

Insights from Kerala's KITE Model



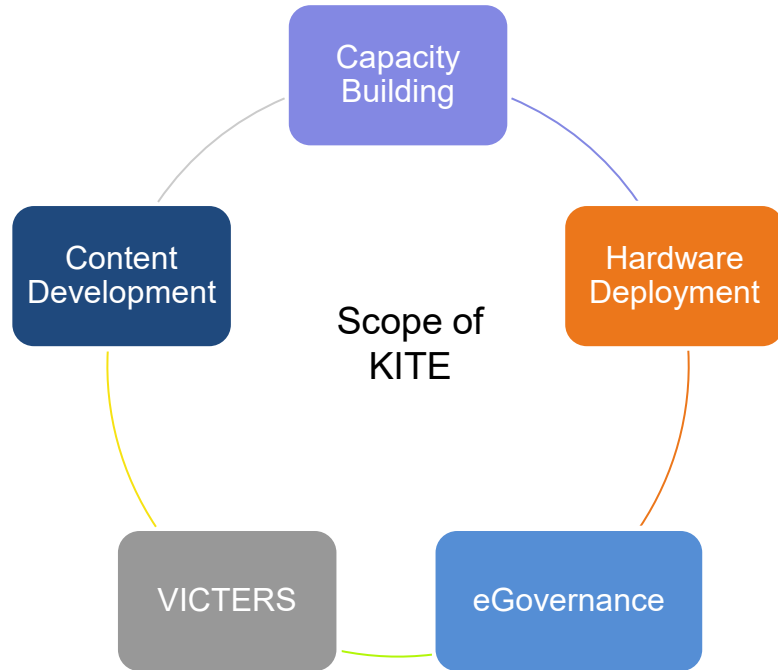
Kerala AI FUTURECON 2026

23 January 2026
Thiruvananthapuram

K.ANVAR SADATH
Chief Executive Officer
Kerala Infrastructure and Technology for Education
(KITE)
Government of Kerala



2 ½ Decades of interventions in ICT@ Education



2000	IT@School Project initiated
2003	IT made a Compulsory Subject in Class 8
2007	Complete Shift to FOSS platform
2010	IT to ICT enabled education
2017	IT@School made KITE, a Section 8 Company
2018	Hi-Tech School project- 45K Hi-Tech Classrooms & Little KITEs
2019	Hi-Tech Lab Project- 11K Hi-Tech Labs
2020	First Bell Digital Classes during Covid
2022	Ecube English & Cyber Safety Programmes
2023	Robotic Kits & Fake news & Fact Checking Training
2024	Artificial Intelligence (AI) Training
2025	Own AI Engine and Robotics in School Syllabus



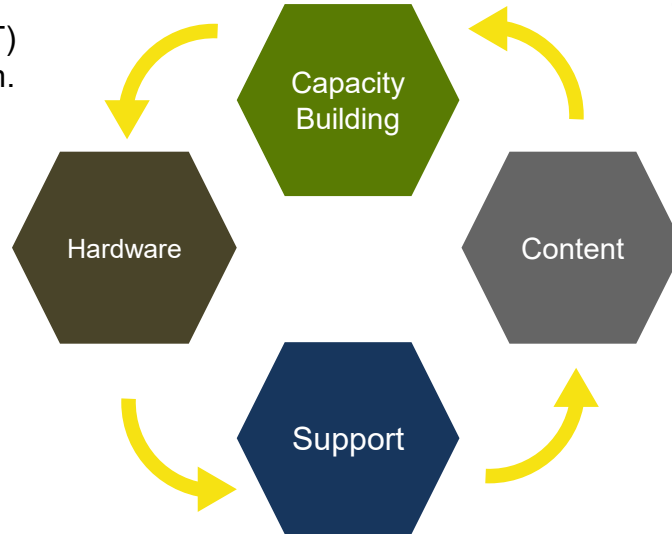
Holistic approach in integration in a single eco-system

Content Development

Adoption of FOSS in Education.
Making Information Technology (IT)
a compulsory subject in curriculum.
ICT Textbooks for all classes.
Samagra Resource Portal.

Capacity Building

Teachers themselves became Trainers.
No external IT resource engaged.
Trainings for Teachers, Students,
Parents and Public.
Training in ICT, Hardware and
Content Development.



Hardware Deployment

Deployment of ICT hardware.
Broadband Connectivity.
Call center & Web portal support.
Hardware Clinics.
ICT guidelines for schools.
eWaste disposal program.

Support systems

eGovernance.
VICTERS educational channel.
Little KITEs IT clubs.
School Wiki.
eCube Language Lab
Sahitham Mentoring Portal



Robotic Teacher



Coding



Direct use of AI tools in Classrooms



ChatGPT

Gemini



How can generative AI better serve children's rights?

Looking to the the Convention on the Rights of the Child

"It is true that AI's rapid evolution makes it difficult for policymakers to keep up, but it is necessary for advocates for children to take stock of how well these technological advances benefit all children, especially the poorest and hardest to reach."

"As it stands, because of the data on which generative AI is trained, children and adults experience similar or worse bias and discrimination using AI tools as they do in their offline lives."

"Meaningful child engagement means considering their young age and evolving capacities, and helping them analyze potential threats, including how AI has boosted the spread of disinformation through synthetic media."

"A couple of persistent myths should be unwrapped. One is that children perceive a boundary between the world online and the world offline, as if they were distinct. This is a misconception. The other myth is that children spending time online is inherently bad. This, again, is not true."

unicef  for every child

Innocenti – Global Office of Research and Foresight

<https://www.unicef.org/innocenti/how-can-generative-ai-better-serve-childrens-rights>

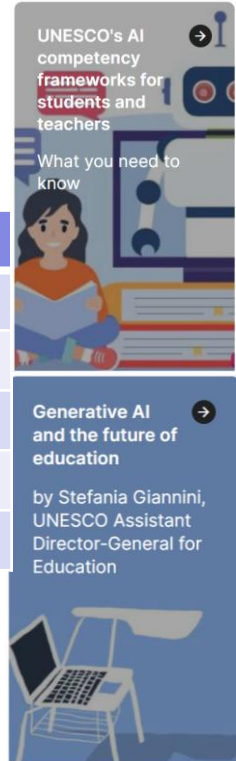


Artificial intelligence in education



Challenge	What it means
Policy coordination & ecosystem	Need for cohesive policies and infrastructure
Digital inclusion & equity	Ensuring fair access to AI-based tools
Teacher training & readiness	Building capacity to integrate AI effectively
Inclusive, quality data systems	Avoiding biases and ensuring reliable insights
Ethics & transparency	Protecting privacy, accountability, and fairness

<https://www.unesco.org/en/digital-education/artificial-intelligence>



May 25, 2022

“How Dare They Peep into My Private Life?”

Children’s Rights Violations by Governments that Endorsed Online Learning During the Covid-19 Pandemic

<https://www.hrw.org/report/2022/05/25/how-dare-they-peep-my-private-life/childrens-rights-violations-governments>

In 2022, a Human Rights Watch investigation found that several EdTech platforms used in India were sharing sensitive data with third-party advertisers, exposing children to profiling & long-term surveillance. Face recognition systems used for attendance or behavior tracking in schools further heighten privacy risks, often misidentifying students based on skin tone or attire, and normalizing surveillance from a young age.

Children’s Data and their Right to Privacy

Children’s privacy is vital to ensuring their safety, agency, and dignity.^[39] At school, privacy enables the very purpose of education by providing the space for children to develop their personalities and abilities to their fullest potential.^[40]

As children spend increasing amounts of their lives online, international human rights bodies have recognized that even the mere generation, collection, and processing of a child’s personal data can threaten their privacy, because in the process they lose control over information that could put their privacy at risk.^[43]



How Kerala is setting a global benchmark for ethical AI in education

Premium

Updated - July 17, 2025 10:46 pm IST

K ANVAR SADATH



The Kerala government, through the Kerala Infrastructure and Technology for Education, has trained 80,000 teachers from Classes 8 to 12 in the ethical and critical use of AI—focusing on bias detection, privacy concerns, and responsible classroom integration. | iStock/Getty Images

The rapid integration of Artificial Intelligence (AI) into global education systems has been met with both enthusiasm and caution. Recent reports from international organizations like UNESCO and UNICEF underscore the significant opportunities AI presents, but also warn of the ethical and pedagogical challenges that must be urgently addressed. In India, it is surprising to see how stories of robotic teachers are garnering more attention in classrooms.

Dangers of uncritical AI adoption

Two critical areas require immediate attention: algorithmic bias/data privacy and digital equity/pedagogical impact. The issue of biased algorithms and data exploitation looms large in AI-powered education.

Many commercial AI systems are trained on datasets reflecting historical prejudices, potentially leading to discriminatory outcomes in student assessments. These proprietary systems operate as “black boxes,” with decision-making processes hidden from educators and students. This lack of transparency makes it impossible to identify or correct embedded biases.

Simultaneously, the extensive collection of student data raises serious privacy concerns. Commercial platforms often treat educational data as a commodity, creating surveillance systems where children’s learning patterns and personal information become products for profit.

In 2022, a Human Rights Watch investigation found that several EdTech platforms used in India were sharing sensitive data with third-party advertisers, exposing children to profiling and long-term surveillance. Face recognition systems used for attendance or behaviour tracking in schools further heighten privacy risks, often misidentifying students based on skin tone or attire, and normalizing surveillance from a young age.

Equally concerning are the threats to educational equity and teaching quality. AI implementation often assumes universal access to technology, exacerbating existing digital divides. Students from disadvantaged backgrounds face further marginalisation when systems require consistent internet access and personal devices.

The pedagogical consequences

Over-reliance on AI risks reducing teachers to mere facilitators of pre-programmed content. The focus shifts from holistic development to measurable outcomes, sidelining crucial skills like critical thinking and creativity. Standardised AI platforms frequently ignore cultural contexts, potentially homogenizing education at the expense of local relevance and values.

AI-powered learning platforms often prioritise content based on past user behaviour, engagement levels, or patterns derived from global datasets. This can cause severe deviations from curricular objectives, especially in regional contexts in India. A child engaging with such a platform might be pushed toward test-prep-centric content that undervalues conceptual understanding, cultural knowledge, or creativity—all core components of curriculum frameworks like NCERT / SCERT’s pedagogical visions.

These challenges don’t suggest abandoning AI in education, but rather implementing it thoughtfully. Solutions must prioritise transparency in algorithms, strict data protection, equitable access, and teacher empowerment. Only through such balanced approaches can we harness AI’s potential while safeguarding educational integrity. The real question is: Are we truly prepared for this?

KITE’s public-centric approach in Kerala

In response to these critical global concerns, Kerala, through KITE (Kerala Infrastructure and Technology for Education), the technology arm of General Education department, Government of Kerala, is charting an ethical alternative. It recognises that AI must serve the public good, and that the teacher remains central to the educational process.

A key initiative has been the training of 80,000 teachers from Classes 8 to 12 in the ethical and critical use of AI—focusing on bias detection, privacy concerns, and responsible classroom integration. AI has been systematically embedded into the curriculum, emphasizing foundational understanding and application over mere tool usage. This is reinforced by Kerala’s adoption of Free and Open-Source Software across 15,000+ schools, ensuring transparency, autonomy, and alignment with public education goals. Additionally, the Little KITEs IT Clubs promote hands-on learning in AI and robotics, nurturing digital citizenship among students—an initiative acknowledged by UNICEF as a global best practice.

Samagra Plus AI, Kerala’s own AI engine and Learning Management System, unlike generic, commercial AI platforms, is designed to be curriculum-aligned and tailored to the educational context. The platform uses datasets curated by expert teachers, ensuring that AI responses are accurate and relevant to Kerala’s pedagogy and textbooks.

By leveraging open-source technologies and Retrieval-Augmented Generation (RAG), a bias-resistant AI engine that prioritizes accuracy is being developed. This in-house development ensures data sovereignty and provides a sustainable model for responsible AI integration in public education, demonstrating that high-quality, ethical AI solutions can be developed and maintained within public education systems.

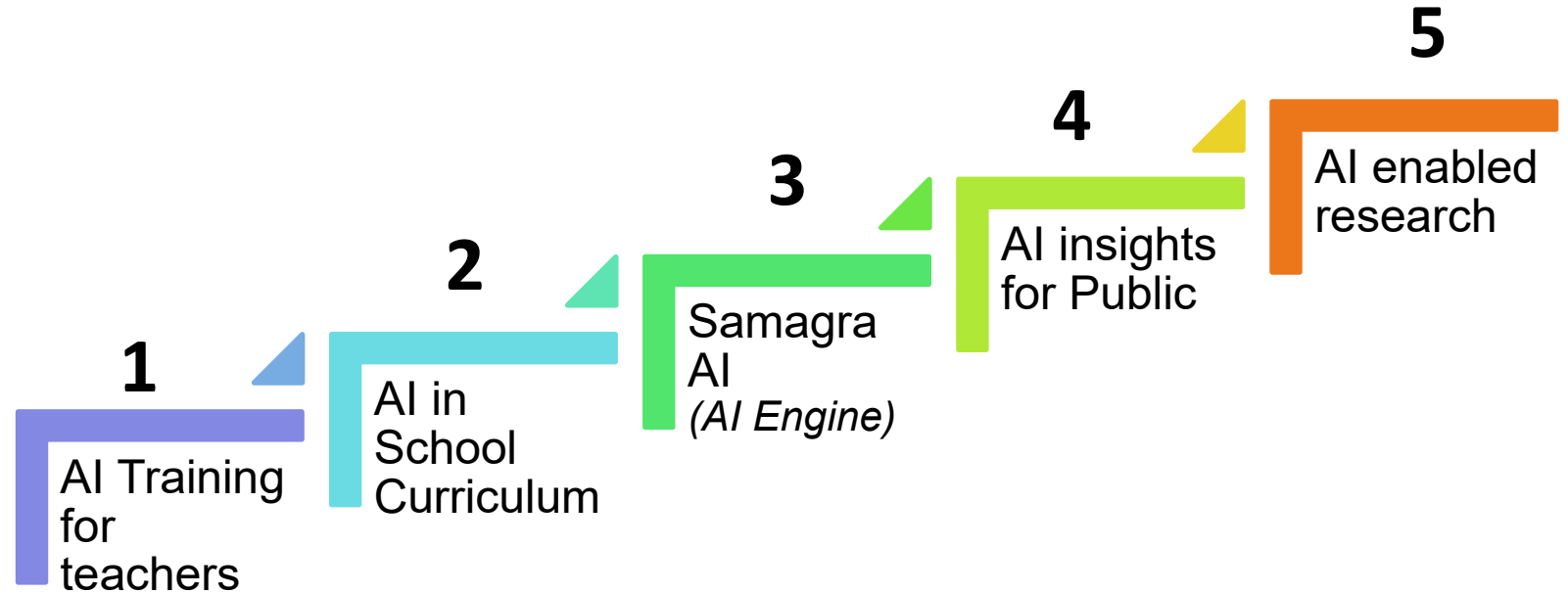
(K. Anvar Sadath is CEO, Kerala Infrastructure and Technology for Education (KITE))

Published - July 17, 2025 08:04 pm IST

<https://www.thehindu.com/education/how-kerala-is-setting-a-global-benchmark-for-ethical-ai-in-education/article69823629.ece/amp/>



How the AI learning was implemented by KITE.



The KITE model for Responsible AI in School Education

- Artificial Intelligence (AI) introduced in ICT textbook of Class-7.
- Basics of AI & Machine learning.
- Leveraging gesture-based software for CWSN.
- Little KITEs Students harness AI to assist CWSN



The Telegraph

16-08-2024

MODULES ON FACT-CHECKING Kerala schools teach kids how to detect fake news

K.M.RAKESH

Bengaluru: Schools in Kerala have introduced modules on fake news detection for students of Classes V and VII as part of a larger initiative on cyber safety and the digital inclusion drive in the state. The IT textbooks for these two classes were revised and launched in June with modules on fact-checking at a time fake news has become a menace to the society.

Brinda recently announced that its schoolchildren would be taught how to spot extremist content and fake news in the wake of the recent anti-immigration riots.

"We have introduced modules on how to detect fake news for all students of Classes V and VII from this academic year that started in June. The fact-checking modules will be introduced to students of Classes VI, VII, VIII and X once their textbooks are revised the next academic year," K. Anoop Sathish, CEO of the Kerala Infrastructure and Technology for Education (KITE), the technology arm of the Kerala general education department, told The Telegraph on Tuesday.

At present, schools teach how to identify fake news in only Class V and VII because only their textbooks have been revised this year. "This means that about 20 lakh students of Classes



ified 'Let's Search and Find' in the Class VII textbook displays a conversation between two students. While one of them says she fell for a fake message claiming there were no classes, her classmate tells her how his teacher has taught them how to verify such information on official websites.

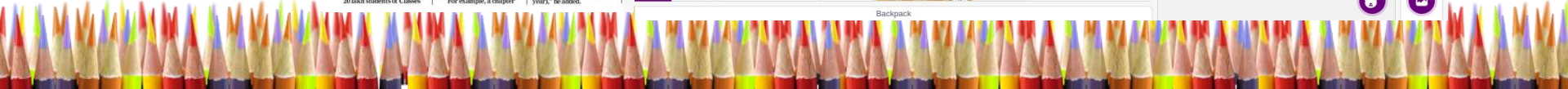
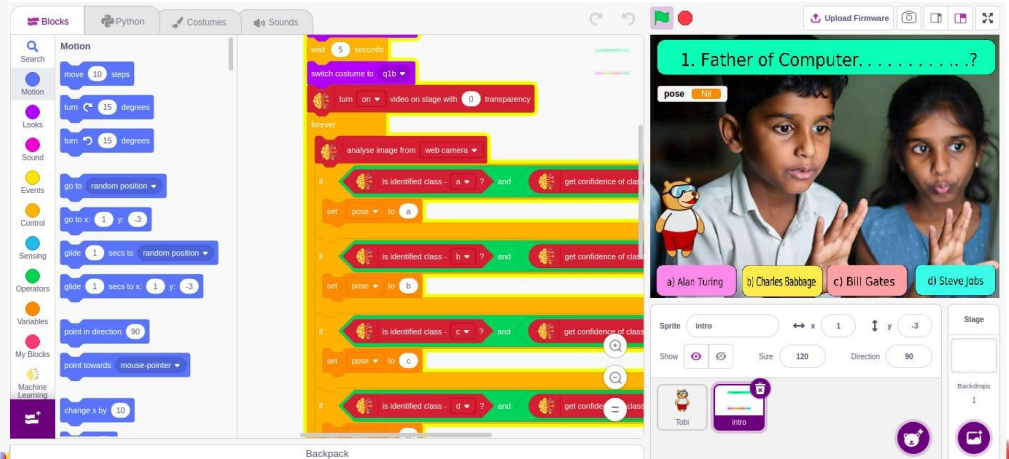
He said Kerala is the only state where IT is a mandatory subject for students from Class I to X. "This makes it even more important to impart skills to identify fake news at a time all kinds of false information is floating around in cyberspace."

KITE, Sathish assured, has always tried to keep pace with fast-changing technology to provide the latest updates to students.

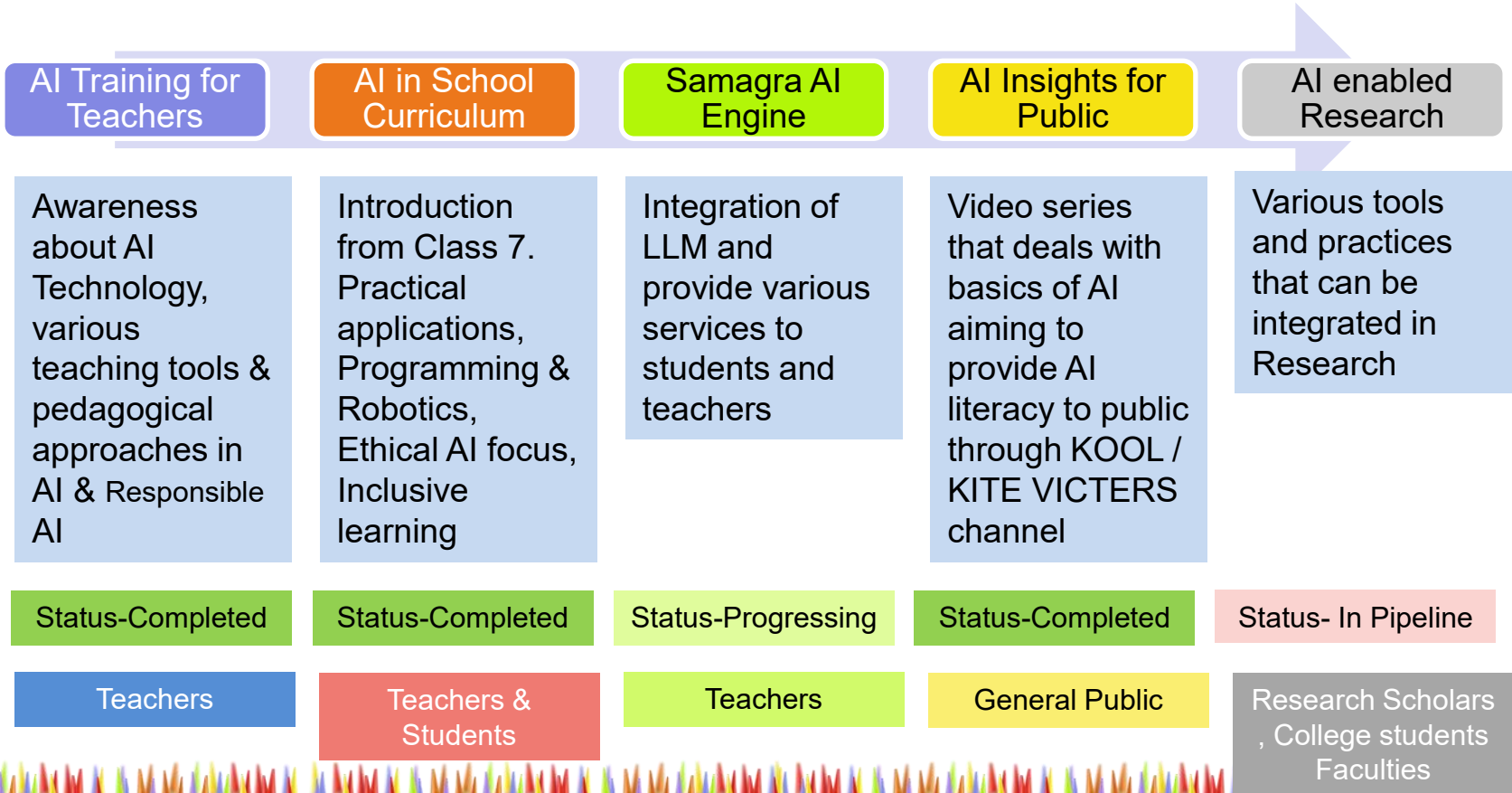
"What they learned in 2020 is vastly different from what they are going to learn in 2024. Our job is to provide the right kind of learning modules for students and teachers to help them keep abreast with the latest developments in technology. It is the same with providing the latest tools and knowledge to check facts," Sathish observed.

KITE has already trained 80,000 teachers in artificial intelligence, its benefits and dangers. "Similar modules on the benefits and dangers of AI will be introduced in high schools (once the textbooks are revised next year)," he added.

For example, a chapter



AI learning – Stages of Progress & beneficiaries



Public AI Literacy through KOOL platform of KITE



- KOOL- KITE's Open Online Learning is the MOOC based training platform developed by KITE for teacher trainings.
- A 4-week AI Online Course titled '**AI Essentials**' is offered to the public, covering ethical use, fake news, and everyday applications.
- 1216 individuals from different walks of life have been trained so far in 3 batches.
- Dedicated Mentor for every 20 participants
- FOSS based contents developed by teachers
- Tremendous response from public

KITE'S OPEN ONLINE LEARNING

Online Artificial Intelligence Training Course for Public
AI Essentials
Duration : 4 Weeks

COURSE OVERVIEW

- Module 1: Artificial Intelligence at Your Fingertips**
Applications in 5 domains: image classification, object detection, video processing, automatic speech recognition, search engine personalization, when data is more abundant, AI, Deep Learning & Image
- Module 2: AI Art Gallery**
Create 8-10 images, Photo-manipulation & editing, Animation & still life photos, Background & logo design, AI in 3D image generation
- Module 3: Mastering AI**
AI for Text & Documents, Automated programming, Automation in applications, Q&A generation, Text to video, Table creation & editing
- Module 4: AI in Everyday Life**
Introduction to AI, AI in various domains, Text-to-image generation, AI in music & animation, Video & audio creation, AI in learning & teaching

REGISTRATION

Visit KITE Website: <https://kite.kerala.gov.in/>
or <https://kite.kerala.gov.in/koolregistration/>

- Last Date: 5th March 2025
- Registration Fee: Rs. 2000/- (Rs. 2000/- + GST)

ABOUT THE COURSE

- Each batch (20 learners) will have a mentor.
- Weekly module-based training and evaluation
- Provides Resources and Video Lectures in Malayalam.
- Weekly online contact classes.
- Learners should complete all modules on time.

COURSE CERTIFICATE

- KITE will provide Certificate to those who successfully complete the course.

CONTACT INFORMATION

+91-471-2529500 | Mon - Sat: 10:00 AM - 5:30 PM | koolpayments@kite.kerala.gov.in | <https://kite.kerala.gov.in/koolregistration/>

What teachers learned in AI



Content Generation

Summarization
Image Gen,
TTS, STT



Prompt Engineering

Prompting techniques
for Text, Image
generation



Evaluation

Preparing various
questions, Table
Gen, Cross words
etc



Responsible AI

AI Classroom
strategies, XAI,
know Deepfakes,
Bias detection in
algorithms etc



How AI is gelled with the school curriculum: Class 7

- Introduction on how AI technology works
- Familiarize Computer vision technology & Face detection
- Recognizes facial expressions: Children themselves create a computer program that recognizes 7 different facial expressions using a pre-trained model.
- Introduces Block programming through Pictoblox

No	Block	Use
1		To take to the <i>stage</i> the picture snapped by the web camera
2		To analyse the picture for detecting faces and their expressions
3		To get the expression of the first face among the detected faces.

Table 9.1. Some Code Blocks related to face detection in the PictoBlox

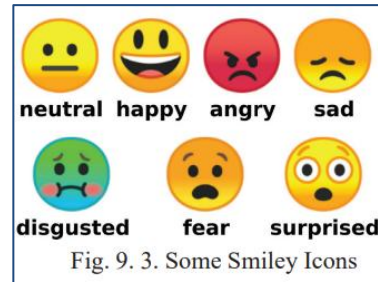


Fig. 9. 3. Some Smiley Icons

Now, activate the program that displays smileys in keeping with the expressions caught in the camera (See Fig. 9. 4.).

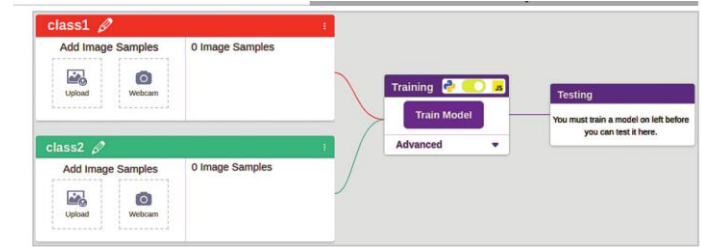
Fig. 9.4. The PictoBlox Program to detect expressions and the sample output



How AI is gelled with the school curriculum: Class -8

Chapter: Machines that Learn

- Discussing the various methods for training machines in machine learning technology
 - Supervised Learning
 - Unsupervised Learning
 - Reinforcement Learning
- Activity involves creating a machine learning model to recognize Indian Sign Language (ISL) signs. Using this model, students will then develop an interactive game for practicing ISL letters.
 - Through this process, children create their own machine learning model through these steps.
 - **Data Set Preparation:** Collecting & organizing the data necessary for machine learning model to learn
 - **Training:** Training the model using the dataset (Supervised Learning).
 - **Testing:** The process of evaluating performance of the trained model.



How AI is gelled with the school curriculum: Class 9

Chapter –Intelligent Machines

• Natural Language Processing (NLP)

- How does NLP work?
- Large Language Models (LLMs)
- Activity: Interacting with an LLM
- How to use NLP applications
 - Prompt Engineering
 - Text generation with the help of NLP
 - Image creation with the help of Gen AI

Utilizing AI techniques in learning process

- Responsive AI, AI Agents

Act as high school teacher and explain What is photosynthesis?
Also explain the light phase and dark phase

Alright class, today we're going to learn about **photosynthesis**, one of the most important processes on Earth. 🌱☀️

What is Photosynthesis?

Photosynthesis is the process by which **green plants, algae, and some bacteria** use sunlight to make their own food. It happens in the **chloroplasts** of plant cells, which contain a green pigment called **chlorophyll**.

In simple terms, plants take in:

- **Carbon dioxide (CO₂)** from the air through their leaves
- **Water (H₂O)** from the soil through their roots
- **Sunlight** from the Sun

And they produce:

- **Glucose (C₆H₁₂O₆)** – a type of sugar used for energy
- **Oxygen (O₂)** – which is released into the air for us to breathe! 🌿



How AI is gelled with the school curriculum: Class 10

Chapter –The World of Robots

Introduction to Robotics and AI

- Introduces the fundamental concepts of robotics
- Children will engage in an activity that explores the application of AI technology in Robotics.
- Learn how to build a model of a smart door that opens by recognizing a person's face.
- Gain the ability to control electronic devices using AI and Machine Learning.
- Utilize a pre-trained model for face recognition & open a door using Arduino, a webcam & a servo motor.

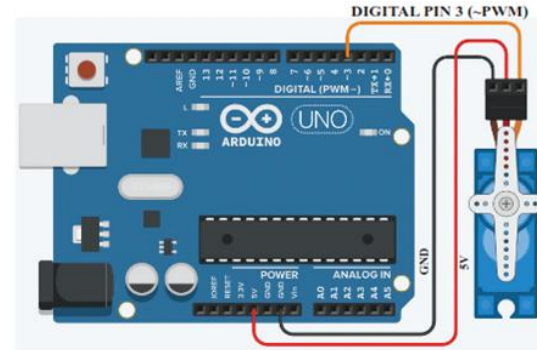
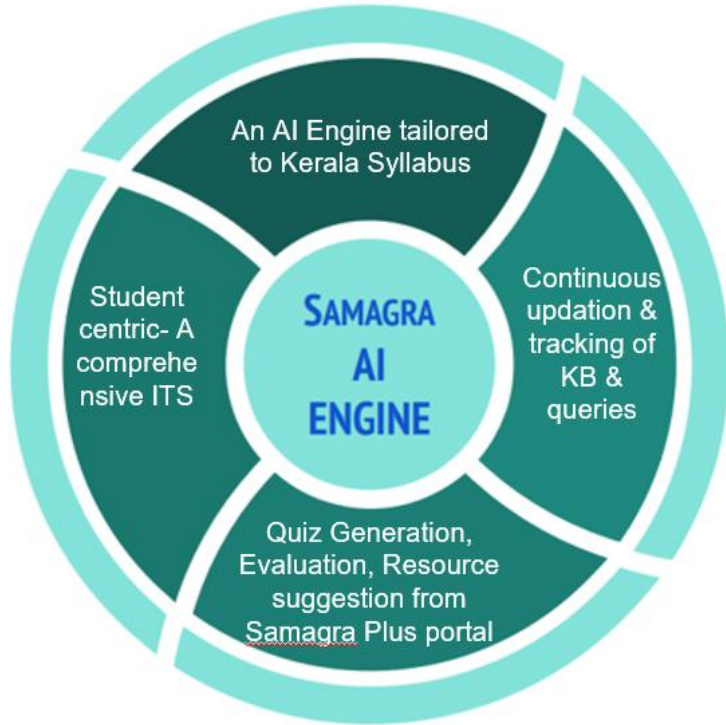



Fig 6.11 Smart Door System - Circuit



SAMAGRA Plus AI- Kerala's Indigenous AI Engine



Wed Dec 4 17:05:04 2024

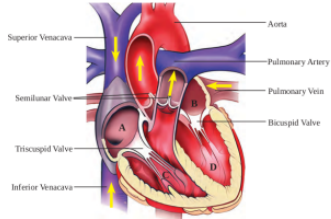
 Samagra AI - Chat Response

According to the textbook excerpt, the human heart has four chambers: right and left atria, and right and left ventricles. The ventricular septum divides the heart into right and left halves.

The upper chambers, the atria, receive blood from the body and lungs, respectively. The lower chambers, the ventricles, pump blood out of the heart to the rest of the body.

The heart also has four valves that help direct blood flow and prevent backflow. The tricuspid valve is located between the right atrium and right ventricle, while the bicuspid valve is located between the left atrium and left ventricle. The semilunar valve is present at the beginning of the aorta and pulmonary artery, preventing backflow of blood from these arteries into the ventricles.

An image shows the structure of the human heart is available here



Hint

Chambers of the heart	
A. Right atrium	B. Left atrium
C. Right ventricle	D. Left ventricle

Illustration 2.12 : Structure of the heart

, and an interactive resource for studying the structure of the heart and its chambers, valves, and blood vessels is available here [Interactive Content](#).

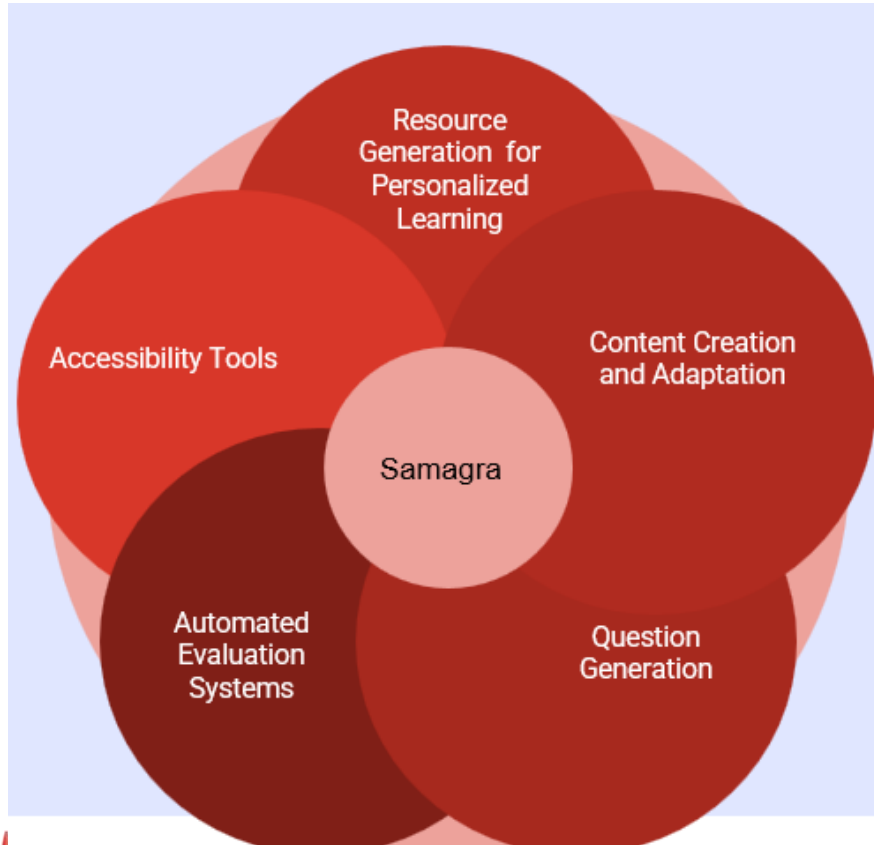


How SAMAGRA Plus AI is developed and what it offers

1. A 'RAG' based AI system that responds using our own knowledge base aligned with curriculum.
2. Describes Learning Concepts along with sufficient resources such as Images, Videos, Interactives suggested from SAMAGRA Plus content portal.
3. Provides Chatbot, interactive quizzes based on selected subjects and topics.
4. Feedback system based on results of interactive quizzes by students.
5. Identifies weak areas of topics selected by students, based on their inputs of interactive quizzes.
6. It retrieves curriculum-specific content from a vetted database before responding, ensuring relevance, accuracy, and zero hallucinations.
7. Facilitates Assessment based on long, short and descriptive questions.
8. LangChain & ChromaDB, FastAPI backend, Streamlit interface, OpenAI Whisper for speech and 100% FOSS stack



AI Enhanced Samagra Plus LLM in Class 8 to 10





Scheme of Work

(You can manage Scheme of Work)



My Teaching Manuals

(You can manage your own teaching plans)



Create Unit Plan

(A study plan prepared by looking a unit holistically)



Create Teaching Manual

(A place digital platform to create teaching manuals)



Teaching Manual Consolidation

(A consolidated list of micro plan and relection notes)

Empowering Education and Innovation with Samagra AI Tools!

Beta Version

Revolutionizing Education Through AI-Powered Tools and Innovations

Chat BOT

Quiz Generator

Teaching Manual

Let's Talk

Topic Finder

Question Generator



Get Started with Samagra AI

Thank you for participating in the testing phase of our AI module. Please note that this is a test version of the software and is still under development.



Activity Presentation

(Images, audio & video contents, presentations, interactives, worksheets etc.)



Question Paper Repository

(You can create question papers using questions from the question repository)



Learning Room

(An Innovative digital multimedia facility to facilitates self-directed learning & assessment)



Registration facility to attend KOOL Examination

KOOL Registration

(Registration facility to attend KOOL Examination)

Other Links



School Resource Group [SRG]

School Resource Group , SRG Creation.



Class Observation Summary (by HM)

This section shows class observations done by your HM.



Profile

Your Samagra account details and update profile picture and more.



Text Book

You can download pdf versions of SCERT (Kerala) Text Books from class 1 to 12.

Empowering Education and Innovation with Samagra AI Tools !

Revolutionizing Education Through AI-Powered Tools and Innovations

Chat BOT

An intelligent AI assistant designed to provide instant and accurate answers to all your academic and administrative queries



Quiz Generator

Create dynamic, engaging quizzes effortlessly to evaluate student understanding and improve learning outcomes



Teaching Manual

Generate comprehensive, well-structured teaching content and lesson plans that align with curriculum standards to enhance classroom efficiency.



Let's Talk

Let's Talk is an AI-powered voice interaction module that enables students to discuss topics, receive real-time feedback, and improve their speaking skills effectively.



Topic Finder

Break down complex topics into concise, easy-to-understand notes for better comprehension and seamless learning.



Question Generator

Leverage AI to craft tailored questions for exams, assignments, or practice sessions, ensuring data-driven and impactful assessments.



Cross Word Puzzle

Empower learning with AI-generated crossword puzzles tailored to specific topics, providing an engaging and interactive way for students to test their knowledge and reinforce key concepts.



Fill in the Blanks Puzzle

Enhance comprehension with AI-crafted fill-in-the-blank exercises, designed to challenge students' understanding and promote active recall in a focused and impactful manner.



One Word Puzzle

Leverage AI to craft tailored questions for exams, assignments, or practice sessions, ensuring data-driven and impactful assessments.



Word Maker

Leverage AI to craft tailored questions for exams, assignments, or practice sessions, ensuring data-driven and impactful assessments.



Rapid Reading

Rapid reading is a technique that enhances reading speed and comprehension by training the eyes and brain to process text more efficiently.




Escape Room

Escape Room is an interactive module where players answer questions correctly to unlock doors and advance through the game.



Quizzes for students & Assessment for teachers

Wed Dec 4 17:08:23 2024



Samagra AI - Quiz Results

Here's how you performed!

Score: 2/5

1: What protects the heart?

- A. Pericardium only
- B. Pericardial fluid only
- C. Pericardium and pericardial fluid
- D. Rib cage only

2: What divides the heart into right and left halves?

- A. Atrium
- B. Ventricular septum
- C. Pericardium
- D. Rib cage

3: What prevents the backward flow of blood from the ventricles to the atria?

- A. Tricuspid valve
- B. Bicuspid valve
- C. Semilunar valve
- D. All of the above

4: What carries oxygenated blood from the lungs to the left atrium?

- A. Pulmonary artery
- B. Pulmonary vein
- C. Aorta
- D. Superior venacava

Dear Student,

I hope this feedback helps you understand your strengths and weaknesses in the quiz on Process of Respiration and Exchange of Gases. You did well in some areas, and there are some topics where you need to focus your efforts.

First, let's talk about your strengths. You did a great job on questions 2 and 3, where you correctly explained why the breathing rate increases during physical activity and the function of surfactant in the alveoli. These answers show that you have a good understanding of the topics and are able to apply your knowledge correctly.

However, you struggled with question 1, where you didn't correctly explain the purpose of the breathing rate experiment. This is an important topic, and I encourage you to review it and make sure you understand the concept.

To improve your understanding of the Process of Respiration and Exchange of Gases, I suggest you focus on the following areas:

Review the purpose of the breathing rate experiment and make sure you understand the concept.

Practice explaining the process of respiration and exchange of gases in different scenarios, such as during physical activity or at rest.

Remember, it's okay to make mistakes, and the important thing is that you learn from them. Keep up the good work, and don't hesitate to ask for help if you need it.

Best regards, [Your Name]

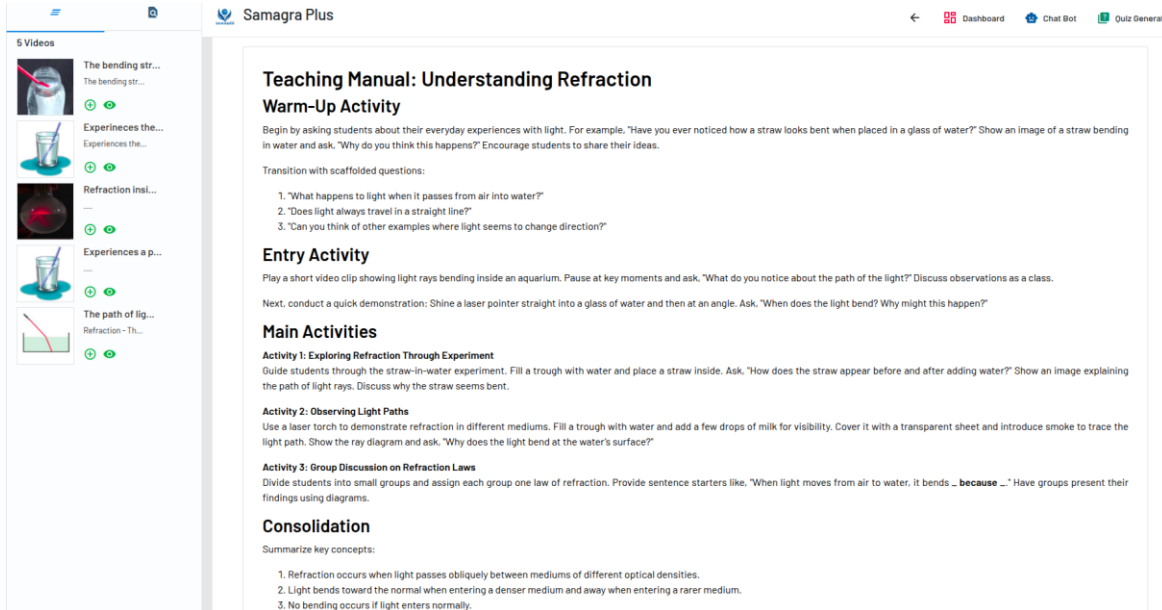
Generate Remedial Quiz

I've highlighted some topics where extra focus could make a big difference. Select a topic to get started.

Process of Respiration

Exchange of Gases

Latest feature –Teaching Manual (TM) Generator



The screenshot displays the Samagra Plus interface. On the left, a sidebar lists five videos related to refraction. The main content area is titled "Teaching Manual: Understanding Refraction" and includes a "Warm-Up Activity" with a paragraph and three scaffolded questions. Below this is an "Entry Activity" with a video clip and a quick demonstration. The "Main Activities" section contains three activities: "Exploring Refraction Through Experiment", "Observing Light Paths", and "Group Discussion on Refraction Laws". The manual concludes with a "Consolidation" section summarizing key concepts and their applications.

5 Videos

- The bending str...
The bending str...
- Experiences the...
Experiences the...
- Refraction insl...
—
- Experiences a p...
—
- The path of lig...
Refraction - Th...

Teaching Manual: Understanding Refraction

Warm-Up Activity

Begin by asking students about their everyday experiences with light. For example, "Have you ever noticed how a straw looks bent when placed in a glass of water?" Show an image of a straw bending in water and ask, "Why do you think this happens?" Encourage students to share their ideas.

Transition with scaffolded questions:

- "What happens to light when it passes from air into water?"
- "Does light always travel in a straight line?"
- "Can you think of other examples where light seems to change direction?"

Entry Activity

Play a short video clip showing light rays bending inside an aquarium. Pause at key moments and ask, "What do you notice about the path of the light?" Discuss observations as a class.

Next, conduct a quick demonstration: Shine a laser pointer straight into a glass of water and then at an angle. Ask, "When does the light bend? Why might this happen?"

Main Activities

Activity 1: Exploring Refraction Through Experiment
Guide students through the straw-in-water experiment. Fill a trough with water and place a straw inside. Ask, "How does the straw appear before and after adding water?" Show an image explaining the path of light rays. Discuss why the straw seems bent.

Activity 2: Observing Light Paths
Use a laser torch to demonstrate refraction in different mediums. Fill a trough with water and add a few drops of milk for visibility. Cover it with a transparent sheet and introduce smoke to trace the light path. Show the ray diagram and ask, "Why does the light bend at the water's surface?"

Activity 3: Group Discussion on Refraction Laws
Divide students into small groups and assign each group one law of refraction. Provide sentence starters like, "When light moves from air to water, it bends _ because _." Have groups present their findings using diagrams.

Consolidation

Summarize key concepts:

- Refraction occurs when light passes obliquely between mediums of different optical densities.
- Light bends toward the normal when entering a denser medium and away when entering a rarer medium.
- No bending occurs if light enters normally.

- Auto-generates **Teaching Manuals** mapped to Curriculum, Learning Outcomes (LOs) & Digital resources in Samagra Plus portal
- Suggests **appropriate classroom activities**
- Saves teacher preparation time



Latest feature - Multilingual Translation Support

The screenshot displays the SAMAGRA PLUS platform's translation feature. The interface is titled "Translate with BHASHINI". It features a "From:" dropdown set to "English" and a "To:" dropdown set to "Tamil". The input text is in Tamil, and the output is the English translation. The translated text is shown in a scrollable area. At the bottom of the translation window, there are "Replace" and "Cancel" buttons. The background shows the SAMAGRA PLUS interface with a sidebar on the left containing navigation options like "Division", "Micro Plan", and "Activity Step". The main content area shows a lesson plan for "Activity 1: Exploring Refraction Through Experiment" and "Activity 2: Observing Light Paths".

- Translates Teaching Manuals into English / Malayalam / Tamil /Kannada
- Powered by **BHASHINI APIs**
- Ensures accessibility across diverse learners



Latest feature - AI Chatbot – Concept Explanation

Experiment Demonstrating Transverse Waves

Setup:

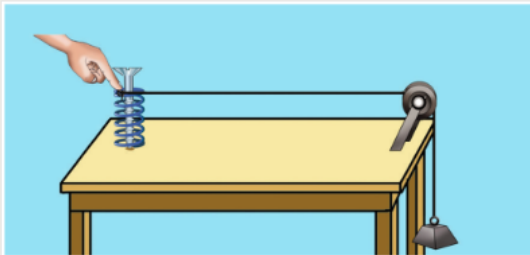
- A spring is fixed vertically on a table.
- One end of a string is tied to the spring, and the other end is attached to a 50g slotted weight.
- The string passes over a pulley.

Observation:

- When the spring is pressed and released, **transverse waves** form on the string.
- The particles of the string move **up and down**, perpendicular to the wave's direction.
- The waveform shows **crests and troughs**.

Visual Aids:

- Experimental setup:



- Curriculum-aligned AI chatbot
- Explains topics using:
 - Approved digital resources
 - Age-appropriate content
- Available 24/7 for student support

Latest feature – Quiz Generator

Practice Questions

Question 2 of 4 Clear Answer Mark for Review Skip

What is the approximate value of acceleration due to gravity (g) near the Earth's surface?

A. 5.2 m/s²

B. 9.8 m/s²

C. 12.4 m/s²

D. 15.0 m/s²

[Previous](#) [Next](#) Status: Viewed [Report](#)

Select Question

Time Left : 10 sec

1 2 3 4

Viewed
 Answered
 Marked
 Not visited
 Skipped

- Generates **interactive quizzes** using LLMs
- Based on curriculum content, Enhances formative assessment
- Supports Multiple difficulty levels & Instant feedback



Latest feature – HOTS – Higher Order Thinking Skills

Based on the context provided, answer the following questions about molecules, atoms, and cathode rays.

1 What is the chemical formula of glucose, and how does it differ from the formula of sugar?

Type your answer here...

500 chars left

2 How do water molecules and carbon dioxide molecules differ in their constituent elements and atomic ratios?

Type your answer here...

500 chars left

3 Explain how the experiments with cathode rays demonstrated that they consist of negatively charged particles with mass. Provide two observations from the experiments that support this conclusion.

Type your answer here...

500 chars left

← Back

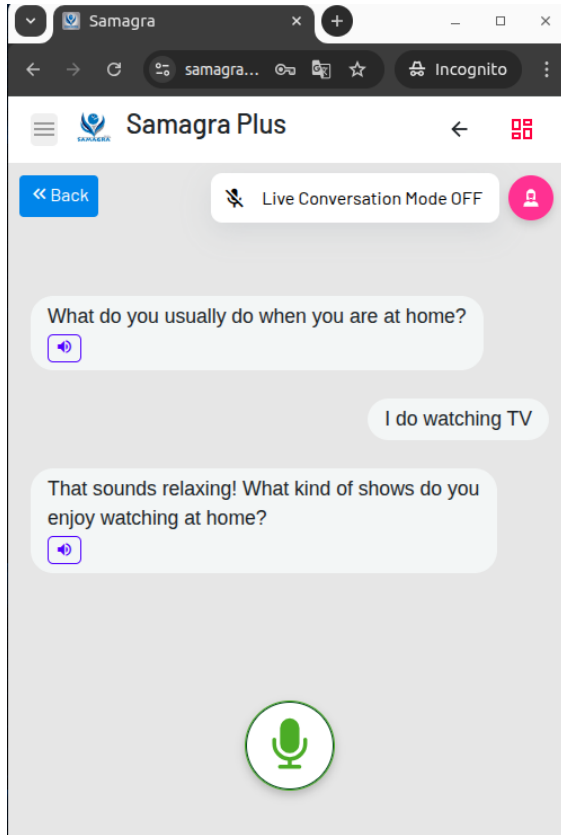
🔄 Regenerate

▶ Submit Answers

Generates **descriptive HOTS questions**
Encourages Analysis, Reasoning & Creativity
AI-based answer evaluation using **EAI Engine**



Latest feature –Let’s Talk – Speaking Practice



- Interactive **text and voice-based AI bots**
- Supports speaking practice on common topics:
 - Home & family
 - Pets
 - Travel
 - Daily life
- Improves communication and confidence



Key to Entrance

The screenshot shows the 'Key to Entrance' web application interface. The browser address bar indicates the URL: `samagra.kite.kerala.gov.in/#/samagra-ai-eyJhbG0OUJUZ1N1N1N1R5cCl6kXpXVCJ9/entrance-quiz`. The user is logged in as 'Adwalith' (AA), a 'COMPUTER SCIENCE' student. The interface features a navigation menu with 'Home' and 'Personalize' buttons, and a 'Study Plan' section. The main content area is titled 'KEY TO Entrance' and includes tabs for 'Exam Mode', 'Class', and 'Subject'. Three primary practice modes are highlighted: 'Targeted Practice' (Single topic focus), 'Subject Drill' (All topics in a subject), and 'Snowball Practice' (Cumulative progress test). Each mode lists its benefits and includes a 'Start' button. Below these are sections for 'Study Plans' and 'Personalize'.

Targeted Practice
Single topic focus

Master one specific concept with focused questions.

- ✓ One topic only
- ✓ Focused questions
- ✓ Quick mastery

Subject Drill
All topics in a subject

Comprehensive practice across all topics in a subject.

- ✓ All topics covered
- ✓ More questions
- ✓ Broader assessment

Snowball Practice
Cumulative progress test

Test knowledge from all chapters up to a point.

- ✓ Cumulative chapters
- ✓ Progress tracking
- ✓ Retention focus

Study Plans

Create and manage learning goals through structured study plans designed to support steady progress and visibility.

- Goal-oriented study frameworks
- Progress tracking with milestones

Personalize

Gain a clearer understanding of your learning patterns through detailed performance analysis and tailored guidance.

- Performance analytics and trend insights
- Identification of skill gaps and

- Designed for **Higher Secondary students** with 10,000+ AI-generated entrance exam questions
- Covers multiple subjects and difficulty levels & supports competitive exam preparation

Personalized Study Plan in Key to Entrance

The screenshot shows a web browser window displaying a personalized study plan for a student named Adwalth, a Computer Science student. The interface is divided into several sections:

- Header:** "ACTIVE STUDY PLAN" and "Competency Development Plan". Below this, it states "Your personalized roadmap to conquer weak topics." and shows "0 Completed Activities" and "7 Pending Activities".
- Progress:** "Overall Plan Progress" is shown as a 0% bar.
- Current Goal:** "Reinforce Topic: Ampere Circuital Law skills through 3 Beginner Practice Exams." with a progress of 0/3 and an "Attempt" button.
- Active Study Plan:** A list of activities with a lock icon indicating they are locked:
 - ACTIVITY 1:** Reinforce Topic: Ampere Circuital Law skills through 3 Beginner Practice Exams. Progress: 0/3. Includes an "Attempt" button.
 - ACTIVITY 2:** Reach 70% proficiency across 1 Beginner Practice Exam in Topic: laws of motion.
 - ACTIVITY 3:** Achieve an average time of 110 seconds per question in 3 Beginner Practice Exams on Pus One Physics while maintaining a minimum performance of 50%.
 - ACTIVITY 4:** Achieve a consistent performance of 90% throughout 2 Beginner Practice Exams in Pus Two Physics.

- AI-driven personalized learning paths, Adaptive recommendations for improvement
- Based on usage history & performance analytics



Challenges faced on development of own AI Engine and how they were overcome

Challenge

Solution

1. Computation

- Need for costlier High-end GPUs.

2. Unavailability of GPU Cloud providers

- Providers unavailable in Govt sector.
- Dependency on private clouds such as AWS.

3. Problem solving in Mathematics & Physics

- LLM model has limitation for problem solving in Mathematics.

API service of DeepSeek availed

4. Creation of accurate Data sets

- Creation of comprehensive data set time-consuming,
- Cannot depend on Text Book alone.
- Need to consolidate relevant information from Textbook, Teachers book & other authorized resources.
- Mapping of all resources and interactives from Samagra to data set is cumbersome.



Present challenges on the AI platform

- Cost for API service of DeepSeek
- Development of Offline model for schools



THANK YOU

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KERALA INFRASTRUCTURE AND
TECHNOLOGY FOR EDUCATION

