

The Science of Happiness and Wellbeing
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Lecture No # 23
Module No # 05
Innovation and Happiness

Welcome to this talk on science of happiness and well-being and today we have decided to discuss something related to happiness and innovation. We would like to know whether happy people innovate more often or not. In fact the idea is to understand that if we remain happy whether our mental aperture also remains open or not and if so then there is more possibility that we would be more creative and innovative. So the topic of focus today is on happiness and innovation.

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Concepts covered

Why is innovation important for happiness?

- Are Indians happy?
- Are Indians innovative?
- Are happier countries more innovative?
- Is there an Indian way to innovation for happy living?

The basic question that I have in hand is why is the navigation important for happiness. Generally people do not find much of association between happiness and innovation. One of the primary reasons is that innovative people are generally very reflective type, imaginative type, and they do not go outwardly to express, their happiness. So common man generally do not find much of association between innovation and happiness.

But the questions I have is just not between the two constructs of happiness and innovation, I would like it to be more specific with regard to our position in India. So I have 3 concrete questions are Indians happy? are Indians innovative? and are happier countries more

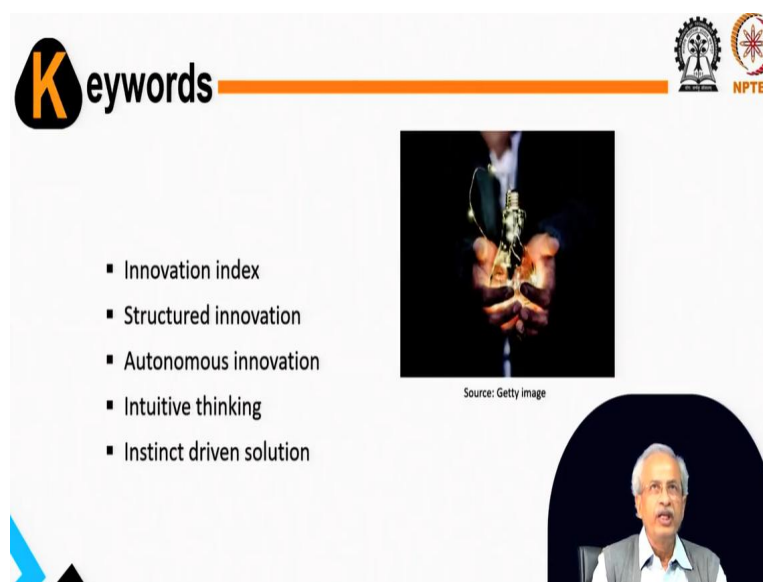
innovative? The last, question I will tell slightly separately to deal with the first question we already came to know that united nations when they conducted a world happiness index.

They did not find India to be very happy country our position out of 156 countries rank in between 136 to 142. I mean we hover around that zone during the last 5 years so we are not perceived to be a very happy country. But the question, therefore are Indians innovative if we are innovative then we are happy or not. And then, whether the countries which are found to be happier are they more innovative than us.

This question is very ticklish, but it need to be answered slightly differently so my idea of talking to you is that is there an Indian way of making innovations for a happy living. We have come to know that Indian happiness come through togetherness, social relations, community ideals, collective fervors and so on and so forth. As compared to who are considered to be highly happier or highly happy based on their living standard, their ability to comfort themselves, having peace through individualism and so on and so forth.

So we would like to know whether Indians are innovative and if they are innovative what kind of innovation they have for their happy living. Because we have discussed in the last class that Indians are happy but not through their standard of living they are happy through their fabric of relationship in a collectively knitted society.

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The slide features a title 'Keywords' with a large 'K' in a black circle. To the right of the title is an orange horizontal line and two logos: the Indian Institute of Technology (IIT) logo and the NPTEL logo. Below the title is a bulleted list of five items: 'Innovation index', 'Structured innovation', 'Autonomous innovation', 'Intuitive thinking', and 'Instinct driven solution'. To the right of the list is a photograph of a person's hands holding a glowing lightbulb, with the caption 'Source: Getty image' below it. In the bottom right corner, there is a circular video inset showing a man with white hair and glasses, wearing a grey jacket over a light blue shirt, speaking.

So we deal with certain concepts during our talk one is about innovation index like happiness index there is something called innovation index. The happiness index was actually done by a survey through Gallup and their associates, the innovation index is done by World intellectual

property organization, WIPO. They calculate the innovation index of each country based on how much input they are giving in terms of having innovation and what is the output of it how much those innovations are translated into an action plan.

By having developed certain technologies and making it accessible by the common people so the input output ratio of the index happiness I mean sorry there is a innovation index is calculated and based on that index comes up, we will discuss about it. But then we will discuss about structured innovation and autonomous innovation.

The structured innovation is a kind of innovation which is a top-down approach based on certain expert system that is there are laboratories, there are experts, there are funding available, risk capitals given to researchers. And then they come out with certain forms of innovation because of their ability to avail the risk capital to do this innovation. The autonomous innovation is just opposite of that. It is a reverse innovation which is actually bottom up innovation. In that innovation there is no risk capital, there is no expert system available, there is nobody to guide people, there is no laboratory, there is no library yet people come out with certain forms of innovation which we call non-expert based innovation. So we will try to make a difference between these two and then try to understand what kind of innovation are actually giving us a better living or happiness.

We will talk about thereafter intuitive thought process or thinking that is intuition and innovation are 2 terminologies we often use in terms of development or having a happier life. Innovation is more a logical processing, a continuous process of understanding a problem and then come out with a solution. Whereas intuitive thought process is not really a very conscious process more often it is a subconscious process, is a discontinuous way of looking at things non-linear way in non-analytical way of making innovation.

So we call it as non-expert based innovation and they are generally instinct driven that is you feel the problem and then you come out with a solution. So primarily these keywords would be utilized in our discussion of innovation and happiness but before we actually go for that its important to understand whether innovation and happiness has got some relationship or not. Let us first try to understand the relationship between innovation and happiness.

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Innovation & Happiness

- Happy people contest for ideas, get more ideas & buy into new ideas...a driver of innovation
- They cannot see dead-end... strive for innovative solutions in case of failures
- They spend less time alone & engage in more substantive discussions
- They change more effectively & innovatively









Now why innovative people are happy or conversely why happy people are more innovative. One idea is that happy people always contest for ideas they always try to understand, develop ideas, afresh, anew and they do not bogged down actually with their current level of stress or anxieties. Their idea-driven thought process becomes a driver for innovation because they try to develop something every time.

The contest for ideas in the sense if there are 10 people sitting and if all of them are happy they will all contest for new ideas. Happy people also cannot see dead end they want solutions and if they have to come out with out of box solution they have to innovate something because they do not like failure. Therefore happier people generally innovate solutions and why they could develop some solutions because they do not stay alone.

They always discuss certain things happy people always share happiness is always shared it cannot be kept within. Since they share, since the discuss both we call add through brainstorming, and brain swarming the 2 terms are generally utilized for substantial discussions. Brainstorming is done through discussion over discussions but brain swarming is done through covert ideas generation and then finally come out with some solution.

So they spend less time alone, engage in more substantive discussions and also happy people are very flexible type they can change their ideas they can come out with a new solution they do not resist change. Therefore happier people are generally more innovative. With this relationship we would now try to understand what do we mean by structured innovation and what is the innovation index worldwide and why do we stand as a country?

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Structured innovation

Expert knowledge system

- A recognized need
- Competent people with relevant technology
- Controlled access to knowledge & high-quality net-worked infra-structure
- Favorable economics & risk capital

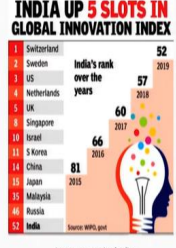



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First of all let us try to understand what do, we mean by structured innovation. As I told you earlier structured innovation is basically an expert knowledge system that is, you should have a proper expertise in a subject matter you should have formal education for that. There must be competent people who are with you and should be able to guide you or work with you. There must be some need felt because every new technology comes up with new ignorance.

And that new ignorance creates a new need since there is a, recognized need there is a competent people with technology there are access to knowledge system through libraries laboratories through infrastructure. The structured innovation can come up very well in countries who have got favorable economies. That is who have got a higher standard of living and who has got better risk capital which they can utilize for innovative researches.

So India if you see, the graph India actually fall much below by a standard of 2019 index of course the 2021 index has also come up where India has fared much better than what it is reported in 2019. India reported at a level of close to 50 to 52 out of 132 countries actually this index is done by as I said world intellectual property organization. Through an index or a ratio of input and output of new innovative ideas, and translated technologies.

So India's position is not so bad as compared to when we actually compare it with world happiness index where we fared slightly and I mean largely low in that sense. So structured innovation India is in a middle category but the question is that are we happy because of for structured innovation? Because all developed nations you will find those who have got favorable economies and very high risk capital they are faring much better it includes European countries and North American countries.

What is our kind of innovation and what makes us happy we would like to know through autonomous innovation.

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Autonomous innovation
Non-expert knowledge system

- ... that offers solutions to complex social problems
- ... that utilizes our traditional knowledge into contemporary use
- ... that offers significant value in our ability to adapt in adversity



Image source in the list

So autonomous innovation is innovation which is non-expert based innovation I told you earlier. These innovations are bottom up, these innovations come up primarily to meet the social, to solve the social problems. Where we use our traditional knowledge to make use of our contemporary I mean capacities. And it significant it adds actually significant value in our ability to adapt in adversity.

Actually these autonomous innovations are innovations which make us resilient because we do not wait for structured innovation to come and sort out the problem particularly, in communities, particularly in communities which are which are vulnerable to many adverse situations including adversities. For, example if you see the farmer if he has got a mobile phone he does not get access to any mobile charger point in order to talk to his family. So he carries a solar panel with him and gets it done it is innovative way of charging it. The other photograph that you see is of the children who did not have a washroom in their school. So they created an idea of create developing a bathroom washroom with water jars and that is excellent way they have actually developed this washroom and they have been awarded by the government for their innovative thought process as well.

So we are referring about such kind of non-expert knowledge system which is also innovation but not, coming through structured knowledge.

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Innovation for common good

[might-not-be-perfect, but will-get -there]

- ...a solution that bends scientific rule into one's favor
- ...non-linear, intuitive thinking (life hack) that maximize resources
- ...flexible, frugal & instinct-driven solution
- ...non-funded, not peer-reviewed, non-publishable



Image source in the list



Now such innovations might not be perfect but people get solutions out of it and these solutions bend scientific rule to someone's favour. For example if villagers are to go for irrigation and they do not have any pump otherwise they can actually use it through this process by utilizing the motor of a bike. And people have been doing it these are not full proof, technologies but people are sorting out their problems.

These innovations are non-linear type their innovative thinking as I said innovative thinking not in the sense of structured innovation. To speak your very frankly these are very intuitive thoughts where the thought process is non-analytical the thought process is discontinuous and it is not consciously done utilizing any expert, knowledge system. They are very flexible frugal and instinct driven solution there is no fund available for doing such kind of things.

These publications there is no publication in it there is no peer reviewing process for developing this solutions but people get often solutions based on what they can innovate for their regular difficulties and problems.

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Common sensical science

- ...a clever solution born in adversity
- ...answers to everyday challenges
- ...meaningful in resource scarce environment
- ...a form of survival strategy, a gateway to happiness



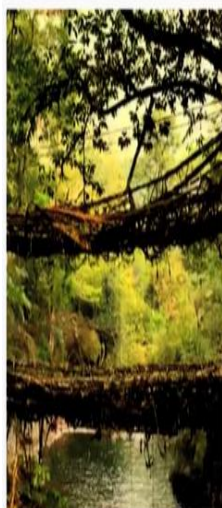
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Now this we call it as common sensical science. It is actually a clever solution born in adversity. And whatever challenges that we face and every day there is an answer to it particularly when there is resources there is scarcity of resources. So they are very meaningful in resource less environment and it is a form of survival strategic and a gateway of happiness. You can see the person is actually preparing coffee in a straight side vendor shop, by having a pressure cooker and utilizing its pressure for making coffee.

So idea is that people can have their intuitive innovative thoughts although they do not have sufficient infrastructural facilities available with them. That brings them happiness because it helps them a better living it helps them to sustain in a better way in order to survive more effectively.

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Root bridge: Image source in the list

A paradigm shift...

- Simple, inexpensive solutions within constraint rather than structured effort
- Insightful breakthroughs instead of incremental problem solving
- Community based shared experience instead of organized knowledge

So I would, call it as a paradigm shift because these paradigms if you try to understand that they are very simple inexpensive solution within the constraint. And there is no structured effort, the breakthroughs are very insightful the photograph that you see is about a rootbridge which is in the area called Cherrapunji in Meghalaya where there are lot of rainfalls. And because of those rainfalls there are a lot, of I mean river outlets and Nalas and you cannot afford to create a bridge on every riverside and Nalas.

Therefore the villagers have come up with some good ideas, the idea is to utilize the live roots of rubber plant and they are very tough and they can be utilized to hold or carry weight up to a very large extent. So people have come out with the idea of having a root ridge to have their I mean daily living through that nalas or rivers very effectively. So they can walk past even they can drive a bike or cycle on the top of it is a 2 tier bridge. So it is a very innovative solution and these solutions are actually making a paradigm shift.

And this cannot be done all alone it is a community based shared experience and this shared experience are utilized with locally available raw-materials based on which they come out with this organized knowledge. Now this organization of knowledge is not like a structured innovation, this is autonomous innovation in which they can come up with this innovative thoughts.

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The slide is titled "Frugal but impactful..." [Bahadur & Doczi, 2016]. It features a Venn diagram with three overlapping circles labeled "FRUGAL", "FLEXIBLE", and "INCLUSIVE". The intersection of all three circles is shaded blue and labeled "JUGAAD". To the right of the diagram is the text "Image source in the list". In the bottom right corner, there is a video inset of a man with glasses speaking. The slide also includes five definitions:

- Inductive:** innovations that arise from non-expert system
- Indigenous:** knowledge system that is locally available
- Inexpensive:** accessibility & affordability to a large section of people
- Intuitive:** 'good-enough' innovation or a product having minimum viability
- Iterative:** 'bottom-up' process that is not burdensome to re-test or re-trial

Logos for IIT Bombay and NPTEL are visible in the top right corner.

Now let us try to understand what are the principal features of these frugal but impactful solutions. These solutions are more inductive in nature when we talk about inductive solution, these solutions are generally not inherent within the problem they have to find out a solution

from somewhere else. When we have a deductive solution these solutions are generally inherent within the problem.

But here this non inductive solution means as I mean non deductive or inductive solution means they do not come out through the knowledge system that is available in the experts so we call them as inductive. They are indigenous in the sense the knowledge is locally available, it is not available in the book it is available with the experience of the people that if the live route of the rubber plant is so hard that it can hold.

I mean a very heavy weight of a car or a cycle or a bike or of course the people then it can be utilized for developing or creating a bridge. So this knowledge system is locally available they are very inexpensive in the sense they are accessible and affordable to a large section of people, people do not have to spend money for that. Intuitive in thought process in this sense that they come out with some instinct-driven thought that what solutions we can have we can have in order to survive.

So when survival is at stake people come out with good enough solutions and the good enough innovation are having product with a minimum viability is created. But if we have structured innovative issues then we have certain specification for every innovation that we make and whether we meet those specifications or not is something which is really required in structured innovation based on which those innovative products are translated productionized and go for end-user integration.

But in you know intuitive thought process this is not done only minimum viability is ensured and also this is a iterative process that is once the innovation is done, once the idea is generated or translated into a process then it can change many times. But for a commercially available innovative product cannot be changed every day. For example if I have come out with a medicine, this medicine can be this research can be iterative but every day you cannot change it.

But autonomous innovation is something which is bottom up you can keep on you can flexibly change you can go for trial retrial but not like the autonomous not like the structured innovation where retest and retrial are much more important than productionization or end user integration. So these are certain basic, points we would like to mention about this.

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Effective social innovations



Source: Getty images

I will give you some examples of effective social innovations now this autonomous and structured innovation has joined hand these days for a country like India. Lot of innovations are being made in a bottom up as well as in a top-down process when the ideas are generated when problems are encountered then lot of social entrepreneurs have come up with the ideas driven by autonomous innovation and then scaled up by structured innovation.

Bio-toilet is one such example where certain autonomous innovations came up how the human fecal material can be converted into near potable water by having a set of cocktail of bacteria. That was otherwise accidentally innovated and then reproduced in large scale for Indian railways. Today more than 60,000 Indian coaches railway coaches are being fitted with the bio-toilet but it came out through autonomous innovation.

Drinking water problem is a problem for everybody everywhere we cannot have safe water everywhere. So people have come up with a straw pipe based I mean filter where one can drink water from any source use it and dispose it at any point of time. Solar energy waste management, the photograph that you see in waste management is basically the road is created utilizing the waste material like Polythenes and they are actually pasted on this roadside.

Health service, trench agriculture everything is effective social innovation trench agriculture is agriculture which is being done in Leh and Ladakh region where there is not a blade of grass is available because of the cold weather. So, villagers have come up with the idea of digging a trench and getting extra 5 to 7 degrees of temperature and doing the agriculture within that trench.

And then during day time they cover it with white polythene to get the sunlight intensify the sunlight and during night they cover it with black polythene. Just to keep the heat captive within that space and in the process they came up with, lot of vegetables and then lot of agricultural products. So trench agriculture has come up in that process because of the joining of the hand.

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Why does such innovation make communities happy?

- Solves problem horizontally, delivers more value at lower cost
- Fights of inequality, promote sustainability, brings autonomy
- Create new relationships & enhance society's capacity to act



Image source in the list

So these innovations make communities happy and why because this solves problem horizontally and it delivers lot of product in very low cost. It fights inequality in the villages everybody has to, in far flung villages everybody has to carry water potable water from distant places earlier they used to use lot of other maneuvering I mean pots on their head to bring water. Today they have come up with a solution and this is a water roller on which they can actually carry over 100 liters of water fetch it from a far flung distance without having any trouble.

So because these are these innovations are being utilized in the community they also create new relationship and the society's capacity to act enhances like anything. Otherwise one person used to bring water from 5 to 10 kilometers just for the sake of having 10 liters of water would have wasted more than 4 to 5 hours of time today this is not being done. So such innovations are making us happy so it is all about community happiness.

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Why does this fail?

- Evidence-based vs. one-hit victory story
- Scalable vs non-expandable model
- Low risk – lost cost vs high risk – high-cost model
- Need (no choice) vs want (more choices)



Mitti Kool: Image source in the list



So our point here is that Indian innovations which we otherwise called as Jugad is also making us happy which is bottom up innovations. The problem is that this innovations often fail because they are one hit solutions. They are not much empirically based they are not as scalable you cannot have too many products out of these innovation innovative ideas. These innovations are low-cost model they are not high -isk high cost model and they can only, fulfill their need but cannot be marketed to a large extent because for that you require it is a commercially viable product.

One such example is mitti kool where you do not require any energy electrical energy and keep the vegetables and enhance their shelf life as good as a normal phrase. But it cannot be sold everywhere because the idea of having these mitti kool fridges and the and the utensils could not flourish because they are not much scalable.


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Creating future jobs with social innovation

- Skill development through non-formal education for elderly (use of lab-on-chips)
- Tapping rural women power for non-traditional blue-collar jobs (Mechanics)
- Location independent job creation beyond IT sectors (Entrepreneurship)
- Non-conventional energy maker (solar-energy technician)

Fostering innovation for sustainable development: Niti Aayog Image



These are the problems and therefore Niti Aayog in Government of India has come up with the new ideas for the people to make them happy to see there to make use of their skill development program. To tap the rural women power who can actually engage into such kind of innovation I mean who can use I mean their capabilities and capacities with the locally available materials.

Which are indigenous inexpensive where technologies can be iterative, inductive, intuitive such innovations are being promoted. So, that the high-end technologies are not always required for the benefit of the people at large.

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CONCLUSION

- Social innovation works as a driver for happiness & as a shared quality for community growth
- It brings power to fight poverty, help sustain health & strength to the weak
- It helps grow knowledge with a deliverable outcome




Source: <https://shanewallto.com/jugaad-innovation-in-india/>




So in conclusion social innovation works as a driver for happiness as a shared quality for community growth. IIT Kanpur has come up with this innovative ideas of having this vehicle for handicapped people which can actually climb and step down through stairs. Otherwise you

require a unmanned ground vehicle with lot of artificial intelligence embedded into it in order to do this so very simple inexpensive solution and that solution make us very happy.

So such innovations helps us to fight against the poverty sustain health, they it can strengthen the weak people it can help grow the knowledge and at the same time with a quicker deliverable outcome. So the point I am trying to make here is that innovation and happiness are closely intertwined constructs, if people are happy they will continue to innovate they might face trouble in adversities they might having problems like disasters. But if communities are happy if they, have got relationship built within themselves if there is a social network available, if there is a collective fervor within the society, then they can continue to innovate even if it is not in a structured top down manner it will continue to happen in a non-expert based bottom-up manner.

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NPTEL

So this was the point of view I wanted to convey so we have got certain references social innovation is the book by Mulgan (32:04) is something I would like to refer and rest of the things are available with the other wavelengths thank you so much.