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## Student Perceptions of the Creation and Reuse of Digital Educational Resources in a Community Development-Oriented Organisation

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**Abstract:** This case study explores students' perceptions of the creation and reuse of digital teaching and learning resources in their work as tutors as part of a volunteer community development organisation at a large South African University. Through a series of semi-structured interviews, student-tutors reflect on their use and reuse of digital educational resources, and identify the challenges they experience in curating, adapting, and reusing educational resources for use in their teaching activities. The data is analysed qualitatively within the framework of an activity system (Engeström, 1987) to surface the primary systemic tensions that student-tutors face in the reuse of resources found online as well as open educational resources (OER). This study found that student-tutors sourced and used educational materials from the Internet, largely irrespective of their licensing conditions, while also creating and remixing a substantial number of educational materials to make them suitable for use in their context. We conclude that greater awareness of the availability of OER and explicit open licencing for works sourced and created within community development organisations could enhance sharing, collaboration, and help sustain high impact resources.

**Keywords:** reuse of learning objects; digital copyright, digital curation; open educational resources, community development organisations, activity theory; student engagement with open education.

### Introduction

The Internet and digital technologies have enabled the creation of digital educational resources, which can be copied and shared at little cost. While some of these resources come with clear license terms which enable them to be used, adapted, and re-shared by others, others do not offer explicit terms of use. While freely available online, many resources without clear terms of use remain invaluable tools for volunteer and non-profit organisations. Resources that are made available under open licenses, are 'open education resources' (OER) which enable legal adaptation, reuse, and sharing (Hassler & Mays, 2015). The extent to which both online and open educational materials are being used outside of educational institutions is not well understood (Harley et al., 2006; Petrides, Nguyen, Kargliani, & Jimes, 2008).

A study undertaken within South Africa suggests that while awareness of resources such as OER is increasing, issues remain for individuals navigating intellectual property rules, accessing support infrastructure, and finding time to adapt resources for a specific context (Hart, Chetty, & Archer,



2015). Within developing contexts where resources may need to be printed for use in teaching and learning activities, reuse and adaptation are sometimes further hampered by file format, file size, and the design of the resources, which may make them difficult or costly to download, adapt, and print (Mtebe & Raisamo, 2014). Researchers have surfaced a number of challenges for educators in reusing digital educational materials including: issues around the context of materials (Amiel, 2013; Bennett, Dawson, Bearman, Molloy, & Boud, 2016; Calverley & Shephard, 2003; Hatakka, 2009); the material's alignment with teaching practice (Conole, McAndrew, & Dimitriadis, 2011; Hennessy, Hassler, & Hofmann, 2016); the time required to adapt materials (Elliott & Sweeney, 2008; Petrides, Jimes, Middleton-Detzner, & Howell, 2010); and copyright concerns (Calverley & Shephard, 2003; Collis & Strijker, 2004). Factors increasing the reuse of such materials is still under researched (Harley et al., 2006; Petrides et al., 2008).

For student volunteers working in community development organisations, the landscape is even more challenging. Volunteers come with a great deal of enthusiasm for community outreach, yet may lack experience selecting educational resources. Additionally, students have limited explicit training on how to use the Internet as a resource for sourcing materials available for use under alternative copyright systems. While students now have access to a wide array of educational resources for use in their learning, personal, and professional lives, as well as for volunteer activities, their understanding of the restrictions and allowances for using digital media in this complex ecology are limited (Czerniewicz, 2016).

## **Student Engagement in Community Development**

The role of universities, as producers and disseminators of knowledge, is critical to the growth and well-being of South African society (Badat, 2009). While recently many universities are under increasing commercial pressure, there is a strong argument for the retention of principles of the 'public good', especially in an age of knowledge enhanced by ICT (Duderstadt, 1997). One way of contributing to this is through the university's engagement with the community, in which student-run outreach programmes play a key role.

This research project focuses on student-tutors' perceptions of the creation and reuse of teaching and learning resources and materials in their work with a voluntary community development-oriented student organisation. The organisation offers university students an opportunity to engage in responsible citizenship through volunteer work in either education or healthcare, with the goal of improving the quality of life for individuals in under-resourced communities. Student volunteers offer their time as tutors, mentors, and educators to unemployed youth as well as to secondary and primary level students. This study focuses on the work of curriculum stakeholders in the organisations' education program, with the goal of understanding how they use, adapt, and reuse educational materials that are curated within the organisation, generated by student-tutors, or sourced from the Internet and print publications.

Although the current availability of OER offers a potential source of educational resources from which this community can draw, this study demonstrates that the use and contribution to OER by social outreach groups is not common. Furthermore, research around how OER might contribute to social outreach activities has received little attention from researchers. The principles of open education and community engagement are quite similar; both promote access to education and wider

community engagement. One might envisage that one of the objectives of the OER movement would be to provide resources that groups such as community development-oriented organisations could use to enhance their programs by providing greater access to high quality educational resources. However, there is currently a dearth of research on how such groups are benefiting from the OER movement. This study contributes an analysis of the challenges and obstacles for community development organisations in accessing and locating resources for use in their programs while offering recommendations for policy, leadership, and a call to increase awareness of OER.

## **The Challenge of Reusing Educational Materials**

Despite the wealth of educational content available online, educators still face challenges in reusing these materials (Amiel, 2013; Browne, Holding, Howell, & Rodway-Dyer, 2010). In the next section we review the key themes in the adoption and reuse literature to identify perceived issues that might arise for volunteer student-tutors.

### **Contextualization**

In Hatakka's (2009) study of the use of OER in developing countries, contextualization challenges emerged as one of the greatest barriers to material reuse. There are various challenges including the scope of content, examples, language and links to curriculum, as well as the suitability of resources within a pedagogical context. The challenge of contextualisation arises as an issue due to the variation in how educators interpret the quality of materials for different contexts, including the scope, level and relevance of content, the suitability of language, and the appropriateness of pedagogical strategies of resources created in developed countries (Hatakka, 2009). Resources designed in one context may include references specific to that culture which are embedded within the resource. Albright (2005) notes that "OER are cultural as much as educational, in that they give users an insight into culture-specific methods and approaches to teaching and learning" (2005, p. 12). While OER enable educators to explore alternative teaching practices and resources, exposing them to new approaches to teaching, these resources are inevitably products of a particular cultural context and may be challenging to reuse in vastly different contexts (Conole et al., 2011). Responding to this challenge, Conole et al. (2011) argue that the creators of OER should make clear their implicit designs which are embedded within the materials. This can be done by making the learning designs that are supported by the resource more explicit in the description of the resource. In supporting the use of OER, they suggest that being more explicit about learning design can "move from making content available, to helping people understand how to make good use of that content" (Conole et al., 2011, p. 19). This shifts the focus from the sharing of educational content to the sharing of learning designs and approaches to pedagogic practice.

### **Intellectual Property and Licensing**

Previous research suggests that ambiguity around copyright on many digital resources found online can make it difficult for educators to know if they are able to legally reuse materials or not (Calverley & Shephard, 2003; Harley et al., 2006). Online materials most often do not come with explicitly clear terms for reuse (Amiel & Soares, 2016). In many jurisdictions, in the absence of a declaration of the resource being in the public domain or being shared under an open copyright license, full copyright is automatically granted to the creator of a resource. When resources are shared online without explicit

copyright, it can be complicated for others to reuse them. Additionally, due to the “anarchic” nature of the Internet, materials are easily copied, mixed or shared, making it difficult to determine the original source or accuracy of materials (Calverley & Shephard, 2003). It has been noted that some educators have difficulty interpreting copyright permissions and simply ignore them outright due to pressure and convenience (Harley et al., 2006).

## **Curation**

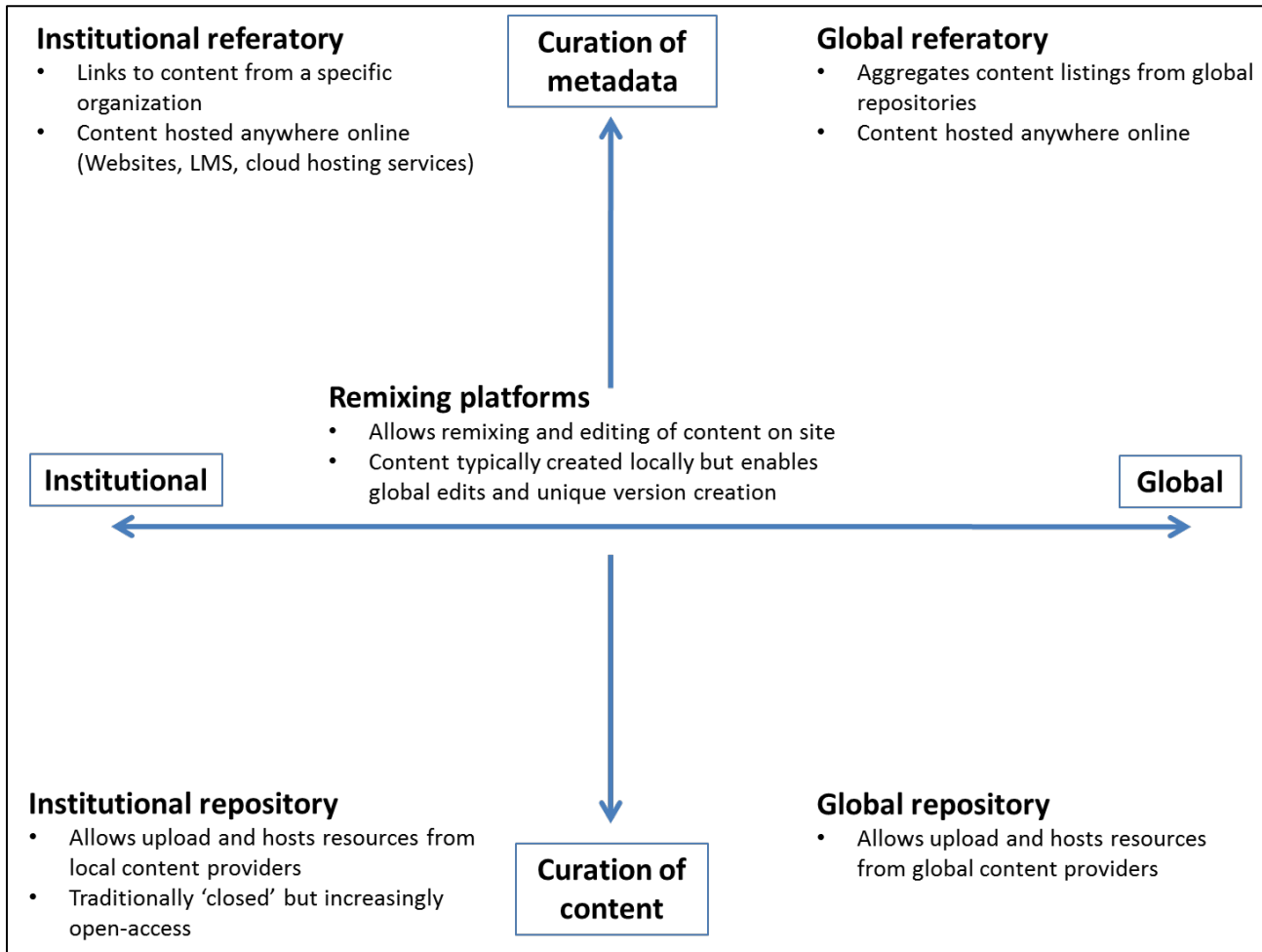
Digital resources are often first stored on users’ hard drives or cloud storage where they are authored. These are undiscoverable to others unless explicitly shared by the resource owner. To effectively organise and share digital educational materials, contributors require a repository or portal that will enable these materials to be stored and indexed, thereby facilitating access and discovery by other educators in the community. Repositories have the advantage of making use of metadata such as taxonomies and folksonomies to describe the resources they host, however, these are not always applied consistently (Amiel & Soares, 2016). The necessity of metadata is underscored in Hodgins’ apt comparison: “Being without metadata is akin to trying to find a house when someone’s taken away all the street signs, or prepar[ing] a meal from cans that have no labels” (2000, p. 28). Metadata increases the discoverability of resources by describing what they are, how they can be used, and for what purpose.

Centralized storage may exist within a password-protected learning management system (LMS) or an institutional repository. Institutional repositories are increasingly open-access, allowing contributions from those within the institution, which can be accessed by all. Similarly, global repositories invite depositing of resources from a global audience to form a large collection. While repositories have the advantage of storing all resources in one place, they may not be optimized to present the diverse types of media that may be deposited.

Another approach to curation is the referatory model, in which digital resources are stored where most appropriate on the Internet and described and linked to from a central database (Hodgkinson-Williams et al., 2013). An example would be hosting a video on YouTube rather than uploading into a repository, thereby taking advantage of the streaming, commenting, and analytics functionality built into the YouTube service. A referatory can be used to host the descriptions of learning designs and pedagogical approaches which use a variety of web resources, which are then linked to, wherever they most suitably reside on the Internet.

Remixing platforms allow for uploading and collaborative editing in one location. Examples may include Google Docs, Wikipedia, and Github, which allow collective contributions and edits to a resource centrally hosted on the Internet. Users of remixing platforms require a consistent Internet connection, user accounts, and several digital literacies in order to contribute.

Figure 1 provides a visual of the curation landscape, which displays the relationship between institutional and global repositories that curate content versus metadata.



**Figure 1: Curation landscape for digital educational resources. Adapted from “365 Days of Openness: The Emergence of OER at the University of Cape Town,” (p. 39) by Hodgkinson-Williams, C., Paskevicius, M., Cox, G., Shaikh, S., Czerniewicz, L., & Lee-Pan, S., 201.**

Perhaps most important is that any repository of educational resources is openly accessible from the Internet, as many inevitably begin their search with a generic query using an Internet search engine. Exposing the metadata from either a remixing platform, referatory, or repository can increase discoverability and help educators searching for content to find their way to resources.

### Provenance

Often cited as a barrier to materials reuse the “not invented here” phenomenon; which is the reluctance of educators to use teaching materials that have been created by others. Bryant (1998) argues that this is often a matter of the necessary time required to assess and modify resources rather than a negative attitude to using other’s work *per se*. Hatakka (2009) reports that educators have a sense of pride and ownership associated with creating teaching materials and feel it is their responsibility to design content from scratch. Educators have generally acknowledged that they are all ‘borrowing’ from content and ideas around them, irrespective of their provenance, even if in a non-attributable way (Browne et al., 2010).

## **Time and Effort**

Educators may have difficulty allocating time to deliberately select additional materials outside of the core curriculum or regularly used textbook. Locating and assessing educational materials created within different contexts can be a lengthy process depending on the institutional resources and educators' awareness of where they may source relevant material, and whether materials are already aligned to the curriculum or not. Browne et al. (2010) note that some educators do not necessarily see sourcing and reusing materials as a time-saving practice but, rather, as adding to their workload.

## **Theoretical Perspective**

Activity theory (AT) has been adopted as a lens to understand how groups of individuals act within specific social settings. Wetterling and Collis (2003) used AT as a heuristic tool with which to examine their social practice and identify how the contextual factors which enable the creation of a mediating artefact in one context differ from the contextual factors of someone trying to reuse that mediating artefact in a new context. Similarly, this study attempts to understand the reuse of educational materials in new contexts and uses AT as a heuristic tool to examine the perceived issues around the reuse of educational materials. An activity system is an analytical tool with which one can examine collective or individual human activity as that which exists within a specific social setting (Parks, 2000). The activity system can be used as a lens to describe "object oriented, collective, and culturally mediated human activity" (Engeström & Miettinen, 1999, p. 19). The theory can be useful to help explain and understand the activity of a collective in a particular context, such as the workplace or classroom (Engeström, 1987).

Within the organisation, educational materials are collectively collated to support the work of student-tutors. Whilst operating within a system of activity, individuals are subject to explicit and implicit rules and conceptions of the division of labour among members of the community. Rules and the division of labour guide the ways in which participants operate and delineate power and status (Murphy & Rodriguez-Manzanares, 2008). The shared object of this group is school learners' acquisition of knowledge and more broadly improving access to quality education.

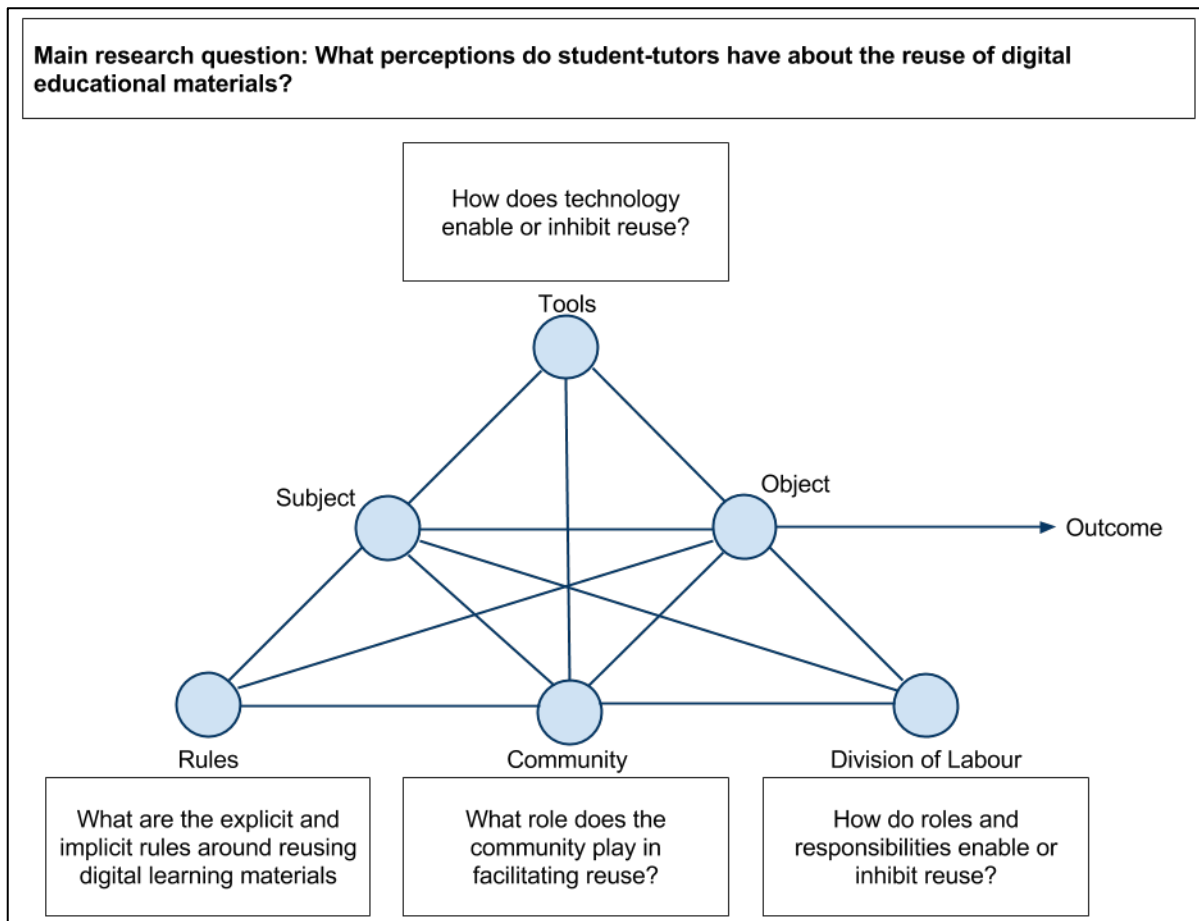
## **Research Questions**

This research study investigates the perceptions of student-tutors as they locate, access, remix, and reuse educational materials for community education projects. The specific question addressed is: What perceptions do student-tutors have about the reuse of digital educational materials?

Research sub-questions are organised through an AT lens:

- What are the implicit rules around reusing digital educational materials?
- What role does the community play in facilitating reuse?
- How do roles and responsibilities enable or inhibit reuse?
- How does technology enable or inhibit reuse?

See Figure 2 for a representation of the research questions posed in this study plotted on Engeström's AT triangle.



**Figure 2: Research questions through the lens of AT – adapted from Engeström (1987).**

## Research Design

This research adopted a case study methodology (Stake, 1994) with students volunteering in the organisation at the beginning of the 2011 academic year. The students, technology landscape, and social conditions in South Africa can be thought of as a “bounded system” (Stake, 1994, p. 236). Using the case study as a bounded system allows for the unfolding of the “complex dynamic and unfolding interactions of events, human relations, and other factors in a unique instance” (Cohen, Manion, & Morrison, 2007, p. 181).

The study focused on primary qualitative data obtained from six student-tutors through a series of semi-structured interviews. Participants were selected using a snowball sampling methodology in combination with a stratified sampling strategy (Cohen et al., 2007). The interviews were conducted with student-tutors fulfilling various roles within the organisation. A person with a leadership role in the curriculum committee was identified and served as the entry point for identifying further curriculum stakeholders. While the head of the curriculum committee suggested other student-tutors for interview, a conscious effort was made to ensure that people with different roles and levels of responsibility in the curriculum design process were interviewed. All students interviewed were involved in the curriculum development process in some way, either as a project leader, curriculum

coordinator, or curriculum committee member (Table 1). Curriculum committee members are primarily responsible for vetting, sharing, and curating content; curriculum coordinators source resources for each project; and project leaders are responsible for supporting the teachers in each program. Interviewees all had at least two years of experience with the organisation and came from various disciplines of study.

**Table 1: Interviewee Profiles**

Faculty of Study	Academic Year	Years Volunteering	Curriculum Development Role
Commerce	4th	3	Project leader
Humanities	4th	4	Project leader
Commerce	3rd	3	Curriculum coordinator
Humanities	2nd	2	Curriculum coordinator
Humanities (postgraduate)	2nd	5	Curriculum committee
Engineering	3rd	2.5	Curriculum committee

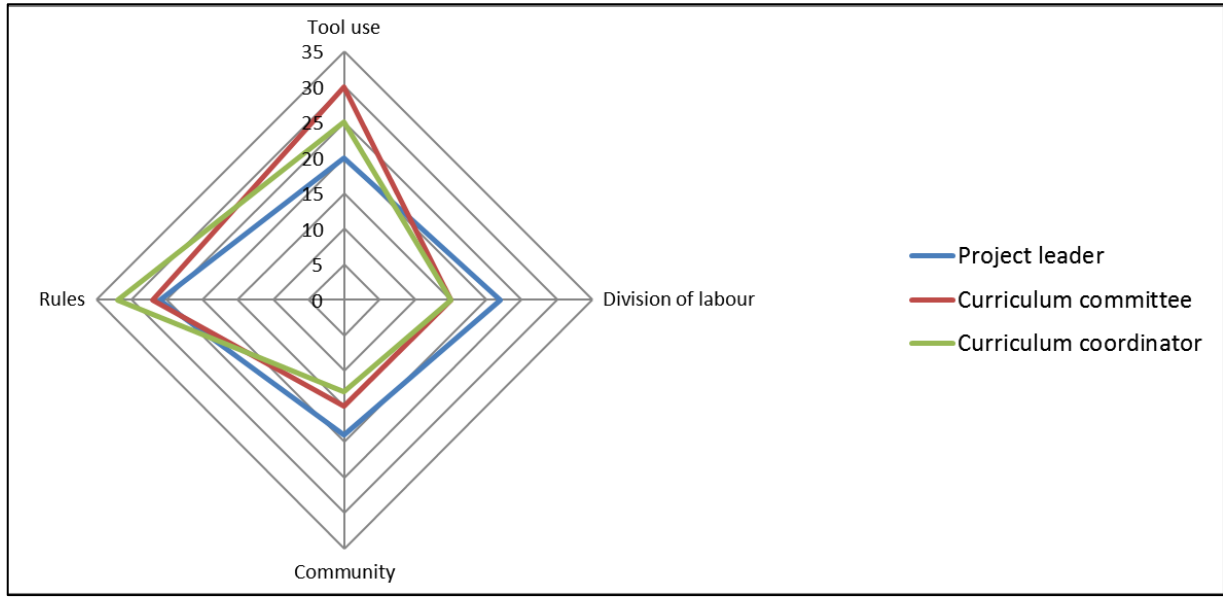
## Data Collection and Analysis

A semi-structured interview schedule was designed to prompt discussion during interviews with student-tutors to seek their perceptions on materials reuse according to the main issues identified through the above literature review. Engeström’s (1987) AT was used as an analytical framework to categorise the emerging themes in the study. The frequencies of responses, corresponding to the key nodes in the activity system, were calculated to provide a sense of the most critical issues facing student-tutors’ adoption of OER.

## Findings

The research themes were grouped according to the activity system elements of: tools use; division of labour; community; and rules. A summary of the codes applied over all the interviews within the broader activity system can be found in Figure 2. This diagram shows the number of occurrences for each code category distributed by role.

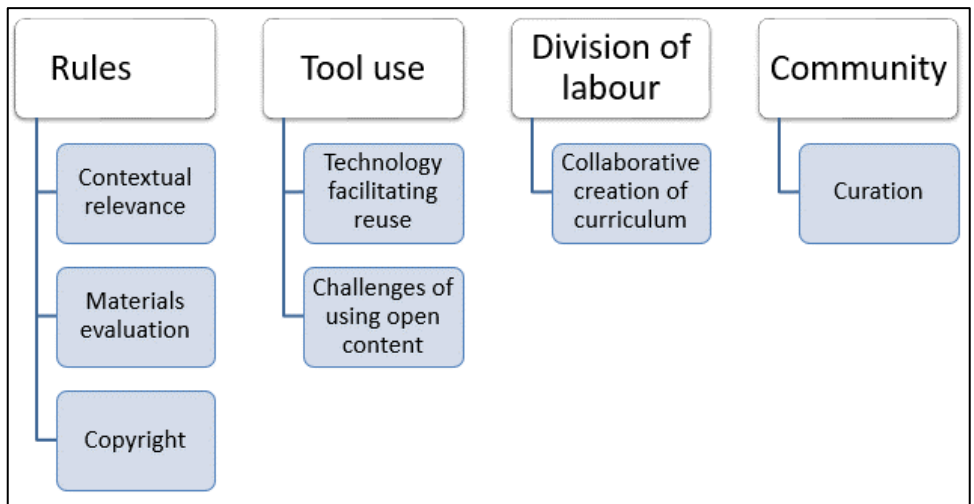
At a macro level, the coded data most frequently related to rules and, secondly, to the use of tools. Issues around the community and the division of labour appeared less frequently but almost equally. The interview transcripts contained 85 coded passages referencing implicit and explicit rules; 75 referenced how tools impacted reuse; 52 related to how student-tutors divided labour among themselves; and 47 referenced the role of the community.



**Figure 3: Frequency of themes emerging from the interviews.**

It was interesting to note the dominant discourses, which varied according to the participants’ organisational role. Curriculum committee members’ discourse centred around how tools can be used to construct and curate the curriculum. By contrast, the curriculum project leaders referred more frequently to issues of labour, indicating that they might be more concerned with how activities are completed in relation to roles and responsibilities. The curriculum coordinators mostly cited the rules governing their activity, including how and when resources get shared and reused. Despite operating within a shared activity system, the different priorities of the student-tutors seemed to centre on distinct operational factors. This is to be expected in an organisation with a shared motive, yet with different roles and responsibilities within the activity system.

A summary of the broad coding schema, and the themes which emerged within each broad code, is presented in Figure 3. For each of the research sub-questions we discuss the thematic issues that have arisen in the order of prevalence.



**Figure 4: Coding schema of emergent themes**

## Understanding the 'Rules' of Reuse

Interviewees noted vast differences in the quality of schooling in the various areas. Specifically noted were the differences in the level of the learners' understanding of concepts expected at their age level. Many of the student-tutors noted that when reusing materials, they had to consider the specific geographical area for which it was intended and for which group of learners.

One student-tutor remarked that even when dealing with learners at the same age they *"sometimes [...] might include more difficult content and difficult problems in the [Area A] curriculum"*. This is due to the disparity in the level of educational achievement of learners experienced by volunteers operating in various communities. It was further highlighted by one student-tutor that: *"even teaching the same grades, like our grade 3 curriculum, won't work for theirs"*. Learners of the same age within different areas required educational materials designed to suit their specific abilities and needs, as the following extract accentuates:

Even though we have the exact same age group of kids who come from like similar circumstantial backgrounds and stuff like that, we face completely different issues in terms of what we try to teach our kids and what our lesson outcomes would be.

Frequently mentioned in the interviews was the desire for greater availability of South African educational materials. It was noted that international educational materials found online *"were not relevant for our children at all"*. Another student-tutor noted that when trying to work with materials from international sources: *"... you can see that it's not you [...] it's just far away"*. Finding education materials from South African creators was a priority for most *"because the stories are aimed at our children and the background our kids are from"*.

Student-tutors reported that some of the resources found online were easily customisable for their learners, while others required more substantive adaptations. One respondent explains that modifications *"could be small things like, you know, change [sic] the units, but also different methods of teaching, different methods of doing long division"*.

Interestingly, when using online materials one respondent noted she was much less concerned about copyright of online materials than the copyright of physical printed resources. The interviewee remarked:

I guess it's sort of a bit of a difference, like if it's an actual form you feel like copyright is more important than something that is sort of available to you anyway on the Internet but not necessarily like, to reproduce. It's a bit more vague, maybe not taken so seriously.

At the time of the study the curriculum committee was investigating ways to help student-tutors increase access to information around copyright issues. However, the pressures of time and priorities prevailed as one respondent noted: *"... usually it's a scramble to get the really basics done, and concerns about copyright and referencing is not really our biggest worry"*.

When asked about alternative copyright licensing models such as Creative Commons, only two of the six student-tutors were aware of open licenses. One of the respondents who was aware of Creative Commons seemed to have a nuanced understanding of Creative Commons, as illustrated by this remark:

My experience with Creative Commons is viewing it from an academic point of view and from a business point of view, for profit. So not in terms of education. But I would definitely say that, it like makes a huge amount of sense for developing curriculum and putting no copyright on it.

Another respondent, who was aware of open licensing, noted that there was a need for a greater understanding of alternative copyright licenses and that the curriculum committee was trying to address this need:

I think on [the curriculum database], there is like a thing when you upload a resource you have to say whether it's copyright. I think we, or I usually put, I am not sure. Like there is an "I am not sure" option (laughs). I don't know whether this is allowed or not, but that is the option I pick.

When uploading resources into their shared database (the institutional learning management system) one respondent noted that there was an option to specify the licensing of the document being added. The respondent noted that this could be useful as it provided a space to indicate the legal terms of use, however the options for licencing were not sufficiently articulated by the tool, which made it challenging to use for those not already aware of licensing options.

## **Tools Used in Creating and Sharing Educational Materials**

Locating and assessing quality and relevant materials online takes a great deal of time and effort. Student-tutors lamented that even after finding suitable resources there was always a chance of finding something even better, given more time and effort, as is illustrated in this extract:

If you haven't found the perfect thing it might mean the perfect thing is out there somewhere! So you keep searching and like it just takes so much time, to search for the perfect lesson which might come sometime but never does.

The student-tutors reported that they had not found an all-encompassing website from which to source materials, so many explorations began with a generic search engine. Since this activity would bring up a wealth of results, respondents admitted that it was often difficult to identify good resources. When examining search results one respondent acknowledged that "*there are too many things and you don't know where to go*". Another student-tutor added "*part of the problem is you need to look at so many things to find one or two ideas you could use in your project*".

Assessing and curating the best resources with contextual metadata is clearly an important skill for these volunteers. One respondent added: "*... the problem [is] being over-resourced. Like having too much information, and the big thing that I would really like, you were saying curatorship [...] to narrow down the best*". Although software and web services that assist with curation of teaching materials have emerged, no single comprehensive solution to the challenge of finding and organising teaching materials is yet available.

Some respondents suggested that a database for storing materials would ease the logistical issues around volunteer turnover and the curation of curriculum. Historically many of these handover processes were not carried out in a systemised manner, as one respondent noted:

Usually that [curriculum] gets individually given in soft copy to the different people, what we have done this year is put it on [the LMS]. So everybody has access to it on [the

LMS]. What we hope was that, people from different projects, because often they do the same things but in different areas, would use each other's information and take the best of all of the different curriculum.

The LMS was being used to store digital educational materials where everyone had access. An added benefit was that students were using the LMS as part of their academic programs, so it was a familiar environment. As new volunteers joined they could simply be added to the site and view and access all the existing content. The excerpt above illustrates the respondents' aspirations that the transparency and openness of this method could lead to improved quality in the curriculum.

### **Division of Labour in Curriculum Development**

As the curriculum is collaboratively created among curriculum coordinators, curriculum committee members and tutors, an understanding of who is responsible for what and how that work gets shared must be articulated. In a voluntary organisation, this a challenge as all the student participants are contributing their time while maintaining busy academic schedules and volunteer turnover is a regular occurrence.

Many of the resources being shared did not contain explicit mention of copyright permissions. Student-tutors noted that this ambiguity created confusion around reusing other people's materials discovered on the shared curriculum database:

I wasn't actually sure, like some of the stuff that was being posted online that other projects had made, I wasn't actually sure if it was ok to take it now, or if you should ask the person for permission. Like, I didn't really know what the agreement was now.

Reusing materials among projects within the organisation seemed to be of greater concern than reusing materials found online. The student-tutors seemed to equate copyright infringement with plagiarism as this respondent went on to explain: "*I didn't just want to take this work and present it as my own*"; as well as acting covertly: "*I didn't want to go behind someone [sic] back*". It is interesting to note a higher degree of uncertainty expressed around using resources created by someone in the organisation then those sourced directly from the Internet.

### **Understanding Curation of Materials by the Community**

To ensure and promote continuity of the curriculum, it was noted that the teaching and learning materials must be readily available to volunteers in an editable electronic form so that they may be refined and improved over the years. Respondents noted that, historically, materials were not well curated and that in some instances, curriculum materials had to be recreated from scratch on an annual basis. As one curriculum coordinator noted:

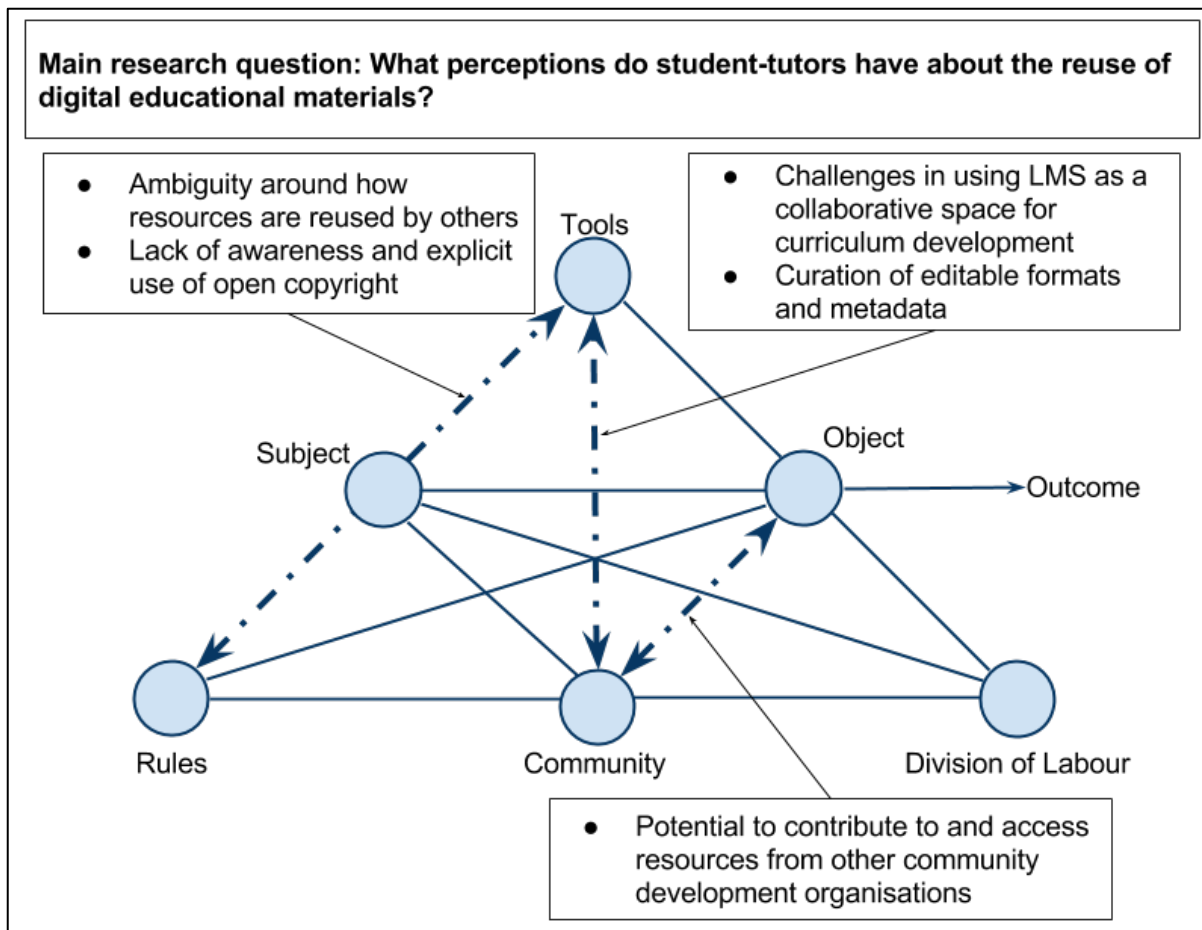
I don't know for how long this project has been running, but I basically had to construct a completely new curriculum. Because I only had last year's curriculum available to me, which [...] wasn't done very well. Just because the person wasn't very committed, or there were issues around that. [...] So I didn't have very many resources from previous curriculum to build on. But I don't understand where like the whole previous years' has gone.

Interviewees generally agreed that systems should be in place to preserve and curate good materials while removing poor materials. One of the problems volunteers currently face is having access to

materials that have not been evaluated and/or are of poor quality. They suggest that: “... if a lesson plan doesn’t work, take it off the database. Make it unavailable so no one will make the mistake of using it again”. Although resources deemed unfit for one context may be very useful in another. This again points to the importance of curation and documenting contextual issues as part of the metadata, which describes the resource so that “institutional memory” is not lost.

## Discussion

The goal of this study was to explore the perceptions of university student-tutors regarding the reuse of digital educational materials for community engagement projects. Overall, the explicit rules, norms, and conventions of the community seemed to most hinder the reuse of educational materials. These impacted the ways materials were sourced, created, curated, and shared. Technical challenges were also significant, and hindered sharing in many ways. The discussion is guided by the AT concept of contradictions, which represent structural tensions between the elements of the activity system (Engeström, 2001). Contradictions are used to identify innovation and changing practices that emerge as the context and participant activity change over time (Barab, Barnett, Yamagata-Lynch, Squire, & Keating, 2002). Framing these contradictions within the activity system provides a lens to document and discuss the issues impacting this organisation. The primary contradictions in this study are distilled in Figure 5.



**Figure 5: Contradictions in the activity system.**

The appropriateness of using other people's work seemed to be a great concern, as students were uncertain whether they could reuse materials created by their peers. This could be related to the students' conception and fear of plagiarism, which is an important component of academic discourse. Students expressed uncertainty about whether materials created by others were even available for reuse, or whether permission was needed from the original author. This resulted in materials being recreated from scratch by incoming volunteers. Conversely, participants in this study noted that they were generally happy to have their works used by others. Since a great deal of time and effort goes into the curriculum development process, materials ideally should be curated to promote reuse, revision, remix, and redistribution as often as possible, all of which are core principles of OER (Wiley, 2014). By simply making the terms of reuse explicit, volunteers can help reduce the uncertainty for new volunteers engaging with internal resources. This process of reuse towards improvement may lead to increasingly high-quality curriculum materials refined by the experiences of volunteers already working in the community. The students expressed a desire for firmer rules around how materials are uploaded and stored in the curriculum database with specific consideration for metadata and explicit licensing that encourages reuse.

When using the Internet for finding educational materials, interviewees seemed to have some misconceptions about resources "freely available" online and the actual legal terms under which the online resources had been released. Interviewees noted a limited understanding of copyright and fair use policies, consistent with the findings of other studies regarding students' awareness of copyright (Czerniewicz, 2016; Kapitzke, Dezuanni, & Iyer, 2011; Muriel-Torrado & Fernández-Molina, 2015). While participants were generally aware that they needed to obey rules around copyright, they were often under significant pressure to find resources in a short space of time. Student-tutors generally did not have a clear understanding of how copyright applied to materials sourced online for use within the classroom. Broadly, as students are not being formally educated on how to appropriately use the Internet as a resource, they have a limited understanding of how to legally source resources online for use. This has implications for the development of their digital literacies, and results in them being unaware of how they can take advantage of open-access, open-source, and open education resources in their work, especially for community outreach activities. So the anarchic nature of using online materials reported in the studies by Calverley and Shephard (2003) and Harley et al. (2006) still seem to be comparable in this context.

An understanding of the learners and their context is essential to providing a relevant and responsive curriculum. Adapting materials from local and international sources was noted as a common strategy to meet the contextual needs of the learners. Local materials were prioritised and when necessary international materials would be adapted and localised for the local context. In some cases, the student-tutors would have to reverse-engineer digital materials for use. For example, this may involve copying text out of a non-editable PDF for adaptation in a document. Taking the time to adapt and localize resources, changing elements such as the measure of units or names of places, was more commonplace than trying to use materials that were unsuitable for the context. The student-tutors took the time to make these changes, knowing that they would benefit the students by making them more appropriate for their contexts, consistent with the findings of Hatakka, (2009). Saving and describing these localized changes for future access is crucial to the sustained quality of the program.

Furthermore, more carefully curating the resources that have been revised for the local context can save future students from repeating this work in years to come.

Participants in this study struggled with the use of the institutional LMS as a repository. The LMS operated much like a file system rather than what was needed, a database which supported metadata, versioning, and comments around resources. While the LMS offered a reliable place to store and curate materials, volunteers frequently mentioned its shortcoming as a collaborative authoring tool. The facilities and technical aspects of the LMS limited participation in collaborative curriculum development. The LMS did not allow the addition of descriptive metadata, which could help volunteers searching for content. As well, the search tool was not sophisticated for querying and discovering resources. Furthermore, interviewees noted the need for the storage of editable formats such as Microsoft Word or Open Document Format (ODF) to ensure that volunteers seeking content can both edit a resource or simply print it out for use.

There is a great opportunity to connect and collaborate with others who espouse similar goals for their own outreach activities. Community development organisations are largely working towards a shared object and could be more explicitly sharing the resources (mediating artefacts), processes (rules), and labour (division of labour). In the context of this study, participants were not pursuing these opportunities and could benefit from more explicitly seeking partnerships in an open way. While sophisticated projects building educational materials for the South African context such as the Siyavula Project, OpenUCT, and Thutong are rapidly developing, only three of the six interviewees mentioned these as sources for developing their own curriculum. Increasing awareness in the pool of educational content created in South Africa would be a useful strategy for community development organisations. There may, additionally, be ways in which similar organisations could collaborate and use the technical infrastructure of one another to better curate their own resources.

## **Conclusion**

This case study has documented how student-tutors are working to improve educational access in disadvantaged communities through educational outreach activities. Simultaneously, advances in technology and the increased commitment by educational institutions to widen access to educational materials are creating an enabling landscape in which to operate. In many cases, community development organisations represent the last mile for bringing educational materials into impoverished communities. There is great potential for student outreach programmes to benefit from the materials being shared by the OER community. As well, community development organisations should ideally engage as contributors themselves to the growing body of OER. For student volunteers working in community development organisations, this could be a valuable way to introduce them to alternative ways of engaging with digital content, which could apply in their personal and professional lives.

The parameters that constrain this activity system are both formally and informally defined by the rules, norms, and conventions of the community. One way to reduce some of the tensions around reusing others' materials, the challenge of curation, and increased collaboration is to apply open copyright licenses such as Creative Commons to all their curated curriculum materials. Adopting open licenses could also help spread the culture of open education, to which community development organisations are closely aligned. There is further potential for partnership between

community development organisations and the OER and open knowledge communities. Proponents of OER should connect with organisations that actively use and rely upon freely available content, developing awareness of content repositories, licensing models, and communities. Furthermore, efforts should be made to offer ways for volunteers to contribute their adaptations and customisations back to the broader OER community, furthering the development of the education commons and contributing OER perspectives from the Global South.

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