



STI Indicators for Measuring Digital Transformation: Gaps and Challenges

Thematic session at the 6th AfricaLics Research Conference, Nigeria

Prepared as an activity of the AfricaLics working group on Africa-focussed innovation measurement led by the Centre for Science, Technology and Innovation Indicators (CeSTII), South Africa, in collaboration with the National Centre for Technology Management (NACETEM), Nigeria.

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Introduction

Increasingly, African states recognise the significance of science, technology and innovation (STI) measurement for assessing progress towards the SDGs and STI Strategy for Africa (STISA) targets, as well as monitoring STI policy achievements at a national level. A concern is that STI measurement is heavily reliant on concepts and theories transposed from the experience of high-income countries, begging the question of relevance.

A decade ago, Lorentzen (2011: 80) identified a critical problem for innovation measurement: that despite some progress in theory development, there is little certainty that “what we aim to measure in Africa is what should indeed be measured”. He questioned the extent to which emerging new indicators were able to capture the kinds of technological change, knowledge and capabilities characterising innovation in the contexts of low- and lower-middle income countries (LICs). One reason is that there is insufficient attention paid to the developmental challenges of LICs, in the field of innovation studies in general. Most of what did exist is country-specific empirical studies that did not theorise how the economic structures and dynamics of African LICs differ from those in upper middle- and high-income countries. Lorentzen surfaced a lacunae in the field – a dearth of theoretical and conceptual research exploring the nature and patterns of technological upgrading, learning and innovation in the context of the poorest economies.

Over the decade since, the emphasis in the field is shifting, from a conceptual focus on the contribution of innovation to economic growth, to interrogating how innovation drives inclusive and sustainable development (Allard and Williams, 2020; Rodriguez et al., 2020; Park et al., 2017; Pansera and Owen, 2018a). The volume and creativity of such research is so great that Godin et al (2021) recently were able to compile a substantial handbook on ‘alternative innovation’, responding to the need for new and different imaginaries.

Despite this shift, ten years later, Diyamett (2021) echoed the challenge raised by Lorentzen, arguing that the field of innovation studies can in fact be detrimental to poor economies, if it



does not build “empirically informed theoretical propositions” explaining how technological capabilities can be built. She emphasised how vital such conceptual foundations are for evidence-informed innovation policy. Indeed, a recent review using more sophisticated bibliometric techniques interrogated whether the gap identified by Lorentzen still persisted. Lema et al (2021) found that there had been little change in the primary focus on middle-income emerging economies, increasingly China (see also Josehp et al 2021). Despite the fact that the literature on innovation and development had increased four-fold over the decade, research on LICs was fragmented, and remained marginal (Lema et al 2021).

This session therefore attempts to encourage and prioritise attempts to fill the gap in the literature and hence, policy spaces. Building on a recent bibliometric research study on the current state of STI measurement in Africa, the session informs the conversation around future research on STI measurement in Africa, towards the goal of creating contextually-relevant STI indicators (Kruss et al 2023). The session contributors share the premise that we require a stronger empirical and conceptual research base to inform shifting policy and measurement objectives.

The session will start with the Chair providing an overview of the research agenda proposed in the AfricaLics Thematic Report (Kruss et al 2023; <https://africalics.org/thematic-chair-report/>). The panel will present recent research addressing four research agenda topics:

- Measuring progress and the impact of digital technologies and the fourth industrial revolution
- STI measurement towards advancing the SDGs and understanding impact
- Creating quality data sets
- Empirically grounded research on innovation measurement in the informal sector

Structure of the session

Chair: Glenda Kruss, CeSTII, HSRC

Speakers and presentations:

- STI indicators for measuring digital transformation: Gaps and challenges, Maruf Sanni, NACETEM, Nigeria
- Mobilising STI for gender equality and inclusivity in a digital world, Ann Kingiri, African Centre for Technology Studies, Kenya
- Contextualising business innovation measurement frameworks and methodologies for the agricultural and informal sectors: insights from South Africa, Il-haam Petersen, Amy Kahn, Yasser Buchana and Nazeem Mustapha, CeSTII, HSRC
- Technological drivers of innovation in the informal sectors in Nigeria and South Africa, Oluseye Jegede, Nazeem Mustapha et. al. (to be confirmed)