

Promoting Science Activism for the Twenty-First Century and Beyond: Positioning Science Activism to Promote Course-Corrections in Science and to Lead to Higher Scientific Output Across Societies and Scientific Disciplines

Sujay Rao Mandavilli

Abstract:- We begin this paper by providing a brief definition of activism, carrying out a brief overview of activism through the ages, and also present a review of the different types of activism as carried out in different geographies and segments of society. We also state why activism is still sorely lacking in various fields in the sciences to promote the cause of the sciences, and explain why we need to step up the ante, and promote science activism which can also be known as scientific activism, in various subfields of science, and in science in general. Even though some forms of activism manifested themselves in various fields of the sciences, the idea is still nascent, and in some circles, still a taboo. We also explain and debate the various areas of scientific and scholarly activity where this technique can be put to productive and fruitful use, in the interests of rapid scientific progress. We also discuss the various mechanisms through which this can be made to happen and brought to fruition and its logical conclusion, and discuss the different types of possible change agents as well. We also explain how and why this can lead to a much faster and a higher rate of scientific progress, and lead to what we have all along called “scientific progress at the speed of light”, and reduce the gaps in a “multi-speed civilization”. Needless to say, this could in turn induce a ripple effect, and promote faster societal and cultural change as well in all walks of life.

I. INTRODUCTION

“Thinking will not overcome fear, but action will.” W. Clement Stone

“Vision without action is merely a dream. Action without vision just passes the time. Vision with action can change the world.”

Joel A. Barker

We begin this paper by defining what activism or general activism, which is a more commonly and widely used English term than science activism, is. Activism may be defined as a policy or a form of action of using structured, preplanned campaigning to bring about meaningful political, cultural or social change in a given society or a set of societies. It is often general, and in this type of activism, meaningful, beneficial or positive change is sought to be brought about across diverse societies. It may also be carried out in an opposition to a position or a stand (what is usually perceived to be a flawed, unclear or an unethical one) on a controversial issue. This type of campaigning is also usually in response to a defined cultural problem or a cultural bottleneck that must be got rid of, in the interests of the advancement of society. Thus, activism is inexorably and invariably bound to both a problem and a target or a goal.^{1 2}

The term activism is a relatively young one, and as such, is believed to be only slightly over one hundred years old. The term is said to derive from the very commonly used English verb “To act”. An activist is therefore, someone who is active in campaigning for a cause or for change, typically on various predefined political, cultural or social issues. Less commonly, though increasingly, it is used in environmental, linguistic and other spheres and domains. Activism is a noun describing what activists do, and may encompass the methods that they may use in order to bring about positive and beneficial change in society, based on a conceptualized target or a goal. According to the Online Etymology Dictionary, the words “activism” and “activist” began to be used from the early twentieth century or so, after which the usage of the terms gradually increased. As per a 1969 definition, activism was defined as “the policy or practice of doing things with decision and with great energy”, without fear of political repercussions or a political backlash, while on the other hand, social action was defined as an “organized action taken up by a group of individuals in order to improve social conditions”, without regard to pre-ascribed statuses, such as class, caste, ethnicity and gender. In the decades that ensued,

¹ Randy Shaw, *The Activist's Handbook: A Primer for the 1990s and Beyond* (University of California Press, 1996). ISBN 0-520-20317-8.

² David Walls, *The Activist's Almanac: The Concerned Citizen's Guide to the Leading Advocacy Organizations in America* (Simon & Schuster/Fireside, 1993). ISBN 0-671-74634-0.

there was a surge of social movements (including movements such as different waves of feminism and feminist movements) some healthy, and some others not, such as new age movements that emerged after the 1960's. Activism may take place in the form of journalism, political activism, strikes, protests, marches, distribution of pamphlets, gheraos, and sit-ins, besides several others such as scientific journalism and one to one communication. In recent years, new forms of activism such as internet activism, hacktivism, hashtag activism, and the digital rights movement have also emerged.³

Activists may also create a generational change, and bring about a generation gap. Such movements were therefore also accelerated in the generation gap of the American roaring pre-depression 1920's which is also commonly known as the flapper age. In the United States, and to a relatively lesser extent in Europe in the 1960s, there was a new youth wave right before the hippie movement of the 1970's, and a new definition of activism emerged as a reflection of liberal, radical and revolutionary ideas of the age. However, such movements were restricted to the west. In many developing nations where levels of literacy, education and awareness were lower, meaningful activism was scant and rarified. However, India was a pioneer in anti-colonial movements dating back to the sepoy mutiny of 1857, and social justice movements; the latter saw stalwarts like Ambedkar and EVR Periyar take the centre stage. Mahatma Gandhi also fought for the rights of the Harijans after the Poona Pact. Raja Ram Mohan Roy, Dayanand Saraswathi, Ishwar Chandra Vidyasagar too were important social reformers, and their efforts represented activism in some form. In recent times, we have also seen movements like wokeism and the Black lives matter movements. Another interesting though somewhat different kind of a campaign was the "Unsafe at any speed" campaign promoted in the 1960's by the American activist Ralph Nader.⁵

After independence, we had movements like the Chipko movement, Silent valley dam protests, the Bhoodhan movement launched by Vinobha Bhave, and the Narmada Bhachao movements. There were also protests against multinationals, and exploitation of ground resources in Odisha and elsewhere. Vandana Shiva is a famous, though somewhat controversial environmentalist and anti-globalization activist. However, revolts and rebellions have been recorded since time immemorial. In Ancient Egypt, slaves were consigned to their lot, and there were no major rebellions recorded despite the presence of some dissent.

³ Sneider, Allison (2010). "The New Suffrage History: Voting Rights in International Perspective". *History Compass*. **8** (7): 692–703

⁴ Cary, Max (1967). *A History of Rome Down to the Reign of Constantine* (2nd ed.). St. Martin's Press.

⁵ Smith, Bardwell L., ed. (1976). *Religion and social conflict in South Asia*. Leiden: Brill. p. 16. ISBN 9004045104.

⁶ *Vinoba Bhave: The Man and His Mission*, by P. D. Tandon. Published by Vora, 1954

⁷ Obar, Jonathan; et al. (2012). "Advocacy 2.0: An Analysis of How Advocacy Groups in the United States Perceive and

Organized protests in history dates back to the slave revolts of the first century before the Christian era in the Roman Empire, where under the leadership of Spartacus, several thousand slaves rebelled and were put to death. The plebeian revolt began in Ancient Rome because the Patricians and Plebeian Classes, did not have the same rights, and were not equally treated. The English peasant revolt of the fourteenth century also represents a form of activism. Slavery was a major issue in the American Civil war, and there were several abolitionists at the time of the likes of William Lloyd Garrison, EP Lovejoy among several others. Several leading writers also took up the cause of the slaves. Later, there were women suffragists (like Jane Adams and Susan Anthony) and birth control activists like Margaret Sanger in the USA, and both these represent forms of activism. In more recent times, the Arab spring movement also made use of the internet and new technologies to some degree. Activism must also have a strong basis in intellectualism, and we have discussed the contours of twenty-first century intellectualism in a recent paper.⁶

Activism has traditionally been categorized into left-wing activism and right-wing activism, though centrist strands have also thankfully begun to manifest themselves in recent decades; therefore activism may be justified or unjustified, and may be used to good or bad ends. Historically, activists have used different forms of literature, including pamphlets, brochures, leaflets, and books to disseminate or propagate their messages and attempt to persuade or convince their followers of the righteousness and nobleness of their cause. Today, different forms of social media such as Facebook, Instagram, Youtube, Twitter, Tiktok and WhatsApp are also used to carry out activism. Activism has therefore been associated most with different levels of fairness and transparency, though sometimes calumny and deceit can also be used. The tools, techniques and methodologies used by activists have now become the subject of intense focus and study; such studies also focus on how various technologies are used in relation to activism, and the ethics (ethical or unethical techniques such as manipulation, brainwashing etc) in relation to activism. Case studies pertaining to the use of activism for nefarious and devious ends are also studied; in extreme cases, activism also promotes terrorism and wholly unethical causes, though this may be somewhat rare.^{7 8 9}

Use Social Media as Tools for Facilitating Civic Engagement and Collective Action". *Journal of Information Policy*. **2**: 1–25

⁸ White, Shelley K.; White, Jonathan M.; Korgen, Kathleen Odell (2014). *Sociologists in Action on Inequalities: Race, Class, Gender, and Sexuality*. SAGE Publishing. p. 43. ISBN 978-1-4833-1147-0.

⁹ Dijck, Jose van The Culture of Connectivity: A Critical History of Social Media. Oxford University Press. ISBN 978-0-19-997079-7

II. TYPES OF ACTIVISM

There are many types of activism, indeed, and most of these promote or enhance social welfare or social justice, besides leading to social, cultural, economic and intellectual development. Of late, environmental activism promoting climate justice and environmental justice has been widely employed. Many summits and conferences for climate change activism and climate justice have also been held, examples being those held at Kyoto, Rio, Glasgow, and Paris. Many climate change activists and thought leaders have also emerged, examples being Rajendra K Pachauri, Al Gore, and Greta Thunberg. Human rights activism, on the other hand, seeks to protect basic human rights such as those laid out in the Universal Declaration of Human Rights. These promote rights such as the right to dignified life and living, citizenship, and property rights, constitutional freedoms of thought, expression, religion, linguistic rights and freedoms, etc, and seek to eradicate social inequalities, slavery, racism and misogyny. Political activism is also promoted including campaigning, voting rights, and the protection of democracy. Economic activism however, involves promoting economic justice and social justice; it can also have a direct and an indirect bearing on governmental and public policy. Some forms of economic activism also oppose the entry of multinationals into the manufacturing and the agricultural sector. In India some groups have also campaigned against the entry of foreign universities. A new and an interesting trend that has emerged in the recent past is the rise of citizen journalism; this has given ordinary citizens a new platform and a forum to voice their rights and raise their concerns.^{10 11}

➤ Science Activism

Science activism is a relatively young, nascent and a virgin field that encompasses a wide spectrum of activities and programs but must be geared towards enhancing scientific output in societies or inculcating a scientific temper. Scientists can throw their weight behind societal reforms and policy change, and can act as trusted messengers in this regard. Science activism may include different kinds of efforts to communicate the benefits of science or ensuring that layman is scientifically aware, and to communicate the principles of science in a more effective way or secure the continued funding for scientific research, in the manner that several social scientists and anthropologists had done on the USA and Europe. Science activism may also include a battle against pseudo-science, bad science or science that is of a subpar quality and standard. Some activists have even fought against nuclear weapons, or chemical warfare, though this is only a limited domain of focus; science activism focuses on several other issues as well. Young though it may indeed be, there are impeccable examples of science activism all around the world. For example, the marches or the scientists marches on Washington, held around the world in 2017 and 2018 were

notable examples of science activism. This movement began in the USA, but rapidly spread all over the world. There are many approaches to science activism, and many are geared for maximum psychological impact; Protests against pseudo-science are held in India from time to time, including a recent protest (organized in 2023) against the removal of Charles Darwin's theories from Indian school textbooks. In the same year, scientists from Mexico protested against a new law that they felt would be detrimental to research. There are many organizations too, promoting the cause of science. For example, the Union of Concerned Scientists is a nonprofit science advocacy organization based in the United States, and is reportedly doing good work.

However, we recommend a more nuanced and delicate approach, and one that is finely attuned to societies' needs. The approach we recommend is one that is culturally sensitive, and one that takes into account and consideration, the target audiences' social, cultural, religious and academic backgrounds. We must always bear in mind the fact that the world is a "multi-speed civilization", and that there are laggards in science, particularly in the developing world. Science activism must also be targeted, and in most cases, public level activism may not be warranted. We must identify thought leaders, champions and subject matter experts, and these thought leaders, champions and subject matter experts must create or nurture even more thought leaders, champions and subject matter experts in their turn. Even though scientific journalism and many scientific journals are old and well-established, these are western-centric and there is still a general dearth or absence of scientific temper particularly in developing countries.

Most leading scientists and Nobel laureates are either European or American, and the participation and contribution of researchers in developing countries is indeed rather limited and peripheral. While the contribution of western scientists to scientific endeavour in general needs to be lauded, this lopsided approach does not bode or augur well for the future of science. There is also a vacuum in high-quality journal publishing in developing countries, and peer-review biases reign supreme. There is rather unfortunately, still, a total or near-total absence of meaningful intellectualism or scientific intellectualism or activism in India. This is in spite of the fact that the rationalist movement (which itself may be outdated and in dire need of a revamp) flourished there. Social science, more so to the extent that studies the relationship between science and society, has yet to come of age. One commonly cited downside of science activism is that this approach can only be used to promote popular causes. Can this approach be used to promote awareness on biases in scientific review? Most probably not. Therefore, this approach must be used in conjunction with other methods, and appropriate channels and techniques must be used as well. The techniques chosen

¹⁰ IPCC (2013). Stocker, T. F.; Qin, D.; Plattner, G.-K.; Tignor, M.; et al. (eds.). *Climate Change 2013: The Physical Science Basis*, Contribution of Working Group I to the *Fifth Assessment Report* of the Intergovernmental Panel on Climate Change. Cambridge, UK & New York: Cambridge

University Press. ISBN 978-1-107-05799-9. AR5 Climate Change 2013: The Physical Science Basis – IPCC

¹¹ Collins, M.; Knutti, R.; Arblaster, J. M.; Dufresne, J.-L.; et al. (2013). "Chapter 12: Long-term Climate Change: Projections, Commitments and Irreversibility" *IPCC AR5 WG1 2013*.

must be current and imaginative. Meaningless dinner table and coffee table rants as those sometimes espoused by the left sans any kind and form of planned or executed action, are probably antiquated, and should not be resuscitated. As impressive as all this sounds, we believe that there is no structured approach to science activism yet; we look forward to more research and papers in this field. We also hope that this work will be a humble beginning in this direction.^{12 13 14}

III. TYPES OF PLAYERS INVOLVED

The following are the various types of players involved in science activism; while there could be more, the following at least constitutes a basic list. These individuals would also naturally be associated with different personal and technical attributes:

➤ *Thought leaders*

Thought leaders are a highly motivated and competent group of specialized individuals with exemplary visionary, leadership and strategic skills; they are highly informed and knowledge-savvy opinion leaders in their respective fields of expertise. As the very name implies and suggests, they lead the thought processes in a given area. They also conceptualize and strategize issues and bring them to fruition. They are critical thinkers, and specialize in critical thought. They naturally become the highly trusted sources who inspire people with their novel and innovative ideas, and goad them to action; they also play a crucial role in turning ideas into reality, and become a role model for others to follow and emulate.¹⁵

➤ *Champions*

A champion on the other hand, is a person who fights for a particular given cause or speaks out for another person or in favor of a specific general or a public cause that is worth fighting for, and dedicating time for. In contrast to a thought leader, who is more of a visionary, a champion as an individual spends more time fighting for a particular cause, and generating popular public awareness in this regard.

➤ *Activists, protestors or agitators*

Activists, protestors or agitators are those who advocate or practice activism in the real-world. These groups typically employ or carry out strong actions in support of a cause (or against a cause) and may take sides in a controversial issue. These people constitute the second rung on the second layer in the thought process; while they seldom strategize issues the way strategists and thought leaders do, they bring plans to fruition and constitute an important cog or spoke in the wheel.

➤ *Subject matter experts*

A subject matter expert or an SME) is an individual with a specialized or a through and a proficient knowledge in a specific or a given area. Their expertise may be acquired or accumulated through long years of work or experience in the given area. Thus, experience is judiciously combined with knowledge, and such an expert may be armed with a barrage of professional qualifications to boot; subject matter expertise help the mission or the cause laterally; they lend their crucial expertise to all layers of the activist undertaking or cause; they also constitute an indispensable component of the overall exercise, and help and arm thought leaders and strategists as well as activists by providing the necessary expertise or material, and fodder or critical ammunition for thought. They also may undertake fact-checking and fact-verification when the situation warrants or demands, and carry out course-corrections wherever required.

➤ *Influencers*

Influencers are those who influence public opinion or governmental policies to bring about rapid and meaningful change; such individuals must possess a different set of abilities, often influencing skills and persuasive ability.

➤ *Organizers and coordinators*

The organizers and coordinators are also a crucial cog in the wheel; they help orchestrate, coordinate, and liaison the entire chain of activities that constitute activism, and must possess appropriate skills in this regard; even though they may not be experts, they must possess adequate technical knowledge and expertise to get the job done.

➤ *Communication of scientific ideas to the public*

Science activism can be gainfully employed to promote a better communication of scientific ideas to the public. Science communication (which is commonly known by several names such as the “Public communication of Science and Technology” or PCST in short) is taken to mean the practice and structured art of communicating, educating, and raising and initiating awareness among the general public about different aspects of science which may impact society directly or indirectly, and using this knowledge to elevate society to a higher level of scientific and intellectual awareness and consciousness. This approach also connects the missing threads and pieces and does away with scientific ideologies, intellectual worlds, quasi-intellectual worlds, ivory tower approaches, and knowledge in silos, (Including Eurocentrism for example) and makes sure that scientists are well connected not only to society, but also to one another, both within and across disciplines, and are as such aware of the various problems and needs facing a given society or the

¹² Fine Sasse, Stephanie; Tran, Lucky, eds. (2018). *Science not Silence: Voices from the March for Science Movement*. The MIT Press.

¹³ Kahn, Brian (January 26, 2017). "Scientists Are Planning the Next Big Washington March: In just two days, more than 300,000 people join a Facebook planning group". *Scientific American*.

¹⁴ Crawford, Elizabeth T. (1984). *The Beginnings of the Nobel Institution – The Science Prizes, 1901–*

1915 (First ed.). *Maison des Sciences de l'Homme & Cambridge University Press*. ISBN 978-0-521-26584-3. Archived from the original on 24 September 2023. Retrieved 18 November 2020.

¹⁵ Karin Frick, Detlef Guertler, Peter A. Gloor, (2013), *Coolhunting for the World's Thought Leaders*, Presented at COINs13 Conference, Chile, 2013

world in general, such that meaningful changes in society are brought about through a directed, conscious and structured effort, public policy, and informed decision making.

Many crusaders of science have argued for increased government spending for the promotion of science to raise general awareness among the masses. Examples of such crusaders have included Carl Sagan and Neil deGrasse Tyson besides less famous ones of the likes of John Durant, Geoffery Thomas, and Steven Hilgartner. Science communication is more mature in the USA and the UK, (and to some extent China), but its progress elsewhere is arguably unsatisfactory. We will carefully observe what direction science communication and science activism take in other countries such as India. Activism must also go hand in hand with awareness generation and better and more robust interdisciplinary scholarship; all these must go hand in hand, and advance in tandem for maximal effect. Downstream changes, such as changes to education systems, and to a smaller extent political systems, must also be suggested. One approach that we recommend is to identify societal problems, lacunae in society, or areas in need of remediation, and then proceed accordingly; we had also proposed that this would be one of the underlying principles of twenty-first century intellectualism; this principle and approach must naturally be carried forward to science activism as well. One needs to keep his eyes and ears wide open. Vistas and avenues for meaningful change will then readily suggest and present themselves.¹⁶

One area with immense potential is the promotion of science and scientific temper in unrepresented and underrepresented areas of the world; the Rationalist society of India played a commendable role here, though we believe some of their tenets and approaches are somewhat outdated and need revisiting; we would also like to see how the Rationalist movement can be recast and modernized to suit today's needs. We may perhaps need thought leaders here as well. In this case, awareness may also be led through better science journalism; This aspect refers to the reporting about science and scientific matters and issues to the public. The field involves interactions between scientists, journalists and the common public. Scientific journalism is closely related to science activism, and may even be referred to as one of the pillars upon which science activism rests. The relationship between the two needs to be multifunctional and bidirectional¹⁷

Just as the Church's persecution of scientists and its promotion of pseudo-science was actively fought, and just as the Eugenics movement was fought and bitterly opposed by scientists and non-scientists such as the American sociologist Lester Frank Ward, the famed English writer G. K. Chesterton, and the eminent German-American anthropologist Franz Boas, the principles of science activism must be extended and carried forward to solve the problems

of today's modern world. The root causes of problems and ills plaguing today's modern world may also need to be identified such that solutions may then be worked out accordingly. In spite of all the glamour, glitz and allure associated with today's modern international-based and international-driven education, pre-scientific paradigms still reign supreme in many parts of the world. These can be attributed to poor-quality scholarship in many fields of the sciences, particularly social sciences, improper education and pedagogical techniques, the presence of several vested interests, the continued and continuing oversized role played by religion in today's modern world, and so on and so forth. The RSS also still champions a Hindi, Hindu (a narrow and not a wide or an all-encompassing definition and interpretation of Hinduism), Hindustan ideology, while Dravidian ideology, Marxist ideology, Dalit nationalism among other ideologies are present to some degree, adversely impacting science and scholarship. Pseudo-history and pseudo-archeology are also still common, and many papers have been published on this issue.

In spite of their often high academic qualifications, most Indians (and many others) have a poor sense of space and time. Beliefs in Pushpak Vimanas, Biblical literalism, Quranic literalism, and the literal interpretation of the Indian epics are still common. Scientists (quasi-scientists or pseudo-scientists usually) try to dupe people with dubious theories which are often published with mercenary motives or intentions. Examples of these are the Orion constellation theory, the chariots of the Gods publications by Erich Von Daniken, the Jesus lived in India theory, among others. Most people do not even possess a scientific compass to understand, analyze and interpret scientific and non-scientific events. Science even when and where practiced without ideological dispensations, is sometimes of inferior quality. The Atlantis theory, the Lemuria theory, bad paradigms in Indology, misuse of terms "Aryan" and "Dravidian", (we had also discussed the motives and motivations of both German and British Indological scholars in a paper published by us several years ago) oversimplifications, the oversimplified Out of Africa theory are some prime and common examples.

Neo-colonial sciences, helicopter research and parachute research is another new and an unhealthy trend. We can also have other forms of activism such as activism targeting a particular institution or scholar, activism targeting bad practices in awarding scientific prizes, and activism targeting peer-review practices. More radically and unconventionally, there can be an agitation to tie language dynamics with language planning. This is just an isolated example and a case that could serve as an illustration of newer avenues of activism to come. In extreme cases, scientific fraud has also been observed and witnessed including rather unfortunately by Indians such as Bharat Aggarwal and Ranjit Chandra. Belief in Godmen is still common and we have Godmen like Sadhguru and Madhusudhan Naidu either

¹⁶ Science communication: A practical guide for scientists, Laura Bowater, Kay Yeoman

¹⁷ Angler, Martin W. (14 June 2017). *Science Journalism : An Introduction*. London:

preying on innocent victims or resorting to mind manipulation techniques. Film stars, politicians and sportsmen are popular heroes, but not scientists. Researchers are still often assessed not based on their output, but based on their ethnicity. There are scarcely and scantily any scientific ideals permeating quotidian life; obsolete and obscure value systems still prevail. Change is however, still indeed possible. We must remember that racism and casteism was rampant a few decades ago, but has largely withered away. We are just beginning to step away from an age dominated and marked by ideology, and one essentially being that of a scientific dark age, to a more modern age marked by analysis and introspection.

The following quote by Babasaheb Ambedkar sums up the present state of affairs succinctly, “It is indeed extremely easy for anybody in India to become a Mahatma by merely changing his attire or his dress. If an individual is wearing an ordinary dress and is leading a mundane or an ordinary life even if he performs extraordinary or noble deeds, nobody takes any notice of him. But if a person or an individual who does not behave in normal manner and shows some queer or peculiar abnormalities or trends in his character, he instantly and automatically is recognized as a saint or a Mahatma. If an individual puts on a suit or ordinary dress and do something, people would not even like to look at him. But if the same person or individual discards all his clothes, run around naked, grows long hair, abuses, preaches to and lectures to people and drinks dirty water from the gutters, people fall at his feet, revere him and begin to worship him“. This quote dates back to several decades ago, but is still sadly relevant even now; it sums up the sad state of affairs.

IV. CONCLUSION

We had begun this paper by providing a brief definition of activism, and had explained why it is extremely important for scientific progress in this modern age of science. We had also debated why science activism is still sorely lacking or inadequate in today’s world, and had discussed tools and techniques to promote science activism as well. All this can lead to a much faster and a higher rate of scientific progress, and lead to what we have all along called “scientific progress at the speed of light”. It can also serve to reduce gaps in a “multi-speed civilization”. Needless to say, this could in turn induce a ripple effect, and promote faster societal and cultural change as well in all walks of life.