



## Short communication

# Researchers: how to act beyond the Lab

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### Abstract

**The discovery of new entity requires diligent research, an application of critical and analytical thinking with good time management, and writing prowess. In all aspects of life, you will deal with other people. It is evident in the post-genomic era that we are experiencing a radical, irreversible, global transformation in the way that science is organized and performed. And with these obvious changes in the practice of scientific research are new ways of advancing science. In this study, the ways by which researchers could act beyond the laboratory for advancement of science, technology, engineering and mathematics (STEM), were evaluated. It is evident that, good research publication demand more than just citation, the beneficiary needs to ACT.**

**Keywords:** Science, Laboratory, Researcher, Connection, Collaboration, Conceptualization.

## INTRODUCTION

The discovery of new entity requires diligent research, an application of critical and analytical thinking with good time management, and writing prowess. Although there is no really new thing, we just discover what the creatures have been ignorant of, which has been in existence since the creation of our world. What do you do when you find a piece of research publication that benefited you? Most researchers often cited relevant works in their own publication and that is all. Human relationship and collaboration is essential; therefore, you really need to know how to act beyond citation.

In all aspects of life, you will deal with other people. No matter what you do as a scientist or how well you do it, your relationship with others is the key to your success or failure. The significance of human relations in our personal and work lives cannot be overstated. The skills that are essential for good relations with others are the most principal skills anyone can learn in life. It is evident in the post-genomic era that we are experiencing a "radical, irreversible, global transformation in the way that science is organized and performed" Ziman (1994). The contemporary result highlights the contexts of application, transdisciplinary, networking and collaboration, and social accountability Cohen *et al.*, (2001). And with these obvious changes in the practice of scientific research are new ways of advancing science. In this study, the ways by which the researchers could act beyond the lab, for

advancement of science, technology, engineering and mathematics (STEM), were evaluated.

Good research publication demand more than just citation, the beneficiary researcher need to ACT.

A = Appreciate by addressing the corresponding author

C = Collaborate by connecting with the concept authority

T = Technique by teaching the conceptualized authenticity

### Appreciate by addressing the corresponding author

Building trust is the fundamental to success beyond the laboratory. Trust is a primary factor in how people work together, listen to one another, and build effective relationships. Yet many people are unaware of the actions that influence trust. Trust is a critical link to all good relationships, both personal and professional. Fowler and Christakis (2008) found that relationships are the number one promoter of happiness in life. A bigger network leads to bigger happiness. When friends of friends become happier, it ripples through the social circle Vozza (2017). Your happiness can affect theirs and many generations to come. To get appreciated for your work, you must increase your visibility. There are researchers

specialized social networking website that could help you better, such as [www.researchgate.net](http://www.researchgate.net). In BWF-HHMI (2006) publication, insightful tips on how to increase your visibility was itemized which include:

a) Broadcast the publication on your personal website and in e-mail correspondence with your friends, making it available in PDF format.

b) Organize a workshop or a brown-bag presentation at your own institution on the research described in your article and your future research plans.

c) Call your friends at universities around the country and offer to give a talk on your research at their institutions or at conferences they are organizing.

d) If your research was supported by an outside funder, let the appropriate staff at the funding organization know about the publication as soon as possible.

### **Collaborate by connecting with the concept authority**

There is essentially no better place for a scientist to make new relationships than at scientific conferences. Conferences provide the opportunity to meet people who are interested in the same things you are on a deep level Kamens (2014).

According to Holt-Lunstad *et al.*, (2010), not having enough friends is the same risk factor as smoking 15 cigarettes a day. Building your social circle is important, but there are ways to go about it that can boost your success. Vozza (2017) gave tips that will also help you better. If you want to remain friends with someone, check in at least once every two weeks. It helps to put a reminder on your calendar. Dale Carnegie book, "How to Win Friends and Influence People" is an indispensable resource that you must have as a researcher. The principles in that book will help you faster in connecting with the right people at any setting such as workshop, conference, and research or professional networking website.

### **Technique by teaching the conceptualized authenticity**

According to Powell and Kusuma-Powell, (2011), there are five keys of personalized learning which include; knowing our student as learners, knowing ourselves as teachers, knowing our curriculum at a conceptual level, knowing our assessments, and knowing our collegial relationships. Pursuit of advanced knowledge in all five domains of personalized learning is critical to success. Scientist can fall into focusing on one or two domains, which will limit the effectiveness of their research enterprise. Beyond the lab, it is the responsibility of scientists to know their curriculum at a conceptual level, which means being able to discriminate between content and transferrable concepts.

Moreover, the first two of the five overarching recommendations provided by the President's Council of Advisors on Science and Technology (PCAST), to transform undergraduate STEM education, during the transition from high school to college and during the first two years of undergraduate STEM education in the United State (PCAST, 2012), are very welcome and practicable in every academic institution of any nation in this 21<sup>st</sup> century.

a) Catalyze widespread adoption of empirically validated teaching practices.

b) Advocate and provide support for replacing standard laboratory courses with discovery based research courses.

The case-study method has been recognized as one innovation that holds exceptional promise in rectifying the deficiency in scientific literacy Herreid (1994). The focus should be on students learning through their joint, cooperative effort, rather than on teacher handover his/her views to student. The teaching of conceptualized authenticity requires proactive approach.

According to Handelsman (2003) "It is unimaginable that students would complete the nation's best graduate science programs unable to deliver a compelling research seminar, defend an experimental design or write a scientific paper. Likewise, we ought to require that our graduate students also know how to craft a lecture, design a pedagogically sound learning exercise, successfully mentor an undergraduate student and communicate science to broad audiences." Majority of professors of science in developing nations are failing in teaching, leaving it to the young faculty members, mostly new doctoral academic staff in their department. It ought to be more mentoring and teaching rather administrating. They need to engage in teaching their conceptualized authenticity.

There is no better concluding statement that can drive this study to the heart of researchers than that of Handelsman *et al.*, (2004) "If research universities marshal their collective will to reform science education, the impact could be far-reaching. Our introductory courses will encourage more students to become scientists. Our faculty will be experimentalists in their teaching, bringing the rigor of the research lab to their classrooms and developing as teachers throughout their careers. Classrooms will be redesigned to encourage dialogue among students, and they will be filled with collaborating students and teachers. Students will see the allure of science and feel the thrill of discovery, and a greater diversity of intellects will be attracted to careers in science.

The benefits will be an invigorated research enterprise fueled by a scientifically literate society."The researchers in 21<sup>st</sup> century can succeed beyond their laboratory if they can act realistically, resoundingly and revolutionarily. It is time to move beyond citing lab publication to celebrating, collaborating and conceptualizing the lab

people and principles respectively, in order to do more promising project on challenging problems of our world, and inspiring the student to take the lead in STEM exploit.

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