

## Global Collaboration: the next paradigm of global improvement

Opinion Editorial

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### Introduction

The United Nations (UN) has debated the relationship between science, technology, and development for over half a century.<sup>1</sup> While at the same time, the international development community has worked to transfer technology from Western high income countries to non-Western low and middle income countries (LMICs) in an effort to help leapfrog these societies past the early stages of development and land directly on the latest of development theory.<sup>2,3</sup> Science and technology studies (STS) is a field of study dedicated to unpacking this process, based on principles grounded in philosophy and sociology. The following will demonstrate STS in action, using the case-studies of new technology for medical care that has risen from a new scientific model in allopathic medicine, and the associated technology used for treatment of chronic illnesses like chronic kidney disease (CKD). To take it a step further however, a perceptual shift based on integral theory will be suggested and opened as a topic of further investigation and discussion for the reader at the end of this article.

### The Question

Dr. Siddhartha Mukherjee discusses his innovative scientific model for allopathic medical care in his book titled, The Laws of Medicine: field notes from an uncertain science.<sup>4</sup> One of the resulting postulations was, could your medicine be an organ created outside your body? This question, as it turns out, had already begun being investigated at the Wake Forest Institute, led by Dr. Anthony Atala, using the technology of 3D printing.<sup>5</sup> Using the science proposed by Dr. Mukherjee and the technology being investigated by Dr. Atala as a case study,<sup>4,5</sup> and STS to unpack

it in the context of international development, the question is: could the new scientific model and technologic product be successfully mobilized, and function as intended, in a hypothetical low resource context with social values and a political system that is different from where it originated?

### The Discussion

Actor network theory (ANT) posits that nothing in the social and natural world exists outside of constantly shifting networks of relationships.<sup>6</sup> Moreover, ANT describes the need for qualitative data to explain social activity, since empirical data alone can only describe social activity. The aforementioned becomes evident even when assessing how to make the science and technology behind 3D printing kidneys outside the body to treat end-stage CKD in a hypothetical low resource context possible. From a strictly empirical standpoint, an extensive amount of material and human capital would be required to properly equip and staff both, the medical facilities, and the medicoacademic institutions, required to run such an operation. By definition,<sup>2</sup> as a low resource context, the hypothetical location would lack access to the aforementioned necessary capital, and would not have the capacity to create that kind of wealth – at least not in the short-term. The latter most point regarding the length of time being considered to accomplish the goal being the key factor across all major empirical considerations that will be discussed here. Indeed, time scale was similarly important in how high income countries developed their wealth of resources and infrastructure to transform the science of the combustion engine into the technology of cars that are used as commonly as they are today. After several decades of development, today,

the following can be observed in high income countries: a system of paved roads, street signs and licensing regulations, auto insurance schemes, fuel networks, and trained staff for each of the aforementioned system nodes. The same is possible of any society, irrespective of the amount of resources they have at a given point in time; but if, and only if however, concerted efforts, resources, and proper governance, are implemented over long enough periods of time. To support this sustainable change on the other hand, the sociocultural norms of the people that live in the hypothetical low resource context have to align with the desire to have the proposed changes happen in the first place. Put another way, in conjunction with the empirical and material considerations, there are also sociocultural considerations to be had that will help explain social activity.<sup>6</sup>

Science is political, and technology is social.<sup>7</sup> This is particularly important when considering a consultation process with the receiving community before the transfer of technology is considered. Where the political nature of the science and the social nature of the technology has already been approved, does not mean the same is true in another sociopolitical system.<sup>6, 7</sup> Assuming however, there is sociopolitical agreement between the two contexts, for argument's sake here, there is still more to consider before the successful mobilization of a technology from a high resource context in a low resource context.

In a low resource setting, the script prescribed by locals to the technology can be drastically different than the one placed on the technology by its designers and creators in its place of origin.<sup>7</sup> To take our technology of printing organs using your cells outside your body as an example, the organ printing technology could alternatively be prescribed a use in the black market to print biological weapons, contribute to a further widening of the socioeconomic gap between the rich and poor of a given country by limiting access to the technology through its privatization, or create other barriers to those with few resources.

This is where the concept of de-scription of the technology prior to its implementation would be critical to its successful mobilization, and would help the technology reach the point of stabilization in the new context.<sup>8</sup>

### A Contextual Example

To put it all into context, using an example of successfully mobilized science and technology, there was the Agua del Pueblo project.<sup>9</sup> *Agua del Pueblo* (translation from Spanish to English, "People's Water"), was a project supporting the transfer of potable water system technologies being mobilized in Guatemalan communities for over 25 years. First and foremost, each community identified the need for a source of potable water. With this need identified, a pump was a technology that was suggested as a means of meeting the community's need for a clean source of water. Through the communities' participation, the pump's component parts were collaboratively designed for maintenance to be feasible by locals in a sustainable manner; this included the delegation of maintenance tasks and governance over the pump being led by community members, with only facilitation of the whole process being done by the project staff. This allowed for a self-directed approach to solving a problem that was self-identified, with technology transfer agents working solely as facilitators to the translation process of the sociotechnical ensemble.<sup>7</sup>

### Summary

Using the scientific model proposed by Dr. Mukherjee and its application as a technological treatment proposed by Dr. Atala as a focal point,<sup>2,4</sup> this discussion paper has shown how STS unpacks the latest theory in international development. Specifically, how to have successful translation of technology and sustainable solutions that use cooperative approaches where all have decision power, and all who will be affected are consulted, rather than operate under a structure that institutionalizes power differences to leverage top-

down prescriptive methods.<sup>10</sup>

### Future Directions

#### On To You

Taking it a step further now, grounded in Integral Theory,<sup>20</sup> has STS foreshadowed a future where the same procedure would be possible in the reverse direction? A future where LMICs can equally share their knowledge and technology to help high income countries resolve their problems?

As a start to this discussion by the readers, the author would like to suggest one possible answer: yes. Such as Canadian volunteer organization, Cuso International, which is currently and actively recruiting South-North volunteers.<sup>21</sup> In fact, in an email from Eduardo Diazgrandados (eduardo.diazgranados@cusointernational.org), Canadian Program Advisor at Cuso International, on December, 2017, Ed confirmed there are already four volunteers from the global South who are working in the Northwest Territories of Canada as Education Assistants.

### Conclusion

#### A New Question

In conclusion, and in-line with the new paradigm the author suggested, this paper is now opened to the reader for a discussion as a part of a collaborative approach to knowledge-claims (science) and technology (solutions) creation. Has STS explained not only the current neo-classical theories of post-modern day international development agendas, but also identified the next step in international development: global collaboration?

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