The contribution of South African higher education institutions to tackling exclusion and sustainability challenges

The Case of University of Johannesburg’s Izindaba Zokudla project in Soweto
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Abstract

One of the most significant consequences of the Covid-19 pandemic has been the worsening of already high inequality in South Africa through a disproportionate loss of employment among low-wage workers. Higher education institutions have the potential to contribute to inclusive transformation as producers of scientific knowledge that can be deployed to help disadvantaged communities solve local development challenges. This article uses a case study of a university-community engagement project to explore how South African higher education institutions deployed knowledge exchange projects to build inclusive and sustainable smallholder farming communities. Key informant interviews indicate that government support is necessary to scale up basic community capacity to optimise knowledge exchange between the university and disadvantaged communities. Incentive structures that reward scientists’ impact on the community more are also more likely to increase community engagement and strengthen local inclusivity and sustainability outcomes.

Introduction

Knowledge is a weightless production factor with the potential to serve as one of the main inputs in tackling the societal challenges confronting marginalised communities in developing countries (Jacobs et al., 2019). As specialised institutions of knowledge production, higher education institutions are expected to play a prominent role in producing relevant scientific or technological solutions to the local societal challenges facing the communities in which they are embedded (Kruss & Visser, 2017; Jacobs et al., 2019). A study conducted by the Southern African Regional Universities Association (SARUA) pointed out that during the apartheid regime, the political governance structure was strongly reflected in South African higher education systems and significantly biased the production of knowledge while hampering the distribution of benefits (Kotecha, 2012). The pervasiveness of apartheid practices in higher education institutions was primarily the result of the white apartheid government’s conception of race and racial politics, which had shaped the higher education policy framework laid down in the 1980s (Bunting, 2021, p.35). This paper examines how South African higher education institutions contribute to tackling exclusion and sustainability challenges in communities in which they are anchored in the post-apartheid era.

In most developing countries, resource-poor rural communities are oftentimes those that most need to apply specialised, university-produced knowledge to address their local challenges. Their inclusion in the innovation process aimed at addressing their specific problems is therefore particularly important because it leads to better development outcomes (Arza & van Zwanenberg, 2014; Petersen et al., 2016). The mechanisms through which universities exchange newly created knowledge with industry in collaborative and commercial transactions (e.g. Etzkowitz, 2002; Chakrabarti and Rice, 2003; Niosi, 2006; Perkmann & Walsh, 2009; Ankrak & Omar, 2015, etc.) or engage with external stakeholders with adequate financial, intellectual and managerial resources to absorb academic knowledge have received considerable academic coverage in literature on university-industry collaboration and community engagement (see Perkmann & Walsh, 2007; 2008; Perkmann et al., 2013; or Kruss & Visser, 2017 for an overview). Collaboration in research and innovation between universities, the private sector and the public sector, in the so-called triple helix, has therefore become a new distinctive approach towards leveraging innovation efforts (Etzkowitz & Leydesdorff, 1995; Leydesdorff & Etzkowitz, 1998; Lawton Smith & Leydesdorff,
The U.S. innovation landscape, for example, has seen a veritable mushrooming of university-government-industry collaborations in the form of cooperative research centres (CRCs) that seek to provide organisational solutions to the challenge of cooperation in science and technological innovation (Wessner, 2013). As a result of the increasing benefits of such collaborations, support for CRCs has become the main channel of government agencies’ funding strategies to promote transformative or paradigm shifting research (Boardman & Gray, 2010). Collaborative development and transfer of technology between local universities and local industry underlies much of the success of innovation clusters such as Silicon Valley, Route 128 and the Research Triangle of North Carolina, as pointed out by Etzkowitz (2002), Chakrabarti and Rice (2003) and Wessner, (2013), among others.

In contrast, much less attention has been paid to elucidating the structures of knowledge exchange between universities as knowledge producers and rural communities where financial, intellectual and managerial resources are scarce, as pointed out by Theodorakopoulos et al. (2012). In developing economies, interactions between universities and other players occur in a context that differs more or less significantly from that of developed countries. The type of collaboration modelled as public-private partnership research centres (CRCs) or Centres of Excellence (CoEs), while successful in university-industry technology transfer, is ill prepared to yield the desired knowledge exchange and technology diffusion to resource poor communities in the face of knowledge asymmetry between knowledge producers and the intended technology recipients. This problem is particularly significant for cases in which the technical solutions to be applied are complex and the intended end users of the technological knowledge are members of under-resourced rural communities (Petersen et al., 2016; Jacobs et al., 2019). Collaboration within such structures is tedious when the mostly tacit, localised knowledge basis of the intended technology recipients has limited overlap and/or complementarity with the specialised, mostly codified technological knowledge required to develop and apply the optimal technological solution to the challenge to be addressed (Jacobs et al, 2019).

With the increasing recognition that problem-solving skills and ability do not automatically follow from curricular studies and specialised knowledge, there is an emerging need not only to broaden the opportunity to acquire specialised knowledge, but also to stimulaten the among members of the communities connected to knowledge centres the capacity to apply the knowledge produced in this way to tackling practical problems that necessitate problem-solving skills (Sutz, 2005; Trauth et al, 2015). Efforts to mediate the necessary knowledge exchange through university-industry-state collaboration (the triple-helix) are often rendered ineffective by the difficulties that higher education and research institutions face when dealing with rural communities to propagate new production methods, as noted by Theodorakopoulos et al. (2012). According to the same authors, those difficulties are due to the following four reasons: (1) potential recipients of new technology have difficulties expressing their knowledge of the methods they use in appropriate language to those concerned with technology diffusion; (2) the benefits of new technologies are not immediately evident to these recipients; (3) the institutions have incomplete knowledge of the new methods and how to connect them with existing practices; (4) there is no systematic process in place to obtain information on how the technology transfer happens and to document the gains achieved.

To overcome those obstacles in the rural agro-food industry in Colombia, knowledge brokers (intermediaries) are proposed as a means to mediate between technology producers and rural technology recipients organised into communities of practice (CoP). Quite often, however, those difficulties are exacerbated by a context characterised by resource poverty and the absence of potent institutional arrangements, so that the proposed approach of using knowledge brokers may still be unworkable for economically marginalised rural communities. The existence of a strong desire within potential knowledge recipient communities to immediately reap the benefits of adopted technology and the knowledge transfer difficulties mentioned above often result in an expectation gap between what the knowledge producer can offer and what the recipient communities can absorb to achieve their intended objective (Theodorakopoulos et al., 2012).

The question we seek to answer in this paper is therefore: how can university-community engagement programmes deploy knowledge exchange projects to contribute to building inclusive and sustainable development in South Africa? This question is particularly relevant, considering the expectations that society places on universities in developing solutions to overcome the intricate challenges of poverty inequality and unemployment compounded by the constraints...
imposed by Covid 19 and the recent social unrest in South Africa.

Most universities engage mainly in passive modes of technology transfer to communities, which usually takes place through presentations or seminars. This renders the transfer of skills associated with that technology very impracticable. Such a mode of knowledge diffusion is therefore unlikely to be effective in rural communities where the proportion of illiterate, technically unskilled people is large. However, the active mode, which is commonly deemed by many observers to be effective in rural areas, provides a technical demonstration of the scientific knowledge by putting in place a working system where technical application of this knowledge is deployed. End users are trained in the utilisation, management and maintenance of the corresponding technological equipment (Le Grange & Buys, 2002). Knowledge transferred under this mode is also aligned and customised to the users’ current environment in a way that enables them to take ownership of it.

This study contributes to these debates by probing what happens at the interface of knowledge exchange to shed light on what can be done to bolster the contribution of university-produced knowledge in addressing community challenges. The paper is structured as follows: the section below presents the theoretical rationale of applying cooperative learning to overcome the hurdles of knowledge asymmetry between knowledge producers at universities and in marginalised rural communities in South Africa. The second section presents an empirical illustration of the application of cooperative learning in university-community engagement at the iZindaba Zokudla farmers’ School and Innovation Lab, an initiative of the University of Johannesburg and the community of black smallholder farmers in Soweto. The final section concludes with remarks on the sustainability and inclusivity of the co-learning outcomes of the project.

The cooperative learning approach

Cooperative learning (also called co-learning) is a capacity building approach that encourages a move from the concept of learning as an individualistic and competitive endeavour to a collective responsibility for knowledge sharing and development in order to achieve a certain task or solve a given problem (Johnson & Johnson, 1989; Johnson et al., 1998). By learning together, team members are likely to learn more in a shorter amount of time while developing social skills and teamwork (Clark, 1999).

The application of cooperative learning has its roots in the social interdependence theory (Deutsch, 1949; Johnson & Johnson, 1989). Positive interdependence (cooperation) results in promotive interaction as individuals encourage and facilitate each other’s efforts to learn. Positive interdependence results in promotive interaction, whereas negative interdependence results in oppositional or “contrariant” interaction.

Co-learning makes use of the instructional organisation of learning into small groups or teams to ensure that group members work together to maximise their own and each other’s learning (Johnson et al., 1998; 2014). It helps develop the skills necessary to work on projects too difficult and complex for any one individual to complete alone in a reasonable amount of time. By using cooperative learning techniques, learners eliminate competition and work better together so that they can learn the vast quantity of information required of their training programmes and professions (Clark, 1999).

Whereas situated learning in communities of practice has been suggested to overcome the complexity of knowledge transfer to rural communities in the presence of knowledge brokers (Theodorakopoulou et al., 2012), the resource constraints of marginalised communities mean that the corresponding transaction costs can be prohibitive. Because of its greater capacity to facilitate skills accumulation, it has been suggested that cooperative learning be used to overcome the hurdles posed by the complexity of the external knowledge to be acquired (Deutsch, 1949; Clark, 1999; Arocena & Sutz, 2000; Teed et al., 2015).

Creating a learning community

A community is a limited number of people who share common goals and a common culture (Johnson & Johnson, 2008). For a community to exist and sustain itself, members must share common goals and values that define appropriate behaviour by community members and increase their shared quality of life. Within a community, everyone should know everyone.
else and realise that relationships are long-term (as opposed to temporary brief encounters). Creating a learning community requires emphasising the overall positive interdependence among members.

Knowledge generation and management at universities and absorptive capacity in partner communities play an important role in determining the rate at which creative solutions can diffuse across value chains (Lämsa, 2008). However, whereas the application of specialised scientific and technological knowledge has often resulted in technological innovations to address societal challenges, more or less sizable mismatches have regularly arisen between university-generated knowledge and the needs of the communities that it was supposed to meet (Wolfson, 2010).

The existence of such mismatches has created the need for an adaptation mechanism between technological knowledge producers and recipients, in which knowledge sharing facilitates a co-learning process that can help overcome the constraints of the knowledge asymmetry inherent in the linear transfer of technological know-how, especially when asymmetry involves tacit knowledge. Co-learning acts as an ignition phase in the process of knowledge co-production between researchers and other and key stakeholders, which is crucial for the successful development of new ideas and innovative solutions (Pohl et al., 2010). Organisational learning and knowledge co-creation based on a continuous and dynamic interaction between tacit and explicit knowledge can thus be a potent tool to overcome the constraints of linear innovation and technology transfer models (Lämsa, 2008).

For externally produced knowledge to diffuse to community members, Nahapiet and Ghoshal (1998) proposed a knowledge exchange mechanism con-

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1. In the United States, for example, research universities are often major drivers of economic development in the areas in which they are located (Chakrabarti & Rice, 2003; Wessner, 2013) because the lion's share of university research is spent on engineering disciplines and applied sciences and is thus directed towards problem-solving (Rosenberg & Nelson, 1994).
sisting of networks of strong, crosscutting personal relationships developed over time that provide the basis for trust, cooperation and collective action. Figure 1 gives an illustration of knowledge exchange involving knowledge asymmetry between specialised knowledge producers and members of under-resourced communities. Successful exchange is facilitated by bringing holders of different types of skills and knowledge together to establish such personal relationships and share their views.

This process of creating a shared understanding of problem-solving knowledge corresponds to what Benneworth and Olmos-Penuela (2018) call the “coupling of knowledge circuits through cognateness” between knowledge creators and knowledge transformers. Cognateness is understood as a shared knowledge base and a common understanding of problems enabling players to incorporate usable knowledge from external sources (Cummings & Kiesler, 2005; Benneworth & Olmos-Penuela, 2018).

As stressed by Lippman (2013), the spatial design of such a space for collaboration and knowledge exchange is of significant importance because of the necessity to establish interpersonal relationships that foster mutual learning (Vigotsky, 1978); Vygotsky’s theory of the zone of proximal development suggests that learners can develop their skills and strategies faster by working with others who are more expert in a given task. It has found a contemporary application in the concept of “reciprocal teaching”, used to improve students’ ability to learn within their zone of proximal development.

Indeed, spatial design influences how people engage with one another and affects their ability to fully participate in activities. When designed thoughtfully, collaborative learning spaces help create optimal experiences for learning by allowing members to cooperate or work independently according to the specific requirements of the learning task (Lippman, 2013).

Figure 2 gives an illustration of such a space, where face-to-face interactions are prioritised in order to facilitate trust building and cooperation.

The section below pays specific attention to the co-learning and co-creation processes that take place in a community engagement project run by scientists of the Department of Anthropology at the University of Johannesburg and members of a local community based in Soweto, one of the most famous townships in the outskirts of Johannesburg.

**Empirical illustration of university-community co-learning: Izindaba Zokudla project**

The co-learning findings presented in this study are based on interviews, documents and observational data collected from the Izindaba Zokudla (Conversations about Food) project in September 2021. The project is based in Soweto, Johannesburg, where the University of Johannesburg (UJ) has a satellite campus.

**Project background**

Izindaba Zokudla aims to create opportunities for urban agriculture in a sustainable food system. This project was initially launched as an action research project with said aim in South Africa, Africa and rest of the world. The project’s success is partly attributable to the use of multi-stakeholder methods being pioneered by project partners in the “Global Innoversity”.

The methods used aimed not only to incorporate multiple stakeholders into the design process, but also to develop technologies, products, systems and practices that have social, environmental and economic benefits.

2. For more information, see https://www.izindabazokudla.co.za/
The project started in 2013 as a service-learning technology development initiative and has since grown into a system of innovation that encompasses events, stakeholder integration and other activities that have created an ecosystem wherein emerging and smallholder farmers can be empowered. This project was born when researchers from the Department of Anthropology and Development Studies at the University of Johannesburg held a 3-day workshop to develop a “Strategic Plan” for urban agriculture in Johannesburg (Malan, 2020). This forum aimed at implementing a participatory technology development service-learning project eventually became ‘iZindaba Zokudla, which juxtaposed technology development, service learning and urban agriculture with popular and university participation, entrepreneurship, food systems change and multi-stakeholder engagements.

**Co-learning approach**

The aim of the iZindaba Zokudla project is to build a framework or institutional foundation for meaningful action research that involves community members, university researchers and industry players, with the aim of triggering a systemic and sustainable change in local food systems. It aims to create opportunities for urban agriculture in a sustainable food system in Johannesburg. The project encourages the consumption of food produced in or nearby local communities. One of the values of the project is to promote a diversity of stakeholders in its endeavour to transform food systems using applied research on smallholder farming methods and sustainable and regenerative agriculture in South Africa. The project also provides a platform enabling emerging farmers to set up enterprises that can produce food for local markets as a key component of a locally based sustainable food system.

iZindaba Zokudla’s main work includes the following:

- running an interactive learning school with an emphasis on agriculture and financial management;
- knowledge exchange through posts from community members as well as research calls and output posted on the community of practice;
- The project also offers short online courses supported by the World Bank

**Outcomes**

iZindaba Zokudla’s learning outcomes reflect its mission of creating a multi-stakeholder platform to transform local food systems into an economically productive, environmentally sustainable and socially beneficial network linking multiple stakeholders. This project has enabled many emerging enterprises to develop new activities and launch new products. Its multi-stakeholder nature has also allowed it to influence the country’s agricultural policy through submissions to parliament and petitions with regards to urban farmers’ problems and challenges. This has led to key innovations, including the creation of the Lab itself, the Khulal app and aparate.co. It has also resulted in the creation of seed libraries for the “rainbow maize” cultivar and the establishment of its value chain, which emerged from the initial visits made by the Slow Food Ark of Taste’s representative to the lab in 2016. The launch of the rainbow maize seed libraries was enhanced by workshops organised in collaboration with the African Centre for Biodiversity and Bioversity International in 2016. Since then, a number of other seed libraries have been established by the farmers themselves.

In pursuit of its goal to change urban agriculture, iZindaba Zokudla also established the Farm Lab, which provides local youth with skills training in organisational development and supports them with marketing, business development and information on agro-processing techniques. Before the outbreak of Covid-19 and the ensuing lockdown restrictions, the Farm Lab brought people together for various activities and regularly hosted 100 to 300 participants on days when such activities were organised. Activity participants included farmers and food processors, students volunteering at the lab (as part of the University’s Community Engagement), outside entrepreneurs coming to buy from farmers and stakeholders, as well as those who were there out of curiosity. Farmers brought produce to sell
at the lab and discussed ways of supporting each other to confront their multiple challenges. They also made use of networking opportunities at lunch time, and some of them even formed (business) partnerships.

In partnership with various stakeholders, the iZinda-ba Zokudla Farmers’ Lab has also been organising the Soweto Eat-In since 2016, an event in the form of a food festival that showcases the best in heritage and indigenous foods. They also organised the ‘School Garden Dialogues’ with Educators in Soweto, the iZindaba iLanga energy workshops with the Process, Energy and Environment Technology Station on UJ’s Doornfontein Campus, as well as other unique events that aimed to facilitate the entry of emerging food entrepreneurs in a sustainable food system in South Africa. The focus on sustainable entrepreneurship is a key feature of this initiative, as it presupposes that real change can only be accomplished by entrepreneurs and enterprises that in many respects exemplify sustainability. This also explains the dearth of direct evidence for the efficacy of iZindaba Zokudla, as the project itself cannot make much real change, given that its activities are all aimed at stakeholders accomplishing the task of social change. This, however, ties up enterprise development with the theme of this project: accomplishing a transition to a sustainable food system.

From our discussions with the beneficiaries of this initiative, it emerged that the main outcome has been the involvement of previously marginalised community members in the iZindaba Zokudla monthly Farmers’ Lab, which translated complicated technical and scientific terms into simple, easily understandable concepts: this resulted in the creation of new activities and the establishment of new enterprises. Peer learning is another important outcome, whereby some farmers who had prior knowledge or specific experience in agriculture used the opportunity offered by the lab to teach fellow farmers.

Knowledge co-creation

The setup of the Farmers’ Lab offers opportunities for full interactive learning and knowledge co-creation between UJ researchers and local community members. One way of achieving this is ensuring that scientific and other jargon is fully explained in concepts that are easy to grasp. In knowledge exchange discussions, expert and non-experts are juxtaposed on a public stage. Interviewed participants recalled that when the Farmers’ Lab discussed biogas, a local farmer who had a biogas unit on her farm and a university expert were recruited to explain biogas adoption to local community members. The local farmer offered a complementary lecture to the university expert. The same process is used in other instances where an expert is paired with a local farmer or community member who has experience in the topic being discussed. Local farmers are now able to teach their peers, provide advice and sometimes

Box 1: The Khula! app as an example of how co-learning can create impressive results.

Khula! is a South African app and supply-chain solution that was created in 2016 by Karidas Tshitshololo and Matthew Piper while they were still studying at the University of Cape Town (UCT). Even though the developers of this app were students at UCT, not UJ, it was facilitated by the iZindaba Zokudla Farmers’ Lab. They helped organise the initial workshops and the iZindaba Zokudla Farmers’ Lab was used to sign up farmers for the first version of this app.

The aim of this app is to assist black farmers who have been excluded from formal markets because their produce is too small. Farmers using the platform are currently supplying fresh produce to hotels and big markets such as the Michelangelo Hotel in Sandton and the Sandton Convention Centre, among other establishments.

In 2018, the app took top honours at the MTN Business App of The Year Awards in a special category called Best Agricultural Solution. In August 2021 the Khula app announced $1.3 million expansion funding to scale operations across the country. (http://www.khula.co.za/ )
even challenge the university expert with their local indigenous knowledge. This knowledge co-creation has even extended to how to sell their produce, as well as graphic design workshops where local designers work hand-in-hand with university design experts to develop optimised irrigation system designs.

The main concern was the lack of government support that would have enabled the scaling up of local community capacity to take advantage of more substantive investment opportunities.

Another limitation on co-learning is the language barrier that seems to be hindering participation by the elderly. When UJ lecturers come to teach them and cannot speak the local languages, it creates frustrations. Participating local community members suggested that more programmes be prepared in isiZulu and other local languages to broaden participation. They also proposed the idea of supplementing the Farmers’ Lab initiative with other measures, including government support for local capacity building and financial assistance to help shore up investments in smallholder farming.

**Concluding observations**

Whereas the legacy of apartheid made it difficult to apply knowledge produced in higher education institutions to address the local challenges of disadvantaged communities, the post-apartheid era has seen the emergence of multiple university community engagement projects, whereby scientific knowledge produced by universities is shared with members of disadvantaged local communities to improve their living conditions in a sustainable manner. Sharing scientific knowledge with members of disadvantaged communities requires overcoming multiple hurdles of knowledge transmission within a context of knowledge asymmetry between epistemic communities. The cooperative learning approach offers the opportunity to overcome these hurdles more easily, by building trust among learning partners and encouraging learning collaboration to increase the speed at which local capacity can be developed among the knowledge end users. As illustrated by the case of the Izindaba Zokudla project involving the University of Johannesburg and smallholder farmers from disadvantaged communities in Soweto, a university-community co-learning approach offers multiple opportunities to co-create readily applicable practical knowledge to help community members confront their local challenges and develop sustainable solutions that increase their inclusion in the local and national economy. The success of such an approach rests on developing a long-term vision underpinned by mutual trust, whereby existing knowledge held by disadvantaged community members is merged with university-produced scientific knowledge to design the most appropriate solutions. Participation of the end-users in the conception and implementation of practical solutions to their challenges increases the sense of local embeddedness and represents a key aspect of both the inclusivity and sustainability of co-learning outcomes.

Community engagement with extensive interactions is necessary to coordinate knowledge sharing and strengthen local absorptive capacity in order to optimise the benefits of co-learning. Accordingly, a reorientation of the incentive systems within knowledge-producing institutions is required to accommodate and attach value to the time and energy spent on enhancing the problem-solving capacity of the local communities in which universities are embedded.

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