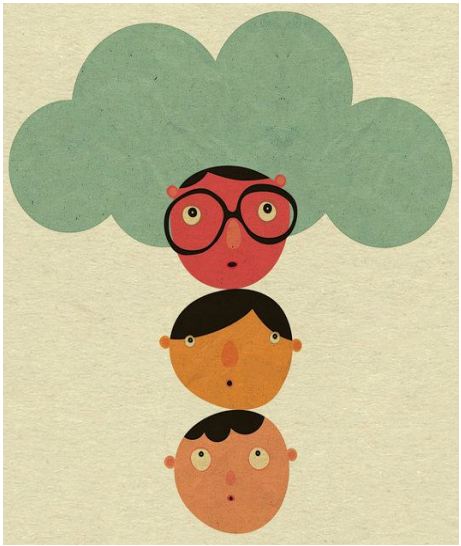
The 'What, Why and How?' of building 'Sawaliram'

Jayashree Ramadas, Nitin Paul, Chandrika

TIFR Centre for Interdisciplinary Sciences, Hyderabad

27 September 2019



What is curiosity?

Illustration by Sabyasachi Hazra, for ডানা ছাড়া ওড়ে কারা written by Drubha Esh

"An emotionally induced, exploratory desire to solve a knowledge gap"

Wu, Pai-Hsing. Kuo, Che-Yu. Wu, Hsin-Kai, Jen, Tsung-Hau. Hsu, Ying-Shao. (2018). Learning benefits of secondary school students' inquiry-related curiosity: A cross-grade comparison of the relationships among learning experiences, curiosity, engagement, and inquiry abilities. Science Education. 102:917–950.

How natural is curiosity?

- Robust characteristic of babies > ~2 months
  - Preference for **novelty**
  - Search for **consistency**
  - Modulated by **'temperament'**
- Epistemic curiosity > ~**9** months
- Children ask **10,000** questions / year between ages **2-5** years
- High in **middle-class, modern** (western) & **educated** families
- Influenced by **parents'** conversational style and **controlling attitude. Reduces** in school.

Paul L. Harris (2012). Trusting What You're Told: How Children Learn from Others. Cambridge, Mass.: The Belknap Press of Harvard University Press.
Illustration: Ankita Thakur, for 'Eye Can See' written by Meethil Momaya.

How fragile is curiosity?

- **Anxiety** - triggers & management
- **Secure** attachment at 2 years
- A **deceptive** independence
- Adult as **conversation** partner
- **Positive** episodic effects

Paul L. Harris (2012). Trusting What You're Told: How Children Learn from Others. Cambridge, Mass.: The Belknap Press of Harvard University Press. Illustration: Sumit Sakhuja, Sonal Goyal, for The Elephant Bird written by Arefa Tehsin.

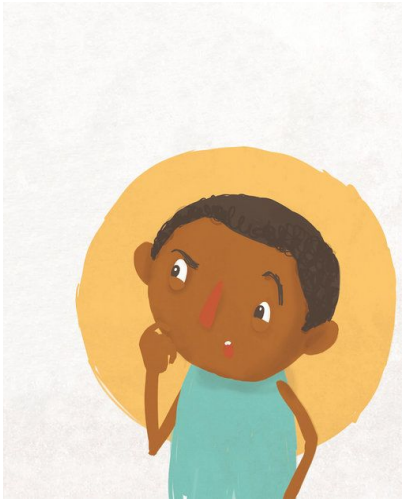
Multiple effects of curiosity

On Memory[1]

fMRI study of immediate and delayed memory tests showed improved memory for information that participants were curious about and also for incidental material learnt during states of high curiosity.

On Academic Performance[2]

Meta-analysis of 200 studies with a total of ~ 50,000 students. Conscientiousness and curiosity had as big an effect on academic performance as intelligence.



1 Matthias J. Gruber, Bernard D. Gelman, and Charan Ranganath (2014). States of Curiosity Modulate Hippocampus-Dependent Learning via the Dopaminergic Circuit. Neuron, 84, 486–496.

2 Sophie von Stumm, Benedikt Hell and Tomas Chamorro-Premuzic (2011). The Hungry Mind: Intellectual Curiosity is the Third Pillar of Academic Performance. Perspectives on Psychological Science, 6:6, 574–588.

Illustration: Why is There a Hole in the Wall? written by Kirsty Paxton

Pedagogic value of questions

- Direct learning, drive knowledge **construction**
- Foster **discussion** and debate, enhance **quality** of discourse
- Help monitor **understanding**
- Increase **motivation** and interest

Christine Chin & Jonathan Osborne (2008). Students' questions: a potential resource for teaching and learning science, Studies in Science Education, 44:1, 1-39.
Illustration: Nivong Sengsakoun, for ທິບທິດາໄປໂຮງຮຽນ written by Viengsavanh Oudomthip

A teacher's perspective - from research

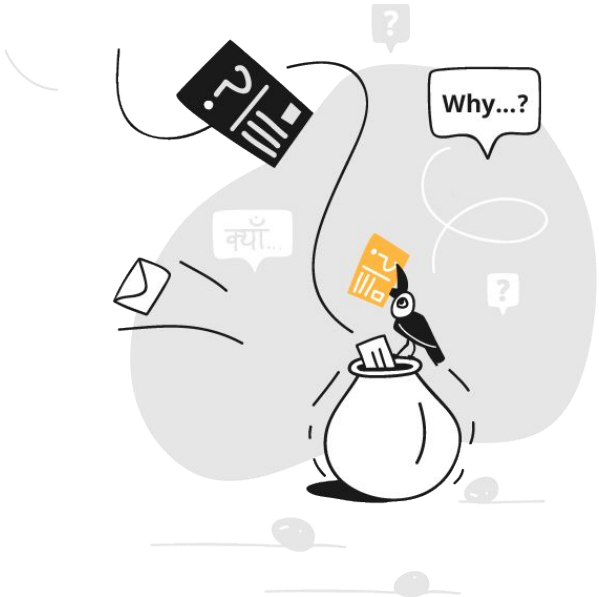
Teacher's response to "thoughtful, content-related and curiosity-driven questions"

- Valued as **indicators** of motivation and search for understanding
- Provided **clues** about students' interest, ability and comprehension

But,

- Interrupt normal **flow** of classroom
- Threat to teacher's **control** of classroom events
- Reduced efficiency of **covering** the content
- **Disruptive**, distracting, intrusive and annoying

Christine Chin & Jonathan Osborne (2008). Students' questions: a potential resource for teaching and learning science, Studies in Science Education, 44:1, 1-39.
Illustration by Saurabh Pandey, for No Smiles Today written by Cheryl Rao



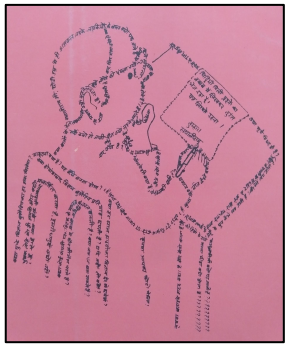
Genesis of Sawaliram 2.0

Illustration by Rohit Keluskar, DesignOrb Studio, Mumbai

From contradiction to resolution

- Curiosity arose early in evolution
- Questions are natural to children
- Yet questions are rare in classrooms
    - Invisible barriers; easily overcome
    - Revealing interests and understanding
- How to capture this resource?
- How to understand, appreciate and nurture curiosity?

Illustration by Rohit Keluskar, DesignOrb Studio, Mumbai



Sawaliram

HSTP, Madhya Pradesh (1970s)

Sawaliram 2.0

TIFRH, EKlavya (2010s)

sawaliram.org

- Online repository of questions and their answers, articles and resources
- Platform to collaborate on answering questions, writing articles and translating the content to various languages
- Allows access to data and lets users view the results of data analysis

tifr TIFR Centre for Interdisciplinary Sciences

sawaliram.org

- **sawaliram.org/public-pages**
  - Accessible to all users
  - Search for and read questions, articles and related resources
  - Find out how to get involved with the project
  - Find information about the project and the team, and how to get in touch
  - View basic analytics and request access to data

- **sawaliram.org/dashboard**
  - Accessible to volunteers
  - Answer questions and review answers by other volunteers
  - Translate content to multiple languages

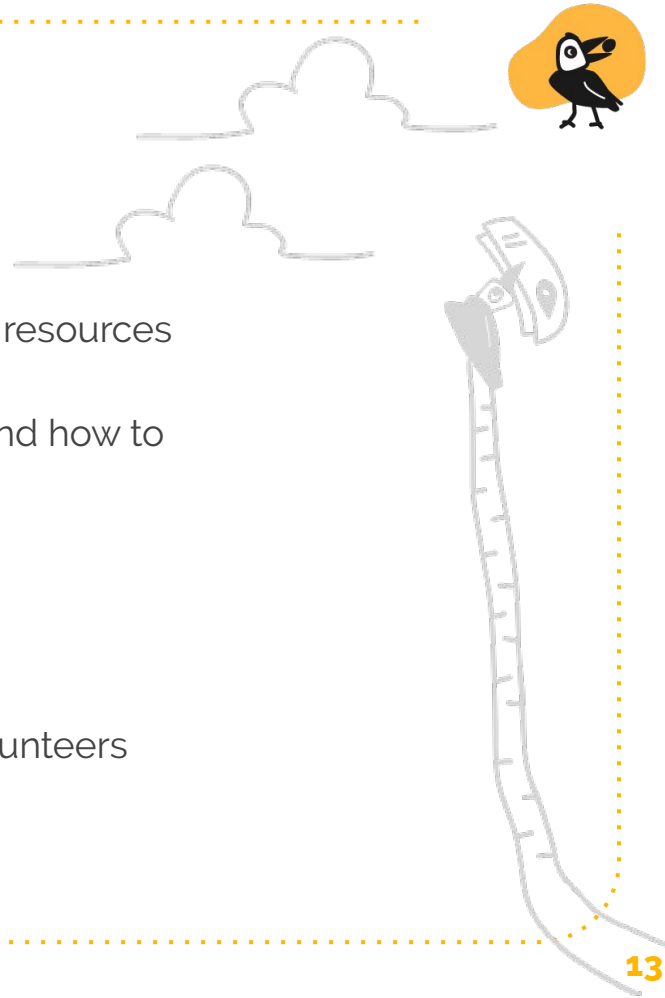
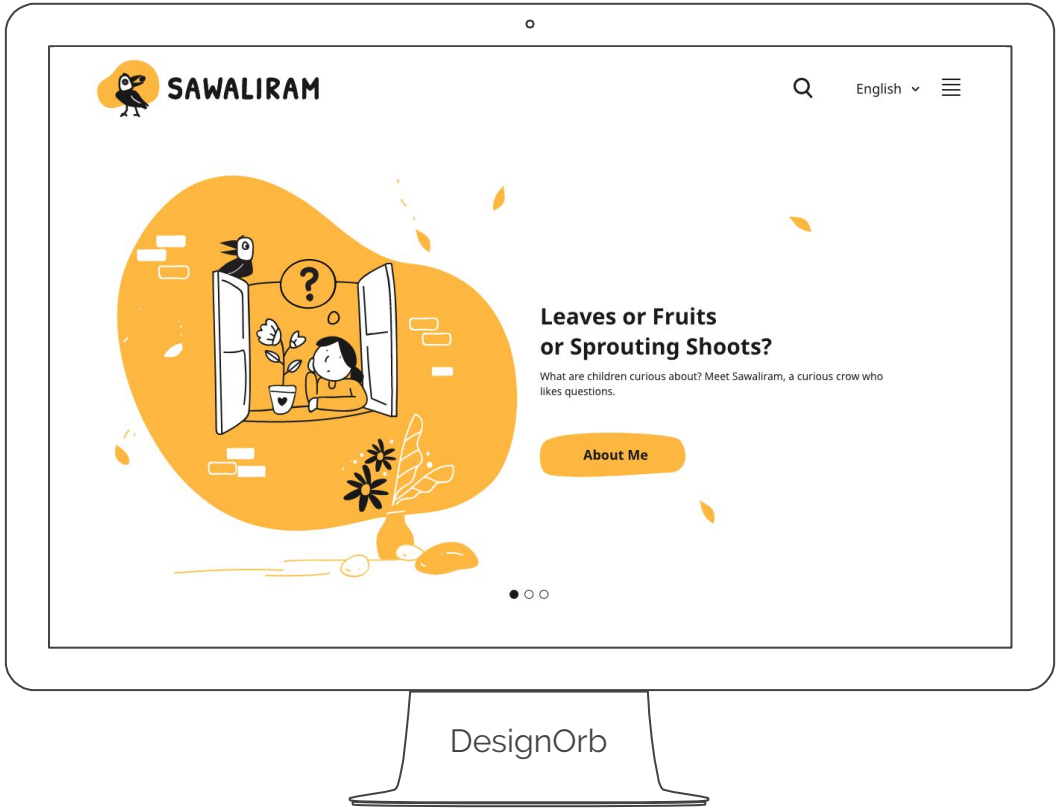


Illustration by Rohit Keluskar, DesignOrb Studio, Mumbai


SAWALIRAM
English
Leaves or Fruits
or Sprouting Shoots?
What are children curious about? Meet Sawaliram, a curious crow who likes questions.
About Me
DesignOrb

Why don't sky and stars fall on earth?

What are children curious about? Meet Sawaliram, a curious crow who likes questions.

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The Sceptical Chymist by Robert Boyle

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Dmitri Mendeleev

His training in pedagogy, and inventing the periodic table, in the course of writing a textbook on inorganic chemistry, to teach a course for which a textbook did not exist.

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You can also volunteer to answer questions, translate, collect questions or manange this site!

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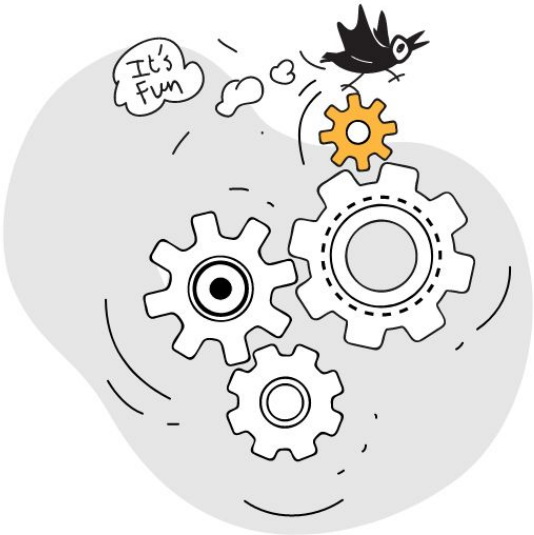

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The proceeds will be used for translation and field volunteers.

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More ways to join hands with us

Are you a teacher, parent or an observer? Bring out the curious kid within you! +

The world of a curious child

21 May 2019 | Jayashree Ramadas

Tags

#Curiousity #Creative

Totto chan (footnote 1) is an energetic, hyperactive, curious child, much like many other children. In school her innocently disruptive behaviour leads to trouble and, at the tender age of 7, she is expelled. Years later, a successful actor and acclaimed host of the first Japanese TV talk show, Totto chan (her real name is Tetsuko Kuronayagi) has blanked out all memories of her first school, except for the band of musicians who played, at her invitation, outside her classroom window.

Instead she remembers, in delightful detail, her experiences at Tomoe Gaken, the elementary school which took her in and awakened her little mind to the possibilities within. Everything at Tomoe Gaken was designed to arouse the curiosity of a child. From the school gate that appeared to be made of two small growing trees, to the classrooms in railway carriages, to the daily routine of lunch with "something from the ocean and something from the hills", every experience offered something new and charming.

See more

100 likes 220 Views

SAWALIRAM

English

View Answer

Why are all the planets in the universe spherical in shape?

Tags

#Geography #Geography #Geography #Geography

There may be billions of trillions of planets in the universe, all too far for us to see, but we do know our own solar system, and these planets are definitely round, nearly spherical. How did they get that way?

The story began 4.6 billion years ago when a part of a giant molecular cloud got dense enough to begin collapsing inwards by its own gravitational attraction. As it collapsed it spun faster. Most of its mass collected at the centre, getting hotter due to collisions of the atoms in it. This part later became the sun, while the outer part flattened into a spinning disc that slowly formed the planets.

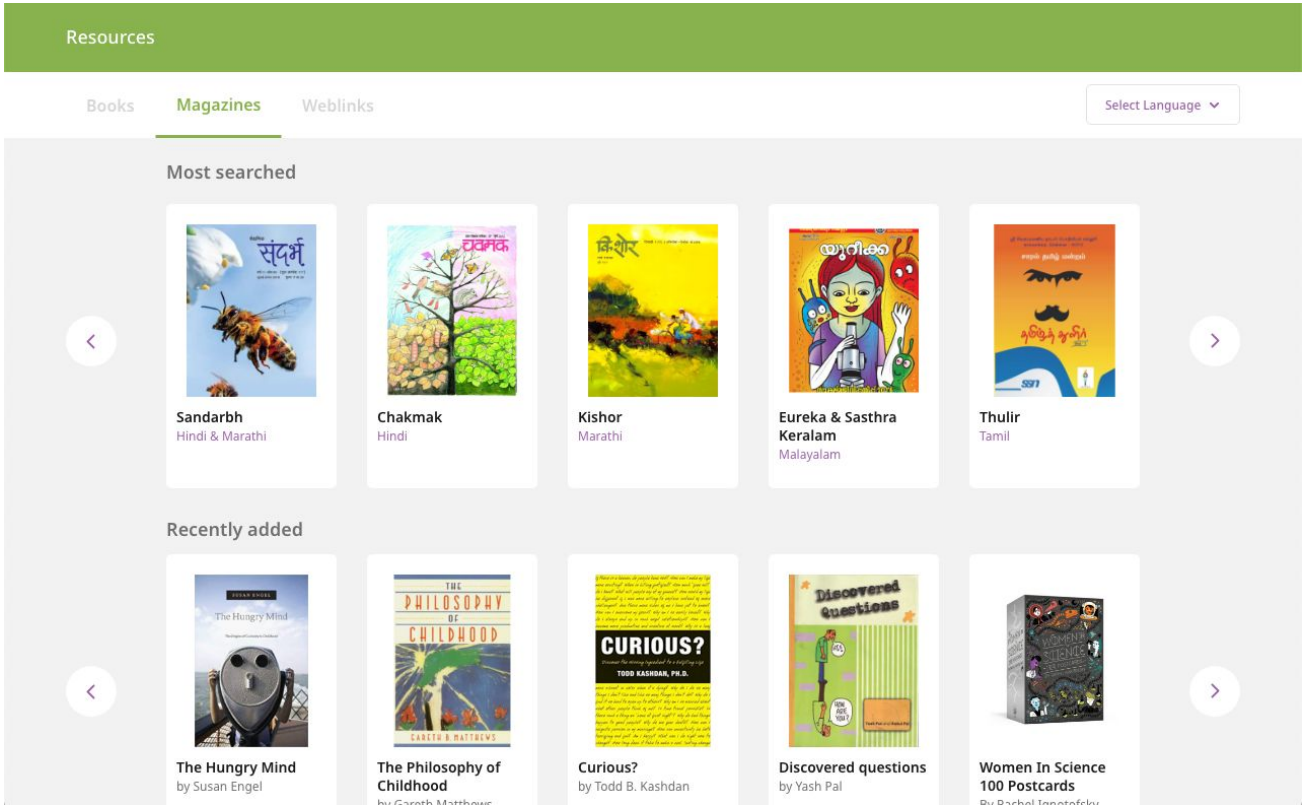
The sun is made of hydrogen and helium nuclei churning in a pool of electrons. It remains round due to the inward force of gravity, which balances the outward pressure of thermonuclear explosions inside the sun.

Unlike the sun, the planets were formed mostly as solids or liquids, out of the relatively cooler disc of dust and gas which surrounded the early sun. Grains of dust collided to form clumps which joined with other clumps and became large enough for gravity to hold them together. The inner planets, Mercury, Venus, Earth and Mars, got formed when some heavier materials with higher melting points (like iron, nickel, aluminium and rocky silicates) condensed close to the sun. More volatile hydrogen compounds got blown further out where it was cooler and formed the large outer planets, Jupiter, Saturn, Uranus and Neptune.

So unlike the sun, planets and their moons were formed mostly as solid or liquid. When atoms and molecules of a solid or liquid are pressed too close there is a repulsive force between them. This force balances the inward attractive force of gravity. The net result of the symmetrical inward and outward forces is that the planet becomes round in shape.

TSWRS Chilkur (State Board)

Telangana Jan 21, 2019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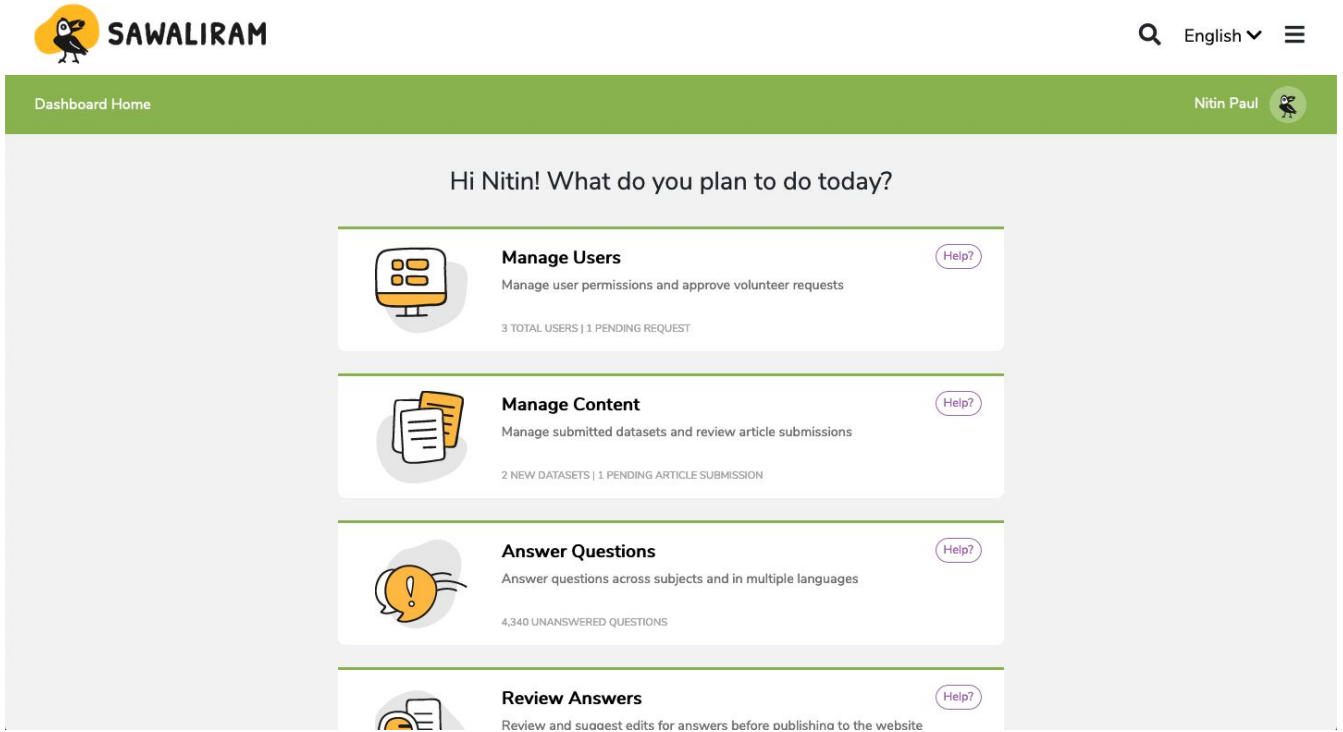
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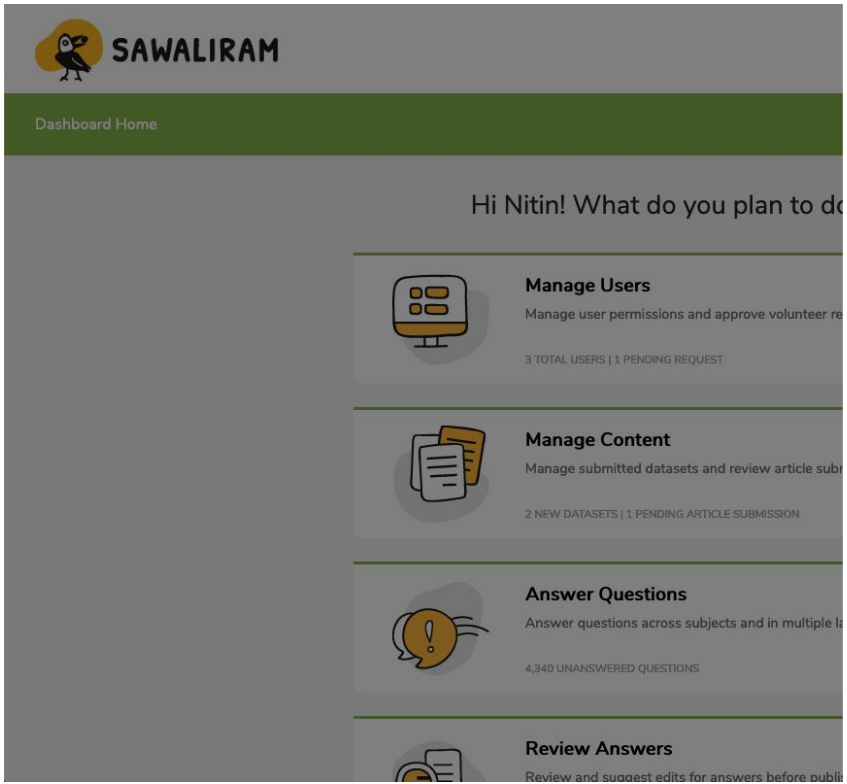
Manage Users
Help?
Manage user permissions and approve volunteer requests
3 TOTAL USERS | 1 PENDING REQUEST
Manage Content
Help?
Manage submitted datasets and review article submissions
2 NEW DATASETS | 1 PENDING ARTICLE SUBMISSION
Answer Questions
Help?
Answer questions across subjects and in multiple languages
4,340 UNANSWERED QUESTIONS
Review Answers
Help?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Manage user permissions and approve volunteer re
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Manage Content
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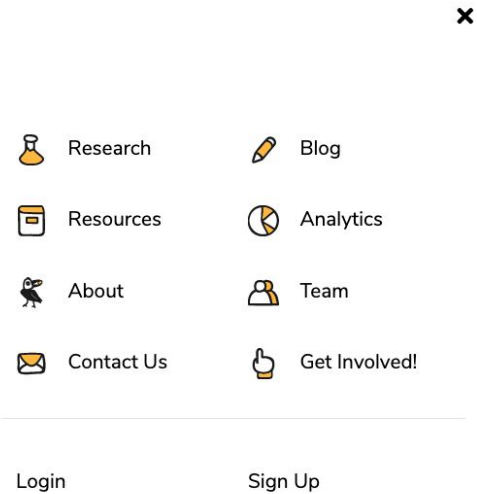
Review Answers
Review and suggest edits for answers before publi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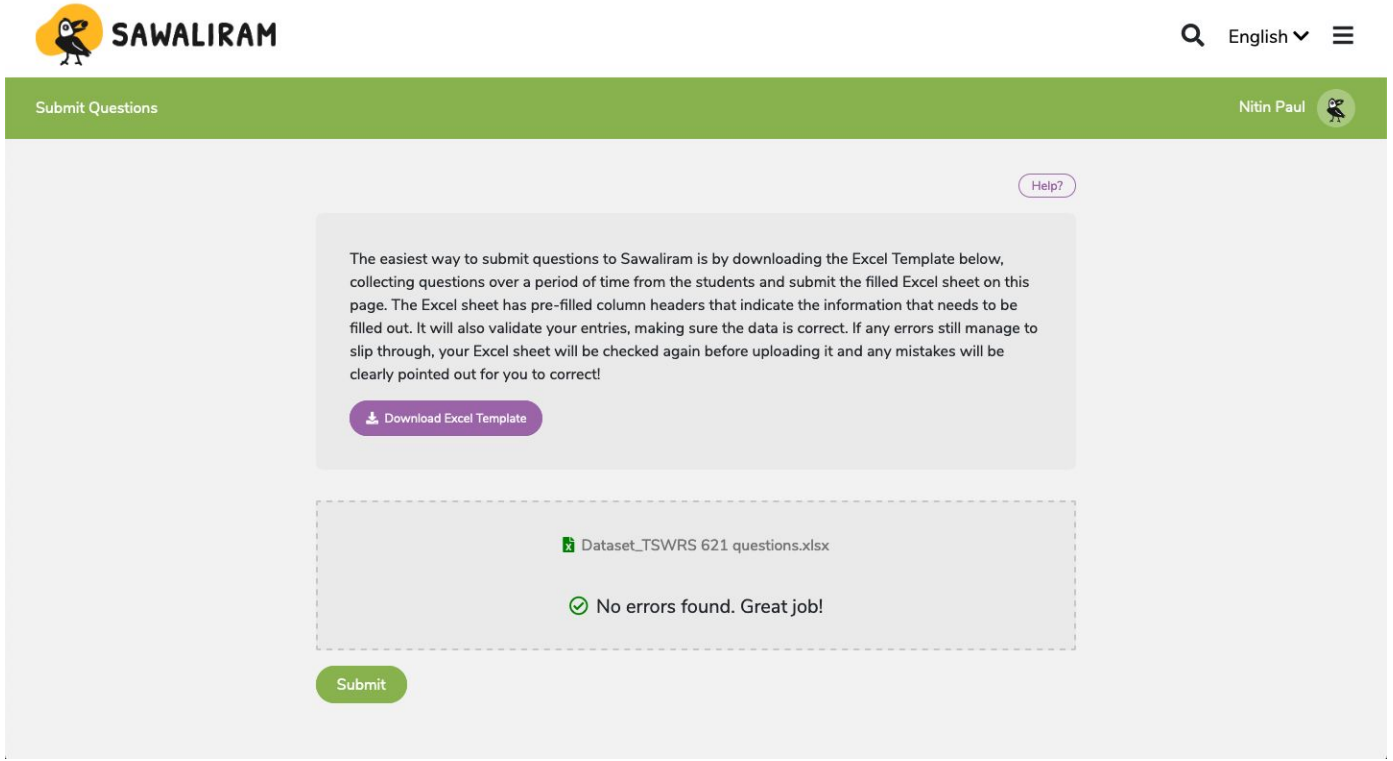
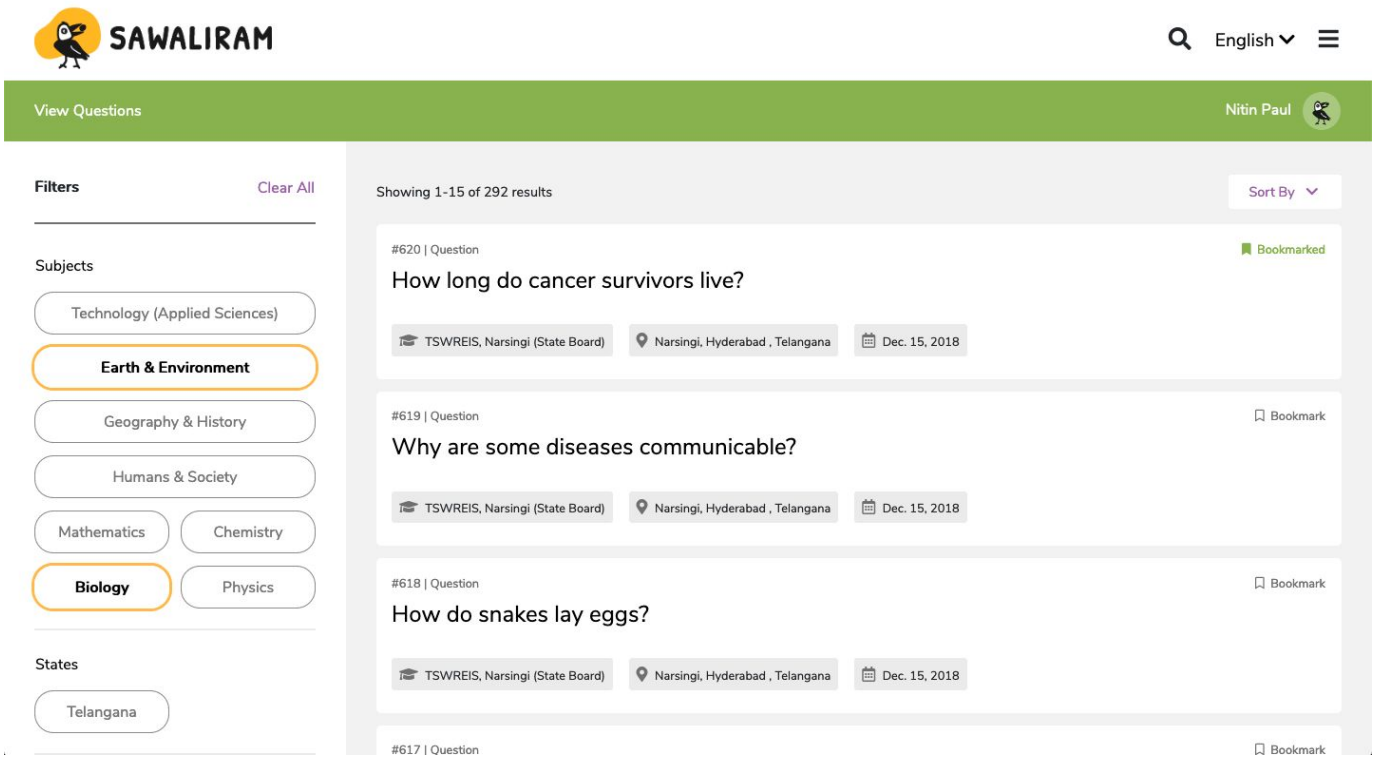

SAWALIRAM
English
Submit Questions
Nitin Paul
Help?
The easiest way to submit questions to Sawaliram is by downloading the Excel Template below, collecting questions over a period of time from the students and submit the filled Excel sheet on this page. The Excel sheet has pre-filled column headers that indicate the information that needs to be filled out. It will also validate your entries, making sure the data is correct. If any errors still manage to slip through, your Excel sheet will be checked again before uploading it and any mistakes will be clearly pointed out for you to correct!
Download Excel Template
Dataset_TSWRS 621 questions.xlsx
No errors found. Great job!
Submit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Dec. 15, 2018
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#617 | Question
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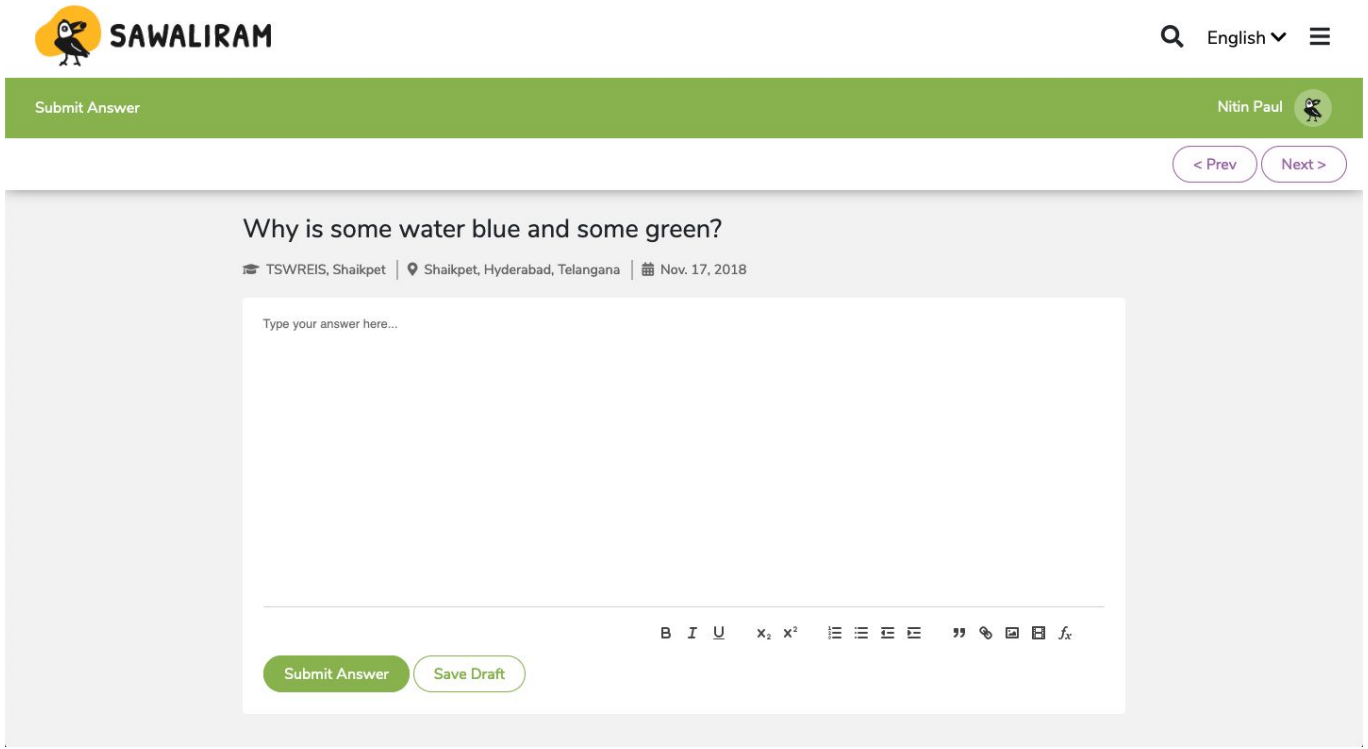
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English
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Nitin Paul
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Next >
Why is some water blue and some green?
TSWREIS, Shaikpet
Shaikpet, Hyderabad, Telangana
Nov. 17, 2018
Type your answer here...
Submit Answer
Save Draft

Technologies used

sawaliram.org/get-involved

- **Writing Code**
  - Open source project - built by the community
- **Beta testing**
  - Using the website, reporting bugs and errors
  - Suggesting improvements and features
- **Answering Questions**
  - Diverse database of Questions
  - Review Answers and engage with the community

sawaliram.org/get-involved

- **Translating content**
  - Bengali, Marathi, Tamil, Malayalam, Hindi
- **Writing Articles**
  - Teaching. Learning experiences
  - Activities, experiments, demonstrations for classroom
  - Reviews of books, websites, podcasts, etc.
  - Life of a scientist
- **Artworks and Design**
  - Help us connect with children through cartoons!

github.com/sawaliram

Sawaliram R&D overview

- **Data - metadata recorded across 20 input fields**

  Question, Context, Student, School, Publishing, Contributor

- **Database has ~4000 questions in 6 languages**

  ~1300 questions curated, with first-level analysis

- **Insights from the data**
  - Field of Interest (Dewey Decimal Classification)
  - Type of Information requested (ToI)

Baram-Tsabari, A., & Yarden, A. (2005). Characterizing children's spontaneous interests in science and technology. International Journal of Science Education, 27(7): 803–826.

Children's questions

"How much memory can our brain store?"

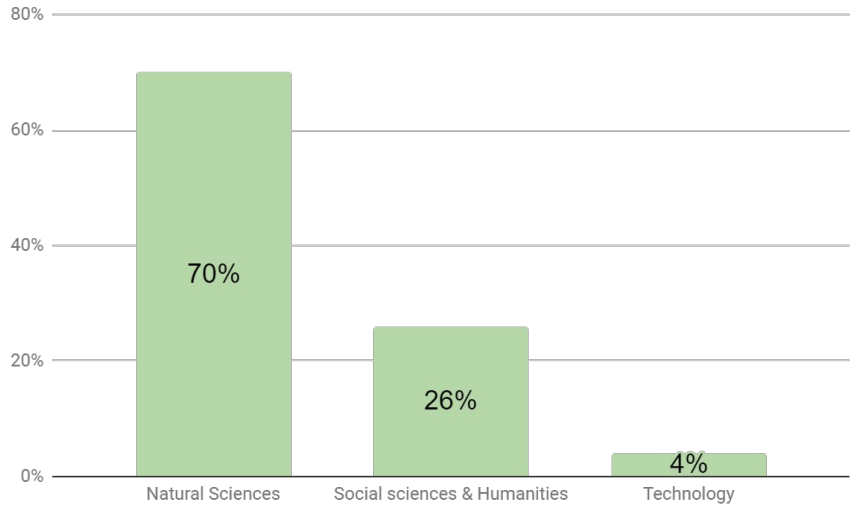
"Will stress reduce if one cries?"

"Why do people fight in the name of caste-religion?"

"Who teaches nest building to the chicks of birds?"

Patterns of questioning

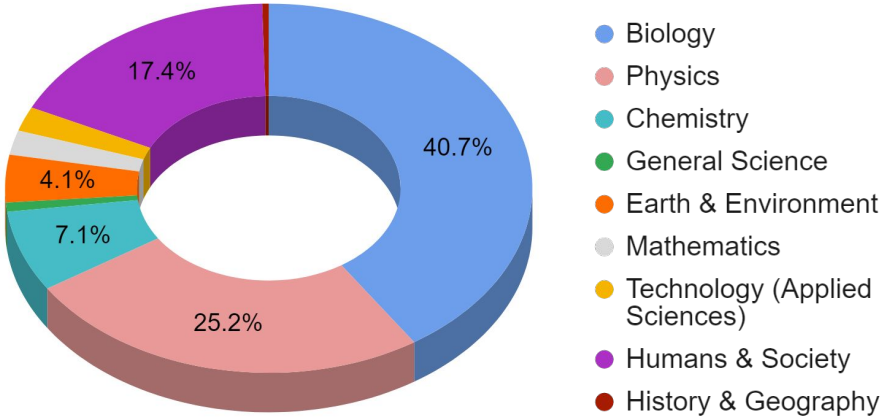
- 83 volunteers over 134 school visits (330 sessions)
- ~750 questions (64% written form and 36% oral)
- 79% of questions from girls (TSWRS Narsingi, Gowlidoddi)
- 65% questions spontaneous; 35% related questions



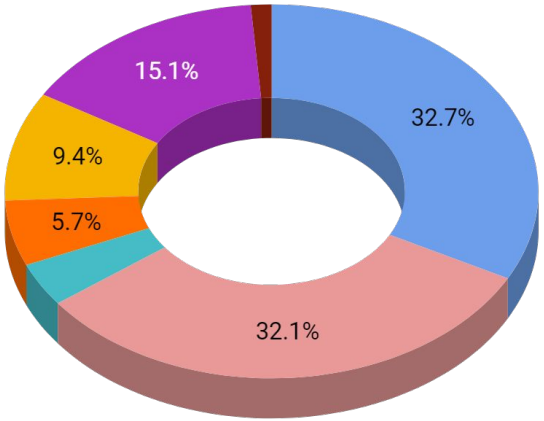
Fields of interest (%) of Spontaneous questions

Student's area of interest

TSWREIS 747 questions, 2017-2018

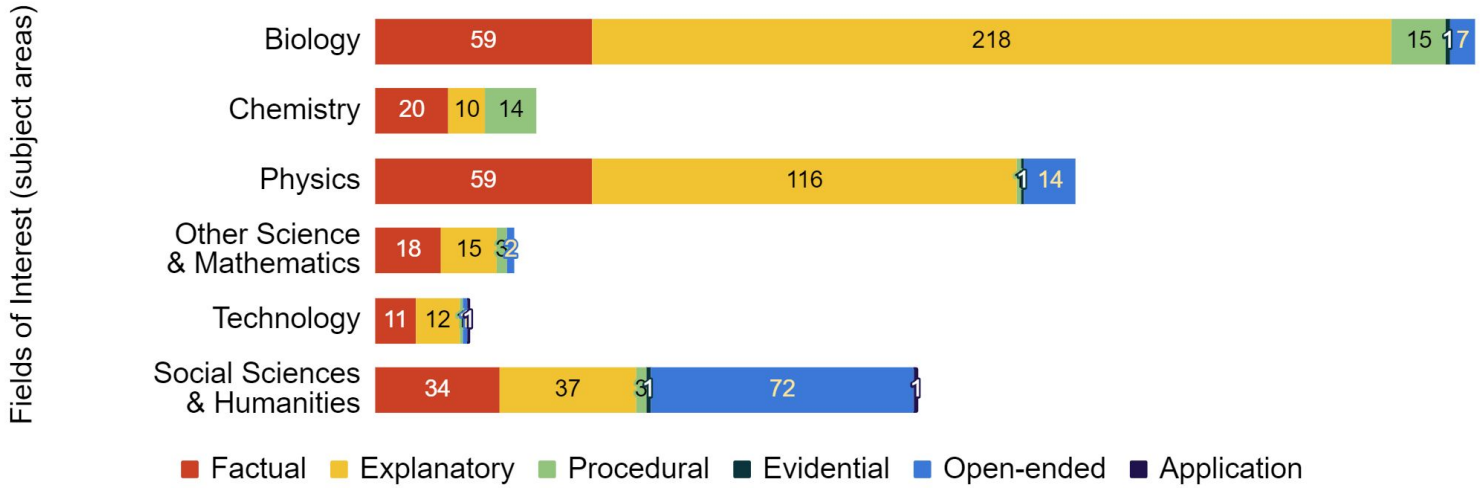


Ashram Shalas 159 questions, 2018

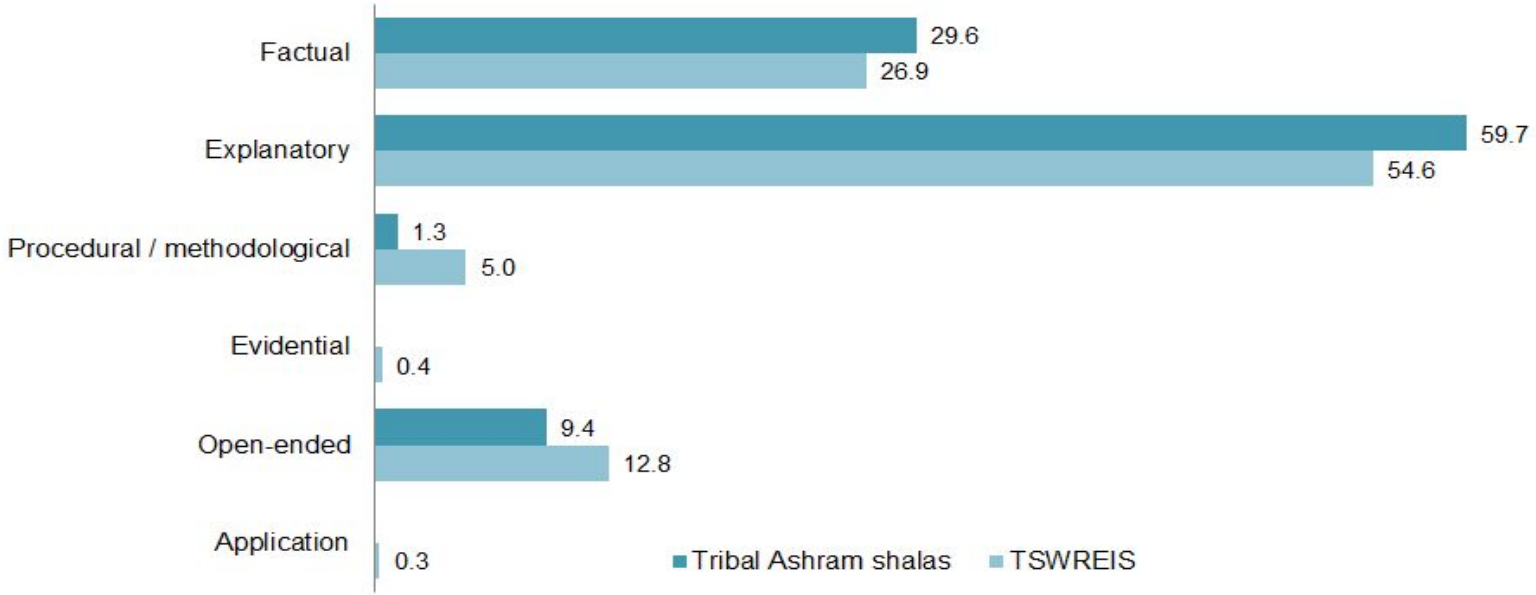


Subject	Percentage of questions	
	Tribal Ashram shalas	TSWREIS
Biology (Human Physiology)	33 (7.5)	41 (14)
Physics	32	25
Humans & Society	15	17

Relationship between subject areas and ToI



Comparative ToI (% questions)



Natural Language Processing

- **Subject categorization**
  - Categorize questions into subjects

- **Identify Identical - Similar - Related questions**
  - Identical questions need to be counted as unique but not displayed
  - Similar questions - share a common core intent but bring in some related aspects that make them distinct. Eg: ‘How does a rainbow form?’, ‘Why are there exactly seven colours in the rainbow?’, ‘Why is the rainbow in a curved shape?’
  - Related questions - currently selected with same tags and overlapping keywords

Get in touch

sawaliram.org
mail.sawaliram@gmail.com