LEARNING TO EXPLORE

Project by Project

Original Marathi Editors
Vivek Ponkshe
Nachiket Nitsure

English Edition Editors
Aakash Chowkase
Pranav D. Kulkarni

Preface

How exactly should education work? Children should ask questions and the ones who know the answers to those should try to answer them using many different ways. It could be through lectures or seminars, by asking counter questions, by asking them to work on demonstrative projects, projects made by the students themselves, through practical experiences, by recommending good books to them or by asking them to interview intellectuals in the fields.

Students and teachers should design a curriculum that makes all of the above possible on their own initiative.Teachers, over long periods, lost the freedom to customise the curriculum for the needs of their students; and currently teaching and learning, unfortunately, have been reduced to this limited context of teaching just textbooks, not curriculum.

An enthusiastic teacher will, however, find this lack of freedom restrictive and will try to grab an opportunity to abandon these restrictions. 'Learning through Projects' is an interactive method of learning where the teacher and the students collaboratively decide what to study, how to study, and how much to study. While working on projects students develop their mental skills and abilities. For example, working on projects gives you insight into finding answers to questions like "How do I get information from primary sources? How should I design the experiments?"

Our education system should incorporate these methods. Doing Projects because the current education system demands them, serves no purpose beyond giving a false sense of learning. Novel educational experiments like the inclusion of "Work experience" and "Social Work" in school syllabi lost their essence in the haste of generalisation. To avoid meaningless ritualisation as happened in the case of both of the above it is very much necessary to expound the intent and methods of the Project-Based Learning (PBL). This book, created for this

purpose, is a result of the accumulation of learnings we have had in the implementation of PBL at Jnana Prabodhini in the past 30 years.

We can organise more training and workshops for schools and teachers who would like to have an in-depth understanding of the PBL. This method should be considered as a chance for us to step up our efforts to improve the overall quality of the entire education system.

March 2017 **Prof. Vivek Ponkshe**

Preface to the English Edition

Doing projects is an important part of experiential learning. First, if properly designed for lower grades, it can provide some freedom, where the hand holding has to be significant on the part of teachers or parents. Learning through projects involves the development of many skills, which continue to develop constantly if sufficient time is devoted to project-based learning throughout the school years. Next, slowly one proceeds to more complex projects, and students' freedom in doing the projects increases progressively. Small successes instil a great amount of confidence, which then translates further into students undertaking more opportunities to learn on their own.

Project-Based learning, where the ownership of the project is with students, makes students set goals, pursue them with great effort, acquire the necessary skills, and as a result of this, develops the attitude mentioned above. When students are slowly exposed to the world around them, are asked to go beyond the boundaries of classrooms, participate in the larger world in a safe, child-friendly manner, they get sensitized to the issues and diversities around the world. This sets up a context for their education, and they can see their place in the large

world. Some of the students start seeing the challenges around them and decide to respond in a creative and constructive manner. Some of them become so engrossed in responding to the challenges that they decide to acquire new skills and even change their own behaviour if it comes in the way. In short, doing projects throughout school years progressively results in learning new skills continuously, developing the right attitude, empathy for the society at large, and the discovery of one's own potential.

This book is a short introduction to the practices adopted at Jnana Prabodhini for this type of self-directed learning. Each of the articles is significantly inadequate without the reader practising the points presented in the articles and understanding them with one's own experiences. This book should not be read and kept aside. Rather, it is a book to be enacted through multiple grades with serious effort and patience.

Many of the articles in the book appeared in the monthly magazine Chhatra Prabodhan, meant for adolescent Marathi-speaking children around Maharashtra. This is why some of the articles mention Marathi surroundings. This should not stop the students from non-Marathi communities from practising the skills so introduced. One can always find similar examples in their surroundings and languages, and it is the process that is highlighted in the book rather than the content itself.

The translation team involved many students of Jnana Prabodhini across the globe who, valuing the role of project-based learning in their education, realise the value of the whole process, and therefore offer this book as *Gurudakshina* (offering to the Guru) from all of us to our alma mater.

September 2020 **Editors**

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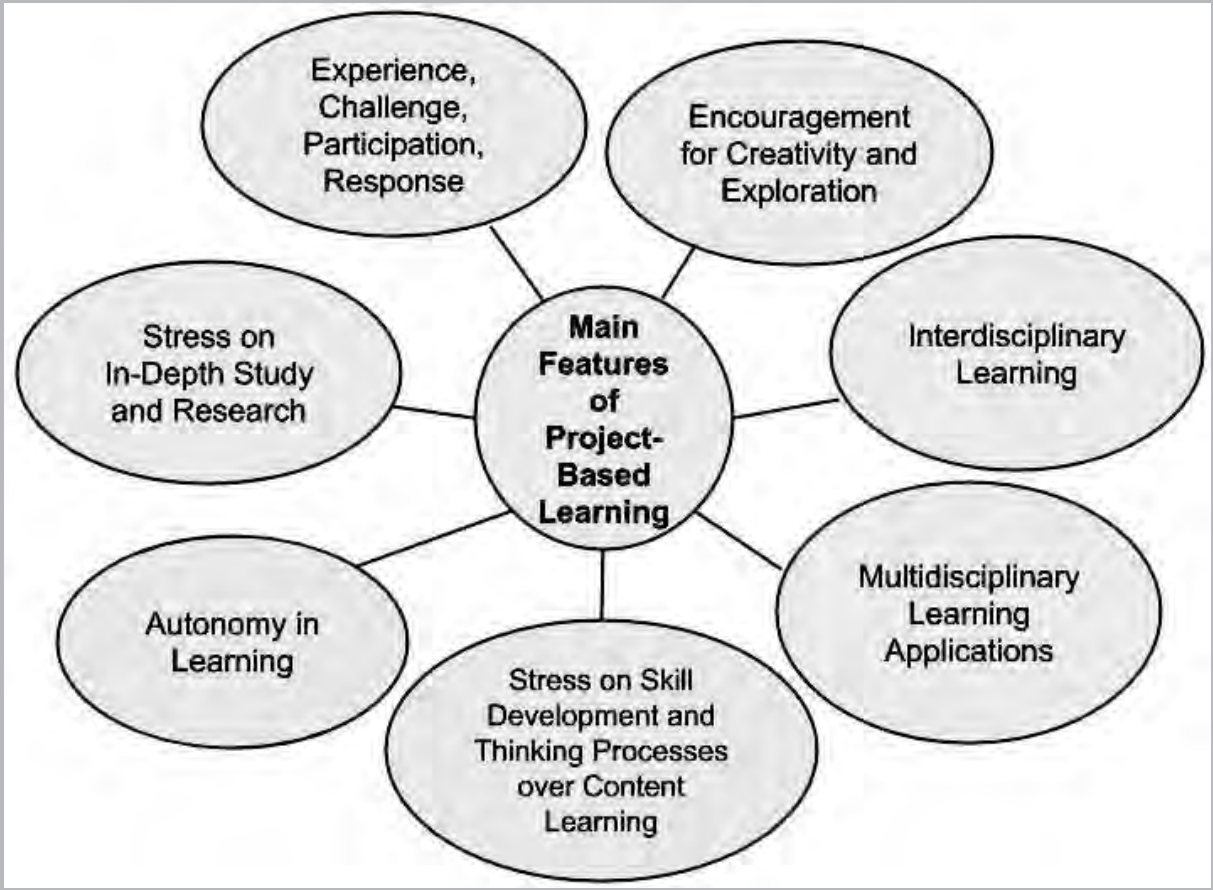
Main Features of Project-Based Learning
Experience, Challenge, Participation, Response
Encouragement for Creativity and Exploration
Interdisciplinary Learning
Multidisciplinary Learning Applications
Stress on Skill Development and Thinking Processes over Content Learning
Autonomy in Learning
Stress on In-Depth Study and Research

1

To Learn is to Explore!

It is a story from when I was a 13-14-year-old dreamy teen! I had a great desire to do something new and adventurous every day. After reading about Scott-Amundsen's competition for the expedition to the south pole, I used to think that I should also discover unknown regions on Earth. After listening to Louis Pasteur's story, the thought of observing several things under a microscope and exploring new microorganisms used to hover in my mind. While reading Jagadishchandra's biography, I used to feel motivated to understand the mysteries of the vibrant life of plants and communicate with them. Once, during our trip to the fort Pratapgad, I started envisioning the slaughtering of Afzalkhan's army by Shivaji Maharaj and I considered roaming in the valleys of Sahyadri and exploring every footstep of Shivaji Maharaj's troops. While reading Kusumagraj's poems, I started believing that I am a poet and I used to try hard to compose a poem.

However, after a while, the bubble of my dreams used to burst. I used to consider myself very unlucky to have been born so

late in this world. Scientists from all over the world have explored many avenues in different areas. What is left for me to invent? If I were born 100 years ago, I would have received the Nobel prize for answering the question of why seawater is blue. If I were born 150 years before, Edison would not have gotten a chance to invent the electric bulb, that would have been my invention! Newton's laws in the books would have been published under my name, wouldn't they? Oh, it was too late to enter this world! I should have been born at least 400 years before! That's why Babasaheb Purandare explored the entire *"Shivapradesh"* before me; otherwise, I would have got the title of *"Shivashahir"* instead of him!

These thoughts used to disappoint the researcher inside me. I had an adventurous friend whom I called 'Mr. Tinkerer', who would come at such times. He always had a brilliant idea, a new thing, or an intriguing question. Sometimes he used to say, "We must make cleaning soap which is eco-friendly as well as cheap. "Come on let's do it!" Occasionally, he had a crazy ball in his hand, which bounced weirdly, and he used to say, "Let us solve the mathematics behind the bouncing of the ball". Sometimes he had various sized kites in his hand and had a large number of questions along with the kites. Sometimes, Mr. Tinkerer encouraged us by saying, "Let's make a model illustrating a battle in *Pavankhinda!*" followed by building a fort using clay, as a part of *Shivsrushti* (terrain reflecting Shivaji Maharaj's times), in our backyard. Every night around 8:30, he also allowed me to join him in observing the motion of satellites in the sky through telescopes he had made for himself. Once, he took me to his secret place, the attic in his house, and read out his autobiography for me. Every meeting with him was a great inspiration, it used to wake up a scientist, an inventor, a historian, a writer, and a poet in me. Our entire team worked with Mr. Tinkerer with great excitement and worked hard to find answers to several questions.

Whenever I look back, I can see mind-boggling and incredible things done by our team. They may not find a place in the documented history of the world, but were the crucial stepping

stones in our academic journey - whether it was about discovering the innovative ways of producing oxygen while experimenting in our school's lab for hours or the taps which turn on after clapping our hands, or the study of insects found in our school's premises, or the invention of Pythagoras theorem which were outside the textbook or searching and comprehending numerous poems on the topic 'mother/*Aai*,' or a program presented in the social gathering based on appreciations of these poems! The musical programme we presented in the social gathering was directed by one of the students who were poor in academics. So in this way, countless ideas were generated and we were madly running to try each of them! On one vacation, everybody decided to write about the history of their family. That was great! My parents also supported this interesting task. Not only parents but my grandfather, who is generally very strict, also got involved in our task by providing a lot of information (and chocolates!).

Today our entire group is scattered in different parts of the world. Mr. Tinkerer is a senior scientist in a national lab. When the rainy season approaches and I read the weather forecast in the newspaper, I always remember him talking about the weather based on the information from the weather station. Friends, only after learning the science of education, I realised that whatever activities we used to do are called projects!

For doing such projects, we should have a continuous flow of questions in our minds that arise due to our natural curiosity. The questions can be about nature, practical human transactions, and basic fundamental concepts in mathematics. Whenever we have questions in our minds, we desperately try to get the answers. Sometimes we get the answers easily by referring to books. But getting answers to certain simple questions can be very difficult. For that, sometimes we need to interview people working in different fields, observe things, try out different experiments, make prototypes and models, and conduct surveys. Sometimes, it leads to the development of a completely new entity that does not exist.

The project does not only mean to collect the information, but it means extracting meaning through this information and generating new knowledge through experience. It is quite possible that someone else in the world has already got an answer to our question but there is a lot of fun in finding the answers ourselves!

I believe that successfully finding the answers to our questions gives a great feeling of satisfaction compared to giving the answers to the questions asked in the exams. The days of gaining good marks by memorising and learning from the books are gone! The importance of experiential learning is increasing day by day. There are many sources available for obtaining the information. In the age of the internet, we need to learn skills such as comprehending the collected information and validating the reliability of it. These skills get developed while working on a project. One learns about classification while collecting things. Charles Darwin, the father of evolution, collected thousands of plant and animal species at a young age. He learnt about the similarities and differences among the species when he tried to classify them. This task which he started at a young age became a lifelong project for him.

Projects can be based on science, mathematics, history, geography, or language but they do not have a limitation to stick to only one subject. It is important to set definite objectives and achieve those in time. A project helps us to think and act with a vision in mind. In science, we need to perform experiments and draw graphs. While studying social science, we need to visit different places and take interviews. While studying literature, it is imperative to understand the universe of poets and writers beyond their words. We have no time and scope to pursue projects while studying textbooks in school. Richard Feynman, a renowned physicist, had a simple question of how ants communicate with each other and he studied that as a hobby.

When we come out of the constraints imposed by the syllabus, we get to experience the freedom of independent

learning. It helps us to develop self-study skills. Mr. Tinkerer used to talk confidently with his faculty members at his university. Where did he get this confidence from? How did he develop the knack of observing the things in one go? How did he start to insist on thinking about alternatives to everything? Even today, whenever we visit our friends for lunch or dinner we always eat some new dishes. This habit of thinking innovatively becomes an integral part of life.

One thing that I like about the project methodology is that we are allowed to make mistakes! The interesting ball game we invented in one of the vacations was also a project. While making the rules which aim for the involvement of all players without affecting the fun part of the game, we made several versions of the game. It was a journey through trial and error towards perfection. We do not get an opportunity to correct mistakes in school examinations, but while working on projects we get an opportunity to learn from the mistakes.

It is good if we get a chance to present our project work in front of others. It requires making charts, drafting a decent report, and fiddling with the prototypes until the end to avoid failure. Also, it is followed by dealing with the pointed/taunting questions posed by friends and examiners. It is a moment of happiness to recover from the mistakes. We understand this better while pursuing projects. This project methodology is a journey of discovery. It is like going on a trek to a tall mountain nearby.

This is a journey of discovery of reaching the difficult caves in the mountains, sketching the caves, noting the details after observing their construction, taking the photographs if possible, conducting the video shooting, and presenting that as research work. Let us start this delightful journey of discovery. This chapter is the starting point of the journey. Let us read about what it means by pursuing projects in the chapters to come!

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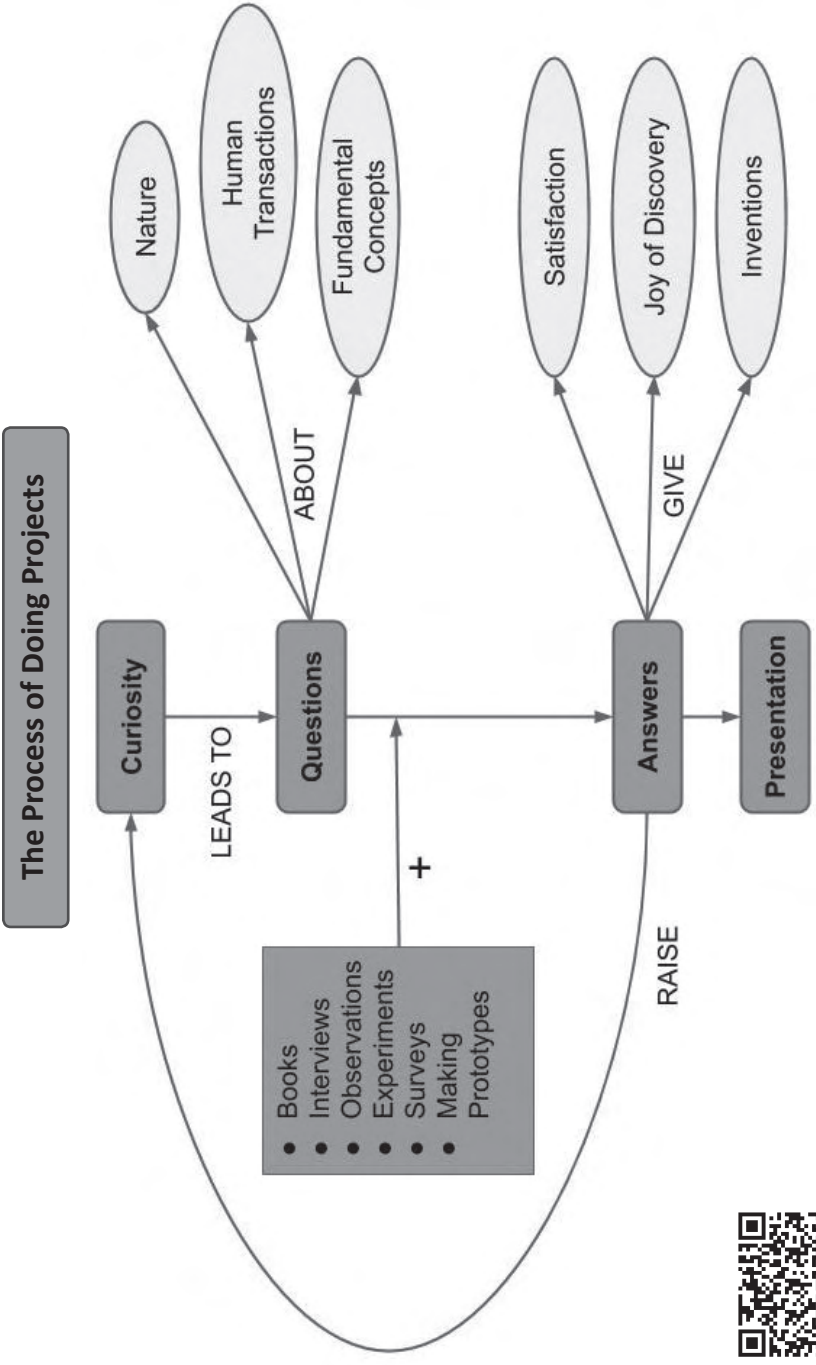
Prof. Vivek Ponkshe


The Process of Doing Projects
Curiosity
LEADS TO
Questions
ABOUT
Nature
Human Transactions
Fundamental Concepts
+
Books
Interviews
Observations
Experiments
Surveys
Making
Prototypes
Answers
GIVE
Satisfaction
Joy of Discovery
Inventions
RAISE
Presentation

How can students learn to create knowledge? In such a process, students pose questions, and those who know the answers try to answer them using different ways - through lectures or seminars, by promoting experimentation, and so on. Students, on the other hand, should ask follow- up questions, conduct surveys, and learn through practical experiences.

All of us should promote and practice Project-Based Learning, where students and teachers join hands in deciding what to learn and how to learn.

This book provides guidance for many relevant questions like:

- How to develop project-related skills such as Observation, Questioning, Interviewing, and Referencing?
- How to undertake different types of projects such as survey-based, collection-based, model-making, and investigatory projects?
- How to guide students through this process? What are the intricacies of doing projects with different themes?

Let us start exploring!

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₹ 200/-

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Educational Activity Research Centre, Pune

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खास कुमारांसाठीची पुस्तके

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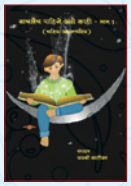

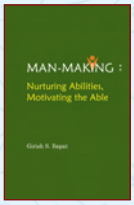

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