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"For good ideas and true innovation, you need human interaction, conflict, argument, debate."

Margaret Heffernan

Science Café

An Inspiring Innovation for Public Engagement with Science

Science and innovation go hand in hand as far as the progress of a country is concerned. A variety of efforts are being made to inculcate scientific temper and fostering the culture of innovation in the society. During the last decade the concept of science popularization has moved from public understanding through science communication to public engagement. Science Café is one such innovative programme aimed at public engagement with science and technology. In fact, it is a forum for providing comfortable environment for lively and engaging discussions on various important and interesting scientific issues in very casual settings. According to Wikipedia it is said to be a grassroots public science initiative which is currently running in different countries. Science Cafes are based on the concept of inviting scientists and other experts to talk in laymen's language about their work in different areas. The science café events are known for their informal and friendly atmosphere. Science Cafes are, now, so popular that they represent a grassroots level movement for public engagement with science and they have spread all over the world.

It is important to mention that Science Café is an idea rather than a particular place, like coffee café. However, it resembles a Coffee Café, because in a cafe you enjoy yourself, relax, discuss informally and enter or leave the café as you please. We can say that the ambience of both is relaxed, informal, discursive and democratic. The discussions and interactions in the science café are quite different from a lecture theatre where audiences are expect to take notes and appear in exams. It is a fact that science is the same across the world, but cultures are different. Therefore, the science café tries to address various scientific issues integrating with the local practices and culture of different areas.

Though the concept of Science Café or Café Scientifique was conceived by Duncan Dallas in Leeds long back in 1998, but it got popularized in this decade only. In fact the idea of starting Science Café was based on the Café Philosophique movement started by the philosopher Marc Sautet (1947-1998) in France in 1992. An interesting thing about the genesis of the science café is that the motivational factor to start science café has been varying in different countries. In France it was started by the scientists who thought that they should inform the public about science and their researches, whereas in the UK it was started by members of the public who wanted to know more about science. However, in both the countries it moved out of an academic structure into popular locations, and thereby attracted audiences and has now reached all over the

world. In different parts of the world the Science Café is known by other names also such as Café Scientifique, Science on Tap, Science Pub, Ask a Scientist, and Café Sci, etc. These science café are run by individuals also with many different names.

Normally the science café is targeted towards people who are interested in science, but they may or may not get involved with scientific discussions. They, generally do not get opportunity to discuss their views and ask questions with someone who knows science. The participants of the science café are not expected to have any scientific knowledge, so anyone who has interest in science and its social issues, can participate in its activities and enjoy the science. The Science café are not only making people scientifically empowered, but they are believed to improve the image of scientists, and are also paving the way for attractive careers in science and technology communication.

If we talk about the innovative features of the science café, we find that not only the very concept is innovative but the way it has been conceived and implemented is innovative. Some of its innovative features are highlighted below:

1. Science café are designed to give participants opportunities to meet, hear and ask questions to the local scientists. Unlike public lectures and talks, the discussions in the scientific cafe are participatory and much more informal and accessible. Anybody can ask any type of question, even stupid question related to the topic of discussion.
2. It is an opportunity where likeminded people keen to know more about science and related issues gather in a relaxed atmosphere. It is an initiative to encourage our community to participate in conversations about all types of science.
3. The talks organized by the Science Café are not routine one way lectures with a passive audience listening to an expert. Rather, they are dynamic having two-way interactions between a scientist and the public. In this way, the public feels empowered to learn, and the scientist speaker gains valuable perspective on his or her own work. In addition to the interactive discussions, cafes provide an opportunity for individuals and groups to take part in several other engaging forms also such as street science, comedy, magic shows, theatrical readings, dancing, “nukkad natak”, demonstration, etc.
4. It helps in demystifying scientific research for the general public and empower non-scientists to more comfortably and accurately assess science and technology issues.
5. An interesting feature of the Science Café is that it takes place in very casual settings and can be arranged anywhere ranging from a local community gathering to coffee house or nearby cafeteria. The schedule of science café are decided as per the convenience of the participants and the availability of the expert or scientists on weekends or other suitable days. The successful café fosters an informal atmosphere where all participants feel encouraged to participate and share their views with the scientists and other participants.
6. Science café normally don't require funding. Participants bring or purchase their own food and beverages. However, sometimes the invited speakers are paid their travelling expenses that too by collecting donations from the audience.
7. Another important feature of the Science Café is that they are not exclusive club meetings for scientists and science experts, nor do they take place exclusively in lecture halls or auditorium. Rather, Science Cafés can happen in any informal community gathering in any part of the world.

Now, with the use of technology, the concept of Science Café has expanded globally and individual Cafes have developed their websites with a provision of discussion forums to reach out to wider community and to arrange prolonged discussions. Besides, Science Café are now being set up in the schools also in different countries like France, Italy, Britain and Africa, etc. In this context, the call of the Indian Prime Minister to the research scientists and professors to go to the schools and interact with the students and teachers about their research and its social relevance, seems to be a similar kind of initiative. This kind of student-scientist interaction should not take place in a classroom situation; rather it should be in the form of Science Café beyond the classroom or formal settings.

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Rabindranath Tagore: A Brief Account of His Innovations in Education

Introduction

Education is the process of enlightenment of the mind. It develops the capabilities of a person, which eventually leads to the development of the society and the country. However, when we look around, we find that our society is grappling with severe problems, such as overpopulation, exploitation of natural resources, illiteracy, unskilled human resources, ill-health, bad hygiene, and degrading ethics. Most of the problems arise due to a lack of proper education. The education system has been generating mostly service-oriented human resources rather than creating a large number of original thinkers, scientists, entrepreneurs, artists, writers and innovators who could transform our country. The very fact that our society is still grappling with various problems indicates that the education system should gear up to generate highly skilled human resources, which could devise innovative solutions to mitigate the unique problems of our society. Indeed, this situation pleads for innovative solutions in education.

There are many aspects on education in which innovation is possible. These range from the basic underlying philosophy and purpose of education, and the broad methodology of education to narrower areas, such as course content, instructional delivery, student support services and evaluation methods, to name a few. The innovation must satisfy the following parameters.

1. It must be new.
2. It must satisfy a specific need.
3. It must be feasible, and
4. It must be replicable at an economical cost.

Sometimes one does not need to innovate afresh but could replicate an already existing and time tested innovation. One such innovation, which exists in the field of education, was done by the Nobel Laureate Gurudev Rabindranath Tagore – which we know today as *Vishwa Bharati*.

It is imperative to mention here that his innovation is relevant not only in the conventional education system but also in the open and distance education system.

Tagore's innovation

The enormity of Tagore's educational innovation cannot be suitably explained in this small article, but an attempt has been made to elucidate his innovation by visualising it through the two parameters of innovation, *viz*, need and novelty. The feasibility, cost-effectiveness and replicability of this innovation is beyond the scope of this article but that these qualities exist in the innovation is evident by the fact that it is still in use almost 115 years after its inception, and institutions, such as *Mitra Niketan* (<http://www.mitraniketan.org/>) have adopted it.

The need for innovation

To set the context of understanding the novelty of Tagore's innovation, let us first understand the specific need that motivated him to innovate.

In 1835, Lord Macaulay implemented the educational policy of the British Government. While articulating the aims of the policy he wrote, "We do not at present aim at giving education directly to the lower classes of the people of this country. We aim at raising up an educated class who will be hereafter, as we hope, the means of diffusing among their countrymen some portions of the knowledge we have imparted to them". He further wrote, "We must at present do our best to form a class who may be interpreters between us and the millions whom we govern: a class of persons, Indian in blood and colour but English in taste, in opinions, in morals and in intellect."

This educational policy had far-reaching consequences, and its effect on the educational, political, moral, and economic fields was detrimental. The mother tongue as a medium of instruction was neglected and this resulted in the withering away of vernacular subjects. Teachers were not trained, and the subjects that were taught became too academic and unrelated to life. The country thus became handicapped for the want of vocational, professional and technical instruction. Young people qualified for clerkships were aplenty but doctors and engineers were in short supply. Education was now valued only because it was of economic significance.

Tagore, on being admitted to such a school, soon found out that it was a "prison", which he called his "Andamans". He observed that "the likes and dislikes that form a large part of the child's mind was completely ignored." He soon left the school to pursue home schooling. He was an explorer and self-taught person. In 1901, he was motivated to start his own school, which he called the *Brahmacharya Ashram* modeled on the ancient gurukuls. His school was an innovation as it had many novel aspects. Let us find out more about the novel aspects of his innovation.

Novelty

The novelty of Tagore's innovation may be found in:

1. His novel philosophy of education.
2. His creation of a novel environment of education.
3. His creation of a novel curriculum.
4. His creation of novel methods of education, and
5. His novel experiments with rural economic reconstruction and education.

1. *His novel philosophy of education*

Tagore's educational philosophy may be divided into two parts: (i) Aims of education, and (ii) Spheres of education.

Aims of education

Tagore believed that the aims of an ideal education system were the following:

1. He propounded that the ultimate aim of education is the all-round development of an individual for harmonious adjustment to reality.
2. He said that the aim of education is "not merely to enrich ourselves through the fullness of knowledge, but also to establish the bond of love and friendship between man and man."
3. He believed that education was valuable for the development of the country and linked to its economic aspect. He therefore believed that the aim of education is also to carry out industrial activities.
4. Finally, he introduced the new philosophy that the aim of education is also to feel the man's bond of union with the Universe.

Spheres of education

Tagore conceptualized three types of education, two of which were old and one was new. These are:

1. Education of the senses
2. Education of the intellect
3. Education of feeling

The education of the senses and the intellect were already been addressed by the formal education system, albeit with some degree of apathy. Tagore proceeded to improvise upon these spheres with his creative inputs. For example, for the *education of the senses*, he included arts, music, games, gardening, cooking and such activities that catered to the development of the senses. He also included meditation and code of manners to instill values. For *the education of the intellect*, he included exploration activities, freedom of expression, philosophy and the sciences.

The *education of feeling* was a totally new concept put forward by him. He felt that "feelings" or "sympathy" was systematically ignored in schools and was in fact repressed. He believed that "We may become powerful by knowledge [education of the senses and the intellect], but we attain fullness by sympathy".

2. *His creation of a novel environment of education*

Tagore believed that the atmosphere of education was extremely important. He envisioned the ideal educational environment to lie in the lap of nature in the form of an *ashram* where "men gather to attain the highest form of life...in the peace of nature, where life is not merely meditative, but fully awake in its activities." Then, he observed, education becomes a process of inspiration and joyful but slow absorption. He established his *Ashram* school in 1901 amidst the beautiful forests of

Shantiniketan, where the children could explore nature, live in its close proximity, and work closely with it.



Source: https://upload.wikimedia.org/wikipedia/commons/4/4b/Rabindranath_Tagore_with_Brahmacharyashrama_boys,_Santiniketan,_1903.jpg

Rabindranath Tagore with his students in 1903.

3. His creation of a novel curriculum

Tagore did not believe in a static curriculum. In fact, there was no fixed curriculum. He had a “curriculum of life” keeping with the school’s goals to teach the ideals of life. He observed that the full development of the intellectual and physical aspects of a human being required ample space and he wanted to provide this space through a full and wide curriculum.

He wanted to cultivate the emotions, and so he included the fine arts, which acted as a means of self-expression and fulfillment. He wanted to cultivate intellect and reason, and therefore his curriculum contained western science. He wanted to throw open the doors to other cultures and so he included as many languages as possible, both Indian and foreign. He wanted the children to develop physical health, and so he included sports in his curriculum.

He allowed every child to choose his or her own subjects. He encouraged their mobility across the subjects.

4. His creation of novel methods of education

Tagore considered that the rate of growth differed from person to person. Therefore, a person should be allowed freedom to grow at his or her own pace, and attain the requisite knowledge and skills. He postulated three types of freedom: (i) freedom of mind, (ii) freedom of heart, and (iii) freedom of will.

(i) *Freedom of mind*: Tagore said that when a child is given freedom, s/he can express himself and explore the world. He never punished the naughty students.

- (ii) *Freedom of heart*: He defined this as unrestricted human relationship. He believed that teacher should substitute for the mother to provide unrestricted love to the children through their understanding, sympathy and companionship.
- (iii) *Freedom of will*: He believed that a student could create his own world with the freedom of will or free activity. He invited the students to participate in the building of his school and its development.

He held the view that “the teacher who merely repeats bookish knowledge mechanically can never teach anything and can never inspire, and without proper inspiration independent creative faculties can never develop.” He said that “For the first twelve years we must educate the child’s mind along the line of its own natural tendencies and instincts and only then, at twelve years old, introduce the books.” “...what is better for boys than to travel, to record facts as they travel, to collect objects for their private museums and thereby to teach themselves. This will enhance their power of thinking and they will be able to store useful facts in their minds easily. A boy with that kind of training can enter the world of books fully equipped.”

He never compelled any child, and he left everything on the initiative of the student. That way he allowed the best side of their human nature a chance to be expressed.

5. *His novel experiments with rural economic reconstruction and education*

Tagore believed that the educational institutions should play an active role in the activities that brought about an economic development in the villages. He also reached out to educate the poverty-ridden village children and the adults who did not get the opportunity to study when they were young. In this context, three of his successful experiments needs mention, which are i) Sriniketan, ii) Siksha Satra and iii) Lok Siksha Sahe conducted three

Sriniketan

He started a school in Sriniketan with the aim “to bring back life in its completeness into the villages making the rural folk self reliant and self respectful, acquainted with the cultural tradition of their own country and competent to make an efficient use of modern resources for the improvement of their physical, intellectual and economic conditions”. To achieve this objective, the students of *Vishwa Bharati* undertake the following activities, among others:

1. They take the problems of the village and field to the classroom and discuss, and to the experimental farm to find solutions.
2. They teach the villagers how develop their resources, improve their practices, and obtain bank credit, they buy some of the produce of the villagers, and also help sell their produce.

Siksha Satra

Tagore also provided education to the village children who were deprived of it because of poverty. He called this project *Siksha Satra*. He said that “Here an attempt is being made to give an all-round education to village children and provide them with training which will not only enable them to earn a decent livelihood but also to equip them with the necessary training and creative imagination with which they help to improve the rural life of Bengal in all its aspects.” The curriculum and

method of teaching is the same as that of the school at Shantiniketan.

Lok Shiksha Sansad

Tagore also successfully experimented on the novel concept of *Lok Shiksha Sansad* or People's Education Council in 1936. Essentially this was the very first concept of open and distance education system in the country.

While elucidating his novel concept he had said "if examination centers are started in towns and cities of different states for those men and women in the country who are for various reasons deprived of the benefit of school education, then many will feel encouraged to educate themselves at home in their leisure hours...The degrees that will be awarded through these examinations will be valuable insofar as they will bring social prestige and will be useful for earning a livelihood." The Central Universities of India (Teaching, Research and Administration) Bill, in 2013 provided for the maintenance of the examination centres for home study courses conducted by the *Lok Shiksha Sansad* and the certificates awarded by the *Lok Shiksha Sansad* on the results of examinations conducted by it.

Siksha Charcha

Tagore instituted a training institute for teachers of village primary school in Sriniketan. He called the activities under it *Siksha Charcha*. It is aimed at training the teachers with both theory and practice. At present the institute works to develop more interactive teaching to enable the primary school students to continue their education and make a smooth transition to secondary education

Conclusion

Tagore's educational innovation is based on an all-encompassing and deep philosophy that was conceived with the lofty ideals of not only the holistic and harmonious development of the human being but also the sustainable development of the country and the world. Today, India is in need of such an innovative solution. Rather than reinventing the wheel, this innovation should be scaled up and replicated in different parts of the country for its growth and sustainable development.

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Innovationclub@IGNOU

A meeting of the Innovation Club@ IGNOU was held on 18th January, 2017 at 11.00 am at Hall no. 5 of the Baba Sahib Ambedkar Convention Centre, IGNOU. A total of 27 members were present in the meeting.

At the outset the Coordinator Innovation Club @ IGNOU, Dr. .Moumita Das welcomed all the members, including the new members to the 18th meeting of the Innovation Club @ IGNOU. She said that in September 2016, the NCIDE decided to reconstitute the Club and invited the interested IGNOU functionaries at the Headquarters to participate as members in the Innovation Club. She informed that 23 new members had joined, taking the total strength of the club to 52 members. She welcomed the new members of the club and requested them to introduce themselves.

She presented a brief background of the genesis of the Innovation Club and stated its basic objectives. She reported that in more than one and a half years of its existence, the Innovation Club has held several brainstorming meetings, held presentations on innovative education solutions, planned projects proposals to develop prototypes, and had set up innovation clubs at four Regional Centres. But now, there are many more activities that need to be taken up from time to time, such as organising various competitions like quiz, debates, posters, etc., on innovation and creativity and organising awareness campaign on creativity and innovations within IGNOU and across the ODL System in the country, to name a few.

Thereafter, Prof. Manoj Kulshreshtha, Director, NCIDE and Coordinator of the Innovation Club @ NCIDE was requested to address the members.

Prof. Kulshreshtha said that this was his first meeting of the Innovation Club after assuming the charge of Director, NCIDE. He reiterated the objectives and activities of the Innovation Club @ IGNOU and expressed the hope that with the active participation of the members the Club would be able to achieve its objectives of identifying and showcasing of innovations done by the students, faculty and staff of IGNOU thereby creating a culture of innovations in the ODL system and the country. Thereafter, he gave a brief presentation on the topic of "Innovation and Value Analysis". He elucidated the difference between invention and innovation and explained the concepts of Value, Value Analysis, Job Plan Phases, and Value Innovation. He urged upon the members to think about how to apply the concept of Value Innovation in context of the ODL system. After his presentation, the forum was open for discussion.

The members thoroughly discussed and provided the following observations and suggestions:

1. Need is important for innovation. Encouragement from the organization is a must. We should create such an environment. The institution must encourage and facilitate the innovators.
2. There is an urgent need to innovate in the self learning materials (SLM). We have to seriously think about changing the way our course materials are written.
3. We need to provide proper services for the students. Suitable innovations should be carried out in that direction.
4. A policy for MOOCs is needed.

The National Centre for Innovations in Distance Education (NCIDE) was established in December 2005. It is a facility for promoting, supporting, re-engineering and disseminating innovations in Open and Distance Learning (ODL) system. The NCIDE is a ground for nurturing bright and inquisitive minds whose ideas and explorations are expected to revolutionise the ODL system to suit the needs of Gennext. The Centre's goal is to develop a culture of continued search for new and innovative solutions to offer seamless education for all, achieve cost efficiency in its operations and provide borderless access to quality education and training.

We look forward to receiving your suggestions for this e-newsletter. We also welcome your contributions for the future issues. Please send us your emails addressed to the Director, NCIDE at: ncide@ignou.ac.in.

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