Chemistry is different to biology.*

3.3. Comparing users and non-users

Of the 42% who did not use the site, most reported (in the questionnaire) that they did not know about it. This is despite the fact that it was strongly promoted by discipline staff during the implementation stage of this project. It may be the case that students are overwhelmed with "resources" as one lecturer in the project commented:

> *Students are faced with a huge range of materials, each for specific purposes without clear guidelines as to which should be used for what purpose. I think we need better integration of all learning resources. I suspect we now have too many digital resources for the unit. Thus I need to develop a guide to resources, including the WRiSE site.*

In general, users and non-users did not differ in terms of demographic characteristics, language background, confidence in writing, past writing experience or skill in writing different parts of a report. However, the user group tended to have written longer academic texts (> 7 Pages) than the non-users (< 7 pages) which suggest that the user group were possibly more experienced and more interested writers than the non-user group. Surprisingly, the proportions of NESB and ESB students both using and not using the site were similar.

Using the sample of students who had completed the questionnaire, we were able to compare the report marks of students who had used the site to those who had not. In general, users gained better marks than non-users, although differences were not statistically significant for each discipline except in one instance, Molecular Biology, 2nd year (Figure 6).

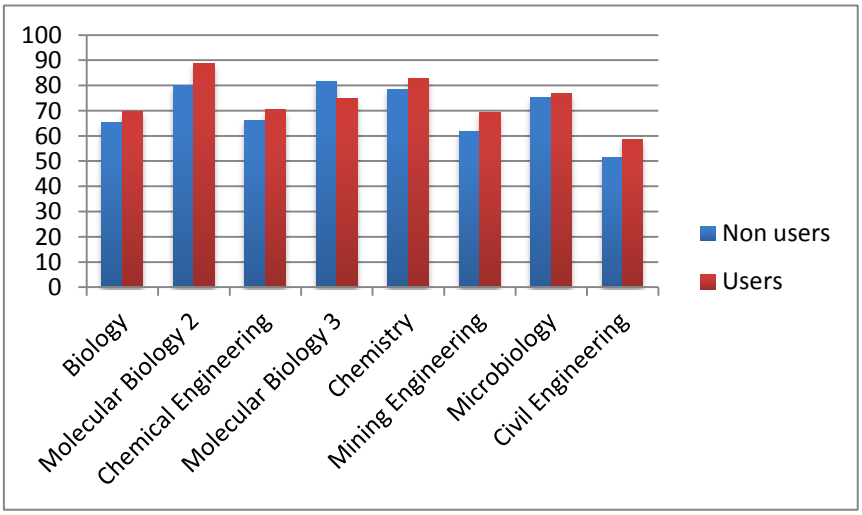

Figure 6. Average report marks (percentage) by each discipline for students who used WRiSE compared to those who did not.

However, when marks were pooled across all disciplines, on average, the report marks of those who used the website (M = 0 .13, SD = 0.97, n = 204) were significantly higher than those who did not use the website (M = -0.19, SD = 0 .98, n = 144; t(306) = -3.02, p = 0.01).[1] Therefore it appears that using the website had a consistent positive impact on report marks across different disciplines. However, since the user group tended to have written longer academic texts compared to non users, further statistical analysis was carried out to control for this variable. This analysis upheld the conclusion that using the website helped students to improve their report marks.

[1] The means reported here are measured in terms of standard deviations above the mean for the entire cohort. That is, those who used the website scored, on average, 0.13 standard deviations above the mean for *all* students while those who did not use the website scored, on average, 0.19 standard deviations below the mean for all students.

3.4. Staff evaluation of WRiSE

Throughout the project, discipline staff provided ongoing informal feedback on the design and content of the report writing modules in meetings and by email. An end of project staff survey was emailed to all 14 discipline lecturers (ten at the University of Sydney and four at UNSW) and four (35%) responses were received. The survey asked for discipline staff feedback on the project processes and outcomes, sustainability, and lessons learned. Feedback (informal and formal) indicated that most staff were satisfied with the project processes and the outcomes both for their students and for themselves. Two comments from the staff survey reinforce this view:

> *I feel we definitely have a well-designed pedagogically sound website. Informal feedback from PhD demonstrators who mark the reports indicate meaningful improvements in student report writing skills. In response to the question "Have you noticed an improvement in student lab reports?", their comments include "Yes !!! by far"*
>
> *There has [sic] been some significant improvements in student report writing in some areas particularly in the area of report structure and writing style*

Staff also commented positively on the development of new working relationships and collaborative links across and within Universities.

4. Reflections

The project team faced a number of challenges in creating and implementing WRiSE. This type of learning resource requires a committed budget and a committed collaborative team with experts from the disciplines of education, applied linguistics, the target disciplines of engineering and science and eLearning. Over a long time frame, in this case two and a half years, staff changes can place a project at risk unless new staff are inducted well into the project scope and aims. During the WRiSE project, staff changes initially caused setbacks but as new incoming project members were keen and motivated, any delays were soon recovered and new team member contributions were also valuable.

As in all projects, communication among project members is vital and although email correspondence is important, face-to-face communication is essential. Finding common times for all project members to meet was difficult and given this situation, learning advisors acted as "liaison officers" within their own institutions, meeting regularly with subject specialists, often on a one-to-one basis, to gain feedback on teaching materials, give project updates etc. They in turn met with each other on a regular basis to ensure good communication between institutional teams and with the eLearning staff.

Allocating design and development time was also a challenge both for learning advisors and discipline staff. Staff new to designing for an online environment needed to rethink the presentation of their learning materials and this often meant that more time was needed than had been planned for a particular module. Any delay impacted on the programming and implementation schedule. Subject area specialists had a further challenge as they needed to find time to be trained in Question Tools software so that they could develop the *Help with Understanding Content* module for their discipline area. Although all staff found developing the instructional activities a creative and fruitful experience, finding a balance between the time demands for design and development and the level of pedagogy required was difficult.

The medium of online learning itself offers both constraints and opportunities for presenting learning materials and approaches for teaching writing. Browser screen size limits the text display such that longer text examples require scrolling. Since we were committed to using authentic student writing as examples as much as possible, this often meant that scrolling was inevitable. On the other hand, the use of colour, animation, audio and interactivity made explanations clearer and exercises more engaging.

Furthermore, using authentic student writing was in itself a challenge. Often good consistent examples were rare as student writers displayed varying ability in different aspects of their

writing. For example, a writer may have good structure in their paragraphs/development of ideas but makes grammatical errors or visa-versa. However, lecturer comments were included on the student examples to identify strengths and weaknesses and in a small number of cases, and in consultation with the discipline expert, some rewriting of example texts was necessary.

Unlike paper-based resources where the print deadline determines the end to any changes, online learning environments are more dynamic and changes are ongoing and often necessary due to changes in technology, hosting of the site etc. Once again, this can be challenging since it requires both financial and time commitments beyond the life of the project. For example, we envisioned the *Help with Understanding Content* part of the site to be the most dynamic with discipline staff making changes each semester or each year, depending on their cohort's learning needs. In fact, due to time constraints and other commitments, the reality is that most of the information and activities in this module will not be changed on a regular basis. However, in many cases this may not be an issue as the concepts and experimental background material will always need to be taught to successive cohorts of students new to WRiSE.

The final and most important challenge was to ensure that WRiSE was used by students. This required regular and authoritative promotion by discipline staff who needed to be informed about WRiSE and its potential so they could encourage their students to use WRiSE. In some courses learning advisors, discipline experts and tutors also demonstrated WRiSE and where computer labs were available, students were given tutorial time to explore and discuss the modules. WRiSE was designed to be used early and often throughout the preparation and production of the written assignment. However in the focus group interviews, some students reported that they chose to access WRiSE just before the assignment was due and were frustrated by the scaffolded quizzes and exercises wanting only to "see" what they needed to do. Clearly, although students will choose their own pathways through WRiSE and use it according to their needs, the earlier they know about this resource, the better use they can make of it.

5. Conclusions

Implementation of a standalone site like WRiSE, no matter how relevant to students' courses or learning, is a critical part of the uptake of this kind of learning support. The main responsibility for implementation rested with the subject area specialists who collaborated with the learning advisors. In the project team meetings project leaders stressed the importance of getting students to use the site in lab sessions or if that was not possible to display and work through part of the site in a lecture. The rationale was that it was best if the subject area specialists rather than learning advisors introduced the site to their students as this would carry more weight with students. For example, when tutors who mark students' reports told students that using the module meant students wrote better and gained better report marks, this certainly made an impact. Clearly, we did not want WRiSE to simply end up as just another link in an online learning management unit of study.

WRiSE has now been in use for 2 years at both institutions and continues to be introduced to new cohorts of students in the way we have recommended. However, with changes in staffing occurring in the discipline areas, it is of ongoing importance that learning advisors continue to promote WRiSE in their networks at institutional, national and international levels. Implementation is also occurring in other teaching settings. For example, in Learning Centre generic workshops, when students attend from the science and engineering disciplines, a quick look at the WRiSE site alerts them to the existence of this extra online support. Also, when running embedded workshops on academic literacy in consultation with discipline lecturers, WRiSE is an extra resource which can be used to highlight a particular aspect of report structure or language.

In summary, positive outcomes from the project include:

- New and stronger relationships have been forged within and across the two universities with a commitment to continue collaborating after project completion.

- Team members (and hopefully students!) gained deep insights into report genres including those which are not frequently practised or for which there were no other resources; for example, field trip reports.
- For all project members the experience has led to increased skills in designing and building online learning materials
- That students' writing did improve is an affirmation of the team's pedagogical choices. The project team believe they have produced what Hannafini and Land (1997) describe as, "concrete experiences that serve as catalysts for constructing individual meaning" (p. 168).
- In 2010 WRiSE received recognition from the Australasian Association of Engineering Education by being awarded a highly commended citation for Programs that Enhance Learning.

The data on student performance and open ended feedback comments show that technology based writing instruction, such as WRiSE, can improve students' report writing. By applying the principles of genre based pedagogy, WRiSE is an effective model for engaging and assisting our students to improve their report writing. As eLearning technologies evolve, the authors hope that WRiSE is integrated in online community academic writing spaces (such as Google Docs, Blackboard, Moodle, etc) and also that WRiSE will serve to guide the creation of new online writing resources in academic disciplines. The authors extend an invitation to Academic Language and Learning educators to visit WRiSE and consider how it may be relevant for their students.

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