केन्द्रीय विद्यालय संगठन
KENDRIYA VIDYALAYA SANGATHAN
आंचलिक शिक्षा एवं प्रशिक्षण संस्थान, मैसूर
ZONAL INSTITUTE OF EDUCATION AND TRAINING, MYSURU

कौशल समृद्धि के लिए व्यावसायिक शिक्षा में एटीएल और स्टीम के साथ प्रायोगिक शिक्षा -टीजीटी (कार्यशिक्षा)

SKILL ENRICHMENT IN VOCATIONAL EDUCATION PRACTICAL LEARNING WITH ATL & STEAM For TGT (Work Education)

7th July 2025 to 11th July 2025

कौशल भारत - कुशल भारत

DIRECTOR'S MESSAGE

It is with great pleasure that I present the e-Manual for the 5-Day Offline Workshop on "Skill Enrichment in Vocational Education: Practical Learning with ATL & STEAM" designed for TGTs (Work Education). This workshop reflects our continued commitment to fostering skill-based, innovative, and experiential learning in alignment with the goals of the National Education Policy (NEP) 2020 and the National Curriculum Framework for School Education (NCF-SE).

In today's rapidly evolving educational landscape, integrating Vocational Education with platforms like Atal Tinkering Labs (ATL) and STEAM (Science, Technology, Engineering, Arts, and Mathematics) is critical for equipping students with real-world competencies, problem-solving abilities, and a spirit of innovation. This workshop aims to empower Work Education teachers with hands-on tools, interdisciplinary strategies, and practical methodologies to transform classrooms into dynamic spaces of creativity and applied learning.

I extend my heartfelt appreciation to the Associate Course Director, expert Resource Persons, participants, Training Associates, and the Workshop Coordinator for their enthusiastic participation and thoughtful contributions. Their collective efforts have made this initiative a rich and meaningful professional learning experience.

Wishing you all an enriching and transformative journey ahead!

MEENAKSHI JAIN
DIRECTOR
ZIET MYSURU

COURSE DIRECTOR

Ms. MENAXI JAIN

DEPUTY COMMISSIONER
KENDRIYA VIDYALAYA SANGATHAN
&
DIRECTOR, ZIET MYSURU

ASSOCIATE COURSE DIRECTOR

Shri. KAMAL JEET

PRINCIPAL, PM SHRI KV WALTAIR
VISAKHAPATNAM

RESOURCE PERSONS

Shri. A. RAJENDER

TGT (WE), PM SHRI KV GHATKESAR
HYDERABAD

&

Shri. GIRI. CH

TGT (WE) PM SHRI KV No.1
AFS DUNDIGAL
HYDERABAD

COURSE COORDINATOR

D. SREENIVASULU

TA(MATHEMATICS)
ZIET MYSURU

LIST OF THE PARTICIPANTS

S.No	Name of the teacher	Designation	KV where working	Region
1	SHASHIKANT OLA	TGT(WE)	ADILABAD	Hyderabad
2	UNGATI GANAPATHI	TGT(WE)	ANANTAPUR	Hyderabad
3	V KRISHNA SAI CHARAN	TGT(WE)	BEGUMPET	Hyderabad
4	K. RAMESH	TGT(WE)	BOWENPALLY	Hyderabad
5	D SAI KRISHNA	TGT(WE)	EDDUMAILARAM	Hyderabad
6	ANAND BHARTI	TGT(WE)	ELURU	Hyderabad
7	ANKUR GOYAL	TGT(WE)	GACHIBOWLI	Hyderabad
8	A PADMAVATHI	TGT(WE)	GOLCONDA NO.2	Hyderabad
9	SARODE NAMRATA VILASRAO	TGT(WE)	GOOTY	Hyderabad
10	B R V K SWAMY	TGT(WE)	GUNTUR SHIFT 2	Hyderabad
11	SUHALA PARVEEN	TGT(WE)	HCU Gachibowli	Hyderabad
12	SATULURI VIJAYA KUMAR	TGT(WE)	IRLAPADU	Hyderabad
13	K. VIJAYA KUMAR REDDY	TGT(WE)	KADAPA	Hyderabad
14	SHIKHAR	TGT(WE)	KAKINADA	Hyderabad
15	SHAIK NAZEER AHAMED	TGT(WE)	KANCHANBAGH	Hyderabad
16	MAYANK SONI	TGT(WE)	KHAMMAM	Hyderabad
17	DEEPAK DAS	TGT(WE)	MACHILIPATNAM	Hyderabad
18	REETESH KUMAR MAURYA	TGT(WE)	MAHABUBABAD	Hyderabad
19	A. SEETHARAM	TGT(WE)	MAHABUBNAGAR	Hyderabad
20	AKRITI DUBEY	TGT(WE)	MALKAPURAM Vizag	Hyderabad
21	YATENDRA PRATAP SINGH	TGT(WE)	NAD Vizag	Hyderabad
22	RAVI PRAKASH MAURYA	TGT(WE)	NALGONDA	Hyderabad
23	BABITA KUMARI	TGT(WE)	NAUSENABAUGH-1	Hyderabad
24	I PRABHAKAR	TGT(WE)	NELLORE	Hyderabad
25	KAMALESH KUMAR KURDIA	TGT(WE)	NIZAMABAD	Hyderabad
26	SIVAKUMAR B	TGT(WE)	NPA SIVARAMPALLY	Hyderabad
27	PANKAJ RAJERA	TGT(WE)	ONGC RAJAHMUNDRY	Hyderabad

28	K SREENIVASA RAO	TGT(WE)	ONGOLE	Hyderabad
29	M. RAJU	TGT(WE)	PICKET	Hyderabad
30	M NAVEEN KUMAR	TGT(WE)	RAJAMPALLI	Hyderabad
31	LVLN KUMAR	TGT(WE)	SATTENAPALLI	Hyderabad
32	SANDHYA	TGT(WE)	SIDDIPET	Hyderabad
33	BALAMURALI KRISHNA K	TGT(WE)	SRIKAKULAM	Hyderabad
34	KUMARI BEENA SINGH	TGT(WE)	SRIVIJAYNAGAR -1	Hyderabad
35	V SIVA KUMAR	TGT(WE)	SRIVIJAYNAGAR -2	Hyderabad
36	KOMAL GUPTA	TGT(WE)	STEEL PLANT	Hyderabad
37	SHUBHAM SINGH	TGT(WE)	SURYALANKA	Hyderabad
38	R RAMI REDDY	TGT(WE)	TENALI	Hyderabad
39	V. SRINIVASA RAO	TGT(WE)	TIRUPATHI NO.2	Hyderabad
40	B GOPI	TGT(WE)	TIRUPATI No.1 SHIFT 1	Hyderabad
41	V HEMALATHA	TGT(WE)	UPPAL NO.2	Hyderabad
42	PULI DIWAKAR	TGT(WE)	VENKATAGIRI	Hyderabad
43	T SRINIVASA RAO	TGT(WE)	VIJAYAWADA No. 1	Hyderabad
44	GAURAV	TGT(WE)	VIZIANAGARAM	Hyderabad
45	SHIVAM MISHRA	TGT(WE)	WALTAIR Vizag	Hyderabad

TIME TABLE

DATE	9.00-9.45 am	9.45 am -11.15 am		11.30am -1.00 pm		2.00 pm-3.30 pm		3.45 pm -5.30 pm
07-07-2025	Inauguration	Recourse materials for enriching Vocational Education- Shri. A Rajender, TGT(WE), RP, KV, Ghatkesar.	Tea Break 11.15 am-11.30 am	Tools and equipment for Vocational Lab- 1. Shri. A Rajender, TGT(WE), RP, KV, Ghatkesar & 2. Shri. Giri. CH,, TGT(WE), KV No.1, AFA, Dundigal, RP	Lunch Break 1.00 pm-2.00 pm	Hands on Practices using ThinkerCad- Shri. Giri.CH,, TGT(WE), KV No.1, AFA, Dundigal, RP	Tea Break 3.30 pm-3.45 pm	Hands on activities with electronic circuits- Shri. A Rajender, TGT(WE), RP, KV, Ghatkesar.
08-07-2025	Assembly	Design Thinking & Innovation- Shri. Giri. CH,, TGT(WE), KV No.1, AFA, Dundigal, RP		Implementation techniques and strategies fin Classroom transactions- Shri. A Rajender, TGT(WE), RP, KV, Ghatkesar.		Hands on practices using demonstration boards- Shri. A Rajender, TGT(WE), RP, KV, Ghatkesar.		Hands on activities on Arduino microcontroller- Shri. Giri. CH,, TGT(WE), KV No.1, AFA, Dundigal, RP
09-07-2025	Assembly	AI Tools for enriching Skill Education -Shri. S. Vijaya Kumar, TGT(WE), KV, IRLAPADU		Introduction to Scratch programming and hands practice- Shri. U. Ganapathi, TGT(WE), KV, Ananthapur		STEAM integrated with Vocational Education- 1. Shri. A Rajender, TGT(WE), RP, KV, Ghatkesar		Hands on activities with Arduino Uno and sensors- 1. Shri. A Rajender, TGT(WE), RP, KV, Ghatkesar & 2. Shri. Giri.CH,, TGT(WE), KV No.1, AFA, Dundigal, RP
10-07-2025	Assembly	Hands on Generative AI Tools such as making PPTs using Chat GPT, Gamma, Song writing & composing with Suno.ai etc ElevenLabs, Play HT, Pictory.ai, Invideo.ai, Lumen5, GravityWrite etc- Shri. S. Vijaya Kumar, TGT(WE), KV, IRLAPADU		Introduction to Raspberry Pi and making minicomputer& Uses - Shri. Ch. Giri Verma, TGT(WE), KV No.1, Dundigal		Discussion on general concerns on Vocational Education, implementation connecting ATL and STEAM based on NCERT activity book- Shri. Kamal Jeet, ACD, Principal, KV, Waltair.		IoT, its applications- - Shri. Giri.CH, TGT(WE), KV No.1, AFA, Dundigal
11-07-2025	Assembly	ATL concepts and Establishment - Shri. A Rajender, TGT(WE), RP, KV, Ghatkesar.		Planning of activities on the text book of VE: Koushal Bodh, ATL, STEAM, Bagless Days etc by all the participants		Presentation of Group wise projects		Closing Session

EDITORIAL BOARD:

S. No.	Name of the Teacher	Nature of works done	Where working	PHOTO
1.	**Shri. SATULURI VIJAYA KUMAR**	**In-Charge**	**KV, IRLAPADU**	
2	**Shri. V SIVA KUMAR**	**Member**	**KV No.2, SVN, VIZAG**	
3.	**Shri. SHASHIKANTH OLA**	**Member**	**KV, ADILABAD**	
4.	**Ms. AKRITI DUBEY**	**Member**	**KV, MALKAPURAM, VIZAG**	
5.	**Shri. SHIKHAR**	**Member**	**KV, KAKINADA**	

Editorial Board with Course Co-ordinator, ACD, Resource Persons

S. No	NAME OF THE OFFICER	PHOTO
	GROUP - 1	
1	**B SIVA KUMAR**	
2	**T. SRINIVASARAO**	
3	**I.PRABHAKAR**	
4	**SUHALA PARVEEN**	
5	**KAMALESH K.R**	
6	**KOMAL GUPTA**	
7	**A. SEETA RAM**	
8	**D.SAI KRISHNA**	
9	**M. NAVEEN KUMAR**	
	GROUP - 2	
1	**SATULURI VIJAYA KUMAR**	
2	**K. SRINIVASA RAO**	
3	**V KRISHNA SAI CHARAN**	
4	**SARODE NAMRATA**	
5	**ANAND BHARATHI**	
6	**U. GANAPATHI**	
7	**M. RAJU**	
8	**ANKUR GOYAL**	
	GROUP - 3	
1	**A. PADMAVATHI**	
2	**BRVK SWAMY**	
3	**PANKAJ RAJERA**	
4	**SUBHAM SINGH**	
5	**R RAMI REDDY**	
6	**V HEMA LATHA**	
7	**GAURAV**	
8	**SHIVAM MISHRA**	
9	**YATENDRA PRATAP SINGH**	

GROUP - 4		
1	K. RAMESH	
2	SHAIK NAZEER AHMED	
3	L V L N KUMAR	
4	SANDHYA KESARI	
5	AKRITI DUBEY	
6	BEENA SINGH	
7	SHIKAR	
8	MAYANK SONI	
GROUP - 5		
1	V SRINIVASA RAO	
2	B. GOPI	
3	PULI DIWAKAR	
4	RITESH KUMAR MOURYA	
5	SHASHIKANTH OLA	
6	RAVI PRAKASH MOURYA	
7	DEEPAK DAS	
8	V SIVA KUMAR	
9	BALA MURLI	

DAY WISE REPORTS

DAY-1: 07-07-2025

The first day of the workshop began with a vibrant morning assembly at 9:00 a.m., setting a positive and energetic tone for the day. The assembly was followed by an insightful address from the Mr. D. Kamaljeet, Associate Course Directors and Principal, K.V. Walters, who delivered an excellent speech outlining the aims and objectives of the course.

In his address, he emphasized the overarching aim of the workshop: to foster innovation and creativity among students and teachers, provide a holistic and interdisciplinary learning experience, and promote critical thinking, creativity, and problem-solving skills. He elaborated that the workshop seeks to cultivate a mindset of curiosity and hands-on engagement, enabling participants to integrate theory with practical application effectively.
Sir also highlighted the specific objectives of the skill enrichment and vocational courses. These include:

- Introducing practical, hands-on learning in schools to complement theoretical knowledge.
- Encouraging students to design and prototype innovative solutions, thereby nurturing creativity and engineering thinking.
- Promoting collaborative and project-based learning among students, fostering teamwork and peer-to-peer learning.
- Integrating arts with STEM subjects to ensure well-rounded cognitive and creative development among learners.

Following the address, the first session of the course was conducted by Sri A. Rajendra, Resource Person from NFC Nagar, Ghatkesar. He provided a comprehensive introduction to the tools and equipment recommended for vocational and skill education in accordance with KVS norms and guidelines. The session was highly informative and focused on the latest resources available in the ATL (Atal Tinkering Lab) environment, ensuring participants were updated on modern teaching aids.
During his session, Sri Rajendra explained various electronic modules such as sensors, power supply units, diode units, laser modules, and several other components essential for hands-on vocational training. He demonstrated the use of each module in detail and showcased the latest versions of equipment available, allowing participants to familiarize themselves with the technology used in practical STEM and vocational education.

The second session was conducted by Sri Giri, Resource Person from K.V. No.1, Dundigal, who introduced the TinkerCad application to the participants. He provided a thorough explanation of how to construct and simulate basic electronic circuits using the platform. Sri Giri, Resource Person demonstrated step-by-step procedures for building circuits and guided participants through hands-on practice, reinforcing their understanding through practical experience. This session effectively bridged the gap between theoretical concepts and real-world application, allowing

participants to simulate and troubleshoot circuits in a virtual environment before attempting them physically.

After lunch, Sri Rajendra, Resource Person resumed the workshop with a hands-on practical session. He guided participants in constructing various basic electronic circuits using sensors, actuators, and modules. The participants were enthusiastic and engaged actively, exploring how different components work together to create functional circuits. Sri Rajendra provided clear explanations at each step, ensuring that every participant was able to build circuits successfully. In the post-tea session, participants continued hands-on practice using trainer kits developed by Sri Rajendra himself. These kits were designed to simplify circuit building while providing a rich learning experience. The participants demonstrated the same enthusiasm as schoolchildren, experimenting with sirens, buzzers, relays, LDRs, and other modules, and thoroughly enjoying the interactive and practical nature of the session.

The trainer kits allowed participants to explore circuits in real time, fostering both creativity and confidence. Each participant was able to construct multiple circuits independently, and Sri Rajendra patiently assisted them, clarifying doubts and providing guidance throughout. The practical activities helped participants understand not only the functionality of electronic components but also the pedagogical approach to teaching these concepts effectively to students in schools.

The day concluded with a collaborative session where Sri Rajendra and Sri Giri supported participants in troubleshooting, finalizing circuits, and reinforcing their learning. Their patient guidance ensured that all participants left the workshop with practical skills and confidence to implement similar activities in their respective schools.

In summary, the first day of the workshop was highly productive and engaging. It successfully combined conceptual understanding, hands-on practice, and technological exposure. Participants gained comprehensive insights into the tools, modules, and applications required for vocational and skill-based education. The interactive nature of the sessions ensured active participation, creativity, and skill-building, setting a strong foundation for the subsequent days of the workshop. The day ended on a fruitful and motivating note, leaving participants inspired to integrate innovation, practical learning, and creativity into their classrooms, thereby enhancing the overall quality of vocational and skill-based education.

Day- 2: 08.07.2025

The day commenced with a morning assembly led by Group 1, during which participants offered a prayer and shared related information, setting a positive and focused tone for the day.

Following the assembly, Sri D. Sreenivasulu, Training Associate (Mathematics), ZIET Mysuru, explained the norms for participation certificates and provided details about the final assessment (post-test). He emphasized the importance of active participation throughout the workshop to ensure effective learning and successful completion of the course.

Subsequently, Mr. Kamaljeet, Associate Course Director, encouraged participants to engage actively in all sessions, emphasizing that active involvement would enhance their professional knowledge and teaching practices. He motivated participants to utilize the workshop as an opportunity to explore innovative techniques and practical strategies relevant to vocational and skill-based education.

The morning technical session focused on "Design Thinking & Innovation", conducted by Sri Giri Charan, Resource Person. He highlighted the importance of empathy in social and voluntary services and explained how analyzing diverse thought statements can lead to effective problem-solving. Sri Charan guided participants on how to connect with online platforms such as the Student Innovation Council (SIC) and Design Thinking & Innovation (DTI) portals to explore resources and learn more about innovative practices.

Following this, Sri Rajendra, Resource Person, conducted a session on "Implementation of Techniques and Strategies for Classroom Functions". The session emphasized using sensors and motors for designing innovative electronic projects suitable for students. Participants were introduced to practical approaches for guiding students in creating functional prototypes, encouraging hands-on learning and creativity.

Sri Giri Charan returned to lead a session on microcontrollers and their applications in daily life. He provided detailed explanations on connecting Arduino boards virtually using TinkerCAD as well as physically, illustrating how microcontrollers can be integrated into simple and advanced projects. Participants were encouraged to explore the versatility of these devices and understand their practical relevance in STEM education.

Hands-on Practice

After the theoretical sessions, participants engaged in active hands-on practice, applying the concepts learned. Using microcontrollers, sensors, and other related modules, they constructed circuits, experimented with motor controls, and simulated projects both virtually and physically. This practical session reinforced their understanding of microcontroller applications and emphasized the importance of experiential learning in the classroom.

Participants demonstrated enthusiasm and creativity, collaboratively troubleshooting challenges and sharing insights with peers. The session successfully bridged theory and practice, preparing participants to implement similar activities in their schools to enhance students' problem-solving and innovative thinking skills.

Day-3: 09.07.2025

The third day of the workshop began with a morning assembly led by Group 2, during which participants offered a prayer and set a positive, focused tone for the day. Following the assembly, Sri Kamal Jeet, Associate Course Director, provided valuable instructions on effectively implementing the activities discussed in the workshop in their respective schools. He emphasized the importance of practical application and encouraged participants to integrate the learning into classroom practices to maximize student engagement and skill development.

The first session was conducted by Mr. Vijay Kumar, focusing on the importance of Artificial Intelligence (AI) in day-to-day activities. He introduced participants to the unique capabilities of AI tools, with a special focus on ChatGPT, demonstrating how it can assist in creative writing, such as crafting lyrics in various styles and moods. This innovative approach enabled participants to explore AI as a tool for overcoming creative blocks and experimenting with new directions in artistic expression.

Participants actively engaged in the activity, becoming "lyricists and composers" as they generated original content using AI tools. The crafted lyrics were then exported to Suno.AI, a generative AI platform designed to create realistic songs by combining vocals and instrumental arrangements. Through this exercise, participants gained hands-on experience in transforming textual content into musical outputs, providing them with both technical knowledge and creative satisfaction.

In addition, Mr. Vijay Kumar introduced Gamma.AI, a versatile AI tool that aids in preparing PowerPoint presentations and converting them into video formats, thereby demonstrating practical applications of AI in both creative and educational contexts.

The next session, conducted by Mr. Ganapati, focused on "Scratch", a visual programming language developed by MIT. Scratch employs a block-based, drag-and-drop interface that allows students to create interactive games and animations, making it suitable for learners aged 6–16 years.

The session was highly interactive and engaging. Mr. Ganapati explained complex AI and programming concepts in a simplified manner, bridging the gap between advanced digital tools and beginner-level programming. Participants were guided step by step, learning how to develop animations and small projects, which enhanced their confidence in using programming tools for educational purposes.

After the lunch break, participants were assigned various projects and activities to be submitted on the final day of the workshop. Resource persons provided clear instructions and guidelines regarding project planning, execution, and submission. These projects aimed to consolidate the skills learned over the previous sessions, enabling participants to integrate AI, Scratch programming, and creative problem-solving into practical classroom applications.

Following the tea break, participants engaged in hands-on practice under the guidance of Mr. Rajendar and Mr. Gir Varma, who provided continuous support, clarifications, and personalized guidance. During this session, participants applied their learning by constructing projects, experimenting with Scratch programming, and exploring AI-based creative applications. The practical approach ensured that all participants gained confidence in handling technological tools and implementing innovative learning strategies.

Day 3 of the workshop was highly productive and engaging. Participants were introduced to the potential of Artificial Intelligence in creative and educational contexts, gained practical skills in Scratch programming, and participated in hands-on activities that strengthened their understanding of vocational and STEAM-based learning. The sessions successfully combined theory, creativity, and practical application, preparing participants to implement innovative projects and activities in their schools.

The day concluded on a motivating note, leaving participants enthusiastic and confident to apply the acquired skills in real-world educational settings, fostering innovation, problem-solving, and creativity among their students.

Day-4: 10.07.2025

The fourth day of the workshop began promptly at 9:00 AM with a meaningful morning assembly conducted by Group 3, which set a positive and energetic tone for the day. Following this, Mr. D. Sreenivasulu, Training Associate (Mathematics), ZIET Mysuru, addressed the participants with insightful guidance. He emphasized the importance of maintaining focus and cautioned against excessive mobile phone usage, highlighting its potential negative impact on concentration, learning efficiency, and mental well-being.

The next session was conducted by Mr. Kamal Jeet, Associate Course Director and Principal of KV Waltair. He provided an in-depth introduction to the Kaushal Bodh framework, a skill-based approach designed to make learning more practical, interactive, and student-friendly. His discussion focused on:

- Integrating vocational activities with the regular curriculum
- Promoting hands-on learning methods to enhance student engagement
- Encouraging practical, experiential learning to develop essential life and vocational skills in students

Participants were encouraged to reflect on ways to apply these principles in their own classrooms to foster creativity, problem-solving, and innovation among students.

Following this, Mr. Vijay Kumar, TGT (WE), KV Irlapadu, introduced participants to Generative AI tools, demonstrating their potential to simplify content creation and enhance teaching practices. Key highlights included:

1. PPT & Video Creation Tools – enabling teachers to create engaging presentations and educational videos efficiently
2. Text-to-Voice Tools – such as ElevenLabs, Speaktor, and Play.ai, which convert written content into natural-sounding speech
3. Text-to-Video Tools – including Pictory.ai, Gravity Write, Invideo.ai, Canva, and Lumen5, which transform scripts or articles into visually appealing videos

Participants actively explored these tools in real-time, gaining hands-on experience and learning practical ways to incorporate AI in classroom teaching and project-based learning.

After a refreshing tea break, Mr. Dinesh Sir delivered a motivational talk on the occasion of Guru Purnima, highlighting the significance of mentorship and the pivotal role teachers play in shaping students' lives. This session reminded participants of the value of guidance, inspiration, and the ethical responsibility of educators to nurture creativity and innovation in young minds.

Post-break, participants engaged in an informative session conducted by Mr. Giri Ch., TGT (WE), who introduced the Raspberry Pi, a compact, credit-card-sized computer widely used in STEM and

ATL activities. Key aspects covered in the session included:

- Understanding what Raspberry Pi is and its versatility in educational contexts
- Its applications in STEM learning, automation projects, and sensor-based activities
- Demonstrations on connecting Raspberry Pi to sensors and programming it for practical projects

Participants observed practical examples of how Raspberry Pi can be utilized for student projects, including automation, coding exercises, and innovative problem-solving tasks.

After a nourishing lunch, participants engaged in hands-on practice, applying the skills learned in previous sessions. They explored AI tools, text-to-video platforms, and Raspberry Pi applications, building simple circuits and executing microcontroller-based projects. The practical session reinforced their understanding, encouraged experimentation, and allowed participants to gain confidence in implementing these tools in school-level projects.

Final Session by Mr. Kamal Jeet – Educational Challenges & KAPILA
The final session of the day was conducted by Mr. Kamal Jeet, who discussed critical challenges in education, including:

- Lack of an integrated educational vision
- Inadequate teacher training for modern pedagogical tools
- Underutilization of ATL labs
- Gaps in student assessment methods

He also introduced the KAPILA program, an initiative designed to raise IPR awareness, promote innovation, and encourage students to undertake creative and research-based projects. Participants were motivated to explore ways to implement KAPILA concepts in their schools, enabling students to develop entrepreneurial and innovative skills alongside traditional learning.

Day-5: 11.07.2025

The final day of the workshop commenced with a morning assembly conducted by Group 4, setting an enthusiastic and purposeful tone for the day. The session was graced by Course Director Ms. Menaxi Jain, DC & Director, ZIET Mysuru, who addressed the participants on the challenges faced by Work Education teachers. She emphasized the evolving nature of the Work Education teacher's role since 2020 and encouraged participants to implement Work Education as a vocational course while adhering strictly to the CBSE curriculum and Kaushal Bodh textbook guidelines.
Ms. Jain highlighted that each school has a unique environment, and teachers must adapt their teaching methods to suit the students' maturity level and the resources available. She advised participants to plan class-wise activities carefully, treating Work Education as an academic subject and integrating hands-on activities that align with the framed syllabus. Teachers were encouraged to overcome challenges creatively and explore innovative measures to implement vocational education effectively in their schools.

Following the Course Director's address, Shri A. Rajendra guided participants on the challenges of organizing activities in the Atal Tinkering Lab (ATL) and STEAM projects. He shared practical

strategies for planning and executing hands-on learning activities in alignment with the goals of vocational education. Participants were encouraged to think critically and develop solutions for common challenges encountered in resource-limited school environments.

A post-training test was conducted by Mr. Giri, with the test administered online through Google Forms. This assessment aimed to evaluate participants' understanding of the workshop content and their readiness to implement the learned strategies in their schools.

At 11:20 AM, a group photograph was taken with the Honorable DC & Course Director, Associate Course Director & Principal, other respected members of ZIET Mysuru, and all resource persons. Following this, a group activity was conducted where participants collaboratively framed lesson plans and activity lists for classes VI to X, based on students' learning levels and available resources. This exercise allowed participants to apply their workshop learnings in a practical planning scenario, fostering collaboration and creativity.

Exhibition

After lunch, an exhibition of projects prepared by different groups was organized. The exhibition was inaugurated by Ms. Meenakshi Jain, who appreciated the efforts of all participants. Each group enthusiastically presented their projects, explaining their objectives, methodology, and expected learning outcomes. The exhibition provided a platform for participants to showcase creativity, teamwork, and innovation, reinforcing the hands-on skills acquired during the workshop.

Valedictory Function

Following the exhibition, the valedictory function was held. It was attended by Ms. Meenakshi Jain, DC & Director, ZIET Mysuru, Shri Kamal Jeet, ACD & Principal, KV Waltair, the resource persons, and all training staff including Shri D. Sreenivasulu, TA (Mathematics) and Course Coordinator. During the session, the dignitaries shared their feedback and reflections on the workshop, providing valuable suggestions for implementing vocational education with the right spirit and motivation.

Ms. Meenakshi Jain blessed the participants, encouraging them to carry forward the knowledge, skills, and enthusiasm gained during the workshop. With a sense of accomplishment and motivation, all TGTs departed for their respective destinations, inspired to apply their learnings effectively in their schools.

SESSIONS

RESOURCE MATERIALS FOR ENRICHING VOCATIONAL EDUCATION

Mr. A RAJENDER
TGT(WE)
KV, GHATKESAR.

1. Facilitator Guidance
   - Overview of vocational education and skill enrichment strategies.
   - Guidance on CBSE optional subjects / technology optional subjects, including materials lists, required qualifications, and implementation strategies.
   - Planning and organizing tools and equipment for the vocational lab, including resources from PM SHRI workshops and soil testing kits.
   - Guidance on self-planning for tools and equipment:
     - Feasibility assessment for workshop execution.
     - Preparation of self-planned kits for demonstrations.

2. Workshop Materials

A. PM SHRI Workshop Kit List
   - Standardized kits and tools provided for vocational activities.
   - Hands-on demonstration materials for classroom application.

B. Self-Planned Kits
   - CKT (Circuit Kit)
   - ADK (Advanced Development Kit)
   - Self Demo Kits
   - Others (e.g., Raspberry Pi modules)

3. CKT (Circuit Kit) Components

Power Supplies (PS)
   - Charger cum 5V booster
   - Charger modules (1S, 2S, 3S, etc.)
   - 18650 Li-ion cells
   - Multiple PS units
   - 9V batteries

Breadboards
   - 800-pin, 400-pin, 270-pin, 25-pin, and others

Loads

Lighting
   - LEDs, BI, TRI, 7C, COB, Laser modules, Ambulance lights

Sound
   - Beeper, Beeper with switch, Buzzer, Alarm

Mechanical
   - DC motors, Motor modules, BO, LM298N, BLDC motors, water pumps, stepper motors (uni-polar & bi-polar), Servo motors

12V Powered Loads

- Buzzers, alarms, cooling fans

Other Essentials

- Pots, switches, relays, MOSFETs, voltage boosters

Sensors

- IR, LDR, sound sensors, and others

4. ADK (Advanced Development Kit) Components

Sensors (for 25-pin breadboards)

- IR sensor, LDR sensor
- Sound sensor, Temperature sensor
- Soil moisture sensor, Rain sensor
- Switches (SW)
- Potentiometers (POT)
- Joysticks
- PIR sensors
- Touch sensors
- Ultrasonic (US) sensors

Activators

- LEDs, Piranha modules, lasers, buzzers, motor modules
- Traffic signal modules
- Servo motors
- 16x2 LCD with I2C
- MOSFET switches

Add-ons

- Stepper motors with drivers
- LM298N with BO for wheels
- Relay modules with DC pumps

5. Practical Application

- These kits and components can be used for designing hands-on learning activities in ATL and STEAM labs.
- Activities include: automation projects, sensor-based applications, robotics, electronic circuits, and vocational skill demonstrations.
- Teachers can customize kits according to class level, available resources, and learning objectives, ensuring practical skill development aligns with curricular goals.

This structured resource list ensures that TGT (WE) teachers have a comprehensive roadmap for vocational education, enabling them to implement innovative, hands-on activities and nurture creativity, critical thinking, and technical skills among students.

TOOLS AND EQUIPMENT FOR VOCATIONAL LAB

Mr. A RAJENDER, TGT(WE)
KV, GHATKESAR &
Mr. GIRI. CH, TGT(WE)
KV NO.1, AFA, DUNDIGAL, RP

Item	Features	Skills	Activities	Suggestive Required Quantity
Refrigeration Cycle Simulator	Wall mounted model having simulation of refrigerator. Understanding components like Compressor, Condensing coil ,Evaporator, High pressure gauge meter ,Low pressure gauge meter	Entrepreneurship ,Application of Science, Job Oriented Concept, Aesthetics value to Lab, Real Time Simulation of a Refrigerator.	Understanding the concept of refrigeration and fault finding. Reverse Carnot Cycle application	As per the schools requirement and availability of fund
LED TV Simulator	Wall mounted model having simulation of LED TV. Understanding concepts LED TV panel ,Controller Board Operating panel key, Remote sensor etc.	Entrepreneurship, Application of science, Job oriented Concept, Asthetics value to Lab, Real Time Simulation of a LED.	Understanding the concept how LED panel works. Proficiency in using LED TV tools and equipment, familiarity with block diagrams and operating principles	As per the schools requirement and availability of fund
Satellite Communication Simulator	Wall mounted simulator for understanding, how signals are transmitted from ground to space based satellite and again back to the ground station.	In line with 21st-century skills, Space Technology.	Understanding the concept of Satellite Communication	As per the schools requirement and availability of fund
Large Schematics Home Appliances	Large schematics and understanding of home appliances like Microwave ,Air Conditioner ,Mixer Grinder and water purifier etc.	Entrepreneurship, Application of science, Job oriented Concept, Asthetics value to Lab, Real Time Simulation of a Home Appliance. Engaging visuals	Understanding the concept of home appliances viz principle, Structure, Assembly, Key Components, Types etc.	As per the schools requirement and availability of fund

Computer Hardware Simulator	Wall mounted Simulation of computer hardware and understanding the assembly concept using monitor ,motherboard ,SMPS,Hard disk,RAM Power cod SATA Cable	Entrepreneutship, Application of science, Job oriented Concept, Asthetics value to Lab, Real Time Simulation of a Computer Hardware.	Understanding the concept of computer hardware Proficiency in using computer hardware and equipment ,Familarity with block diagrams and operating principles	As per the schools requirement and availability of fund
Basic Electronic Kit	Introduction to components such as multimeters, motors, switches, LEDs, and capacitors, Resistor, batery etc.	Electronics, Construction, Presentation and STEM skills	Introduction of hands-on projects like LDR-based street lights, fire alarms, car seat belt circuits, and refrigerator/washin g machine door circuits. Activities on resistor and capacitor combinations and logic gates enhance understanding of circuit design.	As per the schools requirement and availability of fund
Electronic for fun and creativity	Progression towards industry-aligned approach to bolster skills for industry-ready projects on Breadboard. Introduction to electrical components like transistors, diodes, IC555, and sensors like LDR etc.	Practical Application of Theory, Design, Innovation creativity and adaptability to Industrial practices.	LED matrix displays for visuals, temperature-adjusting fans and sound- triggered alarms, combining visual, temperature-based regulation, and auditory alert systems, Safety-focused experiments and touch-responsive LEDs	As per the schools requirement and availability of fund

Sensor Based Interactive Projects	Hands on experience and projects using different sensors and controllers, arduino nano,Ultrasonic	Practical Application of Sensors, Design, Innovation creativity and adaptability to Industrial practices.	Smart Dustbin ,Smart Irrigation , RFID- based Door Locking System for security and a Temperature Humidity Indicator	As per the schools requirement and availability of fund

	sensor , PIR sensor,moisture sensor ,RFID senosor.		for environmental monitoring.	
IOT based Projects	Introduction to IOT based projects using arduino nano, communication module like Node Mcu, Ultrasonic sensor , PIR sensor and Basics of embedded C coding.	Practical Application of IOT, Design, Innovation creativity and adaptability to Industrial practices, Industry Focus 4.0	Home automation, Motion detection, Smart display, and Touch-responsive Automatic Night lights.	As per the schools requirement and availability of fund
Pre planned Navigated Vehicle	Activity related to sensors such as Ultrasonic sensors, learn about motors, and understand how to integrate them with Arduino using motor drivers. Introduction to Mechatronics	Practical Application of Robotics, Coding, Design, Innovation creativity and adaptability to Industrial practices. 21st Century skills, Data Science, AI, ML skills	Dedicated path following robot.	As per the schools requirement and availability of fund
Introduction to Drones	Drone Assembly including a flight controller, motors, propellers, ESCs, batteries, frame, GPS module, telemetry system, and optionally, a camera.	Practical Application of Theory, Design, Innovation creativity and adaptability to Industrial practices, 21 st Century Skills	Assembly of Drone .	As per the schools requirement and availability of fund
Moisture finding Rovers	Rover having moisture and temperature sensor.	Space, Design, Innovation creativity and adaptability to Industrial practices AI, ML skills	Moisture and temperature detection robot.	As per the school's requirement and availability of fund

Design Thinking & Innovation

Mr. GIRI. CH
TGT(WE)
KV NO.1, AFA, DUNDIGAL

What is Design Thinking?

Design Thinking is a human-centered problem-solving approach that focuses on understanding the needs of users and developing creative, practical solutions. It is widely used in business, technology, education, product design, and other domains where innovation and problem-solving are essential.

Why Use Design Thinking?

Design Thinking is valuable because it:

- Solves real-world problems in a creative way
- Focuses on the needs of people rather than assumptions
- Encourages teamwork, collaboration, and innovation
- Helps develop user-friendly products, services, and systems

The 5 Key Stages of Design Thinking

1. Empathize
    - Understand users deeply through observation, interaction, and listening
    - Identify their needs, motivations, and challenges
2. Define
    - Clearly articulate the problem statement based on insights from the Empathize stage
    - Focus on specific user needs rather than general assumptions
3. Ideate
    - Brainstorm a wide range of possible solutions
    - Encourage creative, unconventional ideas — there are no wrong ideas at this stage
4. Prototype
    - Build quick, low-cost models or versions of potential solutions
    - Test ideas in a tangible form to see how they might work in reality
5. Test
    - Share prototypes with real users and collect feedback
    - Refine and improve solutions based on user responses and insights

What is Innovation?

Innovation is the process of creating new or improved ideas, products, or ways of doing things.

- Design Thinking fuels innovation by providing a structured method for human-centered problem-solving
- It encourages organizations and individuals to think differently, test ideas, and implement solutions that meet real needs

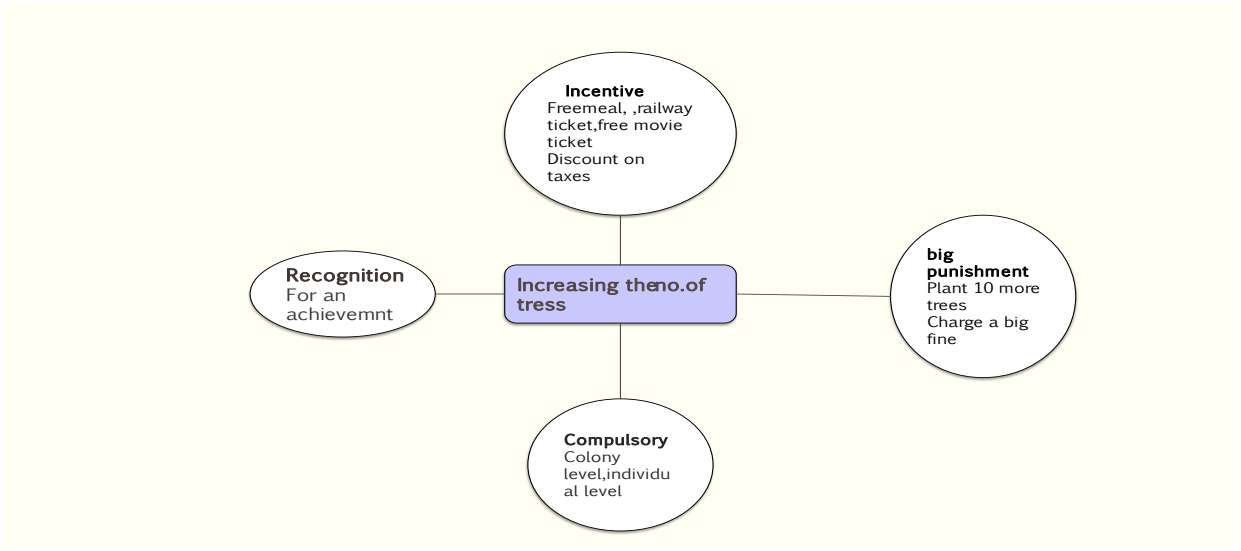
Random Thinking vs Frame-Based Thinking

- Frame-Based Thinking:
  - A frame is like a window in your mind through which you view a problem or situation
  - Ideas are generated within a frame, providing a structured lens for creativity
  - The more frames you explore, the greater the diversity and number of ideas
  - Shifting frames helps you approach a problem from different angles, leading to innovative solutions
- Random Thinking:
  - Ideas appear without structure or context
  - May produce creative sparks but lacks focus and systematic application

Examples of Design Thinking in Innovation

- Approaching a challenge by shifting frames to see the problem from multiple perspectives
- Using empathy-based insights to generate user-centered products
- Rapidly prototyping ideas to test feasibility and usability
- Iteratively refining solutions based on user feedback

Key Insight: The more frames you explore, the higher the chance of generating unique, practical, and effective ideas.



Design Thinking vs Traditional Problem Solving

Design Thinking	Traditional Approach
User-focused	Problem-focused
Creative ideas	Practical only
Iterative steps	Linear steps
Involves testing	No feedback loop

Conclusion

Design Thinking is a powerful method to drive innovation. It's not just for designers — anyone can use it to solve problems creatively and make things better for people.

IMPLEMENTATION TECHNIQUES & STRATEGIES IN CLASSROOM TRANSACTIONS

Mr. A RAJENDER
TGT(WE)
KV, GHATKESAR.

1. Empathy Mapping Activities

Strategy: Encourage students to see problems from others' perspectives.

- Use storytelling, role play, or interviews.
- Example: Ask students to step into the shoes of a farmer, customer, or teacher and identify their daily challenges.

  Outcome: Builds empathy, communication, and strong observation skills.

◇ 2. Define the Problem Clearly

Strategy: Help students narrow broad issues into a clear, actionable problem statement.

- Use "How Might We" questions.
  - Example: *"How might we make our school cleaner?"*

    Outcome: Develops critical thinking and focuses students on achievable solutions.

◇ 3. Brainstorming Sessions

Strategy: Create space for free, creative thinking in groups.

- Set a time limit (e.g., 10 minutes).
- Use sticky notes, whiteboards, or digital tools (Jamboard, Padlet).
- Rule: No judging ideas at this stage.

  Outcome: Encourages divergent thinking and collaborative teamwork.

◇ 4. Prototyping with Simple Materials

Strategy: Promote hands-on learning through low-cost models.

- Materials: Paper, cardboard, clay, straws, etc.
- Example: Build a model of an eco-friendly house or design a mobile app on paper.

  Outcome: Transforms abstract ideas into tangible, testable forms.

◇ 5. Peer Testing & Feedback

Strategy: Allow students to test prototypes and get feedback.

- Conduct peer review sessions or mini-presentations.

- Ask guiding questions:
  - *What worked well?*
  - *What can be improved?*

    Outcome: Strengthens constructive criticism and supports iterative learning.

◇ 6. Integrating Design Thinking Across Subjects

- Science: Solve environmental or health problems with creative solutions.
- Math: Use real-life data for problem definition and solution building.
- Social Studies: Design community improvement plans.
- Language: Create awareness campaigns or presentations.

  Outcome: Promotes cross-curricular learning and real-world application.

◇ 7. Reflective Thinking & Journaling

Strategy: Encourage students to reflect after each session.

- Prompts:
  - *What did you learn today?*
  - *What would you do differently?*
  - *How did your thinking change?*

    Outcome: Develops self-awareness, metacognition, and lifelong learning skills.

◇ 8. Group Dynamics & Role Allocation

Strategy: Assign clear roles in teamwork.

- Example roles: Leader, Researcher, Recorder, Presenter.

  📌 Outcome: Builds responsibility, leadership, and effective collaboration.

Technique	Purpose	Outcome
Empathy Mapping	Understand user needs	Develops empathy
Define Problem	Focus learning	Clear goals
Brainstorming	Spark creativity	Many solutions
Prototyping	Try out ideas	Visual, hands-on learning
Testing & Feedback	Improve designs	Peer learning
Subject Integration	Relevance	Deep engagement
Reflection	Self-evaluation	Critical thinking

AI TOOLS FOR ENRICHING SKILL EDUCATION

Mr. S. Vijaya Kumar
TGT(WE)
KV, IRLAPADU

NEP 2020 Vision on Skill Education

- Emphasis on 21st-century skills: critical thinking, creativity, problem-solving, and digital literacy.
- Integration of vocational education and technology-enhanced learning from early grades.
- Promotion of experiential and project-based learning.

AI Tools that Support Skill Education

1. Pictory.AI

For: Video Creation & Communication Skills

- Converts text into engaging videos
- Useful for student projects, storytelling, digital presentations
- Enhances creativity and content communication

2. Canva AI / Magic Write

For: Design Thinking & Visual Literacy

- AI design suggestions for presentations, posters, infographics
- Promotes digital art, design skills, and visual communication

3. Scratch (with AI Extensions)

For: Coding & Logical Thinking

- Drag-and-drop programming platform
- AI extensions allow basic machine learning projects
- Ideal for middle school coding education

4. Teachable Machine by Google

For: Machine Learning Awareness

- Allows students to train their own image, sound, or pose models
- Introduces real-world AI concepts in a playful way
- Can be used in STEM and computer science clubs

5. TinkerCAD + AI Design Tools

For: 3D Design, Innovation, Prototyping

- Used for basic 3D modeling and electronics simulations
- Fosters product design and engineering skills

6. ChatGPT / AI Assistants

For: Language, Research & Creative Writing

- Helps with idea generation, content writing, learning support
- Encourages independent thinking and curiosity
- Used under guided supervision for safe, ethical AI use

7. Flip (by Microsoft) + AI Integration

For: Public Speaking & Expression Skills

- Students record video responses to topics
- Teachers can prompt reflective thinking, debate, presentations

8. Notion AI / Eduaide.AI

For: Personalized Learning & Productivity

- Organizes learning content, projects, notes
- Helps teachers prepare innovative learning resources

Implementation Strategies in KVS

Strategy	Description	Example
Project-Based Learning	Use AI tools in real-world projects	Create a video on climate change using Pictory
Blended Learning	Combine classroom and AI tools	Use Teachable Machine during science lab
Skill Labs / Clubs	Weekly sessions for hands-on AI learning	Coding Club with Scratch & AI modules
Peer Collaboration	Group work with shared tools	Canva presentations or Flip debates
Teacher Training	Capacity-building in AI use	KVS ZIET workshops on educational AI tools

Alignment with KVS and NEP Goals

- Multidisciplinary learning
- Integration of technology in pedagogy
- Focus on creativity, problem-solving, and communication
- Inclusion of coding and AI awareness from Class 6 onward
- Promotes “learn by doing” philosophy

Suggested Activities for Students

- Make a video biography using Pictory.ai
- Train a mini AI with Teachable Machine
- Design a campaign poster in Canva
- Build a game with AI elements in Scratch
- Record a viewpoint video on Flip

Conclusion

By incorporating AI tools into skill education, Kendriya Vidyalayas can meet the futuristic vision of NEP 2020 — creating learners who are not just academically sound, but digitally empowered, creative, and future-ready.

INTRODUCTION TO SCRATCH PROGRAMMING AND HANDS PRACTICE

Mr. U. Ganapathi
TGT(WE)
KV, Ananthapur

Introduction to Scratch Programming & Hands-On Practice

Scratch is a block-based visual programming language developed by MIT, designed to teach kids (ages 8-16) coding fundamentals in a fun, interactive way. It helps develop computational thinking, creativity, and problem-solving skills through game and animation creation.

1. Getting Started with Scratch

Step 1: Access Scratch

- Visit scratch.mit.edu
- Click "Create" to start a new project.
- No login is needed, but creating an account saves projects.

Step 2: Understand the Scratch Interface

- Stage: Where your animations/games appear.
- Sprite List: Characters/objects in your project.
- Blocks Palette: Coding blocks (Motion, Looks, Sound, Events, etc.).
- Script Area: Where you drag and snap blocks to create code.

https://scratch.mit.edu/images/editor/en/editor.png

2. Basic Scratch Concepts

A. Motion & Movement

- Use "Move 10 steps", "Turn 15 degrees", "Go to x: y:" blocks.
- Example: Make a cat move forward and bounce off edges.

scratch

when green flag clicked

forever

  move 10 steps

  if on edge, bounce

B. Events & Controls

- "When green flag clicked" (Starts the program).
- "When key pressed" (Interactive controls).
- Example: Move the cat with arrow keys.

scratch

when [right arrow v] key pressed

  point in direction (90)

  move 10 steps

C. Looks & Animation

- Use "Say Hello for 2 secs", "Switch costume", "Change size".
- Example: Make a sprite talk and change costumes.

scratch

when green flag clicked

forever

  switch costume to [costume1 v]

  wait 1 second

  switch costume to [costume2 v]

  wait 1 second

D. Sound & Music

- Use "Play sound meow", "Start sound", "Change tempo".
- Example: Play a sound when a sprite is clicked.

scratch

when this sprite clicked

  play sound [meow v] until done

E. Variables & Conditions

- Create variables (e.g., "Score") for games.
- Use "If-then", "Repeat", and "Forever" loops.
- Example: A simple scoring system.

scratch

when green flag clicked

set [score v] to 0

forever

  if <touching [apple v]?> then

```
  change [score v] by 1
  play sound [pop v]
end
```

3. Hands-On Practice Projects

Try these beginner-friendly projects:

Project 1: Animated Storytelling

- Goal: Create a short story where sprites move and talk.
- Skills Used: Motion, Looks, Events.

Project 2: Maze Game

- Goal: Use arrow keys to navigate a sprite through a maze.
- Skills Used: Controls, Sensing (if touching wall, go back).

Project 3: Interactive Quiz Game

- Goal: Ask questions and give feedback based on answers.
- Skills Used: Variables, Conditions, Broadcasting.

Project 4: Pong Game (2-Player)

- Goal: Create a simple ball-and-paddle game.
- Skills Used: Motion, Collision detection, Score tracking.

4. Advanced Scratch: Adding AI & Extensions

Scratch supports AI and machine learning through extensions:

- Text-to-Speech: Make sprites talk.
- Translate Extension: Convert text between languages.
- LEGO Mindstorms: Control robots with Scratch.

Example: Voice-controlled sprite

scratch

when [listen v] button clicked

set [speech v] to (listen and wait)

if <(speech) = [move]> then

  move 20 steps

5. Resources for Learning Scratch

- Official Scratch Tutorials: scratch.mit.edu/ideas
- Scratch Cards (Printable Guides): scratch.mit.edu/cards
- Scratch Projects Gallery: scratch.mit.edu/explore

STEAM INTEGRATED WITH VOCATIONAL EDUCATION

Mr. A RAJENDER
TGT(WE)
KV, GHATKESAR

Integrating STEAM with Vocational Education in Kendriya Vidyalayas (KVs) as per NEP 2020
The National Education Policy (NEP) 2020 emphasizes experiential learning, skill development, and vocational education from an early age. Kendriya Vidyalayas (KVs), being a central part of India's schooling system, must align with this vision by integrating STEAM (Science, Technology, Engineering, Arts, and Mathematics) with Vocational Education to prepare students for future careers.

1. NEP 2020 & Vocational Education in Schools
Key Directives:

✓ Vocational Education from Class 6 onwards (with internships).

✓ Blending academics with practical skills (STEAM + Vocational).

✓ Partnerships with industries, local artisans, and ITIs.

✓ Focus on AI, Coding, Robotics, Design, and Soft Skills.

Vocational Subjects Suggested for KVs (CBSE-aligned):

- AI & Coding (Python, Scratch, Data Science)
- Robotics & IoT (Arduino, Raspberry Pi)
- Design & Multimedia (Graphic Design, 3D Printing)
- Agri-Tech & Green Skills (Sustainable Farming, Hydroponics)
- Healthcare & Wellness (Basic Nursing, Yoga, Nutrition)
- Entrepreneurship & Finance (Digital Marketing, Banking)

2. How to Integrate STEAM with Vocational Education?

A. Project-Based Learning (PBL) Approach

- Example 1: Smart Agriculture (AI + Agri-Tech)
  - Use sensors (IoT) to monitor soil moisture.
  - Analyze data with Python/Excel (Data Science).
  - Design a low-cost farming tool (Engineering + Arts).
- Example 2: Robotics & Automation
  - Build a waste-segregating robot (EVS + Robotics).
  - Program it using Scratch/Arduino (Coding).

B. Maker Spaces & Tinkering Labs

- Atal Tinkering Labs (ATLs) can be used for:
  - 3D Printing (Design & Prototyping).
  - AI-ML experiments (Teachable Machine, Google AI Experiments).
  - Electronics & Drone Making.

C. Collaboration with Industries & Local Experts

- MoUs with ITIs, NSDC, and Local Businesses for hands-on training.
- Guest Lectures by engineers, artists, and entrepreneurs.

D. AI & Digital Tools for Vocational Skills

Skill	AI/Digital Tools
Graphic Design	Canva, Adobe Express
Coding	Scratch, Code.org, Python
AI & Data	Google Teachable Machine, IBM Watson
Robotics	LEGO Mindstorms, Tinkercad Circuits

3. Implementation Strategy for KVs

Phase 1: Teacher Training & Curriculum Design

- Workshops on STEAM-Vocational integration (NISHTHA, NCERT).
- CBSE's 'Hubs of Excellence' for vocational training.

Phase 2: Student Engagement

- Vocational Clubs (Robotics Club, AI Club, Design Studio).
- Hackathons & Exhibitions (Science Fair + Skill Demo).

Phase 3: Industry & Community Connect

- Internships with local businesses (e.g., IT firms, hospitals).
- Apprenticeships under artisans (pottery, carpentry, coding).

4. Expected Outcomes

- Job-ready skills by Class 12.
- Innovation & Problem-solving mindset.
- Entrepreneurship opportunities (Startup India linkage).
- Reduced skill gap as per India's NEP 2020 goals.

Conclusion

By integrating STEAM with Vocational Education, Kendriya Vidyalayas can transform into future-ready skill hubs, aligning with NEP 2020's vision of holistic and employable education.

Next Steps for KVs:

1. Identify vocational courses based on local industry needs.
2. Train teachers in STEAM-based vocational pedagogy.
3. Set up labs (ATLs, Computer Labs with AI tools).
4. Partner with industries for real-world exposure.

HANDS ON GENERATIVE AI TOOLS

Mr. S. VIJAYA KUMAR
TGT(WE)
KV, IRLAPADU

Generative AI Tools for Schools: Enhancing Creativity & Productivity
The rise of Generative AI has opened new possibilities for education, content creation, and skill development. Below is a categorized list of powerful AI tools that can be integrated into Kendriya Vidyalayas (KVs) and other schools as per NEP 2020's focus on digital literacy, vocational training, and creative learning.

1. AI for Presentations & Content Creation
(Ideal for Teachers & Students)

Tool	Use Case	Link
Gamma.app	AI-powered PPTs & Documents (Just type & generate)	gamma.app
Canva Magic Design	Auto-generate PPTs, Posters, Infographics	canva.com
Beautiful.ai	Smart slide designs with AI suggestions	beautiful.ai
ChatGPT + PowerPoint	Generate PPT outlines & scripts using AI	openai.com

Example Classroom Use:

- Students can create project presentations in minutes.
- Teachers can automate lesson plan slides.

2. AI for Music & Songwriting
(Creative Arts & Vocational Skills)

Tool	Use Case	Link
Suno.ai	AI-generated music with vocals (Just input lyrics)	suno.ai
Boomy	Create original songs in seconds	boomy.com
Soundraw	Custom AI music for videos & projects	soundraw.io
AIVA	Compose AI-generated classical music	aiva.ai

Example Classroom Use:

- Music classes can use AI to compose school anthems.
- Students learn lyric writing & digital music production.

3. AI for Video Creation & Editing
(Digital Media & Vocational Courses)

Tool	Use Case	Link
Pictory.ai	Convert blogs/text into videos	pictory.ai
InVideo.ai	AI-assisted video editing & templates	invideo.io
Lumen5	Social media videos from text	lumen5.com
Synthesia	AI avatars for video presentations	synthesia.io

Example Classroom Use:

- Students create digital storytelling projects.
- Teachers make animated explainer videos.

4. AI for Writing & Content Generation
(Language Learning & Creative Writing)

Tool	Use Case	Link
ChatGPT	Essay writing, summaries, Q&A	openai.com
GravityWrite	SEO-friendly blogs & marketing content	gravitywrite.com
Copy.ai	Social media captions & ad copies	copy.ai
QuillBot	Paraphrasing & grammar checking	quillbot.com

Example Classroom Use:

- Helps students improve writing skills.
- Generates debate topics, stories, and reports.

5. AI for Voice & Speech Synthesis
(Language Labs & Accessibility)

Tool	Use Case	Link
ElevenLabs	Ultra-realistic AI voice cloning	elevenlabs.io
Play.ht	Text-to-speech in 100+ languages	play.ht
Murf.ai	AI voiceovers for videos	murf.ai
Amazon Polly	Cloud-based TTS (For developers)	aws.amazon.com/polly

Example Classroom Use:

- Create audiobooks for visually impaired students.
- Helps in pronunciation practice for English/Hindi.

6. AI for Graphic Design & Art
(Visual Arts & Digital Creativity)

Tool	Use Case	Link
DALL·E 3	Generate AI art from text prompts	openai.com/dall-e
MidJourney	High-quality AI artwork	midjourney.com
Deep Dream Generator	Turn photos into AI art	deepdreamgenerator.com
Adobe Firefly	AI-powered design tools	adobe.com/firefly

Example Classroom Use:

- Students design posters, logos, and book covers.
- Helps in digital art & animation projects.

How Schools Can Integrate These Tools?
Digital Literacy Programs – Teach AI tools in computer classes.
Vocational Courses – Include AI-based content creation in skill labs.
Teacher Training – Workshops on AI-assisted teaching.
Student Projects – Encourage AI-generated presentations, videos, and music.

Conclusion
Generative AI tools like Gamma, Suno.ai, Pictory, and ElevenLabs can revolutionize education by making learning more interactive, creative, and skill-based—aligning perfectly with NEP 2020's vision.

INTRODUCTION TO RASPBERRY PI AND MAKING MINICOMPUTER& USES

Mr. Ch. Giri Verma
TGT(WE)
KV No.1, RP, Dundigal

Introduction to Raspberry Pi: Building a Mini-Computer & Its Educational Uses

The Raspberry Pi is a low-cost, credit-card-sized computer that enables students, hobbyists, and professionals to learn programming, electronics, and computing in a hands-on way. It is widely used in education, robotics, IoT, and DIY projects.

1. What is Raspberry Pi?

- A single-board computer (SBC) developed by the Raspberry Pi Foundation (UK).
- Runs on Linux-based OS (Raspberry Pi OS) but supports Windows IoT, Ubuntu, etc.
- Used for coding, electronics, home automation, robotics, and more.

Popular Models:

Model	Key Features	Best For
Raspberry Pi 5 (Latest)	4GB/8GB RAM, 2.4GHz CPU	High-performance projects
Raspberry Pi 4B	2GB/4GB/8GB RAM, Dual HDMI	General computing, coding
Raspberry Pi Zero 2 W	Ultra-compact, WiFi	IoT & portable projects
Raspberry Pi Pico	Microcontroller (No OS)	Electronics & Robotics

2. How to Set Up a Raspberry Pi as a Mini-Computer?

Components Needed:

✓ Raspberry Pi board (e.g., Pi 4B)

✓ MicroSD card (16GB+) with Raspberry Pi OS

✓ Power supply (USB-C for Pi 4/5)

✓ HDMI monitor, keyboard & mouse

✓ Optional: Case, cooling fan, breadboard, sensors

Step-by-Step Setup:

1. Download Raspberry Pi OS from raspberrypi.com/software.
2. Flash OS to MicroSD using Raspberry Pi Imager (or BalenaEtcher).
3. Insert MicroSD, connect peripherals (monitor, keyboard, mouse).
4. Power on & complete setup (WiFi, username, password).
5. Start using it like a mini-PC! (Browse web, code, play games).

https://www.raspberrypi.com/documentation/computers/images/pi-desktop.jpg

3. Top 10 Educational Uses of Raspberry Pi in Schools

(Aligned with NEP 2020's Skill Education)

1. Learn Coding (Python, Scratch, C++)
   - Write & execute Python scripts.
   - Create games using Scratch 3.0.
2. Build a Retro Gaming Console
   - Install RetroPie to play classic games (Super Mario, Pokémon).
3. Home Automation with IoT
   - Control lights/fans using relays & voice commands (Google Assistant/Alexa).
4. Robotics & AI Projects
   - Build a line-following robot using sensors & Python.
   - Run OpenCV for face recognition.
5. Weather Station (Science Project)
   - Use temperature & humidity sensors to log data.
6. Network & Server Hosting
   - Create a personal cloud server (NextCloud).
   - Run a WordPress website.
7. Digital Art & Music
   - Code LED matrix animations (using Sense HAT).
   - Make electronic music with Sonic Pi.
8. Cybersecurity Learning
   - Set up a VPN or firewall.
   - Experiment with ethical hacking tools (Kali Linux).
9. AI & Machine Learning
   - Run TensorFlow Lite for object detection.
   - Train ChatGPT-like models (LLMs).

10. Low-Cost Computer Lab

- Replace desktop PCs with RPi thin clients.

4. Sample School Projects Using Raspberry Pi

Project	Skills Learned	Components Needed
Smart Attendance System (Face Recognition)	Python, OpenCV, AI	Pi Camera, OpenCV
Voice-Controlled Home Light	IoT, Electronics	Relay module, Google Assistant
School Weather Monitor	Data Science, Sensors	DHT11 sensor, Python
Obstacle-Avoidance Robot	Robotics, Coding	Ultrasonic sensor, Motors
Pi-hole (Ad Blocker)	Networking, Linux	Raspberry Pi, Ethernet

5. Why Raspberry Pi in Kendriya Vidyalayas?

Low-cost alternative to PCs (₹3,000–6,000 per unit).

Hands-on STEAM learning (NEP 2020 & Atal Tinkering Labs).

Prepares students for future tech careers (AI, IoT, Robotics).

Encourages innovation & problem-solving.

Conclusion

The Raspberry Pi is a powerful yet affordable tool for schools to teach coding, electronics, AI, and IoT in an interactive way. By integrating it into KVs' vocational curriculum, students can gain 21st-century skills aligned with NEP 2020.

ATL CONCEPTS AND ESTABLISHMENT

Mr. A Rajender
TGT(WE)
KV, Ghatkesar

Point in brief:

- General Concepts followed before ATL:
  - PBL
  - STEM
  - NCSC
  - Prototypes
  - Products - Employability skills (SUPW / WE Now in Vocational.Education)
- Success story:
  - https://www.youtube.com/feed/downloads
  -
  - https://photos.app.goo.gl/gjP8BF8zupnVxv8XA
  -
- ATL Concepts:
  - Solving problems with unique solutions.
  - Ideas into Reality.
  - Marathons.
  - Student Innovation Program (Support by Atal Innovations Mission with mentors in incubation centres)
  - Productivity - Investors Pitch etc.

Student Innovation Council.

- Encouraging and motivating students

GLORIOUS MOVEMENTS"

1. Our project won in Atal Innovation Marathon-2019 by a team of students (named as Poton +ve). The project video submitted for Marathon-2019 is available at: https://youtu.be/DbMRB2nJE6Q. Winning information is published in Atal Innovation Mission website https://aim.gov.in/ATLMarathon2019Announcement.pdf and also kept back up file at https://drive.google.com/file/d/1lz1igcFlrXQHoPjeNerD3WZUbhKLWM7H/view?usp=sharing

2. They have got selected for Student Innovation Program-3.0 to be held for 45 days by Atal Incubation Centre - MIT ADT Incubator Forum, (Supported by Atal Innovation Mission, NITI Aayog, Govt. of India), MIT ADT University Campus, Rajbaug, Loni, Pune-412201, MH, India, Web : www.aic.mituniversity.edu.in

- Marathon:
  - https://youtu.be/DbMRB2nJE6Q
  - https://photos.app.goo.gl/BaTMAtb8N3k1oDfx5

Setting up of Lab:

- Area of Lab: 1500 SFT required to apply for ATL as per AIM norms.
- Procurements:
  - a. P1 - Electronics Development, Robotics, Internet of Things, and Sensors
  - b. P2 - Rapid Prototyping Tools
  - c. P3 - Mechanical, Electrical, and Measurement tools
  - d. P4 - Power Supply, Accessories and Safety equipment
- Work stations:
  - Soldering Workstation.
  - Mechanical Workstation
  - Programming.
  - Working Tables for preparing projects and products by various teams.
- ATL INAUGURAL - KV1, UPPAL: https://photos.app.goo.gl/z9LPFori1BjYrSM59
- PARTICIPATION AT SCIFEST, IIIT BASARA: https://photos.app.goo.gl/792YY4kVGs2jMViw7
- ANNIVERSARY CELEBRATIONS: https://photos.app.goo.gl/gjP8BF8zupnVxv8XA

Under the National Education Policy (NEP) 2020, Kendriya Vidyalayas (KVs) have been conducting “Bagless Days” as part of efforts to make education more engaging, holistic, and experiential. The 10 Bagless Days initiative is aligned with NEP 2020’s focus on reducing rote learning and integrating skill-based and experiential learning into the curriculum.

What are “Bagless Days”?

Bagless Days are school days when students do not carry school bags and instead participate in skill-based, creative, and activity-oriented learning sessions. These days are meant to:

- Break the monotony of textbook learning.

- Foster creativity, collaboration, and life skills.
- Promote vocational education, sports, arts, and hands-on activities.

Objectives of 10 Bagless Days in KVs under NEP 2020

1. Implement NEP 2020 recommendations for experiential learning.
2. Introduce students to vocational education and real-life skills.
3. Reduce stress and encourage joyful learning.
4. Create a multi-disciplinary and holistic learning experience.

Activities Conducted During Bagless Days

Each Kendriya Vidyalaya designs its own schedule, but common activities include:

Theme/Area	**Example Activities**
Vocational Skills	Pottery, carpentry, gardening, cooking
Creative Arts	Drama, music, dance, painting
Science Experiments	DIY projects, STEM kits, eco-friendly models
Sports & Fitness	Yoga, martial arts, indigenous games
Life Skills	First aid, traffic rules, basic finance
Environmental Awareness	Plantation drives, clean-up activities, sustainability projects

Implementation Strategy

- Scheduled across the academic year: Schools plan 10 non-consecutive Bagless Days.
- Activities are age-appropriate and conducted from Classes 6 to 12.
- Local resource persons and artisans are often invited to demonstrate real-life skills.

Documentation & Sharing

- Schools often document these days through photos, videos, and reports.
- Activities are shared with parents and uploaded to school websites.
- Best practices are compiled by KVS HQ for future reference.

Key Benefits

- Encourages active participation and self-expression.
- Builds confidence and practical knowledge.
- Supports multi-disciplinary learning as emphasized by NEP 2020.

SUGGESTIVE ACTIVITIES IN THE FOLLOWING AREAS BY TGT(WE):
2025-26 onwards:

1. ATL ACTIVITIES FOR CLASS VI MONTH WISE

S NO	MONTH	ACTIVITIES CONDUCTED
1	JULY	MAKE STUDENTS AWARE OF BASIC MATERIAL USED IN ATL LAB AND LET THEM TEACH BASIC THING 1. JUMPER WIRE, LED, BATTERY, BREADBOARD, DC MOTOR, RESISITOR, CAPACITOR, SWITCH LET THEM TEACH TO HOW TO CONNENT THESE COMPONENT ON BREADBOARD.
2	AUGUST	INTRODUCING THEM TO TINKER CAD SOFTWARE.
3	SEPTEMBER	1. MAKING A LED GLOW USING JUMPER, RESISTOR, WIRE AND BATTERY ON BREADBOARD. MAKE SURE EACH STUDENT IS ABLE TO IT BY HIMSELF.
4	OCTOBER	2. TRAFFIC LIGHT SYSTEM WITHOUT USING ARDUINO.
5	NOVEMBER	3. SMALL HELICOPTER MODEL USING DC MOTOR.
6	DECEMBER	4. INTRODUCTION OF POTENTIOMETER AND USING IT CONTROLLING INTENSITY OF LIGHT BULB.
7	JAN	5. CONTROLING SPEED OF DC MOTOR USING POTENTIOMETER.

ATL ACTIVITIES FOR CLASS VII MONTH WISE

S NO	MONTH	ACTIVITIES CONDUCTED
1	JULY	INTRODUCTION OF BLOCK CODE IN TINKER CAD
2	AUGUST	. INTRODUCTION OF IDE AND IOT AND MACHINE LEARNING.
3	SEPTEMBER	THEORY RELATED TO ADAFRUIT APP.
4	OCTOBER	1. MAKING A LED GLOW USING JUMPER, RESISTOR, WIRE AND BATTERY ON BREADBOARD. MAKE SURE EACH STUDENT IS ABLE TO IT BY HIMSELF. **USING ARDUINO**
5	NOVEMBER	2. TRAFFIC LIGHT SYSTEM WITHOUT USING ARDUINO. **USING ARDUINO**
6	DECEMBER	3. SMALL HELICOPTER MODEL USING DC MOTOR. **USING ARDUINO**
7	JAN	ASK STUDENTS TO BUILD A PROJECT BY THEMSELVES. **USING ARDUINO**

ATL ACTIVITIES FOR CLASS VIII MONTH WISE

S NO	MONTH	ACTIVITIES CONDUCTED
1	JULY	INTRODUCTION OF TEXT CODE IN TINKER CAD
2	AUGUST	INTRODUCTION OF MECHANICAL TOOLS
3	SEPTEMBER	DIFFERENT KINDS OF CONSUMABLE AND NONCONSUMABLE MATERIAL REQUIRED AND THEIR USES.
4	OCTOBER	BASIC DEFINITION OF IOT ,MACHINE LEARNING, AND AI.
5	NOVEMBER	INTRODUCTION OF SOFTWARE LIKE ADAFRUT.
6	DECEMBER	INTRODUCTION OF POTENTIOMETER AND USING IT

		CONTROLLING **USING ARDUINO** INTENSITY OF LIGHT BULB.
7	JAN	CONTROLING SPEED OF DC MOTOR USING POTENTIOMETER. **USING ARDUINO**

ATL ACTIVITIES FOR CLASS IX MONTH WISE

S NO	MONTH	ACTIVITIES CONDUCTED
1	JULY	INTRODUCTION OF DIFFERENT MODULE AND SENSOR
2	AUGUST	BUZZER SENSOR PROJECT
3	SEPTEMBER	BLUETOOTH MODULE PROJECT
4	OCTOBER	ULTRASONIC SENSOR PROJECT

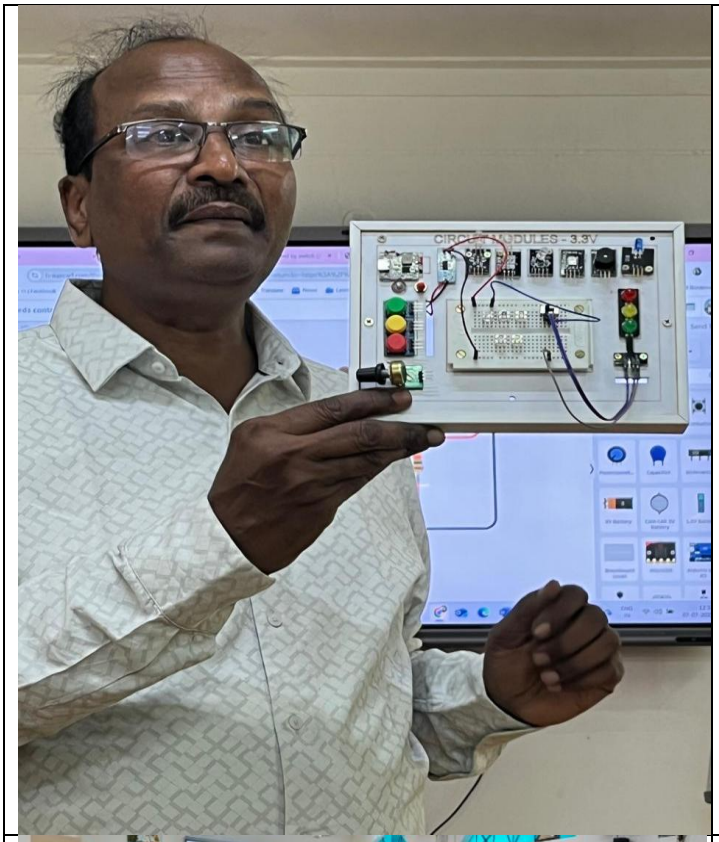
ATL ACTIVITIES FOR CLASS X MONTH WISE

S NO	MONTH	ACTIVITIES CONDUCTED
1	JULY	TRAFFIC SENSOR PROJECT
2	AUGUST	LINE FOWLLOWING ROBOT
3	SEPTEMBER	RADAR PROJECT

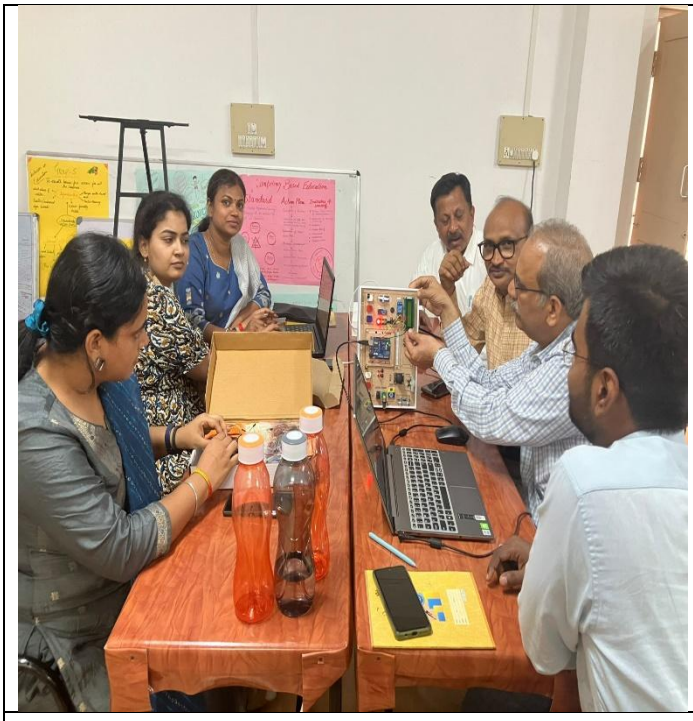
MADE BY **: A SEETHARAM (K V MAHABUBNAGAR)**

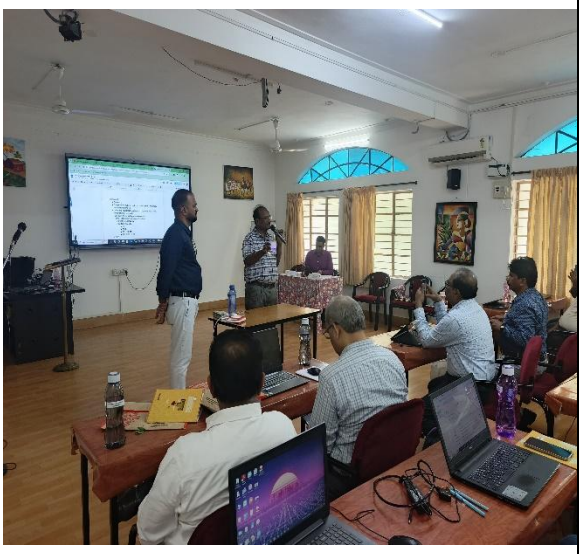
: KAMALESH KUMAR (K V NIZAMABAD)

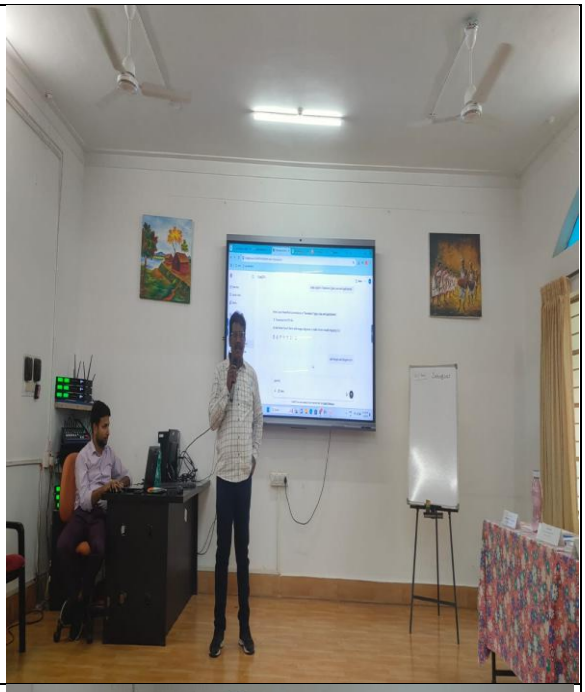
For all digital documents of PPT/PDF/ others are available here:
https://drive.google.com/drive/folders/1bG1wjAU4IX7TpfDIsbCBitucQ6jwb2kK?usp=sharing

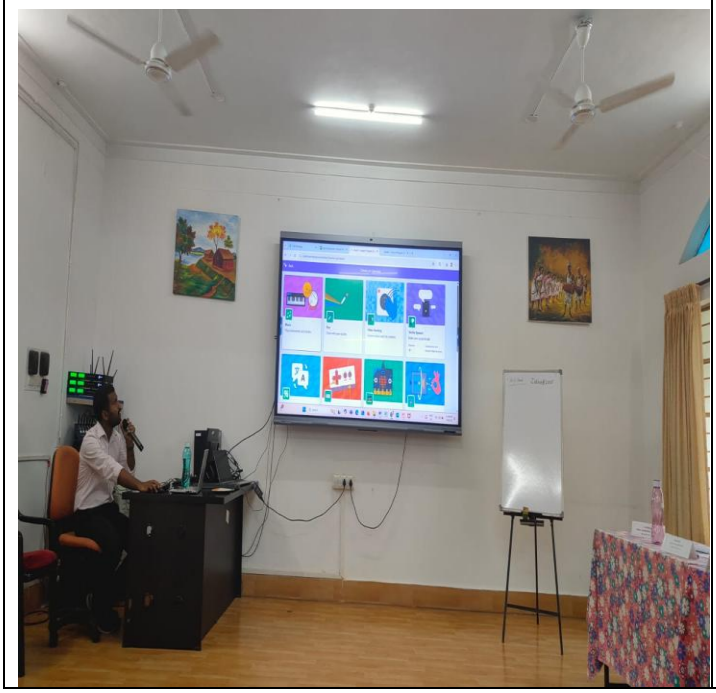

CIRCUIT MODULES - 3.3V

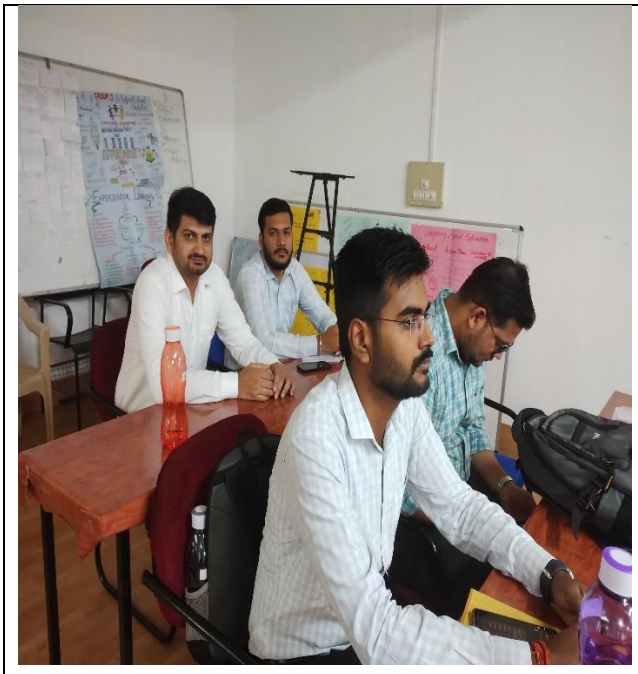

ARDUINO



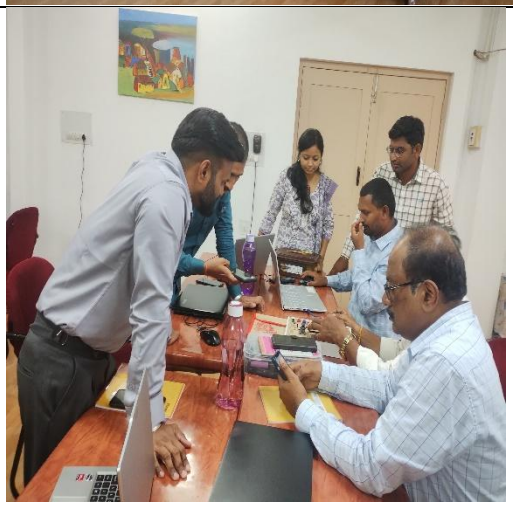




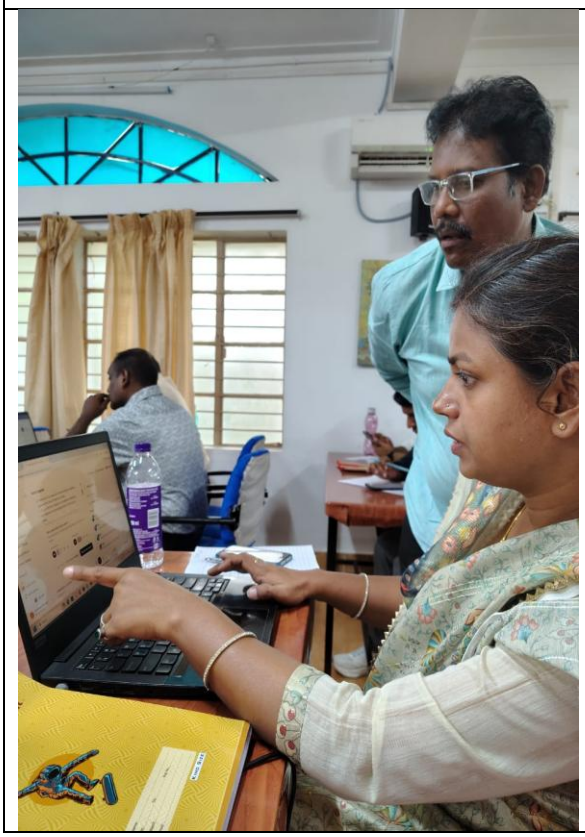





K. SRINIVASA RAO,
KV ONGOLE



DAY – 4




Raspberry Pi - Setup


Ms. MENAXI JAIN
DC & DIRECTOR
ZIET MYSURU
&
COURSE DIRECTOR


Teacher Training &
Coordination


Integrating Vocational
Education with AIL & STEAM

Editorial Board with Course Co-ordinator, ACD, Resource Persons