

Postgraduate students as OER capacitors

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Abstract

A comprehensive theoretical, legal and practical basis for OER has been developed over the past fifteen years, supported by the expansion of open source curation platforms and the work of advocacy groups and international bodies. OER's potential has been sufficiently documented; the question remains how best to support, integrate and normalise OER activity within the academic community in a sustainable fashion. This paper draws on the experiences of the Vice Chancellor's Open Educational Resources Adaptation project in the University of Cape Town, which explored whether postgraduate students, with their blend of developing subject knowledge, greater time resources, and experience of teaching artefacts from both a learner's and educator's perspective, may be a valuable resource for lecturers or institutions eager to engage in OER but lacking the requisite support structures. It was found that postgraduates were best employed as capacitating agents, focusing on the non-pedagogical elements of OER adaptation.

Keywords: open educational resources; postgraduate students; sustainability; intellectual property management; openness; OER

Introduction

Particularly in the developing world, the accessibility, reach and sustainability of higher education provision has been highlighted as one of the primary challenges facing the sector, as the international economic situation continues to provide less-than desired rates of growth. Furthermore, institutions are simultaneously being tasked with improving the relevance of their teaching and beginning to engage more strategically in informal, adult and lifelong learning.

Open Educational Resources (OER) have been posited as a mechanism to help reconcile these varying demands in the higher education sector (Atkins, Brown & Hammond, 2007; CERI, 2007; Caswell, Henson, Jensen & Wiley, 2008). Through producing these reusable, revisable and freely available online educational resources, educators are able to share high-quality materials in their disciplines with each other, provide students with access to materials to assist in 'flipping the classroom' and other forms of educational innovation, and allow non-students the chance to engage with higher education by accessing the educational artefacts that support the learning process.

Producing OER however requires time and resources (Spilovoy & Seaman, 2015). Evidence to date (Camilleri & Ehlers, 2011) suggests that without the support and additional resources provided by a mandatory institutional OER programme, university educators are disincentivised to engage systemically with OER production, outside its adoption by a small group of innovators. Developing such a programme is a time-intensive process, and invariably requires the time and resources of a number of institutional stakeholders across the institution, including intellectual property specialists, contracting lawyers, and senior management. This requires a strong will in the executive to enact, as well as specifically earmarked resources, both of which may be less practical for under-resourced institutions struggling to fulfil their existing teaching requirements.

Even if an appropriately comprehensive policy is established, engaging with it requires lecturers to commit additional resources, in terms of both time and the development of a new skillset appropriate to online, open education. These competencies, including intellectual property management and technical skills, have not traditionally been integral to the core operations of individual lecturers. Developing these competencies and allocating the time to adapt teaching materials into OER therefore may not be feasible in the short-term, particularly in institutional environments which do not incentivise this activity.

However, lecturers often have access to an untapped resource—postgraduate students. Postgraduate students occupy a particular position in the academic ecosystem with regards to their lecturers' teaching materials, having experienced them from the student's perspective as well as potentially from the educator's perspective through tutoring or teaching assistance. They also typically have more time, necessary for developing the technical and intellectual property skills needed for OER adaptation. Employing postgraduate students within the OER production chain could therefore potentially be an innovative way for lecturers who lack a strong institutional support structure to engage in Open Education.

Sustainability of OER

While OER has been posited as a means to reduce time costs in education by providing high-quality sets of materials that require only adaptation to an educator's teaching needs (Lane, 2008), this scenario relies on a critical mass of OER and OER production practice. Until that point is reached, creating OER requires additional effort on top of existing teaching requirements. In the meantime, there is a need for models and workflows that help build the sustainability of the movement.

Once the potential benefits of OER had been demonstrated by standout OER initiatives conducted at the Massachusetts Institute of Technology, Rice University (Baraniuk, 2008) and the Open University (Gourley & Lane, 2009) significant effort was made by institutions (Rodgers, 2011; Kanwar, Kodhandaraman & Umar, 2010), consortia (such as Jisc: <https://www.jisc.ac.uk/>) and individual lecturers to develop sustainability frameworks and models that could ensure that the initial momentum would result in lasting change. Various aspects of the OER ecosystem have been identified as crucial to the normalisation of OER practice within an institution, such as OER champions (McGill, 2013; Tucker & Bateman, 2009); a supportive IP policy and institutional buy-in (Miao, Mishra & McGreal, 2016); and the establishment of institutional support structures and networks (OECD, 2005; Wiley, 2007).

The most sustainable OER projects appear to be those that are supported by an institutional mandate, ideally one that stress that "OER release and use is an integral part of existing activities, an approach that supports ongoing sustainability" (McGill, 2010, p. 1). While short-term or soft-funded OER projects are certainly valuable in developing the skills and competencies required for OER production, as well as producing actual OER artefacts, they suffer from a lack of sustainability. As projects finish and the support in terms of resources and advocacy comes to an end, OER activity often also slows or ceases, as evinced by the Utah State University OER programme's closure (<http://ocw.usu.edu>) as the ability of lecturers to continue producing OER without additional support wanes.

However, engagement in OER should not necessarily be contingent on a supportive policy environment. There should be space for individual lecturers to engage in their own OER production, but doing so requires an assessment of the intellectual and time costs of engagement compared against the academic's other commitments. This is of particular importance in institutions in developing countries, which often lack the resources and IP support structures that the current high

OER-producing institutions possess (D'Antoni, 2009). While it is certainly possible for individual lecturers to develop their own OER without support, they may also be in a position to use existing support networks, in the form of postgraduate students, to enhance the quality and quantity of their OER output.

Student involvement in OER

Much of the literature regarding student interaction with OER concerns their role as learners or consumers (Lee & McLoughlin, 2007; Carson, Kanchanaraksa, Gooding, Mulder & Schuwer, 2012). A few studies have explored students' potential as OER creators, such as Kleymeer, Kleinman and Hanss (2010) and Hodgkinson-Williams and Paskevicius (2013); fewer still have fully explored their potential role as adapters of existing teaching materials into OER.

Initial research has explored the concept that postgraduate student involvement can support sustainable practice by taking responsibility of some of the activities needed to transform a standard teaching artefact into an OER, freeing up academic time to focus on the pedagogical development and performative elements of teaching (Kleymeer, Kleinman & Hanss, 2010). They can also provide quality enhancement to the completed OER. While much of criteria for determining quality is shared between traditional closed-access teaching materials and OER, there exist other "Domains of Learning" (Kawachi, 2013, p. 19), including technical, curatorial and metadata considerations as well as more traditional pedagogical concerns, in which the quality of an OER can be measured. Students or other third-party adapters can perform adaptation work that enhances areas of quality that did not apply to classroom-focused teaching.

Quality of OER is based on the quality factors that would apply to any non-open teaching resource, with additional quality measures that apply as the distributional and legal factors begin to exert themselves as the resources leave the confines of the classroom and enter the public sphere. These involve the strategic choice of file formats (to ensure reuse and/or revisability), file size (for use by those in low infrastructure areas), quality of the descriptive metadata, and other technical concerns separate from the resources' pedagogical elements. To be legally open, they also need to contain only legally re-shareable third-party content, such as those under Creative Commons licences.

The scenario above makes the assumption that the teaching artefacts—lecture notes, visualisations, simulations, presentations, videos, etc.—are valuable in and of themselves. This is an implicit assumption in OER advocacy: the potential for (well-designed, adequately described, possibly scaffolded) teaching materials to be useful outside of their immediate performative context, i.e. a specific classroom environment. This potential depends strongly on the creator's pedagogical style and the nature of the activity the materials support - for example, educators who use humour, classroom interaction or debate may need to adapt their materials heavily to make them most useful to an online, decontextualised audience. Here again, a third-party eye on the materials, distanced from the experience of teaching them according to a specific performative style, can adapt (or offer advice on how to adapt) the materials so as to maximise their reach.

As adaptation is based on existing materials, the costs incurred in adaptation is largely in terms of time – both in terms of developing the skills and competencies required to adapt, and the actual adaptation work itself. In most cases no specialised or proprietary software is required, and the abundance of open subject repositories means that an institutional lack in that area is not necessarily a barrier to OER engagement. As the creator, the educator may not be aware of exactly how their materials are being interpreted from the student perspective, and thus may include superfluous materials, under-elaborate certain points or over-emphasise others. A critical eye that can parse the

materials through the audience's perspective could be a useful support mechanism to maximise the value of the materials.

Thankfully, many educators have access to a useful local resource that combines a learner's perspective, a developing critical gaze, and simply more capacity in terms of available time - postgraduate students. Postgraduate students occupy an interesting educational niche in many/most institutions, simultaneously learning as students and teaching (or facilitating teaching) as tutors or teaching assistants. As such they can potentially experience a particular teaching resource from both the student and instructor's perspective. Conversely their formal experience in pedagogical design is likely to be limited. Harnessing this perspective to enhance the quality of the materials is one potential way of incorporating students in OER development.

Study site – the Vice Chancellor's Open Educational Resources Adaptation project

This paper draws on a specific project, namely the Vice Chancellor's Open Educational Resources Adaptation project (hereafter, 'the Adaptation project'), organised by the Centre for Innovation in Learning and Teaching (CILT) at the University of Cape Town (UCT). This project piloted an innovative process aimed at supporting institutional OER activity by employing postgraduate students as 'hunter-gatherers' of potential OER. In this role, student adapters would actively seek out high-quality teaching materials (based on personal and peer experiences) and attempt to persuade their creators to offer them for adaptation. Based on the assumption that a number of lecturers would be willing to share their materials as OER but lack the technical and IP skills needed to adapt them into OER themselves, the students took responsibility for all of the adaptation work needed to transform a teaching artefact into an OER.

UCT's intellectual property policy, which shares copyright of teaching and learning materials between the university and the lecturers who produced them, permits for autonomous engagement in OER activity. While there are a number of grant processes that assist lecturers in this production, and the presence of a unit that among other roles can support lecturers in this regard (CILT), the institution does not have a formal OER mandate and does not actively incentivise lecturers to produce OER.¹ This lack of incentivisation has been identified as a possible barrier preventing otherwise-interested lecturers from engaging in OER production (Kursun, Cagiltay & Can, 2014). As incentivisation is reliant on upper-management decisions, the ability for a short-term project to change policy at that level was limited. In contrast, the Adaptation project took an agile alternative approach in supporting lecturers in developing their own enabling systems for OER production, specifically through employing students to reduce the time costs of OER engagement.

As the student adapters were responsible for identifying which materials should be adapted, an attempt was made to recruit from each of UCT's faculties, as a level of disciplinary familiarity (and ideally personal experience of the materials as a learner) was considered valuable in identifying quality teaching materials and supporting any attempts to change the educational or pedagogical content during adaptation. Five students were substantively involved in the project, adapting materials from nine lecturers. The student adapters were employed on a paid-on-claim basis, allowing them a degree of flexibility in their working hours, under the assumption they would work approximately five hours per week. The following table maps the students and lecturers to the UCT faculties in which they studied and worked:

¹ Correct at time of writing.

Table 1: Lecturers and student adapters matched to UCT faculties

Student	Student faculty of origin	Origin of adapted materials
Student 1	Humanities	Humanities (2)
Student 2	Humanities	Humanities
Student 3	Science	Humanities, Sciences (2)
Student 4	Humanities	Humanities (2)
Student 5	Commerce	Commerce

This acquisition process was a necessary condition for the main body of work, the adaptation work itself. The nature of the adaptation work is dependent on the level of responsibility the student adapters are given and the ‘moment’ in which they become involved in the OER process, namely the *generative moment*, the *adaptation moment*, and the *publication moment*. These moments broadly correspond to the three letters of OER, as shown below:

Educational (generation)

Conceptual design, curriculum design/shaping, teaching mode (written, visual, etc.)

Skills: content knowledge, learning design **Time:** High

Open (adaptation)

Copyright clearance & Intellectual Property Management

Skills: Intellectual property management, copyright clearance **Time:** Moderate

Resources (publication)

Technical editing, publication, metadata

Skills: Technical editing, publishing, metadata **Time:** Low/Moderate

Figure 1: ‘Moments’ in the OER Adaptation process

In the Adaptation project, the role of the student adapters was conceived of as operating at primarily the *adaptation* (‘O’) and *publication* (‘R’) moments; specifically, their work was to find pedagogically-complete teaching materials, perform copyright-clearance on them and subsequently apply an appropriate Creative Commons licence. Simultaneously they would perform technical editing on the materials, ranging from correction of typos, reformatting to open file types, and ascribing metadata for the final upload to the institutional repository (OpenUCT: <http://open.uct.ac.za>). While the project acknowledged the possibility for pedagogical-level changes, these were felt to be less likely as the materials to be adapted were supposed to already be used in teaching, and therefore assumed to be pedagogically ‘complete’. All changes were intended to be done only after communicating

with the contributing academic. The requisite intellectual property management and technical skills (metadata and curation) needed were developed in training sessions held at CILT, which also advised the adapters on acquisition strategies.

In this activity the student adapters were envisioned as acting as OER advocates as well as material developers. Through their acquisition activity, it was hoped that they would spread information on intellectual property and open licensing, both to the potential contributing lecturers as well as (ideally) fellow students. Ideally, this would have supported the development of a local OER community-of-practice, incorporating both student and staff actors to facilitate OER production.

Semi-structured interviews were held with the five students adapters to determine the nature of their materials acquisition and adaptation approaches, complemented by structured interviews undertaken with contributing lecturers to identify their experiences of the project. Where possible, the insights from the interview process were compared to an artefact analysis of the completed OER (as compared to the original teaching materials) in order for triangulation (Denzin, 2006; Patton, 1999) in order to determine the veracity of student claims of their adaptation activity.

Findings

The adaptive ‘moment’ – copyright clearance and intellectual property management

The copyright clearance aspect of the adaptation work proved to be relatively straightforward, with few students reporting difficulties with sourcing open equivalents of media objects (such as pictures). As many images used in the resources were decorative rather than illustrative, or were generic representations of the topic under question, replacing them was generally uncontroversial. Rather more difficult was their role as intellectual property educators and open advocates, and indeed a large number of the lecturers who declined to participate did so because of concerns about “being exposed” (King, 2016, p. 63) that the OER adaptation process would entail.

In contrast to the lecturers who declined to participate due to intellectual property concerns, the majority of those who did contribute accepted the most open Creative Commons licence (CC BY) without comment. However, many of these lecturers had been involved in other open projects and thus been exposed to open licensing beforehand. Post-project interviews with the contributing lecturers indicated that while negotiating the licensing was unproblematic, their knowledge of the specificities of copyright and Creative Commons was generally low or incomplete, indicating students were responsible for only partial knowledge transfer.

The publication ‘moment’ – technical editing

The technical editing process was similarly straightforward. As the majority of materials adapted were presentations or sets of notes, familiarity with basic Microsoft Office software was sufficient for modifying those elements of the files (typically spelling and grammatical errors, borders, and adding explicit Creative Commons licensing) that students felt empowered to adapt. Depending on the individual initiative of each adapter, other formatting and stylistic features were adjusted for visual consistency and coherence.

The one exception was Student 2, who worked primarily with video content in the form of recorded lectures. While this student faced multiple problems with the video software, which was prone to failure, these problems were amplified by the working relationship with the contributing academic which was characterised by long periods between meetings, frequent revisions on already-completed materials, and an increasing wariness over representationality by the academic. These can be explained in part by the more performative and intimate nature of video content and the

somewhat sensitive topics discussed in the recorded lectures. This increasing wariness eventually led to the completed OER videos being removed subsequent to the project's completion at the contributor's request.

The metadata process proved to be unproblematic, in that students readily grasped the concepts of metadata tagging and were assisted by the student coordinator in the final upload process. What did emerge from the post-project interviews with the lecturers was their disengagement from the publication process, particularly as pertained to the final upload to OpenUCT. The presence of an existing, closed-access LMS (a Sakai-based platform named 'Vula') with which lecturers were more familiar may have acted as a disincentive, as its functionality was well-suited to the needs of existing UCT students – the primary audience that contributing lecturers desired to reach (King, 2016).

The generative 'moment' – pedagogical engagement

Of the three adaptation categories (generation, adaptation, publication), both adaptation and publication are 'agnostic' in that the skills they require are not tied to any particular discipline. Therefore, for a project that focuses purely on adaptation, the disciplinary background of the student is less important than their ability to master the intellectual property and technical skills needed. In contrast, pedagogical development obviously does require disciplinary knowledge, and the degree of to which postgraduate students feel able to contribute in this area varied significantly.

Students' involvement in the generative/pedagogical 'moment' of OER production was expected to be minimal as the adaptation was to occur on materials already used in teaching. In most instances there was indeed no pedagogical development, particularly when students worked on materials originating from other disciplines. In contrast to previous student-led adaptation projects (see Discussion below), students rarely made attempts to "expand the object" (Engeström, 2001, p. 149) by adding contextualising information that would make the resources more broadly understandable outside of the UCT context in which they were generated. However, given the resources under adaptation were often from (supposedly) context-independent disciplines, such as Economics, Mathematics and Physics, or dealt with particularly South African socio-political issues, the ability for such contextual adaptation was limited.

In two adaptation scenarios, however, students were more strongly involved in the original creation of the resources they were adapting. The resources (a set of skills-development tutorials, intended for a specific Humanities department but relatively generic in content) were developed by the departmental tutor group in conjunction with an academic. The two student adapters (S1 and S4) had both used the materials in their own tutoring, and so during modification into an OER were far more confident in their ability to contribute pedagogically to the final OER, adjusting the content based on their experiences of delivering the original materials. This mirrors the findings by Bovill, Bulley and Morss (2011) and Cook-Sather (2014) who found that the greater the student involvement in the curriculum design process, the greater their general pedagogical involvement.

Acquisition and community-building

While capable of providing valuable adaptation services, students were less well positioned to acquire materials for adaptation. Their ability and willingness to approach lecturers for materials were strongly influenced by the cycles of the academic year, particularly exam and vacation periods, which led to long periods where little or no acquisition or adaptation work could be performed. Lastly, confidence in approaching lecturers was highly variable, and several students indicated that their subordinate status penalised their interactions with lecturers, particularly from other disciplines.

Their ability to successfully acquire materials did not appear to be strongly influenced by the respective disciplines of the adaptor and potential contributor. Although the lecturers interviewed in the project expressed that a student's disciplinary knowledge was a positive attribute encouraging them to contribute, in practice the students often adapted materials outside of their discipline, and occasionally even from different faculties. In these instances, all adaptation work was purely at the *adaptation* and *publication* moments, and involved no pedagogical development.

The autonomy of the student adapters in the Adaptation project proved to be both an enabling and constraining factor. Positively, it enabled students to integrate their project commitment with their academic responsibilities, which reduced fatigue and maintained their enthusiasm for the project. However it also relied heavily on highly-motivated individuals with strong people skills who were able to introduce the concept of OER adaptation, and the participating students indicated that a more structured, production-focused model with dedicated weekly or bimonthly in-house workshops set aside for adaptation activity would have improved their output.

Status of completed OER

Emerging from the lecturer interviews was the surprising finding that in many cases, the contributing lecturers had not incorporated the completed OER in their own teaching, or in extreme cases had not even viewed the OER records on the institutional repository after the project's completion. This is however in line with the general disengagement or *laissez-faire* attitude towards the adaptation process exhibited by the lecturers. Student 3 noted that "[one lecturer] had received quite good viewership ... so I sent him my low statistics and he was quite happy that now people were using the actual material" (King, 2016, p.81) but also that "[lecturers] did not ask for statistics themselves" (King, 2016, p.81). In further discussion with the contributing lecturers, it was discovered that they had not received any sort of feedback from colleagues or departmental managers from engaging in OER production, and therefore did not see it as contributing to their academic profiles. Rather, they appeared to view their engagement as another means to access their existing student bases, in a similar fashion to their use of the institutional LMS platform.

S1 and S4 collaboratively adapted skill development materials emerging from the same department into OER. As departmental tutors, they were able to push the use of the completed OER by the tutorial programme, increasing their use. In contrast to the majority of the other adaptation instances, the closer relationship between the adapters and both the original material and the contributing department supported the integration of the OER product into departmental practice.

In sum, while adequately equipped to adapt and curate materials, the relative power disparity between the student adapters and the potential contributing lecturers and the pressures of the academic year served to weaken their ability to effectively acquire materials. When materials were adapted, in most instances the completed OER were not re-integrated into teaching practice but rather served as an additional mechanism for students to access course materials. Where the student adapters were more involved in the creation and use-as-educators of the original teaching materials, the completed OER were more easily integrated back into departmental practice.

Discussion

The findings of the Adaptation project can be productively compared to the findings of a similar project by Hodgkinson-Williams & Paskevicius (2011), also conducted at UCT by CILT, which similarly employed postgraduate students as OER adapters. In this study, students worked on materials originating from a single department with a history of internal, online

sharing. The study similarly found that students easily developed the requisite technical skills and found copyright clearance “easy and straightforward” (Hodgkinson-Williams & Paskevicius, 2011, p. 9).

Even though the students in the Hodgkinson-Williams & Paskevicius study worked within a single, pre-identified department with an existing history of sharing, their experience of acquiring materials was also not straightforward. Many of the same reasons for non-contribution were given, such as a lack of confidence (Hodgkinson-Williams & Paskevicius, 2013), but in addition, technical problems occurred in the acquisition process, as many of the files used in the department were created in LaTeX. Sourcing the original LaTeX files provided an early barrier that slowed the adaptation work, somewhat similar to Student 2’s experience with video files being far harder to adapt than document and presentation files.

In contrast to the Adaptation project, these students were more involved in the pedagogical development or generative moment, and performed a wider range of adaptation activities that were aimed at enhancing the educational quality of the materials. This may be due to their greater involvement in the developmental stage as co-creators, rather than purely adapters, of the original teaching materials, as the materials had been pre-identified and students were recruited directly from the department that provided the materials.

The similarities (relatively straightforward copyright clearance and curation activity, difficulties in acquisition) and contrasts (more pedagogical development) indicate that student experiences of OER adaptation are broadly similar, but subject to local peculiarities of discipline and context. It also suggests, given the common difficulties in acquiring materials, that more focus be placed on the pre-adaptation factors that influence the success of OER adaptation, and that projects interested in employing postgraduate students in this role look to the possible contributing lecturers first to determine what structural, agential and practical factors are at play in their choice whether or not to engage in OER adaptation.

Conclusion: Students as OER capacitors

Students can serve as quality-enhancing agents, but the forms of quality-enhancement that they are best suited for (curation, metadata and copyright-clearance) are often unfamiliar to lecturers who understandably focus on pedagogical quality (Alaniska et al, 2006; Masterman, 2015). The students in the Adaptation project were generally unwilling to even consider pedagogical work. Many expressed that they felt uncomfortable in even discussing altering pedagogical content with the contributing lecturers, and this occurred regardless of their disciplinary knowledge. The two instances where pedagogical adaptation was performed occurred when students were involved in the original material’s development stage. This suggests that while students acting as post-hoc adapters are less likely to make pedagogical changes, their confidence and willingness to contribute to the intellectual content increases the earlier their involvement in the production phase.

Employing students in a pedagogical adaptation role is also heavily reliant on their disciplinary knowledge. As it may be difficult to recruit from each department providing materials, focusing on the technical and publication aspects of adaptation allows for more flexibility in which students are employed, as well as their ease of replacement.

In summary, employing students in a co-authorship role for the pedagogical enhancement of OER requires:

- a) Students with specific disciplinary knowledge;
- b) Possessing high levels of confidence (and perceived as competent by the co-creating lecturers);

- c) Recruited during the material development stage (i.e. at the production rather than adaptation moment);
- d) Ideally involved in a co-instructional role (e.g. teaching assistants, tutors).

The ability of students to act as change agents actively driving OER innovation is limited. Finding sufficiently-positioned students may be difficult, particularly when adapting OER from a range of departments or disciplines. An alternative is employing students as *capacitating agents*. In this role, students (who do not need to possess specific disciplinary knowledge) serve to support existing OER production activity by assuming the burden of non-pedagogical adaptation activities, thus making it easier for lecturers to contribute materials. In this instance, disciplinary knowledge is less relevant than developing copyright clearance and curatorial skills. This facilitates recruitment, as students do not need to be tied to specific disciplines or Faculties in order to provide adaptation services.

Lecturers experimenting with this innovation should be cognizant of two time-related issues: firstly, that students do possess more time than lecturers; but their tenure at the university is likely to be limited to a 1–3 year span (of course, the percentage of post-graduate students will vary by institution). This particular combination can be harnessed by using students as ‘OER capacitors’, whose perspective as recent students can help refine the materials for greater clarity, and who can perform the technical and intellectual property skills needed to fulfil the ‘Open’ requirements of OER thus freeing up academic time to concentrate on the pedagogical enhancement of the materials.

Projects incorporating students in OER acquisition activity need to be cognizant of the constraints students experience, particularly around their ability to act as advocates for OER. A simpler way to include students is focusing more tightly on their role as adapters, supplemented with acquisition initiatives conducted by more senior institutional actors.

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