

'We teach them to be university students'
**The role of peer educators in the provision of ontological access to
higher education**

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Abstract

In South Africa, we have been concerned with students' epistemological access to disciplinary knowledge, but perhaps not sufficiently concerned with their ontological access into disciplinary identities. This paper argues that undertaking university studies requires the integration of epistemological access with ontological formation within disciplinary communities, and, thus, personal transformation, as well as knowledge acquisition. The focus of this study is the role of peer educators in the provision of ontological access to disciplinary identities at a South African University. The study found that student assistants who 'are from the same backgrounds as the students' and 'understand where they are coming from' were well positioned to provide ontological access to disciplines and fields. The University has developed a strong culture of students supporting students, and the paper draws on concepts of social and epistemic justice to theorise how this was achieved for the purpose of generalising these insights more widely.

Keywords: epistemic justice, ontological access, peer educators, social justice

Introduction: Why ontological access matters

An important part of transforming the South African higher education system is the provision of access to greater numbers of students, particularly students who were excluded from higher education by the policies of the past. Increasing access to higher education has meant increasing the enrolments of students who, for reasons of economic or social disadvantage, are underprepared for higher education. Despite many initiatives to transform South African Higher Education, inequalities in student enrolments, retention, throughput and academic access persist and are extensive. The Council on Higher Education (CHE) reports that almost 50% of contact students drop out of their first year and that less than half of the remaining students graduate within the regulation time (CHE, 2013). The report acknowledges that although racial disparities in students' performance have reduced, the



completion rate of African students is approximately 50% less than that of other groups (CHE, 2013). Cooper points out in his study of student full-time equivalents by field of study 'that African undergraduate enrolments were concentrated outside the sciences, engineering, commerce and medicine' (2015: 247). Thus, for many students from poor and working-class backgrounds, successful graduation in technical and professional fields remains elusive. While many of the causes of student attrition and failure are systemic, students' experiences in higher education institutions, for example, of curricula that marginalise their own experiences, or teaching and learning practices that ignore their needs, are strong contributory factors (Norodien-Fataar and Daniels, 2016). The recent student protests in South Africa, have brought attention to issues, not only of social justice, but of epistemic justice, in particular students' right to an education that is transformative, sensitive to, and appropriate for, the context of the global South.

The educational philosopher, Wally Morrow (2009), warned that the provision of access into programmes would not be transformative if students failed in large numbers, thus it was important to be concerned with students' epistemological access to disciplinary knowledge in order to support their academic success. The term 'epistemological access' was coined to distinguish between a student's admission into a higher education programme, and the student's acquisition of the knowledge and literacies of the discipline or field. Morrow argued that admission of students onto programmes required a commitment both on the part of both the students and the academics who teach them. Considerable work has been done in South Africa to build a knowledge base of the kinds of undergraduate curricula and pedagogies that might provide epistemological access (see e.g., Leibowitz and Bozalek, 2014); this paper, however, argues that that University students also need ontological access to their disciplines and fields. Undertaking University studies requires the integration of epistemological access to a disciplinary field with ontological access to a disciplinary community, and thus a personal transformation as well as knowledge acquisition (Dall'Alba and Barnacle, 2007). Barnett argues that full access to higher education involves both 'knowing and becoming', and that the process of knowledge acquisition 'has ontological implications' (2009: 435). The provision of ontological access to higher education involves interrogating the values and attributes of an institution, learning how to become a student, understanding (and critiquing) what is valued in a discipline, why practices have evolved, and how they might change. In vocational higher education, an important aspect of 'becoming' is students' emerging relationship to the field of practice (Dall'Alba, 2009).

The particular focus of this study is the role played by peers in the provision of ontological access to higher education practices at a South African University. We argue that peers, in the form of mentors, tutors and other peer educators, who 'are from the same backgrounds as the students [and] understand where they are coming from', are well positioned to guide students through the process of becoming University students and, in vocational fields, aspiring practitioners. At many South African higher education institutions, the academic staff are too distant from the students in terms of knowledge, age, socio-economic status, and in some cases 'race' and language (see CHE, 2019: 45-48) to provide

ontological access to their disciplines. The research question that this study therefore addresses is: How might peer educators facilitate the provision of ontological access to technical and vocational disciplines and fields? The University in this study has developed a strong culture of students supporting students, and the paper draws on a theoretical understanding of how this was achieved for the purpose of generalising these insights more widely.

A brief overview of the literature on peer support in higher education

There is a considerable literature that studies the impact of peer support in higher education. The findings of these studies are remarkably consistent: peer groups provide students with personal, social and academic support (e.g., Colvin and Ashman, 2010; Peregrina-Kretz, Seifert, Arnold and Burrow, 2018). Longitudinal studies and systematic reviews of the literature have repeatedly found that peer relationships and interactions have important, usually positive, impacts on students' success (Jacobi, 1991; Thomas, Chie, Abraham, Raj and Beh, 2014; Windchief and Brown, 2017). Peer support has been identified as 'the single most potent ... influence on growth and development during the undergraduate years' (Astin, 1993: 398). Similar studies confirm and extend findings that claim that 'interactions with peers is probably the most pervasive and powerful force in student persistence and degree completion' (Pascarella and Terenzini, 2005: 615), and that peer support shapes 'individual and collective life on campus in terms of identity, group membership, acceptable discourse and desirable behavio[u]rs' (Peregrina-Kretz et al., 2018: 262). Indeed, 'a student's most important teacher is often another student' (Boud, Cohen and Sampson, 2014: 392).

There are many different forms of peer interaction; these forms could be located along a continuum from informal interactions between classmates to more formal interactions with a tutor or teaching assistant (Boud et al., 2014). Formal interactions usually occur through institutional programmes, while informal interactions occur more 'organically', as students form connections with peers in various settings. There are often different kinds of peer educators on a single campus, including tutors, teaching assistants, laboratory demonstrators, residence assistants, orientation leaders, and peer mentors (Wilson, Holmes, de Gravelles, Sylvain, Johnson, McGuire, Pang and Warner, 2012). Students in these formal positions play a critical role in shaping the academic and social experiences of new students in higher education. This is evident, for example, in the socialisation role that residence assistants and orientation leaders play in acclimatising students to their new institution and its culture (Ganser and Kennedy, 2012; Wawrzynski, LoConte and Straker, 2011). Peers also play a key role in the provision of academic assistance to students (Jacobi, 1991; Terrion and Leonard, 2007). Peers take on roles such as connecting link between academic staff and students, learning coach, and student advocate (Tett, Cree, Mullins and Christie, 2017). While formal peer programmes vary in their models, their intentions are to provide support to students (Boud et al., 2014).

Peer support is particularly important in technical and vocational disciplines and fields; it is the medium through which the values and norms of the discipline and profession are

conveyed (Bell, Tzou, Bricker and Baines, 2012; Dunleavy, Galen, Reid, Dhar and DiZazzo-Miller, 2017). Studies have identified peer interaction 'as having the largest impact on [students'] academic performance' in technical disciplines (Kendricks, Nedunuri and Arment, 2013: 40). Peer support 'helps students to realize and envision their self-identity as STEM [i.e., Science, Technology, Engineering or Mathematics] scholars with the potential to offer meaningful contributions to their disciplines' (Wilson et al., 2012: 154). Peer support has been identified as playing an even stronger role when the students are from under-represented groups in technical and vocational fields (Bell et al., 2012; Holmegaard, Madsen and Ulriksen, 2014; Makala, 2017; Soldner, Rowan-Kenyon, Inkelas, Garvey and Robbins, 2012). Studies have found that tutors and other student assistants are most effective when they are from similar backgrounds as the students whom they support (Espinosa, 2011), for example, under-represented students in STEM disciplines and fields felt 'validated within a community that affirmed their presence and abilities to succeed in fields they select[ed]' (Palmer, Maramba and Dancy, 2011: 501). Personal, social, and academic support are embedded in peer groups and in the work of mentors or tutors who support students across their programmes of study and foster 'a sense of community among faculty, students, STEM alumni, and professionals in STEM fields' (DeForge, Colquhoun, Richmond, Emberly and Newman, 2019). When peer and other academic support interventions are integrated into a coherent and structured programme, this can effectively 'guide STEM undergraduate majors in adopting the metacognitive strategies that allow them to excel in their programs of study, as they learn to appreciate and understand science more completely' (Wilson et al., 2012).

Theoretical framework: Understanding ontological access

An 'ontological turn' has been noted in teaching and learning in higher education (Barnett, 2005; 2009; Dall'Alba and Barnacle, 2007) which proposes that 'instead of knowing the world, being-in-the-world has to take primary place in the conceptualizations that inform University teaching' (Barnett, 2005: 795). Theorists of ontological formation (e.g., James, 2014; Pickering, 2017) understand the processes of becoming as emergent and mutable. In this paper we draw on these, and other, theorists to explain how peer educators help students to navigate the demands of higher education studies in ways that support their identification with the discipline or field. To avoid false categories and false dichotomies, and even more importantly, to avoid ontological formations reproducing formations-in-dominance, the provision of ontological access needs to be socially and epistemologically just, thus rejecting the 'structural violence' associated with most acculturation practices (James, 2014: 92). In conceptualising ethical ontological access, we appropriate the analytical lenses of social and epistemic justice (Fraser, 2009; Fricker 2003; 2007) to envision a socially and epistemologically just higher education system. Dimensions of social and epistemic justice were used to analyse peer educators' understandings of how to become a University student in technically and vocationally oriented disciplines in a 'disadvantaged' (some might say majority representative) University in South Africa.

Socially and epistemologically just ontological access

Social justice is achieved through the equal redistribution of the resources of society, the recognition and affirmation of difference, and through equality of representation towards 'participatory parity' (Fraser, 2009). Epistemic justice is achieved when the knowledge that people have acquired in different contexts and through different life experiences is valued, regardless of their social or economic status, and when there is greater empathy for, and understanding of, the knowledges and experiences of others. Fricker (2007) identifies two types of epistemic injustice: testimonial injustice and hermeneutical injustice. Testimonial injustice occurs when the knowledge of an individual or group is not valued for reasons of social status; hermeneutical injustice occurs when an individual or group's experience is not valued, usually because 'there are no concepts available that can adequately identify or explain that experience' (Fricker, 2007: 67). Epistemic injustice happens when 'a speaker receives the wrong degree of credibility from his hearer owing to ... prejudice on the hearer's part'; thus to achieve epistemic justice, 'a special sort of *reflexive critical openness* to the words of others' is required (Fricker, 2003: 154-155).

It is possible to translate the philosophical concepts of social and epistemic justice into practical understandings towards how universities might be re-imagined as more socially and epistemologically just higher education communities, comprising lecturers, academic developers, peer educators and students working creatively across their differences. Anderson (2012), for example, draws on Fricker's (2003; 2007) concepts of epistemic justice to conceptualise inclusive higher education institutions. Leibowitz and Bozalek (2016) find Fraser's tripartite account of participatory parity to be 'a valuable frame to describe instances of social justice, as well as the kind of institutional arrangements that should be instituted to support participatory parity' (2016: 109). Kidd and colleagues' (2017) description of epistemic injustice in educational practices will be uncomfortably familiar:

Epistemic injustice refers to those forms of unfair treatment that relate to issues of knowledge, understanding, and participation in communicative practices. These issues include a wide range of topics concerning wrongful treatment and unjust structures in meaning-making and knowledge-producing practices, such as the following: exclusion and silencing; invisibility and inaudibility (or distorted presence or representation); having one's meanings or contributions systematically distorted, misheard, or misrepresented; having diminished status or standing in communicative practices; unfair differentials in authority and/or epistemic agency; being unfairly distrusted; receiving no or minimal uptake; being co-opted or instrumentalized; being marginalized as a result of dysfunctional dynamics; etc. (Kidd, Medina and Pohlhaus, 2017: 1).

Fraser (2009) and Fricker (2003; 2007) provide useful tools for conceptualising inclusive forms of peer support, as well as how peer educators might help University students to negotiate their identification with academic disciplines and fields of practice. Describing urban spaces that facilitate encounters across differences, James (2014) explains that

'locals and strangers should rub shoulders, sometimes painfully, as they move through in locally defined places' (2014: 92). In a University in South Africa (particularly one in an impoverished rural environment), an argument could be made for:

... the deepening of reflexively understood ontological friction – that is, for the creative facilitation of positive and painful intersections of engagement, allowing for different ontological orientations to be present in the same place (James, 2014: 92).

Accommodating multiple ontologies is not a strong feature of South African higher education, although promising studies around the intersections of Indigenous Knowledge and Western Science – both in scientific work and in teaching science are emerging (see e.g., Dalvit, Murray and Terzoli, 2008; Masinde and Bagula, 2012). The integration of Indigenous Knowledge and languages in formal education is associated with social and epistemic justice; for example, Dalvit et al. (2008) argue that drawing on indigenous knowledge and languages can empower students from marginalised communities, 'even in typically "Western" disciplines, such as Computer Science'. Ogawa (1995) proposes a 'multiscience' approach:

... a 'multiscience' perspective on science education affords richer implications for reflection and practice. A multiscience perspective recognizes the existence of various types of science at play in all science classrooms, especially personal science, indigenous science, and Western modern science (Ogawa, 1995: 583).

McMahon and colleagues propose 'bi-epistemic' practices (McMahon, Harwood, Bodkin-Andrews, 2017) that resonate with Fricker's (2003) view of epistemic justice as 'responsible hearing' that has the potential to expand the limitations of traditional technical and vocational curricula.

Applying Fraser's (2009) trivalent conceptualisation of social justice, and Fricker's (2003; 2007) understanding of epistemic justice to students' ontological access to technical and vocational disciplines requires a bridge between the high-level theoretical concepts and the research context. In translating Fraser's (2009) concepts of redistribution, recognition, and representation and Fricker's (2003, 2007) concepts of 'reflexive critical openness', 'other words and other worlds', and 'the responsible hearer' into their equivalents in the context of students' ontological access into academic disciplines, the following concepts and exemplars are proposed:

Table 1: Social and Epistemic Justice in Higher Education

Fraser's modes of social ordering	Dimensions of social justice (Fraser 2009)	Dimensions of Epistemic Justice (Fricker 2003, 2009)	Ontological access in a socially and epistemologically just University
Redistribution	Economic	Reflexive critical openness	'Bi-epistemic' resources
Recognition	Cultural	Other words, other worlds	Supporting and affirming systems
Representation	Political	Responsible hearing	Opportunities to develop expertise and 'voice'

Redistribution in educational contexts is achieved through access to appropriate knowledge resources, the valuing of bi-epistemic practices and Indigenous Knowledges, and the sharing and exchange of ideas in a context of 'reflexive critical openness'. Cultural oppression and misrecognition can occur when there is no parity of esteem or affirmation of difference; thus, recognition in the technical and vocational disciplines requires systems of support and affirmation in which 'other words and other worlds' are recognised. The third pillar of social justice, representation, is necessary to avoid excluding participants on the assumed attributes of their socio-economic status, 'race', gender, or age – and instead to enable their own voices and expertise in the field to develop through 'responsible hearing'. Representation in higher education ensures that course participants have a say in what is learned and how it is learned in developing an expert practitioner identity. Bringing these principles together, we can say that social and epistemic justice would be served if students were provided with the resources, status and voice necessary to enjoy participatory parity. Thus, sharing material resources as well as knowledges and experiences, affirming and supporting individuals and groups, and creating a space for different voices to develop through engagement in disciplinary concepts and practices, emerge as key indicators of a socially and epistemologically just pedagogy towards ontological access to vocational and technical higher education.

Research design and methods for studying ontological access

The research design, comprising focus group interviews with peer educators and their trainers, was intended to address the guiding research question: How might peer educators facilitate the provision of ontological access to technical and vocational disciplines and fields?

Research site

The research site was a disadvantaged rural University with a mission to 'uplift talented but mainly disadvantaged individuals', a 'commitment to social redress' and creating 'the

opportunity [for all students] to achieve their full potential'. The majority of its students are poor or working-class students who attended predominantly rural disadvantaged schools in the region.

Research participants

The University in this study has developed a hierarchical system of peer educators, comprising five levels. At the top of the hierarchy are tutors. Tutors tend to be Masters' or doctoral candidates who are enrolled at other universities in the region, as the University does not offer postgraduate degrees in many of its programmes. The tutors conduct tutorials and practicals at all undergraduate levels. Teaching assistants are next in the hierarchy; they are senior students at the University (usually fourth year students with strong academic records) who are appointed to assist academic staff with a number of different tasks. Laboratory demonstrators (also usually fourth year students with strong academic records) are appointed to assist STEM lecturers and laboratory technicians and to help students to set up experiments in laboratories. Supplementary instructors (senior students with strong academic records) are appointed to provide academic support (e.g., with homework tasks and assignments) in the residences, or after University hours in the case of students who are not in residence. Finally, peer mentors (who are volunteer senior students) are appointed for a term (about three months) to support and advise first year students. Depending on funding, the institution appoints about 600 peer educators for its student body of approximately 9,000 students. Fifteen student assistants were selected to participate in focus group interviews. The student assistants were selected by the trainers to participate in the focus group interviews. All the student participants were African, most spoke isiZulu as a home language, and all were fluent speakers of English.

Tutor trainers are responsible for the generic training of all student assistants in preparation for their roles and responsibilities, while academic staff are responsible for discipline-specific training, with some support from academic development staff who are knowledgeable in the field or discipline. After successful completion of their training, all student assistants receive certificates, which they tend to value and include on their CVs. Four tutor trainers were interviewed.

Data collection

Data for the study were obtained from focus group interviews with the different peer educator groups, as well as the tutor trainers. Focus group interviews were conducted with three peer mentors, three supplementary instructors, two laboratory demonstrators, three teaching assistants, and four tutors. Four tutor trainers were also interviewed, including a discipline-specific tutor trainer, who was based in a STEM Faculty. The trainers were interviewed after the student assistant focus groups and data from the trainers were used to triangulate findings across the peer educator groups.

Data analysis

All interviews were transcribed, using standard transcribing methods (e.g., Edwards and Lampert, 2014). 'Member checks' (Savin-Baden and Major, 2013: 477) were undertaken and the transcriptions were revised, prior to their analysis. A two-step process of coding the data was undertaken following the verification of the transcript by both interviewers and interviewees. The process used was to initially code data with *in-vivo* coding, following Saldaña's (2013) first cycle coding methods, which entailed extracting keywords from the participants' actual words (2013: 58 – 60). The second cycle of coding reframed the *in vivo* keywords in terms of categories of ontological access (see Table 1), and more fully explained the data with reference to the conceptual and theoretical frameworks. Engagement with the data provided insights into the provision of socially and epistemologically just ontological access, as these concepts were understood by the peer educators.

Ethical considerations

The project obtained ethical clearance from the institution's research ethics committee, as well as permission to conduct the research activities. Informed consent was provided by all focus group interview participants.

Research findings: How peer educators provide ontological access

Findings from the different student assistant focus group interviews are presented separately, to identify and explain the role that each group of peer educators played with regard to students' ontological access to University life and disciplinary identities.

'We've been there': Orientating to a new life

First year students' initial encounters with the University were mediated by peer mentors, who were officially appointed during the first-year orientation period in the first term, although their relationships with their mentees often extended considerably beyond this time. The peer mentors interviewed were senior students with strong academic records; they were all volunteers and received a small stipend after they submitted a report on each mentee at the end of the official mentoring period. Each peer mentor was responsible for five to six mentees and their role was to 'assist students with personal and social issues related to their studies, although this sometimes spill[ed] over into academic support as well' (Trainer 1). As their volunteer status implies, the mentors were dedicated to supporting students:

Peer Mentor 1: They call us if something they do not understand happens ... or maybe when they feel pressure.

Interviewer: Do they sometimes come to you with academic issues?

Peer Mentor 1: Ja ... all the time ... so we ... sometimes we help them academically too

...

Peer Mentor 2: It's like I'm a big sister ... I can help them with their socialising ... but I can also help them with their studies too ... usually it's something like ... 'what does this mean?' ... and the academic language thing ...

The peer mentors' contribution to students' ontological access was through the sharing of their prior knowledge and hard-won experience about the University and the processes (especially the challenges) of becoming a successful University student. As Peer Mentor 1 explained: 'We are from the same backgrounds as the students, so we understand where they are coming from'. Peer mentors were able to make the transition to University life easier for the first years:

As peer mentors we've been there so we can talk about everything the first years are going through ... more especially as I've been at the University since 2015 ... I understand University life and challenges (Peer Mentor 3).

'Peer rapport': Recognition in a new space

The supplementary instructors interviewed were residence-based peer tutors, and therefore available in the evenings to help students with homework tasks, guide them through readings, and provide formative feedback on assignments (There were also supplementary instructors available after University classes for students not in residence). As students themselves, supplementary instructors understood the need for new students to work with more knowledgeable others, to ask questions, and to find help:

Supplementary Instructor 1: Studying in the residence is not easy ... students make a noise and it becomes difficult to concentrate ... there's a lack of control in that space.

Supplementary Instructor 2: ... I do my own work when it is mostly quiet ... late at night ... but I take my study group to the [laboratory] ... it's quite convenient and I have a key for a room there ...

The supplementary instructors provided both physical access and ontological access to the world of University study. Like the peer mentors, the supplementary instructors paved the way for their students, ensuring they had a place to study, and helping them to understand the requirements of University study. When the interviewer asked how often the supplementary instructors met with their groups, they responded:

Supplementary Instructor 1: For me ... it's about once a week with the whole group ... just to check on what's going on ... but I'm available to the students ... kind of all time ...

Supplementary Instructor 2: Ja ... 24/7 ...

Supplementary Instructor 3: Just anytime someone will come and say I need help with this or that ...

Supplementary Instructor 1: So, we are open for business all the time ... we are usually in the same residence as our group ... so no boundaries ...

Supplementary Instructor 1 described herself as offering 'peer support and peer rapport' – which precisely described the role of academic and social induction into the practices of study. Supplementary instructors, like the peer mentors, tended to 'get involved' with the students whom they supported:

I'm informally supervising a lot of students' projects ... it wasn't expected ... but I got involved out of interest (Supplementary Instructor 4).

'I'm a bridge': Redistributing science

The laboratory demonstrators introduced students to the practical world of science. They epitomized Fraser's (2009) notion of 'redistribution' in the ways in which they shared social and scientific knowledge. The laboratory demonstrators explained their roles as 'showing and guiding [students] in the processes to follow in the lab' (Laboratory Demonstrator 1). These processes included making sure that the students were correctly attired – thus facilitating the physical transformation of the student into 'scientist':

Laboratory Demonstrator 1: Ja ... we are the ones that sort of explain what a lab is ... and what rules to follow ... how you must behave in the lab ... safety issues ...

Laboratory Demonstrator 2: For an example ... we do not allow students into the lab without their lab coats ... and they must tie their hair back ...

The laboratory demonstrators set up the experiments, prepared the laboratory, and assisted the lecturer and laboratory technicians, 'and sometimes ... when there isn't a lab technician ... we're also the lab technicians ...' (Laboratory Demonstrator 2).

Laboratory Demonstrator 1: And then after the lab ... the students want help with writing up their reports ... so we help them with that too ...

Students enjoyed the interactive and practical orientation of learning in the laboratory which, as many researchers point out, has a greater potential than lectures to build positive attitudes towards learning in scientific disciplines (Hofstein and Lunetta, 2003). Laboratory Demonstrator 2 explained: 'It's here that [the students] learn to love science'. In vocational higher education, where many students will become laboratory technicians, the laboratory demonstrators were role models, repositories of scientific knowledge, and deeply engaged in the practice of science:

We are the practice of the theory (Laboratory Demonstrator 2).

'This is what I want to do': Representing students in the world of science

If the laboratory was the world of the demonstrators, the academic classroom (with its educational technology, whiteboards, maps, charts and notices) was the teaching assistants' domain. The teaching assistants rendered practical forms of assistance to the lecturer, such as setting up the class and equipment, preparing group work activities, classroom management, photocopying, helping with media (e.g., showing videos), assisting with online modalities, and so on. The teaching assistants had a 'representative' role. In one sense, they 'represented' the lecturers: 'I set up the tech for the lecturer ... I help him with that' (Teaching Assistant 1). Lecturers who had large classes and heavy teaching loads, delegated some of their work to a teaching assistant who assisted with 'marking ... quizzes ... invigilation' (Teaching Assistant 2) and 'co-supervise[ing] [student] projects' (Teaching Assistant 1). Teaching assistants represented the lecturer in learning spaces other than classrooms, such as 'running the labs and prac[tical]s with the demi' (Teaching Assistant 3).

The teaching assistants, because they worked closely with lecturers, also took on the role of representing the student to the lecturer:

Sometimes I take over from the lecturer ... and I have to do the teaching ... but mainly I'm just helping the students to understand what he's saying ... (Teaching Assistant 1).

They helped students to 'understand' the lecturer, but also helped the lecturers to understand the students:

The students asked me to tell [the lecturer] that there's no way ... two tests in one day ... they can cope with that (Teaching Assistant 2).

In this dual representative role, teaching assistants provided ontological access in the form of facilitating the relationship between lecturers and students – and helping each to understand the other's world.

'Becoming a scientist': Participation in the world of science

The tutor trainers explained that the tutors provided continuity in a context in which resources were limited:

... student numbers are growing all the time ... lecturers are stretched very thinly ... there is insufficient expertise and many lecturers are retired and back [at the institution] on part-time contracts ... (Trainer 2).

The tutors interviewed were doctoral candidates at other universities in the region and therefore deeply immersed in the worlds of their disciplines. The tutors were expected to attend all lectures in the subjects for which they were providing tutorials. Tutors' observation of lectures is a well-established best practice (see e.g., Bell and Mladenovic, 2008), which

although time-consuming, was found to be useful because even though tutors had the disciplinary knowledge, it was helpful for them to understand the depth of the topics covered, the assessment criteria of assignments, and the scope of the tests for which students needed to prepare:

Interviewer: So, are tutorials mainly based on the lecture content?

Tutor 1: Yes ... we follow up the lecture with practical activities ... usually something that the lecturer sets for them to do...

Tutor 2: Or in some cases we just build on and expand on the lecture ... try to get the students to make connections ... kind of between the lectures ... and seeing the larger issues ... the big picture ...

Tutor 3: Because we are all doing postgraduate studies ourselves ... so we can help the students to put things together ...

Tutor 4: We join the dots between lectures!

Tutor 1: So that each lecture is not in its own box ... there is a connection between them...

The tutors were able to 'join the dots between the lectures' because they were involved in the wider world of their disciplines through their postgraduate studies; they understood that each lecture focussed on a single concept within the larger inter-connected concepts of the discipline. They could see the bigger picture and thus helped students to orientate themselves within the discipline. As Tutor 3 explained 'We help them to make sense of what they hear in the lecture'. Tutors were sense-makers:

I kind of know what the students are going to find difficult ... so I can prepare for this and adapt the concepts so the students will understand them (Tutor 2).

The tutors worked under the supervision of the lecturers in their tutorials, but also saw themselves as disciplinary experts in a context where a majority of the academic staff did not have higher degrees in their own disciplines or fields. The tutors thus introduced students to the wider world of science, beyond the University.

Analysis and discussion: Social and epistemic justice in the provision of ontological access to the university and beyond

All the peer educators played a role in enabling their students' epistemological and ontological access to disciplines and fields, and all supported students in ways that aligned with the dimensions of social and epistemic justice. When we considered the interview data in the light of the theoretical framework, we saw that although there were many areas of overlap, each peer educator group had a fairly specialised role in the provision of ontological access to higher education. The peer mentors were prominent in orientation, or pre-preparation for ontological access, in terms of guiding first years towards becoming

successful University students. The peer mentors built a bridge between where students had come from to where they were going to, academically and socially. The supplementary instructors, who largely assisted students with their assignments and preparation for tests, built a bridge between students' contexts (and the ways in which they might have tackled homework tasks or other study tasks in the past) and the new context and its new requirements. They offered 'peer support and peer rapport' (Supplementary Instructor 1). They recognised and affirmed the students, which they were well able to do, having once been in the same position themselves. The laboratory demonstrators continued to bridge the gap between old and new practices. Many students would not have had laboratories at school and the laboratory demonstrators opened up the practical world of science and its procedures to the students. They 'redistributed' the knowledge of the laboratory, as well as its practices. The teaching assistants 'represented' the students to the lecturer, and the lecturer to the students in support of the teaching and learning relationship. Finally, the tutors opened the wider world of the different disciplines and fields to the students – drawing on their more advanced knowledge and experience to help their students to make sense of their learning and aspirations. Table 2 summarises the different roles played by the student assistant groups in the provision of ontological access.

Table 2: Peer Educators' Roles in the Provision of Ontological Access

Peer Educators	Ontological access: Building a Bridge between...		Dimensions of social and epistemic justice
Tutors	Students' worlds	Academic worlds	'Participation' in the wider academic world.
Teaching Assistants	Student learning	Academic teaching	'Representation' and 'responsible hearing' of students and academics.
Laboratory Demonstrators	Student practices	Academic practices	'Redistribution' of knowledge; building 'reflexive critical openness'.
Supplementary Instructors	Students' contexts	Academic contexts	'Recognition' and affirming of 'other words, other worlds.'
Mentors	Students' homes/schools	Academic institution	Orientation to the academic institution.

Although the findings, and Table 2, present the forms of ontological access in terms of the main roles of the different student assistant groups, a hierarchy in the provision of ontological access to students is not intended; the interview data showed that there was overlap across the peer educators' contributions to the different forms of ontological access. There were, however, areas of specialisation in the forms ontological access that the different student assistants were able to provide. Similarly, all the peer educators contributed to the different dimensions of social and epistemic justice, again with areas of specialisation across the different student assistant groups. Table 2, thus, shows the broad trends

emerging from the interviews, rather than the areas of overlap and inter-connection. While the study focused on ontological access, both epistemological and ontological access were evident in the student assistants' practices, and in how they understood their work. Epistemological and ontological access are thus not understood as separate and distinct, but as concurrent and emerging.

Conclusion: Towards a socially and epistemologically just university

This study addressed the issue of how peer educators facilitated the provision of ontological access to technical and vocational disciplines and fields. The findings of the study show that through sharing similar backgrounds and experience, but having already encountered the challenges of higher education disciplines and practices, the student assistants were able to expertly guide new students into ways of being and becoming University students, as well as supporting their emerging identification with different fields of practice.

Contribution to knowledge

The study reveals the strong role that peer educators play in students' success. The contribution to knowledge that this paper offers is a theorised understanding of how the student assistants were able to provide socially and epistemologically just ontological access to academic disciplines and fields of practice.

Contribution to practice

Student assistants substantially contributed to student success through the creation of a University environment that was supportive of students' ontological access to disciplines and practices. Developing a strong culture of students supporting students requires commitment and resources. Thus, for sustainability the provision of ontological access cannot be 'outsourced' to student assistants indefinitely. Ultimately, all academic departments and academic staff will have to change their practices to ensure social and epistemic justice in higher education. The study raises questions about how universities in South Africa might explore ways of teaching, learning and doing academic work that are socially and epistemologically just, and that respond to the challenge of connecting long-standing academic principles with locally engaged practices. Universities in South Africa pride themselves on internationally bench-marked academic practices, but how might these relate to other, older forms of Indigenous Knowledge, and with networks of interchange and movement? South Africa Universities might generate new hybrid academic identities, anchored in socially and epistemologically just conceptions of academic work and academic programmes. The new generation of academics, currently student assistants, are well positioned to create the kind of University that could sustain a multiplicity of ontologies.

Implications for further research: 'Unanswered questions about my being'

Two important, but unresolved issues emerged from the study and need further investigation: firstly, the student assistants support the students – but who supports the student assistants, beyond the period of their training?

... you talk about the academic pipeline ... I'm in the pipeline ... I'm becoming [a scientist] I've gone to conferences and I'm applying for funds for research ... but sometimes it's difficult to see myself as [a scientist] ... so I have unanswered questions about my being an African [scientist] (Tutor 3).

As potential new academics, peer educators also need ontological access to the academic world and support as they develop their expertise and identity as African academics. The second issue is around their 'misrecognition' by faculties and departments who are unaware of the importance of their work. The tutor trainers described the work of the student assistants 'as central to academic departments' successful graduation of students' (Trainer 3), yet they are largely ignored, and their efforts are not highly valued.

In these final reflections we confirm the important role that peer educators play at the institution in supporting undergraduate students' ontological access to technical and vocational fields, although considerable work needs to be done to understand how an institution might affirm itself as an African University and create a space for different ontologies and ontologies-in-transition within its walls. In this regard, there is much we can learn from the success of the student assistant programme.

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References

- Anderson, E. 2012. Epistemic justice as a virtue of social institutions. *Social Epistemology*, 26 (2): 163-173.
- Astin, A. 1993. *What Matters in College: Four Critical Years Revisited*. San Francisco CA: Jossey-Bass.
- Barnett, R. 2005. Recapturing the universal in the university. *Educational Philosophy and Theory*, 37 (6): 785-797.
- Barnett, R. 2009. Knowing and becoming in the higher education curriculum. *Studies in Higher Education*, 34 (4): 429-440.
- Bell, A. & Mladenovic, R. 2008. The benefits of peer observation of teaching for tutor development. *Higher Education*, 55 (6): 735-752.
- Bell, P., Tzou, C., Bricker, L. & Baines, A-M.D. 2012. Learning in diversities of structures of social practice: Accounting for how, why and where people learn science. *Human Development*, 55 (5-6): 269-284.
- Boud, D., Cohen, R. & Sampson, J. 2014. *Peer Learning in Higher Education: Learning from and with Each Other*. London: Routledge.
- Colvin, J.W. & Ashman, M. 2010. Roles, risks, and benefits of peer mentoring relationships in higher education. *Mentoring & Tutoring: Partnership in Learning*, 18 (2): 121-134.
- Cooper, D. 2015. Social justice and South African university student enrolment data by 'Race', 1998–2012: From 'skewed revolution' to 'stalled revolution'. *Higher Education Quarterly*, 69 (3): 237-262.
- Council of Higher Education (CHE). 2013. A proposal for undergraduate curriculum reform in South Africa: The case for a flexible curriculum structure. Pretoria, SA: Council of Higher Education.
- Council of Higher Education (CHE). 2019. Vital statistics: Public higher education 2017. Pretoria: CHE.
- Dall'Alba, G. 2009. Learning professional ways of being: Ambiguities of becoming. *Educational Philosophy and Theory*, 41 (1): 34-45.
- Dall'Alba, G. & Barnacle, R. 2007. An ontological turn for higher education. *Studies in Higher Education*, 32 (6): 679-691.
- Dalvit L., Murray S. & Terzoli A. 2008. The role of indigenous knowledge in computer education in Africa. In Kendall, M. & Samways, B. (eds.) *Learning to Live in the Knowledge Society*: 287-294. Boston, MA: Springer.
- DeForge, R., Colquhoun, H., Richmond, S.A., Emberly, D. & Newman, K. 2019. Developing a theory of peer mentorship in a knowledge translation trainee context. *Studies in Higher Education*, DOI: 10.1080/03075079.2018.1504909.
- Dunleavy, K., Galen, S., Reid, K., Dhar, J.P. & DiZazzo-Miller, R. 2017. Impact of inter-professional peer teaching on physical and occupational therapy students' professional role identity. *Journal of Interprofessional Education & Practice*, 6: 1-5.
- Edwards, J.A. & Lampert, M.D. 2014. *Talking Data: Transcription and Coding in Discourse Research*. New York, NY: Psychology Press.

- Espinosa, L. 2011. Pipelines and pathways: Women of color in undergraduate STEM majors and the college experiences that contribute to persistence. *Harvard Educational Review*, 81 (2): 209-241.
- Fricker, M. 2003. Epistemic injustice and a role for virtue in the politics of knowing. *Metaphilosophy*, 34 (1/2):154-173.
- Fricker, M. 2007. *Epistemic Injustice: Power and the Ethics of Knowing*. Oxford: Oxford University Press.
- Ganser, S.R. & Kennedy, T.L. 2012. Where it all began: Peer education and leadership in student services. *New Directions for Higher Education*, 157: 17-29.
- Hofstein, A. & Lunetta, V.N. 2004. The laboratory in science education: Foundations for the twenty-first century. *Science Education*, 88 (1): 28-54.
- Holmegaard, H.T., Madsen, L.M. & Ulriksen, L. 2014. A journey of negotiation and belonging: Understanding students' transitions to science and engineering in higher education. *Cultural Studies of Science Education*, 9 (3): 755-786.
- Jacobi, M. 1991. Mentoring and undergraduate academic success: A literature review. *Review of Educational Research*, 61 (4): 505-532.
- James, P. 2014. Urban design for the global south: Ontological design in practice. In Kalantidou, E. & Fry, T. (eds.) *Design in the Borderlands*, 91-108. London: Routledge.
- Kendricks, K., Nedunuri, K.V. & Arment, A.R. 2013. Minority student perceptions of the impact of mentoring to enhance academic performance in STEM disciplines. *Journal of STEM Education: Innovations and Research*, 14 (2): 38-46.
- Kidd, I. J., Medina, J. & Pohlhaus, G. (eds). 2017. *The Routledge Handbook of Epistemic Injustice*. London: Routledge.
- Leibowitz, B. & Bozalek, V. 2014. Access to higher education in South Africa. *Widening Participation and Lifelong Learning*, 16 (1): 91-109.
- Leibowitz, B. & Bozalek, V. 2016. The scholarship of teaching and learning from a social justice perspective. *Teaching in Higher Education*, 21 (2): 109-122.
- Makala, Q. 2017. Peer-assisted learning programme: Supporting students in high-risk subjects at the Mechanical Engineering Department at Walter Sisulu University. *Journal of Student Affairs in Africa*, 5 (2): 17-31.
- Masinde, M. & Bagula, A. 2012. ITIKI: Bridge between African indigenous knowledge and modern science of drought prediction. *Knowledge Management for Development Journal*, 7 (3): 274-290.
- McMahon, S., Harwood, V., Bodkin-Andrews, G., O'Shea, S., McKnight, A., Chandler, P. & Priestly, A. 2017. Lessons from the AIME approach to the teaching relationship: Valuing bi-epistemic practice. *Pedagogy, Culture & Society*, 25 (1): 43-58,
- Morrow, W. 2009. *Bounds of Democracy: Epistemological Access and Higher Education*. Cape Town, South Africa: HSRC Press.
- Norodien-Fataar, N. & Daniels, D. 2016. Exploring the educational engagement practices of disadvantaged students at a South African university. *Alternation*, 23 (1): 90-112.

- Ogawa, M. 1995. Science education in a multiscience perspective. *Science Education*, 79 (5): 583-593.
- Palmer, R.T., Maramba, D.C. & Dancy, T.E. 2011. A qualitative investigation of factors promoting the retention and persistence of students of color in STEM. *The Journal of Negro Education*, 80 (4): 491-504.
- Pascarella, E.T. & Terenzini, P.T. 2005. *How College Affects Students: A Third Decade of Research*. (Volume 2). Indianapolis, IN: Jossey-Bass.
- Peregrina-Kretz, D., Seifert, T., Arnold, C. & Burrow, J. 2018. Finding their way in post-secondary education: The power of peers as connectors, coaches, co-constructors and copycats. *Higher Education Research & Development*, 37 (5): 1076-1090.
- Pickering, A. 2017. The ontological turn: Taking different worlds seriously. *Social Analysis*, 61 (2): 134-150.
- Saldaña, J. 2013. *The Coding Manual for Qualitative Researchers*. (2nd edition). London: Sage.
- Savin-Baden, M. & Major, C.H. 2013. *Qualitative Research: The Essential Guide to Theory and Practice*. London: Routledge.
- Soldner, M., Rowan-Kenyon, H., Inkelas, K.K., Garvey, J. & Robbins, C., 2012. Supporting students' intentions to persist in STEM disciplines: The role of living-learning programs among other social-cognitive factors. *The Journal of Higher Education*, 83 (3): 311-336.
- Smith, P. 2018. The paradox of higher vocational education: The teaching assistant game, the pursuit of capital and the self. *Educational Review*, 70 (2): 188-207.
- Terrion, J.L. & Leonard, D. 2007. A taxonomy of the characteristics of student peer mentors in higher education: Findings from a literature review. *Mentoring & Tutoring*, 15 (2): 149-164.
- Tett, L., Cree, V.E., Mullins, E. & Christie, H. 2017. Narratives of care amongst undergraduate students. *Pastoral Care in Education*, 35 (3): 166-178.
- Thomas, S., Chie, Q.T., Abraham, M., Raj, S.J. & Beh, L-S. 2014. A qualitative review of literature on peer review of teaching in higher education: An application of the SWOT framework. *Review of Educational Research*, 84 (1): 112-159.
- Windchief, S. & Brown B. 2017. Conceptualizing a mentoring program for American Indian/Alaska Native students in the STEM fields: A review of the literature. *Mentoring & Tutoring: Partnership in Learning*, 25 (3): 329-345.
- Wawrzynski, M.R., LoConte, C.L. & Straker, E.J. 2011. Learning outcomes for peer educators: The national survey on peer education. *New Directions for Student Services*, 133: 17-27.
- Wilson, Z.S., Holmes, L., Sylvain, M.R., Batiste, L., Johnson, M., McGuire, S.Y., Pang, S.S. & Warner, I.M. 2012. Hierarchical mentoring: A transformative strategy for improving diversity and retention in undergraduate STEM disciplines. *Journal of Science Education and Technology*, 21 (1): 148-156.