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A Deeper Understanding of Reuse: Learning Designs, Activities, Resources and their Contexts

Sandra Wills* and Chris Pegler†

This paper positions discussion of learning designs in the broad context of reuse and repurpose. It proposes that not enough attention has been given to the *purpose* of reuse and the motivation of those who choose to share or use reusable learning resources. There is a need for both a broad and deep understanding of what occurs when designs, activities and resources with potential for reuse are encountered in practice.

The paper compares two longitudinal case-based studies, one from Australia and one from the UK. The independently conceived and executed investigations shed light on what influences reuse of designs, activities, and resources.

While Wills has tracked the reuse of online role play designs, activities and resources to create a deep understanding of reuse and repurposing of specific resources, Pegler has drawn on five significant UK-based case studies representing different levels of reuse-focused activity, ranging from personal to national initiatives. Mapping the two studies, both representing extensive doctoral research (Wills, 2010 and Pegler, 2011), reveals a general consistency in the factor types identified and a common focus on the influence, complexity and importance of context.

In exploring academics' thresholds for reuse, Pegler proposes the concept of "zones of proximity" and Wills proposes "nuances of reuse". Both concepts highlight that reuse currently more typically occurs in close contexts. The paper points to the need for research to be directed towards understanding how to better facilitate the goal of sharing and reusing of learning designs, resources and activities, globally.

Introduction to reuse and repurpose

This paper positions discussion of learning designs within the broad context of reuse and repurpose. It compares two independently conceived longitudinal case studies on reuse: Wills (2010) and Pegler (2011). Within the topic of reuse, various terms and concepts have emerged such as Learning Objects, Open Educational Resources (OER), Reusable Learning Objects (RLO), Reusable Learning Activities, Repurposable Learning Objects, Generative Learning Objects (GLO) and Learning Designs. In education, a useful "reusable chunk" could be a piece of content but it could also be a generic design for a sequence of learner-centred activities, (reusable) resources and supports (Oliver, Harper, Hedberg, Wills & Agostinho, 2002). In reflecting on the constructs of Learning Object versus Learning Design, Wills (Wills & McDougall 2009) expanded the concept of Learning Object to include

Learning Designs as a sub-set because they too are sharable resources, albeit generally content-free. Wills' study contrasts reuse of learning designs with reuse of learning resources in order to shed light on issues for uptake of learning designs. Pegler's study concentrates on reusable learning resources and adopts the term Open Educational Resources.

The widespread reuse of digital online resources in technically efficient ways has often been described as a Holy Grail within e-learning (Weller 2004; Ferguson et al. 2007) and is a key concept behind the Larnaca Declaration. It is assumed that uptake and adoption of educational technology in teaching will be faster if teachers reuse educational resources developed by other teachers rather than "reinventing the wheel". University teachers use educational materials, digital or otherwise, by breaking the materials into their constituent parts, reusing those parts that are relevant to their subject, context and perspective, and reassembling those parts from the original package along with parts from other packages to form a new set of educational materials. It is assumed that systems that mirror teachers' natural instinct to reuse chunks in their own preferred order

* Charles Sturt University, Australia
  swills@csu.edu.au

† Open University, UK (retired)
  chrispegler1st@gmail.com

for their own context will assist uptake and adoption of educational technology. The vision for reuse is expressed in the Larnaca Declaration (Dalziel et al. in this Special Collection) and yet there is a lack of research on how this theory works in practice.

Reuse has often been associated with e-learning, not because reuse does not occur within other forms of learning and teaching, but because the scope of reuse is different when learning and teaching occurs online. The digital online format allows many users to access the same resource without compromising access for others and without consumption of the original. Reuse of learning resources within UK HE has also been recognised for some time (Boyle, 2003) as relying on some element of techno-logically-mediated repurposing or adaptation of resources to re-contextualise them. This ideal of potential to repurpose continues in discussion of reuse (e.g. Kernohan, 2010), with Bissell (2011) suggesting that the licence adopted should be as open as possible to facilitate the making of derivatives.

Focus of two previous studies on reuse

The rationale for Pegler's study was that, while technical barriers and enablers to reuse have been well addressed in literature on reuse, from reusable learning objects (RLO) to OER, less attention has been given to the *purpose* of reuse and the motivation of those who choose to share or use reusable learning resources. The questions of which factors have impact or influence on reuse, and how they relate to each other, are largely unexplored.

Addressing intellectual property rights (IPR) barriers has dominated the discussion about reuse practice for many years. Rights issues have deflected attention from other barriers and enablers which may have significant effects on reuse. Non-rights concerns now needed to be identified, understood, and where they prove significant, addressed.

The rationale for Wills' study was to improve potential for reuse by identifying *design* factors in reusable e-learning resources, focussing on both reusable learning designs and reusable learning objects. Online role play was the context. It was proposed that issues around reuse of active, authentic and collaborative learning environments such as online role play may be different from reuse of small chunks of content which has been the (stereo-) typical portrayal of RLOs.

Typically a RLO has been defined as a small chunk of learning material because a low level of granularity means it is easier to reuse, as it is, without modification. The larger a learning object becomes, the less likely it might be to meet all new needs in the new context to which it is transferred and the more likely it will need adaptation. Previously, the e-learning industry would have deemed an online role play too large to be categorized as an RLO. However, following Wiley's definition of Learning Objects (2000; 2002) as anything that can be reused, Wills describes Learning Designs as an example of a digital resource that can be reused.

The two studies adopted differing terminology, as seen from the description above, ranging from RLO to OER, which reflects the differing years of data collection and cultural differences in the two countries. To reduce confusion for the reader in the remainder of the paper, the authors choose to now use one term, "reusable learning resource", unless specifically referring to Learning Design.

Methodology and results from the two previous studies

This paper compares the two longitudinal case-based studies drawn from across a decade. Both researchers are educational practitioners and national award winners[1] which has provided an access and closeness to their cases, and to the networks of their case participants that is unusual. The independently conceived and executed investigations into factors shed light on what influences reuse of designs, activities, and resources. While Wills has tracked the reuse of online role play designs, activities and resources to create a deep understanding of reuse and repurposing of specific resources, Pegler has drawn on five significant UK-based case studies representing different levels of reuse-focused activity, ranging from personal to national initiatives. Both researchers used grounded research approaches drawing on qualitative data (group and individual interviews) and quantitative (survey methods), with Pegler also using data capture observation.

Wills Study

Fifty-three online role plays in Australian higher education were identified and tracked between 1990 and 2006 (Wills, 2010). Interviews and surveys led to the creation of a generational mapping of the online role play designers. From this map it was calculated that forty-five role plays were a reuse of another role play (**Table 1**), demonstrating that the topic of reusability is an important one in higher education.

However, there were only eight instances of reuse of the same **role play itself** (18%). Predictably these eight instances were a reuse within the same discipline. Meanwhile, 82 per cent of the instances were a reuse of another's role play **design**. This high percentage confirmed the importance of research about learning designs to guide and underpin programs for sharing good teaching practice.

Interestingly, the transfer of role play design ideas was mainly to different teachers in different disciplines whereas it was predicted that the ideas would be more likely picked up by teachers in the same discipline. Additionally, the results show that teachers who were reusing were almost as likely to be at different universities as at the same university. Whereas proximity is an influence in reuse of the same role play, proximity was not a significant affordance to reuse for learning designs.

The eight instances of reuse of the same role play involved four role plays. These four were analysed in more detail via case study methodology, documenting their history of reuse. This case study analysis, conducted three years after the earlier mapping, identified further instances of reuse for these four online role plays (**Table 2**).

The study was seeking design factors influencing reusability including starting from a known learning design

Reuse by different *teacher*

	in **same** discipline		in **different** discipline	
	same university	different university	same university	different university
of **same** role play	5	2	0	0
of **same** role play **design**	9	1	19	12

Reuse by same *teacher*

	in **same** discipline		in **different** discipline	
	same university	different university	same university	different university
of **same** role play	0	1	0	0
of **same** role play **design**	2	2	1	1

Table 1: 2006 analysis of reused role plays comparing different teacher or same teacher & comparing different university or same university (n = 45).

Reuse of ...	Middle Eastern Politics	Idontgoto Uni	Round Table Discussion	Mekong eSim
same role play by different teacher/s in different university in same discipline	one instance repeated numerous times	almost	2	1
same role play by different teacher in same university in same discipline		3	2	3
same role play by same teacher in different university in same discipline		2	1	1
same learning design by different teacher in different university in different discipline	numerous		2	3
same learning design by same teacher in different university/context in different discipline			1	1
same learning design by different teacher in same university –in different discipline –in same discipline		8	1	3
same learning design by same teacher in same university –in same discipline –in different discipline			1	1 1

Table 2: 2009 instances of reuse for each of the four online role plays.

however the case studies also brought to light important design *context* factors. The factors identified as influences on reusability in the case studies are summarized in **Table 3** according to whether the factor operated FOR or AGAINST reuse.

In general, in these case studies, the **design** factors which contributed to reuse are: access to a secure and reusable platform; small class size and small number of roles; an interesting and rich scenario which at the same time is not overly-complex; embedding the role play activity and assessment in the departmental curriculum; clear place for debriefing as an important step in the sequence of learning activities; guidelines and training for teachers and facilitators involved in the online role play; and

branding of the online role play so that it has an identifiable, memorable name and image.

Design factors which at times worked **against** reuse include large class size and large number of roles; difficulty of reaching consensus or resolution, a factor related to size; personal style of the original facilitator which other facilitators might not be comfortable with such as humour or sarcasm; cross-disciplinary or cross-institutional implementation involving collaboration with others students and teachers leading to extra organizational workload.

The **contextual** factors which impacted the design process positively are: collaborative design by partners including a significant role for educational developers;

	Middle East Politics	Idontgoto Uni	Roundtable Discussion	Mekong e-Sim
Design Factors				
Platform	FOR/AGAINST	FOR	FOR/AGAINST	FOR
Size	AGAINST	FOR	FOR	AGAINST
Scenario	AGAINST	FOR	FOR	FOR
Embedded in the curriculum		FOR	FOR	FOR
Designer's personal style		AGAINST		
Resolution	AGAINST		AGAINST	AGAINST
Debriefing			FOR	FOR
Facilitation guide &/or training			FOR	FOR
Cross-disciplinary &/or cross-institutional student collaboration	AGAINST			AGAINST
Branding & marketing				FOR
Design Context Factors				
Discipline expertise	AGAINST	AGAINST	AGAINST	AGAINST
Partnership & collaboration	FOR	FOR	FOR	FOR/AGAINST
Educational developers		FOR	FOR	FOR
Scholarship		FOR	FOR	FOR
Licensing & legal contracts		FOR	FOR	FOR
Intellectual property	AGAINST	AGAINST	FOR	
Identity & territory of HE staff		AGAINST		

Table 3: Summary of factors influencing reusability in four Australian role plays.

recognition of the value of a scholarly approach to evaluation and publication about the innovation; establishment of legal contracts and licensing agreements for governing reuse by others.

A significant contextual factor which worked **against** reuse in two of the cases was conflicting and unclear perceptions of intellectual property rights. Partly related to this factor in one case were differing perceptions of the identity of academic staff and professional staff and the territory in which they may operate in terms of scholarship and intellectual property. This factor has implications for the role of what are variously called educational developers, learning designers or instructional designers as well as for the role of tutors in the higher education workplace.

Another contextual factor was that the four online role plays required significant discipline expertise for the role play itself to be reused. The high level of discipline expertise may be a reason why learning objects and repositories are not as common in the higher education context as they have become in the school and technical education contexts.

The design factors and design context factors which contributed to the reusability of the four online role plays in this study can be framed more generically as factors influencing the design of reusable learning resources (**Table 4**). The fifteen factors warrant attention when developing e-learning resources to be reusable. These factors particularly apply to those reusable learning resources

that involve active, authentic and collaborative learning such as online role plays.

It is noticeable that cost has not emerged as a factor in the design of online role play because it usually appears on the list in most studies. However, this type of learning design is a low-cost learning activity, one of the reasons for its usefulness. Therefore cost need not be a consideration, unless designers decide a graphically immersive 3D learning environment is required to meet the learning objectives or if video is used as the trigger scenario.

Pegler study

Pegler drew on case-based research conducted across five reuse contexts within the UK higher education sector, representing a span of initiatives over an eight year period (Pegler, 2012). The cases ranged from a project exploring personal and informal reuse strategies with focus on blogs and wikis, to activity underpinning formal national and institutional repositories. Reuse activity noted (i.e. sharing and/or use), included personal/institutional; formal/informal; distance/blended learning scope of activity. The cases also included reuse activity at different scales: course/module; intra-institutional (departmental); geographical (regional and national); and intra-disciplinary. Each of the cases occurred between 2003 and 2010 and each was directed at facilitating reuse of digital online resources, or using reusable resources, within UK higher education. They included OER and RLO examples.

	Factors influencing design of reusable learning resources
1	Access to common e-learning platform
2	Activity matched to manageable class size
3	Scenario that is engaging but not overly complex
4	Scaffold students through all phases of the learning activity, especially resolution or conclusion
5	Embed use of the learning activity in departmental curriculum, especially the assessment tasks
6	Clear place for debriefing and reflection in the sequence of learning resources
7	Guidelines and training for teachers and facilitators using the learning resource
8	Cater for different facilitation styles
9	Brand the learning activity so that it has an identifiable, memorable name and image
10	Collaborative design by partners including a significant role for educational developers
11	Reward the role of professional staff and tutors in designing and implementing reusable learning resources
12	Scholarly approach to evaluation and publication about the innovation
13	Establish legal contracts and licensing agreements governing reuse by others
14	Confirm intellectual property rights of all team members
15	Support teacher workload if the reusable learning activity involves inter-disciplinary and/or inter-institutional student collaboration/competition

Table 4: Wills' 15 factors influencing the design of reusable learning resources.

The case research was grounded in an extensive literature review and recorded interviews or observations with educators involved in both sides of reuse activity (sharing and use). Twenty-one semi-structured interviews with 24 participants in a reuse facilitation activity, and a further two data capture suite observations with potential users selecting and commenting on resources for reuse were recorded and transcribed, then coded, to identify potential drivers and enablers of reuse for each context.

Participants were asked questions about their experiences and expectations of reuse, their preferences and practices in order to identify factors which could affect reuse within their contexts. From this context-specific research, 222 factors were identified from coding of interview and observation transcripts, and reference to project documentation and evaluations. These factors represented a broad spread of observations or comments, primarily by participants within interviews, relating to factors which had potential to affect decisions to share or use reusable resources. Repetition of factors within each case were not recorded separately, although note was made of the extent of the repetition. A broad list of factors was derived across five separate and distinctive contexts.

As the factors related both to sharing activity and (re)use activity, even when grouped in this way, the list was both complex and unwieldy. Sorting was therefore attempted on the basis of broader themes, derived from clustering and comparing groupings and the common features across groups.

Coding, sorting and comparison of the factors resulted in identification of three broad classifications. 221 (i.e. all but one) of the comments and observations about reuse could be classified as relating to Technical, Quality and/or Motivation concerns or conditions.

It was noted that some comments related to the technical features and potential of the systems and processes. These became described as Technical factors. A larger group of factors related to how selection and choice between alternatives might be addressed, identifying a number of approaches or concerns relating to Quality. A further set of factors, most of which could not be described as Technical or Quality factors, or not solely so, addressed the reasons for resource reuse and informed the conditions under which reuse would occur. These were described as Motivation factors, and this class included the widest diversity (115 factors). In contrast the technical factors were the least diverse (75 factors). This may reflect the emphasis placed in projects on addressing Technical factors, and the volume of research and commentary on issues such as metadata and licensing, resulting in an established technical vocabulary around reuse.

Re-coding the factors using the three-factor classification resulted in 71% (158) fitting within a single category with some overlap between classes for the others. Of the factors that overlapped, only six (3%) were located within all three classes. Examination of these established that they were particularly general comments. For example 'Would be useful to allow comments on the objects [resources] while reviewing' was one of these statements. Although this suggests a technical modification to the repository commented on, it could also suggest a purpose for which this functionality was required (motivation) and a preference for resources which featured this function (quality). Statements that were capable of classification in all three classes were general or vague in nature and could perhaps be disaggregated into individual factors, although in interviews they were expressed and recorded as a single concept. A further factor was not classified in any category:

'Changing teaching practices towards sharing and reuse takes time'. This led to the decision to exclude these seven from the analysis, leaving a set of 195 factors.

As an aid to exploring reuse factors and reuse contexts with different educator audiences, in a supplementary activity, sets of physical cards were generated. Each card within the 36-card set represented a reuse factor or group within the 195 factor list. All three factor classes were represented, with 12 cards created for each for the Technical, Quality and Motivation themes (**Table 5** and **Figure 1**).

Comparing factors about reuse drawn from the two studies

Comparison of conclusions and analysis in the two studies reveals a general consistency in the factor types identified and a common focus on the influence, complexity and importance of context. Mapping Pegler's summary 36 factors (**Table 5**) against Wills' summary 15 factors (**Table 1**) demonstrates that each of Wills' factors matches factors in Pegler's study although there are some Pegler factors which do not map to Wills' factors (**Table 6**). Despite the different countries and different types of reusable learning resources studied, this mapping provides external validation of the results for each of the two independent studies of reuse.

However, it is interesting to note that Wills' factors mainly match factors from Pegler's Quality theme. Only two Quality factors were not accounted for: *30 Persistence* and *36 New/improved.* Persistence is described on a Pegler card as: 'Learning to use a new repository takes time. Is knowing it will be around and maintained far into the future important?' New/improved is described as 'Is reuse a way to update and improve your teaching? If so, are you attracted to easy means of updating?' These two were difficult to map since Wills chose a specific context of online role play and focussed on design aspects rather than motivation aspects.

Also not mapped were seven Motivation factors – 1, 2, 8, 9, 10, 11 and 12 – again, due to the fact that Wills' study was not about motivation for reuse, but about design for reuse. Wills' study was focussed on the sharers rather than the users.

Likewise, not able to be mapped from Pegler's Technical theme were eight factors: 13, 14, 15, 17, 18, 20, 21 and 23. An explanation might be that in Wills' study, technical factors did not dominate use of online role play. The platforms for online role play were in general low tech and utilised the standard easily-accessible university-provided LMS/VLE platforms. However, it is worth noting that seven of 15 of the Wills factors did map repeatedly to the same four factors from Pegler's Technical theme.

Overall, factors from the two studies did correlate, thus providing validation for the studies as well as demonstrating that numerous themes in reuse are universal. However, mapping the two studies is also significant because it reveals differences that merit further investigation. The remainder of this paper's analysis centres on enhancing understanding of academics' thresholds for reuse, exploring the wider relevance of specific issues highlighted in the studies around what Pegler describes as "zones of proximity" and what are termed by Wills as "nuances of reuse".

Wills – Nuances of reuse

The above analysis of case studies of four online role plays focused on factors that influence reuse of online role play. However the case studies also gave rise to reflection more generally on what it means to 'reuse'.
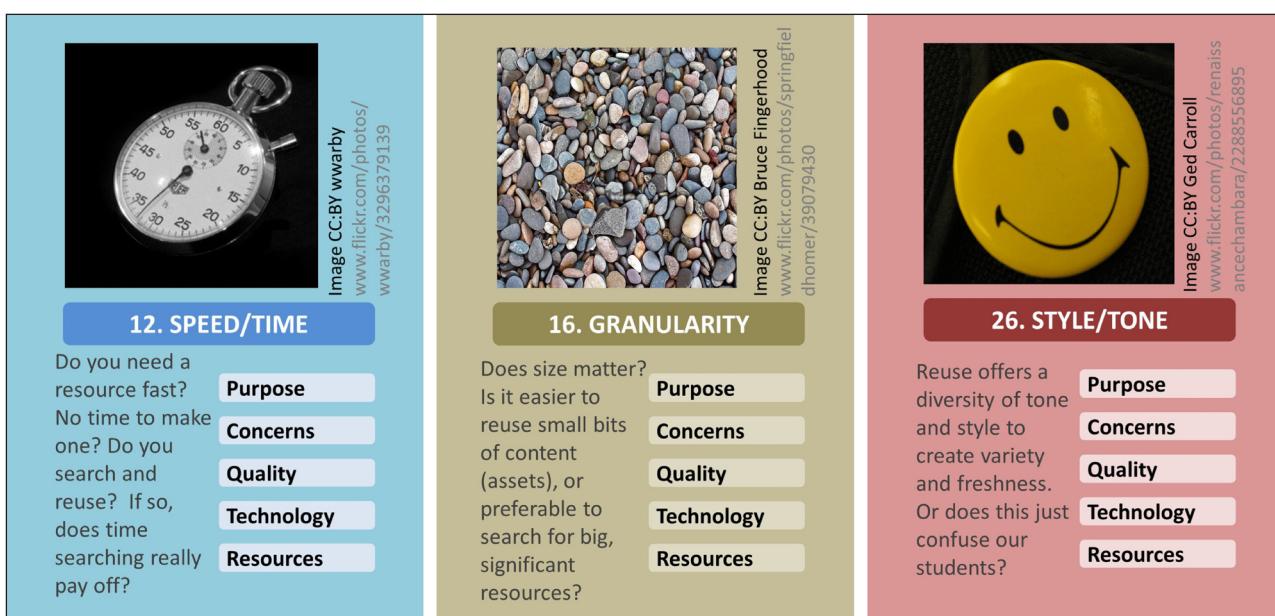
The initial analysis of reuse of fifty-three role plays used the framework of generational mapping, distinguishing between reuse of a role play design and reuse of the role play itself, according to the following additional dimensions:

· same teacher versus different teacher
· same discipline versus different discipline
· same university versus different university.

From the four in-depth cases, further dimensions were revealed. **Table 7** lists a number of scenarios that occurred in the history of reuse of the four online role plays. This list of types of reuse goes further than the types discussed in the previous statistical analysis.

Blue -Motivation	*Gold - Technical*	*Pink - Quality*
1 Exclusivity	13 Metadata	25 Brand
2 Custom/Habit	14 Moving online	26 Style/Tone
3 Sharing is good	15 Discoverability	27 Appearance
4 Personalisation	16 Granularity	28 My community
5 Funding	17 Reliability	29 Quality Checks
6 Policy	18 Context-free	30 Persistence
7 Learn new stuff	19 License to use	31 Ratings
8 Cutting costs	20 Adaptable	32 Known Creator
9 Rarity	21 Innovation	33 Research-basis
10 Up to date	22 Inter-operable	34 Proved in use
11 Convenience	23 Accessible	35 Description
12 Speed/time	24 Repurpose-able	36 New/improved

Table 5: Pegler's 195 factors summarised as 36 factors categorised by three themes.

Figure 1: Sample of cards from Pegler's set of 36 cards.

Pegler – Factors influencing reuse			*Wills – Factors influencing design for reuse*
Inter-operable	22	1	Access to common e-learning platform
Granularity	16	2	Activity matched to manageable class size
Granularity	16	3	Scenario that is engaging but not overly complex
License to use	19	13	Establish legal contracts & licensing agreements governing reuse by others
License to use	19	14	Confirm intellectual property rights of all team members
Repurpose-able, Adaptable	24, 20	6	Clear place for debriefing and reflection in the sequence of learning activities
Style/Tone, Personalisation, Granularity	26, 4, 16	8	Cater for different facilitation styles
Description	35	4	Scaffold students through all phases of the learning activity, especially resolution or conclusion
Description	35	7	Guidelines & training for teachers and facilitators using the learning activity
Known Creator, Brand, Appearance	32, 25, 27	9	Brand the reusable learning activity so that it has an identifiable, memorable name & image
Quality Checks, Research-basis, Ratings, Proved in use	29, 33, 31, 34	12	Scholarly approach to evaluation & publication about the innovation
Known Creator, Policy, My community	32, 6, 28	5	Embed use of the learning activity in departmental curriculum, especially the assessment tasks
Learn New Stuff, Sharing is good, Known Creator	7, 3, 32	10	Collaborative design by partners including a significant role for educational developers
Funding	5	11	Reward the role of professional staff and tutors in designing & implementing reusable learning resources
Funding	5	15	Support teacher workload if the reusable learning activity involves inter-disciplinary and/or inter-institutional student collaboration/competition

Table 6: Mapping Pegler's 36 factors against Wills' 15 factors.

Each of these reuse scenarios have implications for how online role plays are designed, if they are being designed with reuse in mind. Only one in this small sample was designed specifically for reuse by (unknown) others (first shaded row in **Table 7**). Most of the other descriptions of reuse involved reuse by people already involved. In other words, the re-users had a degree of familiarity with the online role play in that either they helped to design it,

Types of reuse	Middle Eastern Politics Simulation	Idontgoto Uni	Round Table Discussion	Mekong eSim
Designed by a team for each to use	y		y	y
Designed by cross institutional partners to be used in each institution	y			y
Designed for cross institutional student collaboration	y			y
Designed for transfer/reuse to unknown teacher			y	
Continued to be used by one partner without the others				y
Used by new cross institutional partners	y			y
Run by tutors/dept members without original designer being present	y	y		y
Run by tutors/dept members after original designer leaves	y			
Modified by tutors or members of same department	y	y		
Transferred to new institution with an original designer	y			
Transferred to entirely new teacher in a new institution			y	
Potential to be transferred but not happened yet		y		y

Table 7: Four case study online role plays: nuances of reuse by others.

helped to implement it, or had been trained to use it. No-one picked it up "cold".

However, the purpose of this study was to look at factors for fostering this reuse by unknown others, hence a better understanding of what is meant by reuse is important. The final nuance in **Table 7** (second shaded row), the 'potential to be transferred but not happened yet' is particularly important as it probably describes the majority of work currently happening under the heading of reuse. If resources are not being reused then gaining a broader understanding of types of reuse might provide ideas for improving the design or improving access.

In summary, Wills' study demonstrated that Learning Designs, as a reusability construct, has more impact for uptake, even influencing adoption in different disciplines and different institutions. However, all the dimensions and factors explored in this study about the four role plays that were reused could usefully be applied to thinking about the nature of learning designs. This focus may improve their uptake and acceptance in university contexts and also inform the development of appropriate programs and services for sharing teaching practice in general (Wills, 2013).

Pegler – Zones of Proximity

Not all the cases studied by Pegler were ones where reuse was feasible within the time span of the research, however one case from the Open University presented several, apparently unproblematic, examples of extensive reuse within a relatively short timeframe. Compared with other cases this was an exceptional level of reuse and achieved quickly in a usually slow production context. While this was attributed in part to technical factors involved in this case and the fact that the production of resources within an Open University Distance Learning system favours reuse, it could also be associated with the close connection between the users and the sharers of the resources.

For these resources the sharers and users were the same people, or members of the same small team.

As the relationship between the sharers and users was a theme commented on across several cases, it was suggested by Pegler that the proximity, i.e. distance, between sharer(s) and user(s) may be a cross-case modifier acting on reuse. To represent the proximity and distance 'boundaries' represented in the cases, **Figure 2** illustrates six 'proximity zones'. In this schematic the zones are shown as concentric circles, with each circle representing a level of connection between the participants in resource reuse (i.e. suppliers and users). The form of the illustration should not suggest that the zones represent equal size or are evenly distributed. It is meant to represent how different zones appear to 'nest' or operate within others.

As with other factors affecting reuse, the proximity level (or zone) can apply to the activity of *supplying* resources for reuse or to the *using/reusing* of these resources. **Figure 2** shows the passage from one zone to another as crossing a clear boundary, representing an identifiable change in the relationship of resource producer and user. The shift from zone 1–6 could be described as a decline of proximity, or growing distance, between creator and user. In practice the move towards more openness, in releasing resources for wider reuse, makes later retreat to a more restricted position impractical. For example, once resources are available under open licence to an international audience, reuse of that version cannot subsequently be effectively restricted to a national or institutional zone.

Although there is a geographical dimension to the labels applied to the zones, with 'national' and 'international' used to describe the two widest ranging zones, the zones do not necessarily denote distance or proximity in a geographical sense. Exchange of online resources does not usually recognise geographical boundaries.

Moving beyond zone 1 level sharing is likely to require additional effort. This could discourage proactive sharing.
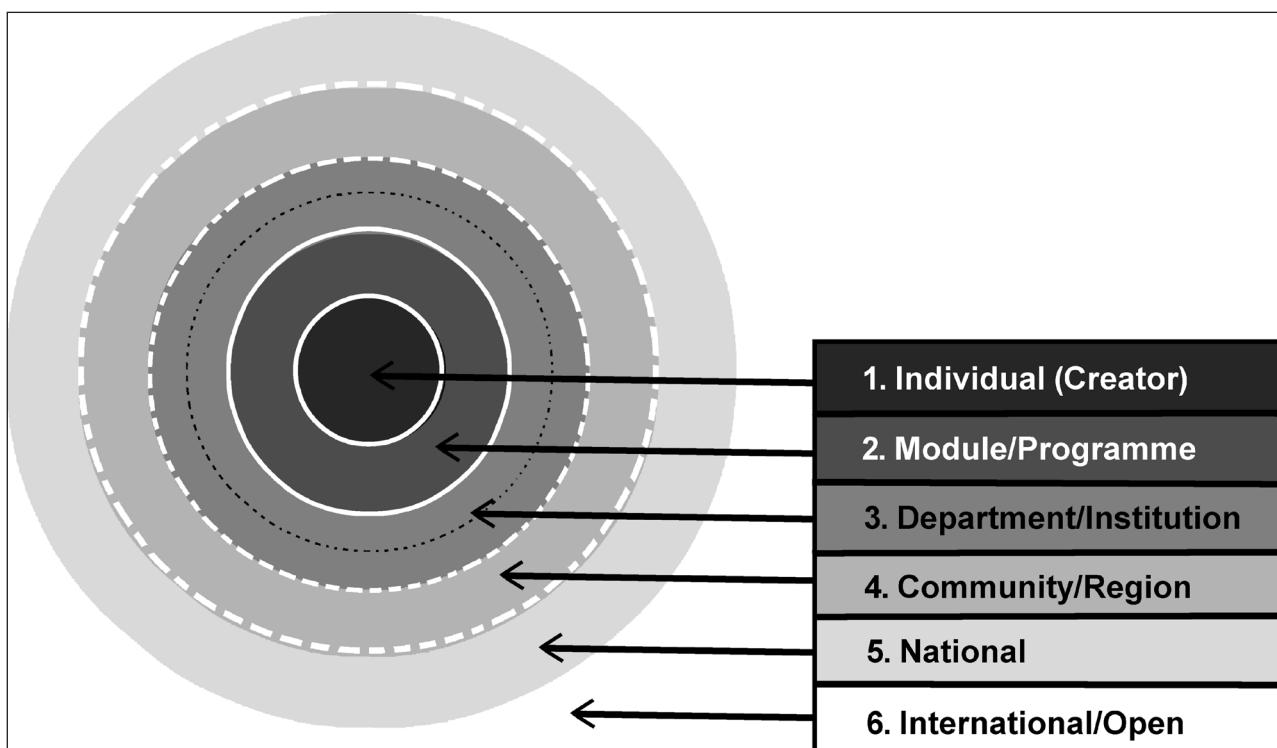
Figure 2: Zones of Proximity as suggested by Pegler.

Motivation to reuse or share could be anticipated to be strongest where the proximity is highest, as the benefits of reuse are realised by the staff expending effort in creating and sharing resources, or by their colleagues/community.

As the zones progress from 1 to 6 the diversity of the resource sources (creators) will increase while the range of resources from each source decreases. At zone 1 there is only one creator of resources, and 100% of that creator's resources reside within this zone. Most resources located here, e.g. drafts and working plans will never be made more widely available. At zone 2 and beyond there are more people involved in sharing or reusing. There is also a degree of selectivity (compared with zone 1) in determining which resources will be shared. For example, Margaryan, *et al.,* (2006) reporting research within the CD-LOR (Community Dimensions of Learning Object Repositories project) found that 87% of respondents shared at least some educational resources at the stage of being work in progress. This indicates that 13% do not share *any* work in progress. What is not known from that research is who these users shared progress versions with and how proximate those were. In one case study, two participants were happy to share even 'fuzzy' work-in-progress, but they identified each other as co-located colleagues working within the same region on joint projects. Others in the same project were more circumspect, even when talking about finished resources.

Decisions on what to share, and who to share it with, are important to understanding reuse of digital online resources (Walker & Masterman, 2010). Moving outwards through the zones from 1 to 6 requires a greater level of trust between creators and (re)users. Participants in the exchange are less likely to have prior knowledge of each other, so need confidence in the description of the resource. Users must usually take on trust technical information provided (e.g. the clearance of, or nonexistence of third party rights within the resource). The resource creator must trust users not to abuse any controls that have been set in place, e.g. by failing to acknowledge rights or not respecting restrictions on reuse.

The examples of proximity illustrated here, drawing on the case studies, suggest that, although increasingly easy to overcome technically, weak proximity between creator and user in dissemination and discovery of reusable resources may increase motivational tensions as well as the challenges of agreeing appropriate quality. With digital online resources structured for reuse and licensed as OER, many challenges to widespread resource reuse have been addressed. However reuse within a relatively select community where trust, shared vocabulary and common systems exist remains easiest to achieve in the short term. That local sharing may, as these cases demonstrate, pave the way for wider sharing as **Figure 2** suggests.

Summary

The cross-case analysis provided in the two independently conceived longitudinal studies compared in this paper, underline the complex challenges reuse can present to operational, pedagogical and cultural aspects of university teaching. While there has been considerable progress in addressing many of the technical and quality concerns around reuse, there has been little progress on understanding how to motivate reuse beyond funded projects. The question of how to persuade educators to invest time into reuse on a consistent, continuous basis is likely to be discipline and context dependant since these represent the least transfer distance, the least transfer across zones of proximity.

However technically easy reuse activity has become, supported through the networking potential of Web 2.0 tools such as Twitter, LinkedIn, Google+ and through approaches centred on establishing communities of practice to share, there is limited incentive for academics to select a resource for reuse, let alone repurpose it for reuse. Expectations of time saving need to be balanced with the practice-informed evidence about time investment required in both supply and use.

Wills' study, despite being based on the single design of role play, points the way to learning designs representing the most effective reuse strategy. The ultimate goal may be widespread adoption of reusable learning resources, however support for adoption of learning designs may reap more immediate gains.

Competing Interests
The authors declare that they have no competing interests.

Authors Information
Prof Sandra Wills is PVC Student Learning at Charles Sturt University in Australia and can be contacted at swills@csu.edu.au; Dr Chris Pegler is retired from the Institute for Educational Technology at the Open University in the UK and can be contacted at chrispegler1st@gmail.com

Note
[1] Sandra Wills, ALTC Citation, Australia; Chris Pegler, HEA National Teaching Fellow, UK.

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