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*Shaping Lives...
Empowering Communities...*

Best Practices For Quality Education



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Best Practice 1: Community Action Learning Program (CALP)

1.1. Objectives of the Practice

The concept stems from a core belief and conviction that an institution is part of the larger community and everything students learn should connect and contribute to a social impact. In pursuance of the UN Sustainable Development Goals, the University proactively aligns all its teaching and learning activities to accomplish the same.

Students with active support from teachers are required to reach out to local communities and put into practice the learning, knowledge and skills acquired in the University campuses to identify and address day to day problems of communities within which it exists. This program additionally helps students to develop a sense of responsibility for community, engagement through communication, strategic planning, innovative approach for problem solving, team spirit, etc, thus building confidence to be a productive citizen of the World.

1.2. The Context

The contextual framework for this practice would require a deeper understanding of the communities within which the University functions and the students' profile that the University attracts.

The University operates in some of the most difficult geographies (Prime Minister's aspirational districts, previously left-wing extremist districts with some of the most marginalized and disadvantaged demographic segments. These locations, with a varied range of development challenges and prone to natural disasters, provide an ideal platform for the University.

A key challenge faced was, firstly, to integrate appropriate and relevant skills into the education system at different levels and secondly, that of taking a heterogenous mix of students with varied beliefs, learning foundations, languages, attitudes and interests and get them to work closely together in reaching out to the community and build sustainable relationships and interventions.

1.3. The Practice

1.3.1. Context:

The Indian education system is much maligned for its theoretical focus and lack of industry and real world connect. The obsession of parents and society at large with narrow career paths of engineering/ medical/ banking/ UPSC etc. as being the only hope limits the students' world view. It then becomes the responsibility of the Higher Education Institutions to transform their intake of disinterested students based on the curricula that does not equip them with real world skills needed to navigate the modern workplace and gainful engagements post the education.

The students have no context of the kind of jobs/ entrepreneurship opportunities that are available in the economy and simply associate rural jobs with farming and urban jobs with factories, banks, call centers or malls etc. The services sector contributes to over 55% of our economy and provides tremendous employment opportunities. This context is missing in education and the CALP is aimed at helping students build the capacity, competency and confidence build to go beyond the curricula to identify real world problem solving and entrepreneurial opportunities.

1.3.2. Objective:

Students are required to reach out to local communities around the campus or go back to their hometowns/ villages to find a problem to adopt as a project that could qualify to be part the learning cycle. The exercise builds a sense of pride in giving back to the community, to be innovative, creative and imaginative and hones softer skills such as confidence, communication skills, negotiation skills etc. in students.

1.3.3. Sample of Program Design:

1st Year students are assigned a role of volunteers or observers. Students of 2nd, 3rd year can form interdisciplinary groups and take up Project designing, coordination and implementation. The group size may vary between 2 and 5 members. Each group is required to select a Team Leader and designated photographer/ videographer. The team had the autonomy to discuss and debate the final idea and prepare an action plan. A mentoring team consisting of experienced faculties provided support. The final submission included documents to capture their experience through posters/ presentations and videography. The final presentations were done in an exhibition mode at the end of the semester and all the projects were viewed by the CUTM senior management team.

Some of the examples were door-to-door home appliance maintenance and repair in the nearby communities; providing maps of homestead land through surveys; awareness generation on environmental cleanliness, personal hygiene and sanitation through the Adarsh gram (model village) project; working with farmers in rural areas on agricultural knowledge and practice; Waste to wealth where farm or household waste is converted to products, community health camps, solar grid installations, elderly care and engagement at old age homes etc.

1.3.4. Constraints:

Another key challenge faced was to integrate appropriate and relevant skills into the education system at different levels and secondly, taking a diversity of students with varied beliefs, learning foundations, languages, attitudes, and interests and get them to work closely together in reaching out to the community and build sustainable relationships and interventions.

1.4. Evidence of Success

This program was initially rolled out on a pilot basis for the Polytechnic or Diploma Engineering students and there was plenty of evidence of success of the initiative through formal student feedback, community feedback and the photo/ video documentation done by the students.

The final submissions included:

- A poster for public presentation,
- A 2 minute video documentary
- Plan of action to scale up the idea
- Institutionalizing a Club or Society or Start-up venture
- Connect more people to the idea and help it grow

The experience resulted in the University to develop Teaching and Learning linked live production labs at commercial scale with all required approvals through its Social Enterprise Entity Gram Tarang within the University Campuses e.g

- Transformer Repair and Production Lab
- Battery Operated Vehicles
- Community Diagnostic Centre





Excerpts of Community Engagement

1.5. Certificates / Appreciation

Certificate of appreciation were awarded to all successfully implemented projects. Teams with Best Projects were awarded and supported further to upscale and supported to apply for different fellowships (e.g.; Gandhi fellowships, Young India Fellowship, Azim Premji Fellowships) or academic programs. Best video documentaries were highlighted in the social media page of the University.

Some of the student feedback received were: ‘Great to get out of the classroom and campus’, ‘interesting to see that simple things like water and electricity are so difficult here’, ‘fantastic learning’, ‘a new perspective’, ‘outstanding experience’. A sample community feedback was: ‘Free electrical appliance repair drive done by students was truly unexpected. Even the government does not do so much for us’.

1.6. Problems Encountered and Resources Required

At the outset there was no budgetary provision for community engagement and travelling to the local community had costs associated with it. Projects undertaken also required resources, material etc. Since budgetary provision was not envisaged at the outset of the program, it almost became a non-starter. However, the students stepped up and decided to self-fund and crowd fund their initiatives which was very heartening to see.

Another challenge faced was from the parents who were uncomfortable with their wards, especially girls, travelling into unknown territory and communities. The security risk was of concern to the University as well and required planning, this was resolved by restructuring of the groups to ensure male/ female mix, being initially accompanied by a mentor and ensuring that approval for field trips was taken in advance.

1.7. Notes

Information regarding Institutional Values and Best Practices which the university would like to include.

- CUTM has been cited in the Best Practice Report of NITI Aayog as the only Best Practice from the State of Odisha and only University to get the mention.
- CUTM was selected as a Center of Excellence by the Ministry of Skill Development & Entrepreneurship, Govt. of India and as an awarding body for skill based certification on the back of the student , community & industry engagement models adopted at the University
- The Rama Devi Women University, Odisha and Govt. of Odisha signed agreement with CUTM to deliver skill courses to their students and set up labs as per the SOP of CUTM



Best Practice 2: GO TO MARKET

New Product Development Process spanning Ideation, Design and Concept Development, Simulation and Testing, Prototype development, Market Assessment, Commercialization.

2.1. Objectives of the Practice

While technology is creating many unicorns and attracting talent, CUTM remains committed to ensuring that the manufacturing sector gets a steady stream of skilled engineers, diploma engineers, business graduates, ITI graduates and skilled workers. GO TO MARKET (LAB TO MARKET) program is designed to equip students with necessary skills that span the product development process which was absent in the traditional theory-based curricula. This typically follows a 7 step process and can also be leveraged for the services sector and IT based products. Entrepreneurship is another core principle and students are encouraged to create businesses based on products or services with adequate training on the commercialization aspects of product development.

2.2. The Context

The traditional departmental structures of Engineering education compartmentalizes the curriculum into rigid streams of mechanical, electrical, electronics, civil etc. In the real world, products developed require a multi-disciplinary approach and there is a particular lifecycle that product development follows which includes design, simulation, testing, prototype development, market scan, commercialization.

The traditional curriculum does not address these issues and therefore the labs available are designed for the traditional curricular structure and equipped with traditional practices like smithy, workshop filing and only reductive manufacturing. The modern industrial workplace engages high precision CNC machines and 3D printers, high resolution scanners and requires functional knowledge of programming, logic controllers and mechatronics. Software are available to design, simulate and develop 3d twins of factories which reduce the cycle time of converting a concept into reality. Real-time hospital environment is in operation as part of blended and hybrid learning.

The students entering the modern workplace need to be equipped with these skills and competencies along with an understanding of the commercialization aspects.

2.3. The Practice

2.3.1. Context:

A unique multidisciplinary multiple credit specialization has been introduced into the CUTM academic curricula called GO TO MARKET (LAB TO MARKET). This course spans one semester with an additional option for students to take the product into the market in the next semester. The course especially focuses on introducing students to technologies relevant to Industry 4.0 and is structurally broken up into the key steps of product development spanning Ideation, Design and Concept Development, Simulation and Testing, Prototype development, Market Assessment, Commercialization.

2.3.2. Objective and Sample Program Design:

The objective of this best practice is to fill the gap that traditional curriculum does not address through partnerships and particularly through industry partnerships, Partnership with Dassault Systems has been established which provides students with state of the art technology and 3D experience software which allows digital product development, validation, simulation, testing and prototype development, bill of materials and product costing. This also includes the following key elements:

- Innovative Digital Product Development from PPR- a Product itself or a Process or Resource
- End to end digital design, validated digitally, Prototyped digitally, manufactured digitally and launched digitally
- Use of 3D Experience Platform of Dassault Systemes -CATIA, SIMULIA, DELMIA, and ENOVIA
- Guided by industry experts to build a go to market in 100 days strategy for Market Assessment to Commercialise the product
- Linkage with 'Gram Tarang Startup Odisha Incubation Center' to hand hold the start-up/ entrepreneur and File IPR/ Patent

The end outcome for the student is to Learn, Experience and develop skill and competencies valued by Industry and as required to be a productive citizen. The project itself is driven as at any Industry - planning, presentation, process learning, communication, Team work and collaboration, risk and its mitigation, product progress and review etc.

Students completing the program were either given handholding for their startups or internships with industry OEM- Automotive, Aero, Process Industry, Heavy Machinery and their Tier-1, Tier-2 suppliers.

2.3.3. Constraints:

One of the major constraints/ limitations of the traditional educational institutions is the lack of a structured entrepreneurship development process. The **Centre for Innovators and Entrepreneurs** is an Incubator established with the purpose of providing mentoring and incubating young minds and create a thriving entrepreneurial ecosystem in Centurion University and is a recognised Incubator under Startup Odisha Initiative of Government of Odisha, MSME Department. Having incubated 27 entities till now from within the CUTM ecosystem, 12 entities are already incorporated under Ministry of Corporate Affairs, 9 are under the process of getting registered and 6 entities are pre- incorporation stage. Major support provided are :

- Work Space support
- Mentoring support
- Technical Support
- Market linkages
- Managerial and Business support training
- Scale up Plan

2.4. Evidence of Success

The evidence of success comes from the various initiatives/ units formally registered through the program as detailed below:

LIST OF STARTUPS INCUBATED THROUGH STARTUP ODISHA	
Name of the Company	Idea/ Innovation/ Solutions/ Products for Business
Centurion Fab	Metallic Utilities: Table, Chair, Almirah, Bed, Desk, Grill etc.
Centurion WoodWorks	Wooden products and modular accessories
Gram Tarang Garments	Uniforms, Customized Bag, Masks T Shirts with Screen/ Embroidered Printing
Centurion Transformers	Manufacturing and repairing of electrical transformers; Providing training on transformer repairing and manufacturing; Consultancy services on manufacturing and maintenance of different types of transformers

Centurion MachTech	Production of aerospace and automobile components as per the industry requirement and specification. Training on manufacturing of aerospace and automobile components, Consultancy to different manufacturing units working through CNC machines.
Centurion Gram Sanjeevani	Provide low budget doctor consultation and medicine in the rural Odisha where there is no hospital in the nearby area. It will be done on CGS App and entirely online. Serves the patients and also supports rural entrepreneur incubation to the medicine kiosks.
Susmita Enterprises	Designer Sarees, Dress, T Shirts with Screen/ Embroidered Printing
Centurion Crafts	Handmade Paper, Writing Pad, Paper Crafts, Ceramic Pottery and utilities
Centurion Repairs	Repairing and Maintenance of Domestic and Industrial Machineries
Centurion Wonderwood	Processing of Waste wood piece with Resin to create products in different segments: Jewellery, Stationary, Tableware, Furniture etc
Centurion VR	To develop and market different apps/projects based on AR/VR, customize technical solutions to the clients as per requirement. Providing high level of training on AR/VR to advanced technical students and provide them employment opportunity/ entrepreneurship in this field. Providing consultancy services to various farms/techies to use and develop products using AR/VR platforms.
Centurion Pavers	Paver blocks of varied designs
Centurion Renewables	Installation and Maintenance of Solar operated equipment in western India. Training on solar panel installation and solar operated equipment. Consultancy on all types of renewable energy , specifically in solar.
Centurion Dairy	Milk, Curd, Paneer, Sweet curd, Ghee, Rabidi, Flavour Milk, Powdered Milk

Centurion Compost	Production and marketing of vermicompost in different parts of south Odisha. Training on preparation of compost and its marketing to agricultural students and farmers. Providing consultancy services to different farms engaged in compost production and its marketing.
Centurion Mush	Production and marketing of different types of mushrooms. Training on mushroom production and marketing to agricultural students and farmers. Providing consultancy to different farms working upon mushroom production.
Centurion Seeds	Processing of different types of seeds and paddy. Training to agricultural students and farmers on processing of different types of seeds and paddy. Consultancy to different farms on different types of seeds and paddy processing.
Centurion Green Feeds	Manufacturing and marketing of different types of fodder in the rural markets of Odisha. Providing training of fodder production and supply chain management in the animal husbandry sector. Providing specialised training to animal husbandry students of fodder production and supply. Providing consultancy services to different farms, working upon different animal farms.
Centurion 3D Imaginator	Production of 3D printers and marketing to customized users. Training on production and different uses of 3D printers to students. Consultancy to different farms on production and different uses of 3D printers.
Skyy Rider Automotive Pvt Ltd	Provides Online & Offline skill training majorly in manufacturing.
Skyy Rider Electric	Assembly and sales of E-rickshaw and other customized e-vehicles.
LIKHAN Ecowriting Pvt Ltd	Paper Pen and Pencils production from waste materials like paper and fabric.
Sangam Designs LLP	Designer Sarees, Dress, T Shirts with Screen/ Embroidered Printing

Zola India	Art & Craft
Familin	Pharmacy Aggregator
Beverage Bees	IoT solution for beverage services
Kalinga Fresh	Agriculture

2.5. Problems Encountered and Resources Required

The biggest challenge faced in the program design and implementation was in finding skilled faculty and trainers to deliver the training and handholding. This was overcome by bringing in key talent at a senior level from the industry and upskilling existing faculty by leveraging industry partnerships. Industry connect has been a key strength at Centurion University. Partners like Ashok Leyland, Dassault Systems, FESTO, FELDER, Café Coffee Day, WIPRO, Volvo Eicher, Schneider etc. have supported these programs especially for training of trainers and providing on the job learning exposure to both faculty and students. ToT programs have also been conducted in partnership with Sector Skill Councils of NSDC which has given exposure to the faculty to step up and deliver the GTM program. A second challenge has been to address the traditional mindsets of all stakeholders. **Securing use cases from Industry and demonstrating through outcomes have been useful strategies in addressing this.**

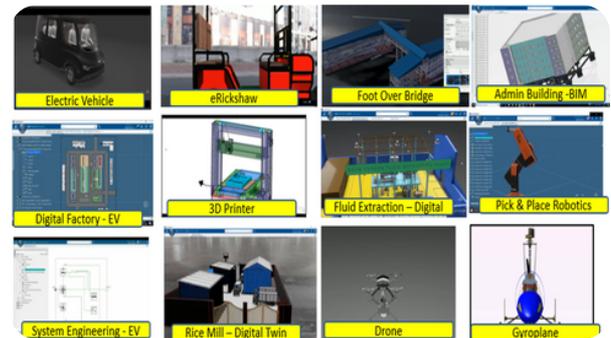
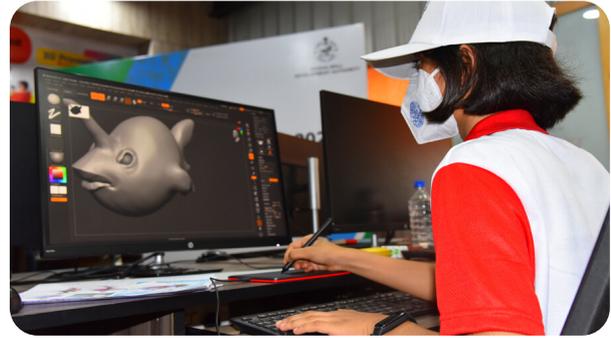
2.6. Notes

Any other information regarding Institutional Values and Best Practices which the university would like to include.

The University's Center for Innovators, Entrepreneurs (CIE) has built an ecosystem for supporting students and faculty with their startups which includes a co-working space, common facilities centers which includes state of the art workshops and labs equipped with 3D Printers, 3 & 5 axis CNC production machines, CNC woodwork machines, 16 Needle automated embroidery machine, fabric printing machine, hand-made paper unit, electric vehicle design & production lab, smart transformer lab etc. Some of the work done by the various incubated units is captured in photographs:

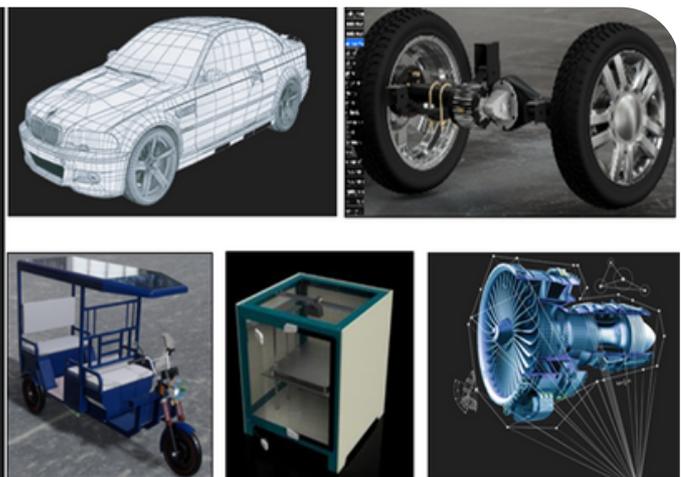






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9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

17 PARTNERSHIPS FOR THE GOALS

Best Practice 3: Skill Integrated Outcome Based Education and World Skills Olympics

3.1. Objectives of the Practice

The concept of Skill Integrated Outcome Based Education and World Skills Olympics best practice stems from a core conviction that the institution has inculcated, “skill integrated higher education” in letters and spirits which empowers the student community by making them a self-reliant and opening path of entrepreneurship aligned with UN SDGs 4, 9 and 17. Students undergo rigorous training on the chosen skills with active support from their mentors and external experts by selecting a special module/domain in the academics called “World Skills”. The World Skills modules are specialized to a particular domain and it is designed in progressive a way accommodating competition at different echelons.

3.2. The Context

The contextual framework for this practice requires a deeper understanding of students’ interests and the profile of the students that the University attracts. A large proportion of university students have expectations of getting placed in companies of their choice. The University has made it possible by imparting specialized domain courses which prepare them for different job opportunities. For example, the domain of Data Science and Analytics prepares students for a career as Data Scientists. The World Skills competition cycle lasts for 2 years excluding the preparation time before making a first attempt. Besides this, each skill category in world skills has a limitation of age which ranges from 21 years to 25 years. It basically shrinks the available student base. In order to increase participation, the University regularly conducts awareness programmes, road shows, hackathons, and open days to exhibit the benefits of the endeavor.

3.3. The Practice

The Skill Integrated Outcome Based Education and World Skills Olympics practice lies in its uniqueness in the context of India’s higher education. However, there are several constraints or limitations that limitations, involved as well.

3.3.1. Context:

Before the inception of the National Education Policy 2020, the Indian education system is much maligned for its theoretical focus and lack of industry and real-world connections. Skills as a world, are rarely coined in institutes of national importance. Even today every thing including skills needs validation which comes from The World Skills competition.

3.3.2. Objective:

The practice adopts a project-based approach to develop the capacity, competency, and confidence of students to go beyond the traditional curricula and careers. It brings a sense of pride for the skills they chose to compete in World Skills. In return, they transform themselves into an asset for the nation in that particular skill category. Besides this, it enables students to become innovative, creative, and imaginative and have a responsibility to give back to society.

3.3.3. Sample of Program Design:

The project is planned for a cycle of 2 years and 6 months as the competition cycle itself is of 2 years. The mentors of different skills category promote their areas through open days, road shows, seminars, and hackathons. Many students have an inbuilt aptitude for a particular skill and they all were hand-picked by the mentors for further training depending on their commitments. Another method of identifying students is through mandatory skill courses. Students across the programs are mandated to study two skill courses at the appropriate semester. Students fairing well and who have competence are picked out by mentors and counseled for World Skills.

The identified students are put on a training cycle of a minimum of 2 hours a day in a dedicated time slot after the mandated academic hours or sometimes within it. The preparation manifests two tiers above the competition that students are about to appear in. For example, for appearing state level competitions, students were prepared for Nationals.

3.3.4. Constraints:

The students have limited exposure to the kind of job prospects/entrepreneurship opportunities that are available after they triumph. So, counseling the students and keeping up their morale is the biggest constraint. Besides this, the training is conducted over and above the academics which students sometimes find burdensome.

Another key challenge is to counsel the students that at any point in time if they could not fare well, they will be eliminated from the competition cycle. However, sometimes it is challenging to make them understand, even if they are eliminated at any echelons, they still possess the requisite skill set which can be further honed.

3.4. Evidence of Success

The outcome of this best practice is reflected in the University through its performance against targets and benchmarks, review, and results.

The following table delineates the result of the endeavor made:

SI No	Name of the student	Skill Competed for	Result
1	Satya Ranjan Mohanty	CNC Turning	Gold in National. Represented India in World Skills 2022
2	J. Lavanya	Health and Social Care	Gold in National
3	Hritik Patra	Joinery	Bronze in National
4	Rohan Kar	Cybersecurity	Medal of Excellence in National
5	Chinmay Biswal	Cloud Computing	Silver in Regional
6	Sourav Dhali	3D Game Art	Silver in Regional
7	Chandra Prakash Sharma	Automobile Technology	Gold in State

The above result indicates students' participation and their outcomes at different echelons of the competition. At any level, the students are dropped out still it signifies they have potential in that particular skill category.





Excerpts of endeavors

3.5. Problems Encountered and Resources Required

The various problems encountered were all targeted and resolved through the required resources to implement the practice.

1. **Parents' consent:** Tweaking from regular academics and preparing for the World Skills Olympic required extensive preparation with a risk of always being dropped out at any echelon. This required counseling of parents as well on the future perspective of the student who is entering into the competition cycle. It was resolved by face-to-face counseling.
2. **Motivating Students:** The students who were participating has to be firm on all aspects which cardinaly focuses on mental health and peer pressure. It was resolved by their mentors themselves by counseling only.

3.6. Notes

CUTM has been instrumental in adopting and implementing this Best Practice in other Institutions as well through the Institutional Values and adherence to the Best Practices

- The program design of CUTM can be easily adopted by other Universities as project-based full credit courses using the assessment methodology adopted by CUTM for awarding the credits.
- An example of the same is the NIIS Institute of Business Administration which has inked an MoU with the University for various endeavors including skill integration.



Best Practice 4: Towards a Sustainable Future and University's Waste-to-Wealth Action Learning Lab

4.1. Objectives of the Practice

The underlying principle of Towards a Sustainable Future and University's Waste-to-Wealth Action Learning Lab best practice is that this concept stems from a core conviction of sustainability which is the heart and soul of the University as substantiated by University's endeavor in THE Impact Ranking for SDG. Reduce, Recycle and Reuse is the concept that the University endeavors by transforming waste generated on the campus into a usable product or an allied product. Besides the underlying core principle of sustainability, the engagement of students in this endeavor is best exemplified as action learning.

4.2. The Context

The contextual features or challenging issues that are needed to be addressed in designing and implementing this practice lie in the contextual framework for this practice requires a deeper understanding of the sources of waste generated in the University. The analysis showed that the majority of waste is biodegradable like paper, and food waste, and non-biodegradable waste like plastics also amount to a significant percentage. The University's research centers started experimenting with all waste sources to transform them into any usable product. It involved several phases of R&D with many episodes of failure. However, with persistence, a Centre of Excellence in Waste to Wealth was established which is endeavoring to provide innovative solutions to all waste generated.

The main challenging issues faced are

1. Identifying the sources of waste
2. Transforming waste into any usable product
3. Research and Development involved

4.3. The Practice

The Towards a Sustainable Future and University's Waste-to-Wealth Action Learning Lab practice lies in its uniqueness in the context of India's higher education. However, there are several constraints or limitations that limitations, involved as well.

4.3.1. Context:

With the inception of the National Education Policy 2020, the Indian education system is shifting from conventional rote learning for producing masses of educated youths for suiting colonial industrial needs to self-sufficiency where an individual is capable to do things on his own. This is all because of skill integration in higher education.

Another noteworthy point is, the Government of India has realized that Climate Change is no more a misnomer but it is happening and its devastating effects are being endured and witnessed. So, practices like this will allow for attaining Carbon neutrality which is a manifestation of skill-integrated higher education.

4.3.2. Objective:

The practice of transforming waste into wealth has the sole objective to achieve Carbon neutrality and take a small step towards preventing climate change by reducing waste and recycling and reusing it to the optimal extent. This practice also involves the students as active participants and makes them even more responsible citizens of the country adhering to Fundamental Duties.

4.3.3. Sample of Program Design:

The project is an ongoing process and it is being institutionalized. The sources of the waste are identified as used papers, newspapers, food waste, and plastic waste which is mostly identified in the form of PET bottles. Papers and newspapers are used for manufacturing handmade papers and handmade paper pens which possess a plant's seed. After pens are thrown into the environment (being biodegradable), a new plant is grown in its place. Another waste source is food and food waste when degrades releases a greenhouse gas called Methane. Waste to wealth practice uses food waste in a biodigester to transform it into manure which is used in the university's agricultural fields. The PET bottles are crushed and are used as an active composite element in the manufacturing of pavers block (infrastructure material).

Students are engaged in the endeavor as a part of the skill course, as Culture Social Responsibility, and as volunteers. The practice is offered as a skilled course to students and the waste to wealth is also one of the Research Centres in the University's ambit. It engages research scholars in several R&D activities as a part of their major projects or doctoral research. The research work includes Solvent Extraction, Carbon dioxide column for enrichment and others.

4.3.4. Constraints:

The major constraints faced were waste identification and developing an idea of transforming any particular waste to any usability.

4.4. Evidence of Success

The outcome of this best practice is reflected in the University through its performance against targets and benchmarks, review, and results.

The following table delineates the result of the endeavor made:

SI No	Major Waste Sources	Final Product	Relevant SDG
1	Newspaper, used paper	Hand made paper pen	4, 9, 14
2	Used papers	Hand made paper (white)	4, 9, 14
3	Waste Plastic	Pavers Block	4, 9, 14, 15
4	Eggshell and allied	Chalks	4, 9
5	Food waste	Organic manure	9, 14

The result indicates that any waste sources have a potential to transform into a usable product with significant research. The existing process is being reviewed with a cardinal focus on upscaling and upgrading.





Excerpts of endeavors

4.5. Problems Encountered and Resources Required

There were not many problems encountered except in the planning phase which called for expending time. Not much resource is required to engage. It only requires everything to be in order. The problems encountered were all targeted and resolved through the required resources to implement the practice.

4.6. Notes

CUTM has been instrumental in adopting and implementing this Best Practice in other Institutions as well through the Institutional Values and adherence to the Best Practices

- The program design of the University can be easily adopted by other Universities ditto or in a tweaked mode. The University will be happy to do a technology transfer.



Best Practice 5: TPP Academic Model, Wow Projects and 5S

5.1. Objectives of the Practice

The underlying principle of TPP or Theory Practise Project best practice is that it stems from involving students in the details of a subject. The conventional model of learning is either a theory or a practical association. TPP models inculcate Theory, Practice, and Project components from every possible subject including subjects like Mathematics and English. The outcome of this model is the involvement of students in the core of the subject. 5S allows the students to understand the technical value system of any organization. For example, a student develops ownership of a particular piece of equipment or machine, and so on.

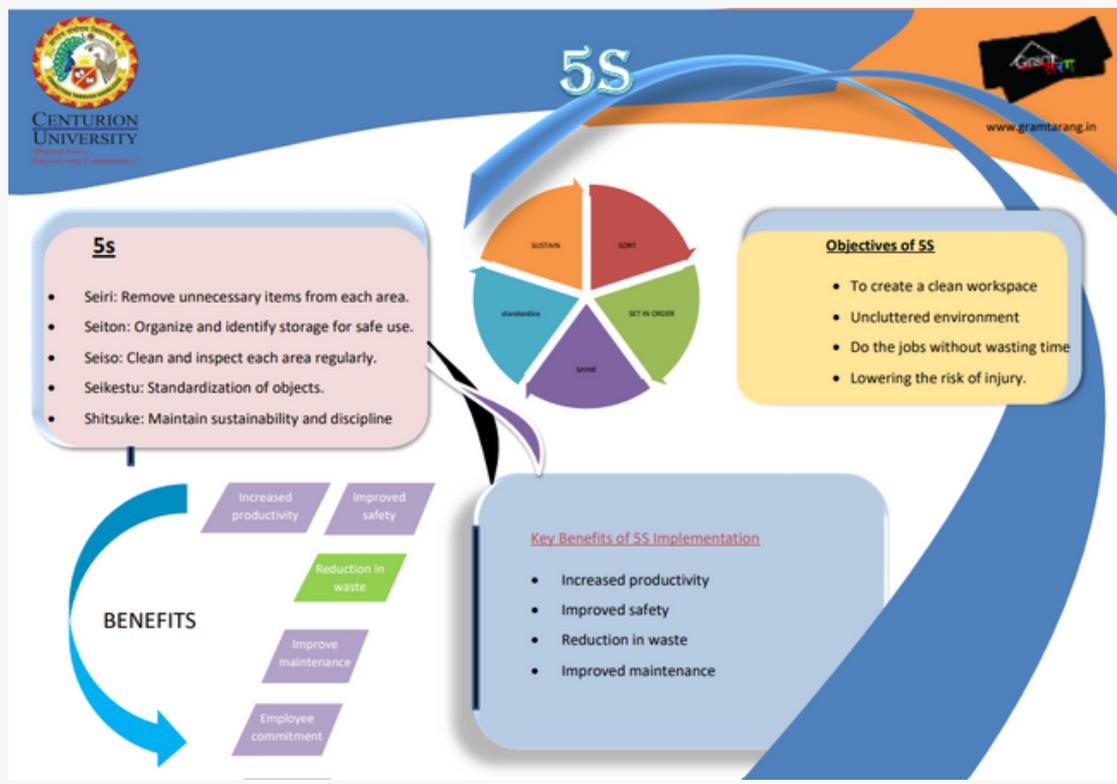
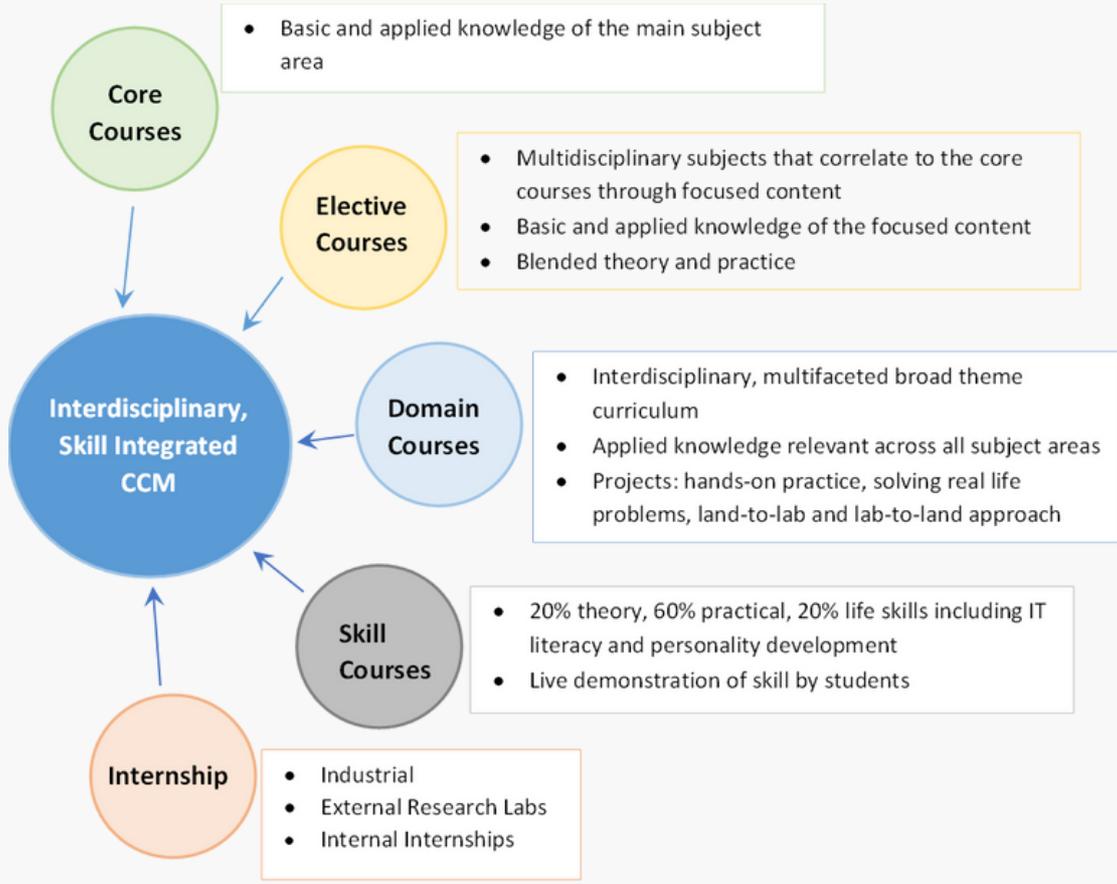
5.2. The Context

The contextual features or challenging issues that are needed to be addressed in designing and implementing this practice lie in the contextual framework for this practice requires a deeper understanding of a subject and then devising an innovative methodology to redesign the syllabus. For example, a critical unconventional mindset is required to segregate the subject of Mathematics into Theory, Practice, and Project components. However, once done students can visualize how vibration can be truly encapsulated in a differential equation.

Hence, the cardinal challenging issues are

1. Understanding the subject and its importance to the student's field of studies
2. Devising a way to segregate it to TPP
3. Taking feedback from industry and academia
4. Define competencies and micro-competencies

5S component implementation is based on an already established detailed procedure as mandated in the philosophy itself. However, requisite checklists are prepared to suit the University's ecosystem and needs. The following two pictures expounds the academic model and 5S.



5.3. The Practice

The Theory Practice Project practice lies in its uniqueness in the context of India's higher education. However, there are several constraints or limitations that limitations, involved as well.

5.3.1. Context:

The practice is aligned with the National Education Policy 2020, which has a maximum focus on skill integration in higher education. TPP model will enable students to get an in-depth critical understanding of the subject which is substantiated by projects which are the results or application results of the study. These practices make students industry ready and besides boosting their confidence aid in the development of their interest in specific areas. It again helps the students to choose domains or areas for world skills.

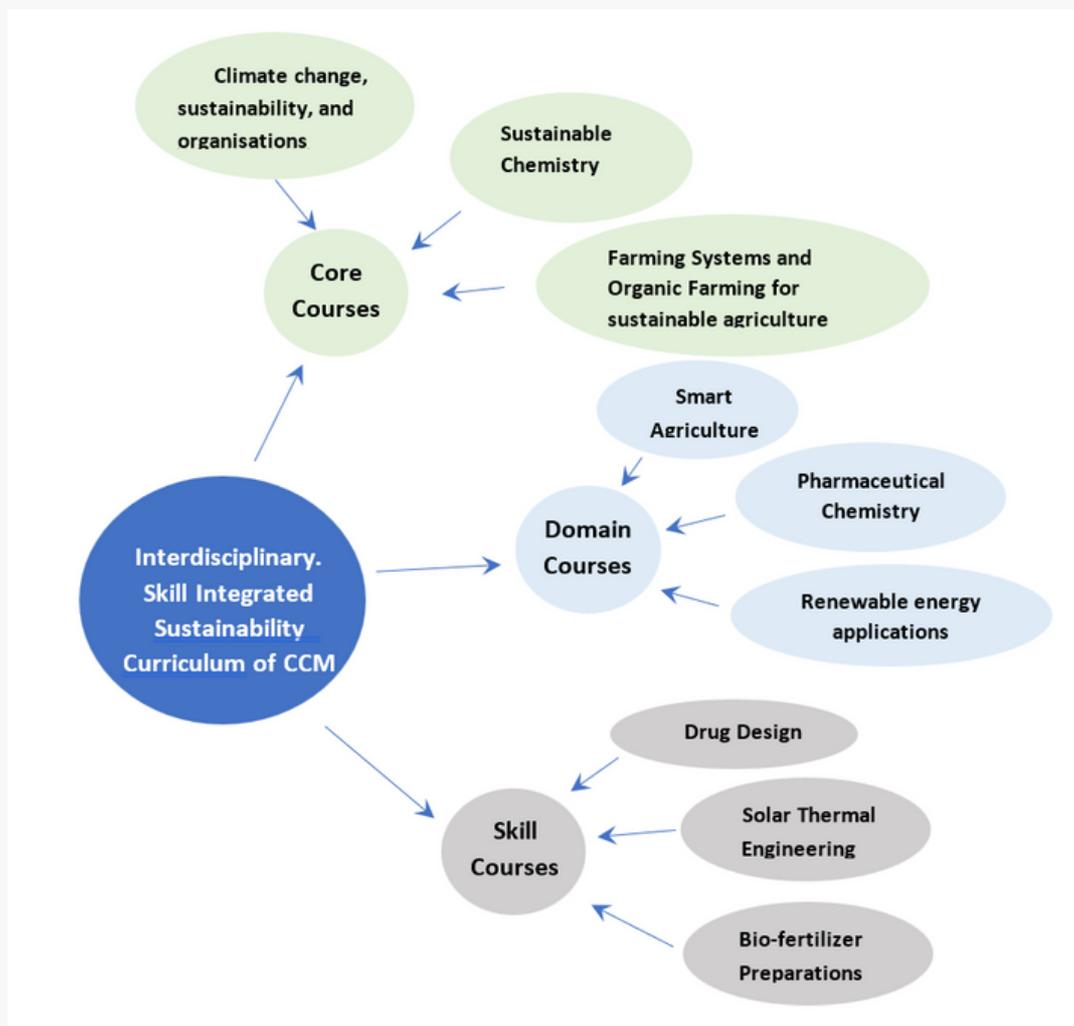
The 5S component is critically important in the Indian education scenario. The University has recorded cases of alumni who could not cope with the industrial environment because of a lack of ownership. 5S trains the students in several aspects intending to do things efficiently and effectively.

5.3.2. Objective:

The practice of TPP in academics has the sole objective to engage students to action learning based on the crux "Learn to apply". The application part is tested in the project components and the best projects are branded as WOW Projects. The indicative list of the project is provided in the syllabus itself which is always linked to real-world problems and proof of concepts.

5.3.3. Sample of Program Design:

The project is an ongoing process and it is being institutionalized. The first step is to understand the requirement of the industry partners and current market trends. The step further is to engage a team of expert academicians to formulate the syllabus with detailed competencies of theory, practice, and project. The project component is usually a real-time problem whose solution or proof of concept is necessitated by the industry partner. The following pictures explain it in details:



For 5S components, every Saturday students of the School of Vocational education and training carry out the 5S activity with mentors' supervision (only in the initial stages). Afterward, they were given a checklist based on the Sort, Straighten, Shine, Standardize, and Sustain (5S) philosophy which a batch of students carries out. The checklist details every minute element, for example,

1. Whether a screwdriver is left at the required place?
2. Whether the machine is clean after operations?

5.3.4. Constraints:

The major constraint faced was the time expended in planning to split a subject into different components.

5.4. Evidence of Success

The outcome of this best practice is reflected in the University through its performance against targets and benchmarks, review, and results.

The following table delineates the result of the endeavor made:

SI No	Major Achievement	Outcome
1	Sort, Straighten, Shine, Standardize, and Sustain	All the University labs and lab equipment (including miniature tools in place)
2	WOW Projects	Students' empowerment and ability to solve real-time problems

The result indicates that TPP component of education can bring changes in students confidence level and make the student industry ready and employable. 5S brings a sense of discipline and ownership.

5.5. Problems Encountered and Resources Required

There were not many problems encountered except in the planning phase which called for expending time. Not much resource is required to engage. It only requires everything to be in order. The problems encountered were all targeted and resolved through the required resources to implement the practice.

5.6. Notes

CUTM has been instrumental in adopting and implementing this Best Practice in other Institutions as well through the Institutional Values and adherence to the Best Practices

- The program design of the University can be easily adopted by other Universities ditto or in a tweaked mode. The University will be happy to do a technology transfer.



