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Community, exchange and diversity: The Carrick Exchange



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The Carrick Exchange is a significant new online service that will provide communication and collaboration services, and learning and teaching resources across the Australian and international higher education sectors. The Carrick Exchange is sponsored by the Carrick Institute for Learning and Teaching in Higher Education. It is for those who teach, manage and lead learning and teaching in Australian higher education. The Carrick Exchange aims to provide access to quality learning materials and resources; information about new technologies and ideas that impact on teaching practice and student learning; opportunities for academic and support staff to network with others, comment on and exchange ideas; and a means for academics to participate in discussions, debates and dialogue about teaching. This paper reports on the first component of the Stage 2 *ascilite* research into the Carrick Exchange. Using a design-based research approach, the *ascilite* project team investigated the human issues involved in development of the Carrick Exchange. Twenty-nine key practitioners were interviewed. The interviews generated a comprehensive discipline, cross-institutional, national and international perspective of user needs and contexts of use for a national online repository. The interview findings were analysed in relation to engagement, resource identification and contribution, and peer review. The findings presented in this paper will inform the design, management, utilisation and associated processes of the Carrick Exchange.

Keywords: Carrick Exchange, engaging communities, repositories, peer review

Introduction

Whilst the development of repositories for sharing learning and teaching resources has expanded considerably in the last few years in Australia, many repositories have a particular institutional or discipline focus, rather than a national focus. In Australia there is no dedicated national repository or 'exchange' for teaching and learning resources in higher education catering to the diverse needs of educators in the sector. Nor is there a related community space for teaching and learning providing the required active online forums and work spaces. The Carrick Institute for Learning and Teaching in Higher Education aims to address this gap by developing the Carrick Exchange. The Carrick Institute is a national body established in 2005 with a mission to 'promote and advance learning and teaching in Australian higher education' (Carrick Institute, 2007). A key objective is to 'develop mechanisms for the identification, dissemination and embedding of good individual and institutional practices at a national and international level'. The Carrick Exchange will provide a web-based solution for this problem. Importantly, the Carrick Institute is aiming to create a service that will not be 'more of the same' or another under utilised repository (Dow 2005, in Phillips, Orrell & Millea, 2007, p. 1/10). The primary goal is to build communities and networks of best practice and exchange around the repository. *ascilite* was invited to participate in the developmental research to help achieve these goals and ensure the needs of end users were met. Stage 1 of the *ascilite* research project included a mapping of current practice and repository usage nationally and internationally. This was realised through a literature review and an online survey focusing on repository use and development (Parrish, Bennett, Keppell, & O'Reilly, 2006). During a forum to discuss the findings of the research with key stakeholders in the sector it was concluded that there was a need to go beyond the idea of 'just' a repository. By building on the communication and collaboration possibilities of Web 2.0 technologies, the higher education sector might be better engaged with the Carrick Exchange as a 'hub' for ideas and resources (Lefoe et al., 2007).

This paper focuses on the first cycle of the subsequent Stage 2 research undertaken by *ascilite*. Using a design-based methodology and conducting interviews with key practitioners supported by a review of the literature and related projects, methods for engaging the sector, the identification and contribution of resources, and peer review processes are analysed. Background to the project and the main issues impacting on the research are outlined. An overview of preliminary recommendations for designing the Carrick Exchange is provided. Directions for further research have been identified in the conclusion.

For the purposes of this research the term 'resource' is used for any digital artefact relating to teaching and learning that can be stored electronically, contributed and shared through the Carrick Exchange.

Background

Engagement of the sector and communities of practice

To promote knowledge sharing in the domain of learning and teaching, and engage the Australian higher education community within the Carrick Exchange, it is not sufficient to build a repository of resources, nor merely provide social networking software and spaces for collaboration and community building. The literature increasingly documents a general lack of user engagement with repositories and online services (e.g. Gunn, Woodgate & O'Grady, 2005; Hand et al., 2004; Hummel et al., 2005; Littlejohn, 2003). It is acknowledged that effort should be directed towards the process of engaging the target audience. That is, familiarising groups with the affordances of the Carrick Exchange and its potential to support user needs, and proactively facilitating the development of networks and communities of practice engaged in sharing and developing high quality resources. Ignoring the sociocultural issues relating to learning object repositories is to run the risk of creating an under-utilised service. It cannot be assumed that reuse will follow existence of the repository (Margaryan & Littlejohn, 2007; Philip, 2007). Margaryan and Littlejohn point to the effect various cultural dimensions (organisational, professional, disciplinary and national) may have on the impact, uptake and usage of the system. These factors are further influenced by the community size, member proximity to the resource, the roles of the stakeholders and types of tasks for which the resources in the repository are intended and used.

The use of social networking software to facilitate communication, networking and collaboration amongst users is an important aspect of the Carrick Exchange. In general, social software supports collaborative online spaces such as blogs and wikis; sharing of and commentary on photo, audio and video files; digital storytelling; 3D virtual worlds; and social spaces such as Facebook. Technology usage by individuals is undergoing a change from consumption of content to creation of one's own content and collaboration via networks. However, there is often an unchallenged assumption that this software promotes communities. The Australian Flexible Learning Framework report (Evans, 2007) summarises the critical elements for successful use of social software: an identified need for the software, relevance to users and a supportive 'enabling culture' (p.13).

The Carrick Exchange may well support fully formed communities of practice, plus other looser and more brittle networks. Wenger, McDermott and Snyder (2002), in defining communities of practice, say that a website alone is not a community of practice. Further, development of the necessary domain of knowledge, the community and shared practice over time (through sharing of stories, experiences and methodologies) will present ongoing challenges. McDonald and Star (2006) point to five key challenges in the formation of a community of practice: the need for financial support; issues of academic time poverty; the need for well-placed institutional champions; the difficulty of identifying and quantifying outcomes from communities of practice; and the question of sustainability and ongoing support.

Furthermore, Hummel et al. (2005) indicate policies should be stated clearly 'and not form unwanted obstacles' for communities to develop and that the threshold for entry into the system should not be unnecessarily complicated or high (p.66). There must be sufficient room for the community to self-organise its own structure and facilities. They also suggest that the system should begin with a minimal set of activities and forums to encourage participation.

The Framework report (Evans, 2007) indicates that the best strategies to help staff learn how to use social software tools are action learning, just-in-time mentoring, coaching, and work-based learning. The tools considered to be most useful in assisting staff to learn how to use social software are virtual conferencing and online forums. In addition, the best professional development strategies were blended ones using a variety of opportunities and strategies. The importance of modelling as an enabler as well as a professional development strategy was emphasised. Digital storytelling through the use of multimedia case studies was considered very effective, along with 'learning by stealth', i.e. blending usage into

everyday practices and inviting managers to 'see, hear and feel what happens' (p.22). These are all strategies the Carrick Exchange could adopt.

Resource contribution and models of use and sharing

As well as the communities, networks and workspaces expected to establish around the Carrick Exchange, there will be a repository of quality learning and teaching materials either deposited on the site or linked from websites and databases elsewhere. In a review of repository development in the UK (the CD-LOR Report), the authors warn all repository managers to clearly establish the *need* for any collection (Margaryan, Milligan & Douglas, 2007; Margaryan & Littlejohn, 2007). Defining the collection (Henty, 2007) and communicating the purpose of the repository and its community will be important to the success of the Carrick Exchange. The Australian Partnership for Sustainable Repositories (APSR) investigation into the ten major issues facing repository service providers, relating to research output in Australia (Henty, 2007), uncovered similar issues of lack of engagement to those noted in the CD-LOR report. Senior academics responsible for repository services and data management were interviewed for the APSR research. It was noted that open access repositories have not been taken up with great enthusiasm: an exception was the Cornell University Physics eprint archive (<http://www.arxiv.org>).

This lack of engagement with repositories has been reported elsewhere (Gunn et al., 2005; Hummel et al., 2005; Littlejohn, 2003; Margaryan et al., 2007; Wenger et al., 2002). While studies such as Najjar, Ternier and Duval (2004) may document usage patterns from the logs of repositories, they do not reveal the broader picture of engagement. Some studies of digital repositories and engagement (Bradley & Boyle, 2004; Littlejohn, 2003; Hand et al., 2004) list incentives for use put forward by target users, but engagement still remains relatively low. Repository managers catering to more diverse users, e.g. around national rather than discipline-based repositories, are likely to face greater problems in this area (Margaryan & Littlejohn, 2007). Furthermore, the way repositories are used depends not only on the 'dimensions of repositories' (purpose, scope, target audience etc), but also on 'key characteristics' of their related communities (p.4336).

One of the design aims of the Carrick Exchange is to promote processes characterised by Stuckey and Arkell (2006, p.7) as 'connection' not just 'collection'. Diverse communities and database or repository models are being explored to determine the elements that contribute to their success. Examples as varied as amazon.com, domain.com.au, Wikipedia, Youtube, Edna and MERLOT are being reviewed. Their strategies for engagement and networking, using Web 2.0 technologies, may inform the development of personal and group workspaces for the Carrick Exchange. On amazon.com, for example, registered users are greeted by name and have delivered to them recommendations and updates about available products. The user can collate chosen resources from the site, and develop their own profile of recommendations, ratings and preferences. The system monitors users' preferences, locates resources based on previous searches and returns information that connects users with other like-minded members. MERLOT (<http://www.merlot.org>) uses similar techniques to support its educational community. A mix of these features may be of value to the Carrick Exchange.

Peer review and commentary

The quality and currency of resources added to a repository is critical to ensure user needs are met. A national repository is well-placed to implement a formal peer review system. Peer review as quality assurance could include an assessment of the currency, educational design and construction of resources; compliance with copyright and intellectual property and digital rights management policies; and technical accuracy and reliability. Formal peer review, a lengthier and more demanding review process, might replicate the scholarly peer review process which leads to publication in the higher education sector. Peer review may also be an informal process whereby members of the community voluntarily respond to others' contributed resources, or resources stored elsewhere but linked to the Carrick Exchange. These resources might be finalised products which the authors are happy to publish and share, or resources under development. This informal sharing of ideas could be an important element of the Carrick Exchange and the basis for various communities of practice.

One of the best models of formal peer review for educational resources is that of the MERLOT system in the USA (McMartin, 2004; Nesbit, Belfer & Vargo, 2002). This system is based on the academic peer review practices for scholarship and publication in higher education, an 'expertise-orientated' approach (Worthen, Sanders & Fitzpatrick, 1997). Peer review is recorded for formal recognition of contributors, and usage pattern updates are sent to contributors each year. Building on the MERLOT model, Nesbit et al. (2002) have created a convergent participation model for evaluation of learning objects where

resources are put through a two cycle process: two individual experts assess the resource, then a combined group assessment is made, amalgamating the feedback from both assessments. Other repositories which implement peer review are Intute in the United Kingdom (<http://www.intute.ac.uk/>), and Educause in the USA (<http://www.educause.edu>).

Though peer review is seen as a value adding process, realisation of peer review processes is problematic. The Taylor and Richardson report on *Validating Scholarship in University Teaching* (2001) concluded that at the time of publication, there was a 'window of opportunity' to establish a peer review scheme to assess information and communication technologies in Australian universities (p.87). The project set out to develop conceptual and procedural bases for a national scheme. Reviewers would be journal and conference proceedings editors and it would be the responsibility of those editors to advertise the scheme. A supporting professional development strategy was to be developed and resourced. The project generated a number of options for the peer review process. Despite the positive outcomes of the project, the scheme has not been adopted nationally.

Methodology

A design-based research methodology was adopted for Stage 2 of the *ascilite* research. This required an iterative approach to data collection and analysis, similar to action research in its inclusion of stakeholders during each stage. The difference, however, is that the outcomes of design-based research should be a series of recommendations and/or principles for design (Design-Based Research Collective, 2003; van den Akker, 1999). (See Figure 1.) Within Stage 2, there are four 'cycles' of research. Each cycle moves through the four steps indicated in Figure 1: analysis of the problem by researchers and practitioners; development of solutions within a theoretical framework; evaluation and testing of solutions in practice; and reflection to produce design principles. Cycle 1 for this research includes interviews with key practitioners; cycle 2 is based around the focus groups; cycle 3 includes involvement of reference groups; and cycle 4 centres on the international symposium and forum with *ascilite* members.

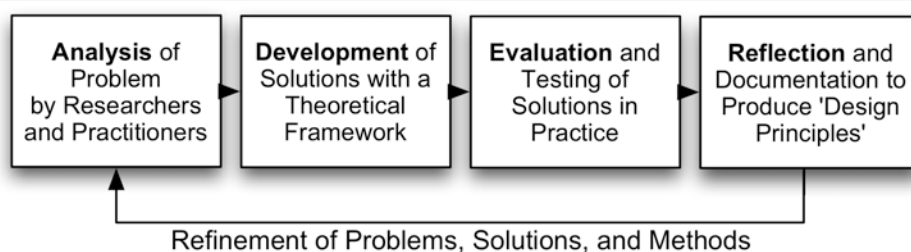


Figure 1: The design-based research cycle. Adapted from Reeves (2000)
(Source: Lefoe et al., 2007, p.112)

For cycle 1 of the research, the project team interviewed twenty-nine key members of the higher education community, liaising with organisations within Australia and overseas as part of the process of developing a well grounded understanding of repositories and their communities based on evidence and experience. National and international interviewees were chosen from across disciplines, institutions and fields of interest. They were identified as those with either a need for online collaboration and communication services for learning and teaching; and/or significant experience in the field of repositories and higher education.

The research questions underpinning all interviews were:

1. What peer review and commentary protocols and mechanisms can be derived from the higher education community?
2. What resource contribution and identification methods will engage and encourage users to contribute and collaborate within the Carrick Exchange?
3. What are the successful methods for establishing and maintaining engagement (i.e. use, reuse and recognition) by the higher education community with the Carrick Exchange?

Each interview was conducted by a single interviewer (one of the five *ascilite* project team members) either face-to-face or by phone, and recorded with the participant's consent. Interviewers took notes during the session and a summary of the interview was made. In five cases records were created from notes only, due to failure of the technology. Transcripts were returned to interviewees for validation and

then entered in an NVivo database for identification of emerging themes and analysis. Cross-checking of themes by two *ascilite* project team members was undertaken to increase reliability. This assisted in the validation and preliminary interpretation of findings reported in the next section.

Key findings and suggested strategies

In this section of the paper the main findings and implications drawn from the interview analysis and literature review are discussed and synthesised in three areas: supporting engagement; encouraging resource identification and contribution; and the processes for peer review. It is acknowledged that there is some necessary overlap in several of these claims, issues and concerns. Each interview covered a number of areas of interest, including the design, management, utilisation and associated processes of repositories. Depending on background and experience, interviewees were able to add more depth to some questions than others.

Supporting engagement

Key themes identified in the research included development of communities, methods to achieve ‘buy-in’ at all levels, targeting of specific contributors, and use of collaborative spaces. The following claims, issues and concerns drawn from the interview data and literature review are specifically aimed at supporting engagement.

One interviewee offered the following observation: ‘It’s important to conceive of the Exchange as a community supported by a repository, (or an exchange mechanism or transaction mechanism), as opposed to being a repository – supported by a community’. Undoubtedly, the Carrick Exchange must note this emphasis, and be proactive in promoting its developing communities. The MERLOT discipline-based model of communities was suggested as a valid option. Consistent with the findings of Hummel et al. (2005), one interviewee suggested that there is likely to be an active core group of users within any project, while others will engage at a low level, and the Carrick Exchange will need to be aware of this and cater for a diversity of users.

Overall, to promote use and establish credibility, interviewees suggested that the Carrick Exchange must be easy to use, integrated with other university systems, and well maintained into the future. It should be aligned with other national, higher education and institutional initiatives (such as the Australian Partnership for Sustainable Repositories (APSR), the Australian Research Repositories Online to the World (ARROW), and the Meta-Access Management System (MAMS) project). Support for its use at the highest levels of universities is imperative. Securing ‘buy in’ from individuals and institutions was agreed to be one of the major issues facing the Carrick Exchange. Some participants warned that there must be a clear demand or need for the Carrick Exchange, echoing findings from the research (Margaryan et al., 2007). Overall, there was a healthy scepticism about the project but a willingness to engage and promote it. ‘Added value’ must be demonstrated, otherwise academics are unlikely to use the tools or share resources and experiences.

Carrick Exchange advocates or champions should be identified to assist with promotion and integration of the innovation. The idea that champions might ‘travel around’ and promote contribution to the Carrick Exchange was seen as a viable strategy. This model is followed within the Learning Object Repository Network project in the Vocational Education and Training sector. In addition, interviewees reinforced the need to win over key stakeholders. Two repository representatives commented that different strategies were required for engaging managers compared with strategies necessary to engage teaching and support staff and other individuals. In one case, it was noted that some managers tended to think that a repository would be of limited value because the institution already had a learning management system, indicating a lack of understanding of the different purposes of each system. Consequently, the Carrick Exchange will need to target special groups or individuals (e.g. librarians, staff and educational developers, and staff within research offices), particularly in the early phases of the project, to promote effective use and provide models of usage and community building. A model to draw on is the RUBRIC project (Regional Universities Building Research Infrastructure Collaboratively) which involves librarians in implementation processes.

In terms of who will use the Carrick Exchange, interviewees advised there are still many teachers in higher education who use technology in a very limited way. Nonetheless, many beginning higher education teachers may find the resources of the Carrick Exchange very useful (e.g. resources on teaching methods and strategies, professional development etc). Further, the availability within the Carrick Exchange of collaborative spaces was seen as a positive new initiative, particularly for cross-institutional

groups. In particular, according to one participant, cross-institutional consortiums want to use 'spaces outside their own institutions that are easily accessible and not restricted by institutional firewalls, administrative practices and other technical constraints.

Perceived or actual disincentives or barriers to engagement that will also need to be addressed include: authentication and metadata procedures; currency and quality of the resources; the costs of contribution or membership; maintenance issues for the originating authors; and the perception that there are few rewards or benefits for contributing – that there is only extra work.

Encouraging resource identification and contribution

The main themes that emerged regarding resource identification and contribution included issues of sharing generally; the identification of types of resources; the need for well-developed metadata and the importance of a new role for librarians in repository development; policies, advocacy and leadership from the Carrick Institute. There were also broader concerns about educational support, culture and change management; rewards and recognition; intellectual property issues; tracking and evaluation mechanisms; funding and implementation models to ensure longevity; and strategies for marketing, communication and dissemination.

Issues of competition and the culture around sharing were consistently raised by interviewees. One of the reasons for the lack of a culture of sharing in higher education is reflected in this comment: 'People in an academic environment . . . are [so] nervous about how polished their material is and [whether] it should go out if it's not polished'. Additionally, some institutions may have a problem with academics sharing courseware that could be reused by competitors. These same institutions may be more likely, however, to share more generic resources that do not raise the same concerns. Some viewing the Carrick Exchange from an institutional perspective warned that if an institution is committing resources to a national repository initiative, it needs to evaluate the impact of that contribution. This was a concern for individuals committing their discretionary time, as well as institutions as a whole. The issue of intellectual property (IP) and lack of alignment between institutional policies on ownership of resources, intellectual property rights and copyright, and individuals' understanding of the policies was often raised by interviewees.

To ensure the benefits of sharing and reuse are realised within the higher education sector, mechanisms and strategies for reward and recognition for contribution to the Carrick Exchange will need to be established. Awards from the Carrick Institute for excellence in resource development, contribution and sharing would be well regarded. Certificates noting contribution to the Carrick Exchange and the extent of re-use of resources could help towards developing teaching portfolios for promotion and tenure. Rewards and recognition from the Carrick Institute should be linked to institutional promotional systems and acknowledged. The *ascilite* research indicates that there is a need for more research in this area to ensure alignment of individual and institutional goals.

In terms of resource types, a national repository which contains, or provides links to, an extensive range of materials on learning and teaching and professional development is likely to be well received by the sector. Some interviewees commented that contextualised resources are important, as well as resources that can be amended. Resources associated with 'commentary' that includes discussion of how resources could be used and whether implementation was successful were seen as valuable. In contrast, a VET sector representative noted that some staff have no time to read through additional commentary and that teachers need to quickly locate and download resources 'put out there for sharing'. It may be that reuse depends on the resource type, the expertise of the user, and the context of use. The findings of Hand et al. (2004) drew similar conclusions.

Participants suggested making a strong connection between the Carrick Exchange project, institutional repositories and other projects such as Carrick Institute projects. They could see there was a case for tying the provision of Carrick Institute grant money to a requirement to contribute to the Carrick Exchange, thereby helping to seed the repository with quality resources for sharing. On the whole there was a perception that the Carrick Exchange should foster resource contribution at the discipline level (this would follow the MERLOT model), with the Carrick Institute providing leadership and advocacy and support through policy initiatives.

Processes for peer review and commentary

Many interviewees agreed that a key method to ensure quality and usefulness of resources within the Carrick Exchange was a system of peer review. Aligning peer review with current processes for research and publication was considered a good model. This does not ignore benefits of the social and professional side of the Carrick Exchange which will have Web 2.0 tools to encourage discussion, collaboration and connect people with common professional interests.

Many interviewees suggested that all resources should be clearly identified as to their status regarding peer review and quality assurance. When asked about a system of quality control for the Carrick Exchange interviewees agreed that the following three tiers would be desirable:

- a. formally peer reviewed resources;
- b. resources receiving limited review, i.e. quality assurance only; and
- c. resources submitted 'as is', receiving no quality assurance or peer review.

Some interviewees also suggested that resources be categorised as 'reviewed by an expert', 'reviewed by a user', and 'not for review'.

Current repository managers indicated that they had quality assurance or editorial processes in place for their resources, and where possible quality assurance should be as automated as possible (e.g. alerts to notify of broken links, automated metadata tagging). Quality assurance has both educational and technical dimensions to be assessed. To speed up the process of sharing resources once placed in a peer review workflow, it was suggested that resources could still be made available to the community prior to peer review but be labeled as 'under review'.

The question of peer review of educational resources was considered more complex than peer review of scholarly research papers. Those familiar with this type of assessment pointed to the greater number of variables and the difficulty of assigning criteria. They raised issues about measuring educational effectiveness and assessing efficacy with students. In addition, the benefits of formal peer review must be weighed against the need to make resources readily accessible within short time frames, to maintain currency and value of the resources. Evaluation from multiple perspectives was considered important by those with experience in this area, assessing for example: the quality and accuracy of the disciplinary content of the resource; the pedagogical soundness; the technological soundness and interoperability; and the user perspectives of the resource (e.g. students' views).

The issue of formal, blind peer review, versus review by identified reviewers was raised with some interviewees. Representatives from one university suggested that peer review should not be conducted 'blind', but that reviewers should be named and accountable (see Bates, Loddington, Manuel, & Oppenheim, 2006). Given the small size of the Australian higher education community, there may be difficulties implementing a blind peer review process. Certain key practitioners thought that formal peer review could be a barrier to contribution for some academics, hence the need to enable contributors to opt in or out of the process. MERLOT's review process was considered outstanding in ensuring high quality reviews, though resource intensive. Having a mixed team of expert reviewers was considered advisable, so that the technical, pedagogical and discipline-based perspectives could be considered.

Informally contributed feedback or narrative, known as 'commentary' is another form of peer review. This type of commentary on resources contributed to the Carrick Exchange was generally perceived as a valuable form of feedback, especially on developing resources. Some cautioned that there could be contributors who may not want feedback or commentary on their resources, nor would they necessarily have the personal capacity over time to field questions from other users about their shared resources. While commentary was considered a valuable asset, understanding how this might be encouraged and effected, given the time commitment, was questioned. The literature indicates that few will commit time to the informal peer review process (e.g. Nature, 2006). The context of the commentary may be important here, as members of small group collaborative spaces may be more inclined to share ideas as commentary, than members would in the more open, public spaces also proposed for the Carrick Exchange. Further, the validity of a numerical rating system (e.g. one to five stars) as part of an informal review of resources was questioned, but still seen as worth implementing.

Design principles

Many design principles were derived from the cycle 1, Stage 2, research. However, the following seven principles are perhaps the most important for repository and community development.

1. The purpose of the Carrick Exchange must be well articulated so that the community and its repository of teaching and learning resources evolve in accordance with the needs of the target user group, and provide the services required by the sector. It is important that the Carrick Exchange does not duplicate what is already available in the sector.
2. To engage the sector, effort and resources must be put towards managing cultural and pedagogical change around the issues of sharing.
3. The Carrick Institute should make it conditional that Carrick Institute grant holders contribute to the Carrick Exchange as part of their obligations in return for financial support. As a consequence there would be an expectation of high quality resources being placed in the Carrick Exchange.
4. There are issues of trust that must be addressed: trust in the system (ease of use and methods of access from individual institutions); credibility of informal peer review processes (e.g. the validity of a ratings system); trust in the management of intellectual property rights by individuals and their institutions that will affect the practice of sharing; and trust that there will be adequate rewards and incentives to support contribution to the system.
5. The Carrick Institute is well placed to provide rewards and incentives for contribution and sharing that carry prestige and can be used by teaching and support staff towards promotion and tenure.
6. Formal peer review based on the system used for scholarly peer review of journal articles is considered to be a good model for peer review of educational resources. However, the Carrick Exchange must develop processes and criteria that enable reviewers to adequately assess problematic areas such as 'educational effectiveness'. Review teams should include a mix of experts, e.g. discipline, educational and technical specialists.
7. Formal peer review of resources is recognised as a resource intensive procedure and more in the domain of a national repository such as the Carrick Exchange compared to institutional repositories which may operate on less formal practices.

Conclusion

While the key practitioners interviewed were generally positive about the Carrick Exchange, they nevertheless viewed the initiative with caution. This may be because many have considerable experience with technology and ICT initiatives in universities and know that creative innovations need more than good will to sustain them. Addressing the technological, cultural and pedagogical change management issues is seen as a considerable challenge. Nonetheless, given the credibility and status that the Carrick Institute has within the sector, those interviewed saw that the Carrick Institute was in a position to lead effective change at a national level. Clarity is required over issues of intellectual property and digital rights management, and institutional ownership of resources, otherwise uncertainty will continue about the benefits and legitimacy of sharing and reuse within the sector. Many academics have a general desire to share effective pedagogy and resources, but there is inherent competition within higher education that works against a culture of sharing. There is competition amongst individuals and institutions. Formal peer review was seen as a positive initiative and one that few institutional repositories have the resources to implement. Therefore, a national approach to peer review was considered beneficial. However, the attractiveness of formal peer review, as a means of rewarding and documenting good learning and teaching, must be weighed against the disincentives of the formality itself, and the time taken to complete thorough peer review. Most were positive about informal peer review and commentary on developing or fully developed resources, and about forums, networks and workspaces which might promote and support learning and teaching.

Clearly the Carrick Exchange will need to show leadership, provide champions and act as a sponsor beyond the early stages of the initiative. Communication with the sector will be key to achieving engagement in the short and long term. The literature, current repository managers, and other key practitioners have emphasised that, to be effective, the Carrick Exchange needs to be based on identified needs. The Carrick Institute Grants Scheme for learning and teaching could provide a natural focus for activity on the Carrick Exchange: a database of resources created by and for Carrick Institute projects would be well received by the sector. Backing this with an incentive and rewards scheme linked to institutional promotion and tenure policies is likely to encourage participation.

This paper reports on the first cycle of the *ascilite* Stage 2 research, and will directly inform the development of the Carrick Exchange. The second cycle of Stage 2 to be reported will include feedback

from focus groups which have reviewed cycle 1 findings and recommendations. The focus groups were drawn from a sample of stakeholders within the Australian higher education sector and a broad range of universities. Participants' responses to the findings will provide a further level of analysis. In cycle 3, expert reference groups of *ascilite* members will then provide commentary on the focus group data and theoretical evidence, to ensure accurate representation of the findings for the next iteration of research. In the fourth and final cycle for Stage 2, the *ascilite* community will be invited to provide feedback on the research through a symposium at the 2007 *ascilite* conference. A set of general design principles will be drawn from the final analysis of Stage 2 in keeping with the requirements of the methodology. By continually and iteratively engaging the target community in the research and development processes in this way it is expected that the Carrick Exchange will be more likely to meet the needs of its diverse stakeholders; i.e. those within the Australian higher education sector who teach, manage and lead education. Ultimately, the success of the Carrick Engage should be reflected in richer learning environments for students at Australian universities, as more teachers within the sector share best practice and excellent resources.

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