ATAL TINKERING LAB

ETHICAL LEADERSHIP FOR TINKERING AND INNOVATION

MESSAGE FROM RAMANAN RAMANATHAN
MISSION DIRECTOR & ADDITIONAL SECRETARY, AIM, NITI AAYOG

Atal Innovation Mission is a flagship initiative set up by NITI Aayog to promote innovation and entrepreneurship across the length and breadth of the country. At the school level, AIM is setting up state of the art Atal Tinkering Labs (ATL) in schools across all districts across the country. These ATLs are dedicated innovation workspaces where latest technologies like 3D Printers, Robotics, Internet of Things (IOT), Miniaturized electronics are installed. This will enable to create a problem solving, innovative mind set within millions of students across the country. To date, 5000+ schools have already been selected for ATL establishment.

Just as important as the students, are the teachers and mentors who will shape the future of our nation by mentoring these bright kids. This module launched by Atal Innovation Mission in collaboration with The Global Education & Leadership Foundation on "Ethical Leadership for Tinkering and Innovation" is an attempt to support these selfless educators in imparting to students the importance of ethics and leadership in the field of innovation. Students can themselves also can read the module and follow the activities in it, to learn about these important softer skills as, which will be critical as they become a part of the nation's innovation and entrepreneurship ecosystem.

More than just grants, the ATL Labs are allowing our young innovative students to dare to dream and dream to dare about being significant contributors to an innovative, progressive, prosperous and sustainable New India. We are extremely delighted to present this module to the ATL stakeholders.

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MESSAGE FROM GOWRI ISHWARAN

CEO, THE GLOBAL EDUCATION & LEADERSHIP FOUNDATION

The mission of Atal Tinkering Labs to create innovators and entrepreneurs resounds with the vision of The Global Education & Leadership Foundation that works with the objective of empowering the young innovators with the motivation of taking leadership so that their innovations can be for the benefit of society at large and address its challenges in a sustainable manner.

The Global Education & Leadership Foundation is pleased to launch in partnership with Atal Tinkering Labs the Ethical Leadership for Tinkering & Innovation module. The program will empower the young innovators on how to take leadership in their spheres while at the same time not losing focus of the larger societal needs.

An experiential programme, the **Ethical Leadership in Tinkering and Innovation** module includes hands on activities that are both challenging and thought provoking, aiming at reigniting conversations on code of conduct and ethics in innovation and taking decisive action to combat challenges in a sustained manner.

The Ethical Tinkering & Innovation programme will empower the young to create change and a better tomorrow.

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Foreword

Atal Tinkering Lab is a flagship intiative of the Atal Innovation Mission, NITI Aayog, that has been instrumental in introducing our young children to the 21st centuary skills of Critical Thinking, 3D Printing, Robotics, Internet of Things (IOT) and so on . This will enable creation of a problem solving mind set amongst millions of students across India.

While the students are being introduced to the latest innovative technlogies to solve community problems, it is extremely crutial to empower them with skills of ethical leadership to become responsible citizens of India.

The following module, "Ethical Leadership for Tinkering and Innovation" will teach us how to maintain our integrity and moral principles, while experiencing the fourth industrial revolution during this fast changing world . It touches upon four key concepts : leadership, ethics, altruism & decisive action, and tries to elucidate them through the medium of activities that the teacher/mentor can organize for students. The activites are designed to teach the students how they shall face difficult situations in their day to day life, while ideating, making, and innovating, and how they have to make conscious and ethical choices, while progessing on the path of technology based innovation and entrepreneurship.

The module is primarily aimed at ATL Incharges/teachers/mentors who would follow it to teach the studetns about the ethical leadership skills. The module has been created in Do-It-Yourself (DIY) mode, so that students can themselves conduct the activites and self learn.

With Atal Tinkering Labs, the goal is to create an innovative mindset amongst students, teachers, mentors and parents, to help transform India into an innovative nation.

Happy Tinkering ☺

Dr. Ayesha Chaudhary

Atal Innovation Mission, NITI Aayog

Government of India

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Contents

Introduction

Atal Innovation Mission, NITI Aayog in partnership with The Global Education & Leadership Foundation (tGELF), is glad to launch a module on ethical leadership in technology and innovation for the Atal Tinkering Labs initiative. This module is primarily for ATL in-charges/Mentors and will be focussing on enabling them to teach the students about four key concepts - Leadership Skills, Ethics, Altruism and Decisive Action and their relevance for the technological innovation.

Using the activities and reflective exercises in this module, the ATL In-charge/Mentor will empower the students to engage with each other to understand the concept of leadership, their own value systems, develop strong dynamic teams, think critically and use their ability to take risks to innovate. The module also works towards helping participants in charting their vision for themselves. The goal is to empower students to embrace and practice ethical leadership while unleashing their innovation potential in Atal Tinkering Labs.

The ATL Ethical Leadership module contributes towards holistic development of students, through integration of value-based components into academic curriculum using an experiential approach. It aims towards creating aware, strong, ethical citizens, leaders and change makers, thereby enabling them to contribute to a better future for the country and the world.

Note: - The content in this module have been curated from various online sources and we do not intend to infringe on any copyrights. Please note that there are 3rd party links in this module and Atal Innovation Mission or NITI Aayog or tGELF does not endorse any person(s) or organizations mentioned on or related to these links.

What is Leadership?

Leadership refers to the ability to influence people to keep them motivated to work together, for achieving the goals of the team or group. Good leaders are great communicators, can see the broader picture, anticipate what comes next and strongly believe in developing other people and in being inclusive.

Activity 1 – What makes a Leader?

Instructions for Teachers

1. Print outs of 5 names of "leaders" to be pasted in different corners of the room. These could be a varied list including names, such as Mother Teresa, Sachin Tendulkar, Mark Zuckerberg, Kailash Satyarthi, Amir Khan, etc.
2. Ask students to walk around the room looking at the names of the leaders printed on the walls. Tell each student to pick a personality whom she/he considers to be a leader and stand in front of the name. Once groups are formed in front of the printed names, ask the groups to have a discussion on the following points:
3. Why do they consider this personality to be a leader?
4. What qualities make him/her a leader?
5. What differentiates this personality from the other names listed in the room?
6. Ask each group to make a brief presentation or pitch with the objective of convincing others to come and join their group. The other groups are open to question the presenting group to generate a discussion on the qualities and skills needed for leadership. Once all groups have presented and answered questions raised to them, every group gets 1 minute to summarize their stance. In case anyone wants to move to another group initiate a discussion on why that is the case. Ask students to return to their places and summarize the discussion on what makes a leader.

Activity Summary and Discussion

Differentiate between leaders, celebrities and icons in open discussion with the students. Discuss the definition and encourage students to think of how they measure on these parameters. Now encourage students to think of personalities who match this definition of leadership. These personalities could be famous, or people known to them who display leadership qualities.

Ask the students to consider the following situations

Situation 1

You are the member of a three student ATL innovation team participating with your innovation in a national innovation exhibition. You have member A, who is an electronics genius and very methodical and structured in her/his work, using only two-coloured jumpers in any circuit she/he builds to ensure that the circuit can be understood clearly. Then you have member B, who is an extremely creative personality who wishes to use all kinds of coloured jumpers, eight or more, to make the circuit bright and stand out in the exhibition. Now the two members of your team are

disagreeing on how to make the circuit – use only two colours of jumpers or use various colours of jumpers? What would you do to resolve the situation as a leader?

(You can share a possible solution with the students, if required to direct the discussion - what if the third student manages to convince the other two to compromise and use four colours of jumpers, keeping the circuit simple enough to understand while at the same time colourful enough to stand out in the exhibition)

Situation 2

Your three-member student team is brainstorming to come up with innovative designs to solve a problem. One of your teammates has come up with a partial solution to the problem, while the other has understood another part of the problem. But both do not realize that together they can solve the problem, instead each maintains that he/she has the correct solution and the other one is wrong. What would you do in this situation as a leader?

(You can share a possible solution with the students, if required to direct the discussion – what if the third student managed to get a healthy discussion going between his/her two teammates and was able to convince them to use the best parts of their respective partial solutions to co-create an innovative solution to their problem statement)

What is Ethics?

Ethics refers to broadly the set of rules that are adopted and upheld by a group internally. They are the guidelines which should be upheld to ensure that one's actions are morally correct and honest.

Activity 2 – The Ethical Challenge ("Value Nani")

Instructions for Teachers

1. Inform participants that they will now be playing "Value Nani" - like someone who helps people resolve their problems and challenges in different walks of life. As "Value Nani", the students will now be helping people resolve their ethical challenges.
2. Ask participants to imagine that the ethical challenging situations have come to them in the form of a letter to the Tinkering Lab teacher and each group has to role play the situation and suggested solutions.
3. Give situations from the ones mentioned below in the <u>activity summary and discussion</u> section. Depending on the time available give the same or different situations to each group.
4. Ask each group to read the Challenge and think of the following:
5. What is the dilemma here?
6. What advice will they give to the person in question? Remind the students to explain the rationale for the choice made.
7. As you will note, it is the same challenge for each group - just a different perspective.
8. Once all groups are done, encourage sharing of different opinions. As a facilitator, there may be a need for you to put in conflicting opinions to trigger debate on each situation.
9. Do ask each group what the core value/ethic in question for each challenge is. Write it on the board.
10. It is important to emphasise that there is no right or wrong in any situation, it is about an individual's value system and decision making.

Activity Summary and Discussion

Initiate discussion amongst the students on the meaning of values and ethics based on the activity outcome and the following questions:

- What are values and ethics?
- Can we learn values? Where do we get our values from?
- Name some values. Do these change? If so, which and how?
- Distinguish between personal, social and institutional values and ethics.
- Discuss the following values – respect, empathy, responsibility & focus.
- Use the following situations for activity 2.

Situation 1

We worked on an Atal Tinkering Lab project and came up with a fabulous idea for a new model. The team was very happy with me and we were doing very well. On the final presentation day, I fell sick and someone else had to present the idea. And now he has got all the credit for the idea as well as the presentation. Our team is going to the State finals and he is presenting the idea. I feel horrible. What should I do?

Yours Truly
The Idea Generator

Situation 2

We worked on an Atal Tinkering Lab project and came up with a fabulous idea for a new model. My team-mate came with the idea, but, on the presentation day, she was absent. I had to take over the team presentation. I made lots of modifications to the presentation and because of my hard work, we got selected for the State presentation. Now she is back and wants to take back my presentation. I think this is unfair. What should I do?

Yours Truly
The Confident Presenter

Situation 3

We worked on an Atal Tinkering Lab project and came up with a fabulous idea for a new model. Anita came up with the idea, but, on the day of the presentation, Vikas had to present because Anita fell sick. Our idea is very good and so was the presentation. Our team is going to the State finals and Anita & Vikas are at loggerheads on who will pitch the idea. I think the team is suffering. What should I do?

Yours Truly
A Good Team Member

What is Altruism?

Altruism is the feeling of concern for the well-being of others. Something, which is done completely for the betterment of others, without taking into any consideration, the benefit of self, is an altruistic act. It is also sometimes referred to as selflessness. Altruism tends to promote a wholesome feeling of connection with others, while at the same time promoting the growth of self-esteem in the individual.

Activity 3 – Discussing Altruism

1. Students begin by considering the different kinds of needs people might have, such as, food, shelter, money, education, friendship or transportation.
2. Working together in groups, they compile a list of these needs and place them into categories, such as "material needs" and "emotional needs."
3. Once students have identified these needs, they can discuss whether these needs are being met for different members of society. For example, people from low-income areas may not have access to education.
4. After students have become more aware of needs in society, they plan an innovative tinkering lab altruistic project. This may even be a fundraiser for a school in a poorer area.
5. Students should work in teams and organize their time effectively to develop teamwork skills and experience altruism in action.

Activity Summary and Discussion

You may screen relevant videos (a couple of examples are given below) to initiate discussion. Students not only learn the definition of altruism but understand how it can improve society and make an impact on the lives around them.

Video Examples
- Unsung Hero Thai Insurance Ad
  https://www.youtube.com/watch?v=Qkmi8jit1Cw
- Naik Foundation
  https://www.youtube.com/watch?v=HkuKHwetV6Q

Ask the students to consider what motivates them to choose a project to work on in the ATL. Do they try to work on projects that solve a problem they have seen people face in their day to day life? Do they work on projects that they think are cool or would gain them popularity among their friends, teachers, relatives, etc.? Ask them to consider the following situation.

Situation 1

Given time and resource constraints, you have the option to work on only one of two projects in the ATL. Project 1 is a cool robot which can play soccer all by itself and if you build it, you will get the opportunity to participate in the World Robotic Soccer Championship with your robot. Project two is a simple yet innovative device which helps the farmers in your area to harvest

their crops faster with lesser effort and makes their lives better. Which project would you devote your time to and why?
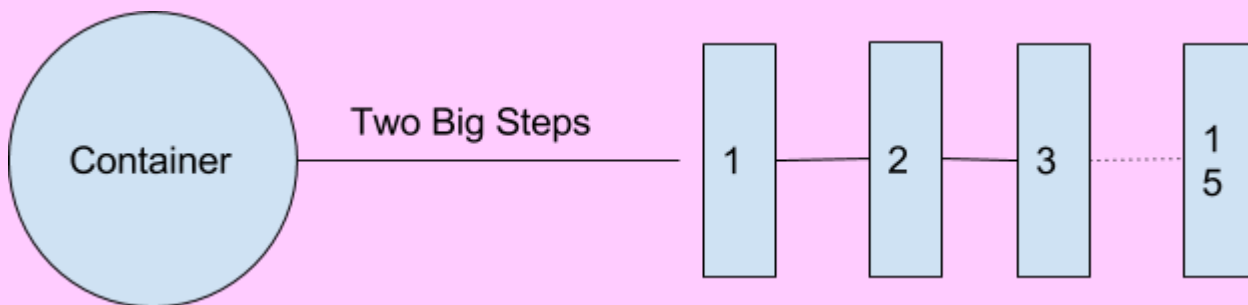
(After the students have presented their views, ask them to consider the difference or similarities in the rewards they see themselves from the two projects. Whether they would get recognition for both? Which one would be considered an altruistic project?)

What is Decisive Action?

When one acts quickly and with confidence, one is said to have acted decisively. While this make seem counter-intuitive to the traditional wisdom of making decision after great deliberation, in today's fast paced world, the key to success lies in the ability to make smart decision at a moment's notice. Too often, students are so paralyzed by the fear of failure that they simply fail to act. To be able to innovate, students need to learn to balance risks with rewards and be ready to act when the opportunity presents itself.

Activity 4: Being Ready to Take Risks

1. Preparation prior to the class
    a. Get space cleared in front of the class and place the resources as given below:
        i. Resources Required
            1. Prepare 15 big cards with numbers 1 to 15
            2. A basket/container
            3. Paper balls (at least 3)

2. Ideal group is of 5 members each.
3. Inform them that this is going to be a point-based game.
4. Each participant of a group will get an opportunity to throw 3 paper balls into the container from chosen points. These could be different or the same. For example, A can throw the first paper ball from the point 1, the second from point 5 and the third from point 10. In case all the paper balls go into the basket, A adds 16 points (1 + 5 + 10) to the team's overall score. If the first and the last ball go into the basket, A adds 11 points (1+10) to the team's overall score. The next team member then comes forward for his/her turn.
5. The scoring strategy is - the more the risk, the more the reward.
6. Choose a score keeper to keep a group tally on the board.
7. Also appoint a referee to ensure that each student is standing behind the chosen mark point.
8. Get participants to come and practice for a few minutes.
9. Post the practice give them strategizing time.
10. Play the game with the groups and declare the winner.

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Note: This activity has been adapted from the following video which you can watch for reference - https://www.youtube.com/watch?v=rz1kzGdron0

Activity Summary and Discussion

Engage students in a discussion covering the following:

- What was your strategy?
- What does the scoring strategy show about the risk element?
- What happened when the first time you were unable to get the ball in the container? Did you continue going farther?
- What are calculated risks?
- How does risk taking ability connect to entrepreneurship/leadership?

Wrap up the session by stressing on the importance of taking risk for an entrepreneur and leader. Elicit examples from students.

Use the situation given below to give the students context on risk taking and decisive action in innovation and the ATL.

Situation 1

You must use an Arduino for your ATL project. You do not know what voltage adapter should be plugged into the Arduino. The ATL has 4 adapters of 5 V, 9V and 12V. Your ATL In-charge is not available today and your project has to be submitted for an exhibition by today evening. What do you do and why?

(direct the students' discussion, if required by giving them the options below –

- they decide to wait for the ATL In-charge to return the next day and forfeit participating in the challenge
- they decide to randomly use any one of the adapters.
- they decide to use the lowest voltage (5V) adapter, on the assumption that it would either work or not but would not harm the Arduino. If that does not work, they would use the next voltage adapter.
- they use the internet to find out what the correct voltage adapter is and then use it.

Discuss with the students, what would the appropriate action be and why. Also discuss what action would not be conducive and why.)

Happy Tinkering 😊