‘Learning by Doing’: A Road Map leading to a New Era of Education --An Interventional Initiative of Mahatma Gandhi National Council of Rural Education (Ministry of Education, Govt. of India)

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Abstract

‘Method of Education’ is the means to attain the principal objectives of education. In a Nation like India, with the highest percentage of youth, the objective of an education system is to ensure the livelihood of a person through imparting basic awareness and vocational practice. It follows then, that there is a requirement to help inculcate necessary skills to pursue a vocation. The method of education adopted through policy will help determine the various sets of skills and competencies possessed by the society in the coming years. Prior to the Indian Independence, ‘Father of the Nation’ Mahatma Gandhi advocated Work Education system known as Nai-Talim (New form of Education), having comprehensively considered the socio economic system of the country. Nai-Talim system entailed that a pupil will learn a vocation which can provide them with a sufficient means of livelihood, in tandem with their regular schooling. This proposed system is akin to the Kolb’s ‘Experiential Methodology’. Following the idea, the New Education Policy 2020 (NEP 2020) took a big leap towards integrating vocational education in subject methodology. Mahatma Gandhi National Council of Rural Education (MGNCRE) has taken up a capacity building program to enhance the capabilities of the faculty members of schools in the country. In the present paper authors made an attempt to describe the intervention of the Council and the outcome realized. The study employs an action research approach, chosen for its participatory and iterative nature. The study arrives at the conclusion that the intervention resulted in the creation of sizeable content (approximately 5000 in number) in the form of re-designed lesson plans embedded with vocational education, thus, successfully paved a way for the introduction of new curriculum with new methods of instruction recommended by New Education Policy.

Keywords: Action Research, Education System, Education Policy, Integrating vocations, Work Education

Introduction

1. Experiential Learning: An overview

In order to design an effective, scalable and promising methodology which can determine the 'best fit' education reflecting the global landscape, it becomes necessary to study the mechanics of learning and visualizing the process through which the desired transformative effect is realized among the masses. A notable point is that learning is a non-linear process, following the teaching and memorization activities. Learning arising solely from teaching or memorization is likely a false presentation or a short living instance.

An effective instructional approach must guide the students to achieve their (Islam et.al, 2022)[1] full potential. Though out of context, it is apt to remember the words of Maya Angelou here: "People will forget what you said, people will forget what you did but people will never forget how you made them feel". In this context, it can be said that the feeling elicited from knowing about the subject creates a lasting impact. As the world tilts towards expanding knowledge and pursues the advancement of technology, it becomes more and more imperative to nurture the human factor. Mere nourishing of cognitive skills might be easiest way to teach and measure, but it is no longer considered a sufficient method as it fails to enrich learners through imparting adaptability and critical thinking. The other two skills of Bloom's Taxanomy – affective and psycho motor also have sizeable importance in the process of transforming learning into knowledge. The "head, heart and hand" model (3H model), propounded by Orr (1992)[2] and developed by Sipos (2008)[3], describes a paradigm which encompasses all three of these domains in providing a transformative experience. Understanding of the concept enriches perception (head/cognitive), feeling it expands value (heart/affective), and active application of it provides experience (hands/psycho motor). Education, when imparted in this approach, acts as a real transformational tool. When students apply their heads to understand and hands to perform, the experience transforms into knowledge - experiential learning methodology.

2. Review of Literature:

Introduction of experiential learning methodology calls for a total change in the ecosystem surrounding a student. It involves several changes within the educational institution and of its stakeholders. It is helpful to develop a broad understanding about its various dimensions in order to identify the right strategy.

The studies conducted by predecessors help illuminate the researcher's paths and provide an understanding about the shape and structure of the problem to be addressed. Few such studies which have helped the researcher gain knowledge are mentioned below.

John Dewey[4] stated that a false dualism had been set during the medieval period, about theory & practice, body & mind, labour & leisure etc. He saw this false dualism being followed in intellectual strands of classical education, which assigned high preferential value to the mental faculties. Consequently, this resulted in an education system which was highly specialized, one-sided and narrow. That kind of learning appeals, for the most part, to the intellectual aspects of our nature, but not to our innate impulses and tendencies to make, create, do, and produce.

David Kolb (1984)[5] the proponent of 'experiential learning,' reiterates the central role of experience in the learning process. It, according to Kolb, is the holistic integrative perspective on learning that combines experience, cognition, behaviour and perception.

The study conducted on reshaping the learning processes in vocational education by Pinheiro et.al in 2008[6] analyzes Project-based Learning. The main objective of the study is to analyse the impact of project-based learning methodologies in higher vocational education. Researchers conducted path analysis to: (i) investigate the changes in how students access and produce knowledge & (ii) assess how PBL produces a more professionalised profile. The findings show that there is a positive impact on the self learning of students, and to some extent it solves the real problem of how-to-do. The results of the study found that simulation learning in vocational higher education helps in softening the journey from academics to the professional world.

Terry Hyland[7] in his presentation, 'embodiment in vocational education' compiled the views of various eminent scholars in the field. Embodied learning is synonymous to action learning, kinaesthetic learning and embodied cognition. Glenberg[8] stated that learning is augmented by learner's physical movements.

Burrow & Farmer (1988)[9] contributed towards vocational education teaching alternatives in their extensive research work. They stated that educational reforms in any context must be supported by 3 'T's – teachers who are superior, techniques of instruction which are modern, and thinking constantly about education, placing it first in all plans and aspirations.

Girvan et.al (2016)[10] attempted to explore the teachers' reflections, experiences and changes in belief system, as a result of introducing experiential learning pedagogy. Teachers observed positive outcomes among students right from the beginning of the pedagogical changes introduced. The changes in students' behaviour were directly observable and motivational for implementation. The research was primarily conducted on Irish secondary grade schools where teachers were asked to implement pedagogical changes of experiential learning.

The concept of an experiential education, or experiential learning, has been identified (Rebecca, 2019)[11] as a system to improve civic and global engagement, plugging increasingly important gaps in traditional education practices. The study mainly reviews several theoretical frameworks regarding experiential learning, providing a synopsis for common

experiential learning activities while also making suggestions about how educators can include this in higher education settings. According to authors, the types of experiential learning opportunities available for college students are simulation models, internships and studying abroad. Authors concluded their study with the view that today's students must be responsive to the direct and indirect needs of their community apart from their personal needs.

Kong (2021)[12] conducted a study on the classroom engagement of students and motivation among them as a result of experiential learning. According to the author, psychologically, there is a close relation between the motivation of learners and classroom engagement. The traditional model of a teacher-centric classroom can't engage students well, therefore, can't motivate them. On the other hand, experiential learning helps student to build a connection with real world, therefore, motivates him through engagement.

Boggu & Sundersingh (2019)[13] conducted a study on students of higher education in Oman. The findings of the study revealed that experiential learning cycle activities implicitly fostered learner autonomy and enabled learning necessary skills for the workplace.

3. The Originality of the present study:

It is evident that the studies conducted so far have addressed the problem only in a limited way, by getting confined to one level of course or by providing theoretical framework. The past research lacked a severe attempt to redefine and revitalize the entire system of education in general, and school education in particular. The past studies were confined to administering questionnaires and analyzing the responses. Additionally, none of them attempted an Action Research method. On the contrary, the present study is a presentation attempt of the Action Research of Integrating the vocational component and redesigning the lesson plans, after making a thorough analysis of contents within the text books. The study is a step towards modifying the entire education system to be futuristic in the most populous economy, with the largest number of youth.

4. Historical Overview of Education System in India – Genesis of Rationale for Planned Change:

A country's education system must be crafted according to the typical features of the country and built to address the unique challenges faced by the country. India as a country is identified by the characteristic features of overpopulation and majority living on rural side. According to the World Bank's collected and compiled statistics of 2022, 64.13% of people in the country dwell in rural areas, surrounded with unsophisticated infrastructure. The education system is expected to provide them a reasonable and decent quality of life. Father of the Nation, Mahatma Gandhi, advocated strongly that the basic education system should be self-supporting for every child, by allowing them to learn a craft or occupational skill to support livelihood. According to him, education must ensure employment. Work education,

NaiTalim, has been propounded by Gandhi as the desirable model of education system in India.

Table: 1: Recommendations of Various Committees on Vocational Education

SNo	Committee	Year	Recommendations
1.	Wood's Dispatch	1854	First-time recommendation of introducing vocational education at secondary school level
2.	Hunter's Indian Education Commission	1882	Recommended two distinctive streams should be there at High School Level; one for preparing the students for entrance examination to University courses and the other for practical occupations
3.	The Hartog Review Committee	1929	Emphasized the need for vocational education in the country's development
4.	The Sapru Enquiry Committee	1934	Reiterated the importance of vocational education in the country's economic development
5.	The Wood-Abbot Advisory Committee	1936	Their recommendations on importance of manual work in education enabled introduction of diploma-level technical education and setting up of polytechnics
6.	Mahatma Gandhi's NaiTalim	1937	Stressed that manual and productive work should be the central axis of the curriculum
7.	ShriB.G.Kher Committee on the Wardha Education scheme	1938	Recommended the implementation of NaiTalim by all the provincial governments
8.	ZakirHussain Committee	1938	"Basic Education" (NaiTalim/BuniyadiShiksha) was accepted as the national pattern of education for the elementary stage
9.	The Sargent Report (1944)	1944	This committee emphasized the need to introduce two streams: academic and technical; with the objective to provide general education, combined with some preparation for careers which students may pursue upon leaving the schools

S No	Committee	Year	Recommendations
10.	Radhakrishnan Commission	1948	Reiterated the need for vocational education and at the same time, retaining their value in assistance of general education as preparation for university courses
11.	The Secondary Education Commission (Mudaliar Commission)	1952-53	Recommended a 11-year pattern of school education. It recommended diversification after eight years of schooling by providing training in various crafts and vocations. The Commission felt that at the end of this, a student should be in a position, if s/he wishes, to enter life and take up some vocation. Many multi-purpose schools were established in response to these recommendations throughout the country
12.	Education Commission (Kothari Commission)	1964-66	Recommended a uniform pattern of education called 10+2+3 pattern all over the country. This meant 10 years of general education for all, with diversification into academic and vocational streams at the +2 level. It gave priority to the plans of educational reconstruction to the Work Experience Programme (WEP) in general education up to middle level (Class 1 to 8) and Vocationalization of Education Programme (VEP) at the secondary school level
13.	National Policy of Education	1968	The Commission found that only 50% of the +2-level pass students go for higher education, while the rest opt out of the education system without holding any productive skills. It further recommended that at the +2 level, 50% of the students should be diverted to vocational education within a period of 20 years
14.	National Review Committee headed by Dr. Malcolm Adiseshiah on Higher Secondary Education	1978	Recommended with Special Reference towards Vocationalization, suggesting that the Higher Secondary stage should comprise of a general education course along with various vocationalized courses, or a mixture of courses The committee also stressed the importance of foundation programs for the vocational courses, and insisted upon the modification of hiring policies and the creation of facilities for proper growth opportunities for the vocationally qualified persons
15.	The National Working Group on	1985	Implementation of recommendations of Kothari Commission were inadequate due to lack of resources & proper management structure, technical expertise and inadequate teacher preparation.

S No	Committee	Year	Recommendations
	Vocationalization of Education, Ministry of Education, led by Kulandaiswamy		New guidelines were provided: • The concept of vocationalization at different levels • The linkages required among different agencies running vocational programs • Setting up of a well-knit management system • An action plan for promotion of vocationalization in the country • Liberal financial assistance for achievement of targets fixed The National Policy on Education (NPE 1986) accorded a very high priority to the programme of vocationalization of education. It was envisaged that a substantial majority of the products of the vocational courses would be absorbed by wage or self-employment
16.	The Programme of Action (1992) prepared by the Ministry of Education for implementation of National Policy of Education 1986 Kulandaiswamy Working Group	1992	• A centrally sponsored scheme (CSS) was launched by the Ministry of Education. Under this, assistance was to be provided to the state governments/UTs administration and non-government organizations • 100% grant was to be provided by the Centre for apprenticeship, evaluation and monitoring, district vocational surveys, curriculum development, instructional material development, textbook development, teacher training, resource person training, equipment to schools and construction of workshop/laboratory buildings • To ensure the successful implementation of vocational education programme, the centrally sponsored scheme also suggested a management structure to be built at state level
17.	The Synergy Group on Vocational Education under the chairmanship	1995	• Recommended fulfilling of national skilled human resource requirements at various levels (professional, middle-skilled and semi-skilled) in the context of: o Removing mismatch between demand and supply o Avoiding duplication through coordinating and integrating the efforts of various departments and

SNo	Committee	Year	Recommendations
	of Dr. Sam Pitroda		institutions and Non-Governmental Organizations (NGOs) o Keeping pace with the globalization, and consequent induction of new and emerging technologies and developing skilled manpower in related occupations/vocations
18.	The International Commission on Education for the Twenty-First Century	1996	• Brought out report entitled 'Learning: The Treasure Within' which states that for economic growth to ensue, a higher proportion of the population needs to receive secondary education • The four pillars of education mentioned in the report are o a) Learning to know o b) Learning to do o c) Learning to live together o d) Learning to be – this component essentially leads to skill competence development; more broadly to deal with many situations of working on teams o Further, there is an emphasis on lifelong learning arising from rapid technological changes
19.	National Curriculum Framework for School Education (NCFSE)	2000	• Stressed the need for high-priority vocational courses in the School system which would help in enhancing the employability of students • Also stated that vocational education system will have to find duplicates in Alternative Schooling especially in the open learning system • To translate this vision of VET into practice, several new support structures and resource institutions will have to be created at various levels
20.	National Education Policy	2020	• Suggested to teach only practical aspects of Vocational Education • Conducted a skills gap analysis and mapping of local opportunities to assign vocational courses relevant to a particular area • Emphasized the credit-based National Skills Qualification Framework (NSQF) which will help in re-integrating the dropouts (from mainstream education) by

S No	Committee	Year	Recommendations
			aligning their practical experiences and appropriate level of the framework • Aligning vocational occupations with international standards as prescribed by the International Labour Organization • Inclusion of industry, NGOs and civil society organizations in implementing the NSQF • Integrating vocational education programmes into mainstream education in all educational institutions in a phased manner would lead to emphasizing the dignity of labor and importance of various vocations involving Indian arts and artisanship"

(Source: WG. Prasanna Kumar &PadmaJuluri (2021): Promotion of Vocational Education among Teacher Education Institutions in Districts of Telangana, West Bengal and Tamil Nadu..Micro Document MGNCRE.)

5. About MGNCRE:

Mahatma Gandhi National Council of Rural Education under the Ministry of Human Resource Development, in Government of India strives to promote resilient rural India through Higher Education interventions. MGNCRE designs, develops and promotes curriculum inputs for higher education programmes offered by Universities and Autonomous Institutions in India. MGNCRE has been awarded UNESCO Chair for Experiential Learning, Work Education and Community Engagement for capacity building of education and research institutions.

6. Integration of Vocational Education in School Education through Methodology – Action Research of MGNCRE towards experiential education:

The pioneer of Action Research Methodology Kurt Lewin (1944)[15]describes Action Research as a research that leads to social action and it uses "a spiral of steps, each of which is composed of a circle of planning, action and fact-finding about the result of the action". Action Research can, thus, be described as a planned change in which initial research provides information about the subsequent action of the change agent.

At stage I of the process, which is the 'entry' stage when the need for a change is identified at the outset, the possibilities of working out a relationship with an expert are explored. Potential leverage points of change are identified. The consultant or expert or anyone who intervenes for bringing up the desired change must have their own normative or developmental theory and must be conscious of the assumptions and values.

7. Materials and Methods:

(i) Research Design and Approach:

This study employs an action research approach to investigate the integration of experiential learning and vocational education in various subject areas within the educational system. Action research is chosen for its participatory and iterative nature, enabling collaboration between educators, researchers, and students to bring about educational improvements and innovations (Johnson, 2002)[15]. This methodology aligns with the goal of enhancing the educational process by directly involving stakeholders and addressing real-world challenges.

(ii) Study Scope:

Participants: The study involves students and teachers from diverse geographical locations and grade levels across different educational institutions.
Subject Areas: The research focuses on the integration of vocational education in specific subject areas, including Mathematics, Science, Social Science, and Languages.

(iii) Objectives:

1. To tag vocations to the topics and sub-topics of the lessons to the possible extents and prepare the documents of content analysis.

2. To develop 20 lesson plans with the description of a vocation that can be implemented by students and facilitating to understand the cognitive inputs through the activity.

(iv) Data Collection Methods:

Interviews: Semi-structured interviews are conducted with teachers, students, and educational experts. These interviews explore their perceptions, experiences, and insights regarding the integration of experiential learning and vocational education.
Surveys: Surveys are administered to a broader sample of students and teachers to collect quantitative data on their attitudes, engagement levels, and perceived learning outcomes related to vocational education integration.

(v) Observations: Classroom observations are conducted to assess the implementation of vocational education within subject-specific contexts. Researchers observe teaching methods, student interactions, and engagement levels.

Document Analysis: Curriculum documents, lesson plans, and student work portfolios are analyzed to gain insights into the alignment of vocational education with curriculum objectives.

(vi) Data Analysis

Qualitative Analysis: Interview transcripts and open-ended survey responses are analyzed thematically to identify recurring themes, patterns, and insights related to the impact of vocational education integration.

Quantitative Analysis: Survey data is subjected to statistical analysis, including descriptive statistics and inferential tests, to quantify the relationships between variables such as student engagement, academic performance, and vocational education integration.

Mixed-Methods Integration: Qualitative and quantitative findings are triangulated to provide a comprehensive understanding of the research questions, allowing for a more robust interpretation of the data.

(vi) Ethical Considerations

This study adheres to ethical guidelines for research involving human subjects. Informed consent is obtained from all participants, ensuring voluntary participation and data confidentiality. Researchers maintain the anonymity of participants in reporting findings to protect their privacy.

(vii) Research Rigor

To enhance the rigor of the study, measures such as member checking and peer debriefing are employed to validate findings and interpretations. Additionally, the iterative nature of action research allows for continuous refinement of the research design and methodology as the study progresses.

(viii) Limitations

The study acknowledges potential limitations, such as the generalizability of findings, as the research is conducted in diverse educational settings. Additionally, external factors beyond the scope of this study may influence the outcomes of vocational education integration.

This research methodology outlines the approach, scope, data collection methods, analysis techniques, ethical considerations, and measures to ensure research rigor for investigating the integration of experiential learning and vocational education in diverse subject areas within the educational system.

8. Timeline of Action Research Process:

An ideal education system, in the lines of MK. Gandhi's tenets, must evolve from teacher-centric to learner-centric and from learner-centric, it must ultimately evolve to be

community-centric. If the learner has to be imparted with skills like critical thinking and mastering the concept, one must 'experience' it.

The journey towards arriving at a consensus on the integration of vocational component in subject methodology and the introduction of experiential learning methodology involves various stages and developments. In the country, National Council of Educational Research and Training (NCERT), provides guidance and support to schools and educational institutions across the country, while the State Council of Educational Research and Training (SCERTs) provide guidance and support to schools and educational institutions within their respective states. Since the country is a multilingual, multicultural entity with diversified socio – economic structure, the functions of conducting educational research and preparation of text books are handled at a National as well as State level also. The Mahatma Gandhi National Council of Rural Education (MGNCRE) intended to empower an individual in the teaching field, irrespective of region, culture or language. Therefore, workshops with NCERT and SCERTs were organized during 2017 - 19. On 5th Sept, 2018 a book on Nai-Talim (Gandhi's model of education) - experiential learning - was launched simultaneously in 16 languages. Gradually the programme was extended to Schools of Education of public universities from all parts of the Nation. It was followed by the activity of Action Research Project of curricular changes with vocational component in it. Along with faculty members of SCERTs and Schools of Education, nearly 160 education research scholars have eventually become a part of this huge project.

The school education program consists of mathematics, science (Physical & Biological) social sciences and language. Generally, students have to learn 3 languages, namely their mother tongue (which mostly differs from state to state), Hindi and English. It is, thus, required to work on 4 methodologies – Mathematics, Science, Social Science and Languages. The course objectives are different in the following way for all subjects:

a) Mathematics:

According to Polish Mathematician Stefan Banach, "Mathematics is the most beautiful and most powerful creation of the human spirit". Mathematics, through its logical and abstract ideas, helps in understanding the phenomena of nature. It is both an abstract science as pure mathematics and applied to other disciplines such as physics and engineering as applied mathematics. The mathematical concepts enable the learner to understand various puzzles posed by nature. It is an area of knowledge which includes topics of numbers, formulae and related structures and shapes. Mathematical activity mostly involves the discovery of the properties of abstract objects and the use of pure logic to prove them. The proof consists of a succession of applications of deductive rules to already established results. The fundamental truths of mathematics, therefore, enable the learner to model any real life situation.

While understanding the mathematical principles, axioms and relationships, students also are required to connect them to a vocation which can be practiced for experiencing while learning.

b) Science:

Science, as described by James. B. Conant, is an interconnected series of concepts that have developed as a result of experimentation and observation. It is the body of knowledge simplified through principles, theorems and rules. Two distinctive objectives can be attributed to the subject of science in the high school curriculum. First, it provides a pre-professional education for traditional careers and secondly, it is a need for all children as they grow up to have a clear understanding of the complex world of science which they confront as citizens for the next 70 years of their life. The methodology integrated with vocations must enable the transfer of these cognitive inputs along with teaching some livelihood practice.

c) Social Science:

Social Science includes primarily the subjects of history, geography, economics, civics and sociology. The elements of ethics, psychology, philosophy and anthropology are also incorporated into the subject field. Social Science helps young people to understand the society they live in, comprehending the way the society works and how people work in the society and how to take part civilly in all kinds of activities related to life in the society. The primary purpose of studying social science is to develop the ability to make informed and reasoned decisions for the public good as citizens of a culturally diverse, democratic society in an interdependent world. While understanding the different manifestations of relations, an able education system must also empower students to identify the avenues of income generation within the framework of rules, explore and acclimatize with the system. The curriculum can be redesigned with embedded vocations in such a way that the subject information reaches student while practicing the vocation through experience.

d) Language:

Language is the principal method of human communication. It imparts the power of using the words in a structured and conventional way and conveyed by speech, writing or gesture. Apart from empowering the learner with communication abilities, language and literature also function to help the learner understand the society, and comprehend the world around them through portrayals of characters. Language is believed to play a central role in learning. No matter what the subject area, students assimilate to new concepts when they listen, talk, read and write about what they are learning. Speaking and writing reflects the thinking process which is taking place. The subject of language is expected to empower a learner's narrative skills, vocabulary, content making and expression. Learners can take up activities like content-making, blogging or any activity, as hinted by the lesson and understand the lesson through their experience.

8. Content Analysis:

In teaching, content analysis is a process of breaking down the teaching content by a teacher for effective planning and transaction. It is a procedure undertaken by the teacher, of scrutinizing the teaching unit. A teacher analyzes the content to different particles with a singularly psychological and factual point of view. The content may be a unit or subunit or

even a specific area. By content analysis of the central theme of the concept, the significant area and concept can be identified.

The new way of content analysis taken up for the action research is contextually redesigned. Researchers are asked to take up each subtopic, identify the central theme of the topic and connect it with a vocation which students can visualize in their minds. It is done for the entire text book by the researcher who participates in the action research program.

9. Lesson Plan:

A lesson plan is the instructor's road map of what the students need to learn and how it will be done effectively during the class time. It gives a scope for designing appropriate learning activities and developing strategies to obtain feedback on the learning of the student. A successful lesson plan has three components: learning outcome, learning activities, and assessment of the student's understanding. The lesson plan also is contextually redesigned to suit the programme objectives. Researchers are asked to write in the order of concepts covered in the lesson, vocations which can be connected to that, skills which can be inculcated with the mentioned vocation, learning outcomes, interdisciplinary concepts, tools/material needed, steps, precautions and assessments. Accordingly the output was generated. Few glimpses are summarized hereunder.

Table: 2:Excerpts from vocations embedded in Mathematics Curriculum

State/UT	Concept	Vocation	Skills	Entrepreneurship	Activity	Assessment
Assam	Functions – Relationship between variables	Nursery – growth of plant is determined by various variable factors – soil, water, temperature, pot size etc	Cognitive – functional relationships Technical - Cutting, shaping, nurturing, observation skills Life skills	Cost calculation, buying and selling Promoting Market Intelligence Negotiating	Students form as teams and develop a nursery under teacher's guidance. Run a stall on an event day at	Formative assessment Learning Rubrics Assessment Portfolio

					school	
Assam	Complex Numbers - numbers that are expressed in the form of a+ib where, a,b are real numbers and 'i' is an imaginary number called "iota"	Electromagnetism – Electric field is real and magnetic field is imaginary. LED bulbs & string lights used for festive decoration.	Cognitive skills Using different tools for cutting, measuring etc Interpersonal skills	Budgeting Planning Organizing Understanding Market Selling and Buying	Gather tools – parallel bonded wire with conductor, pliers, scissors etc. cut THHN wire, fix light sockets, choose colors and make	Formative assessment Assessment Portfolio Knowledge about tools
Uttarakhand	Quadrilaterals - Types	Making of Pocket Diaries and Kites	Aesthetics, skill of using tools like scissors, cutting skills, making new shapes	Budgeting, planning, team work, cost calculation, negotiation, market penetration	Gather material like unused papers, paints, brushes, glue, scissors etc and make diaries of different shapes	Formative assignment Rubrics of making and selling
West Bengal	Permutations & Combinati	Ice Cream Man/Girl	Using different combinations to increase	Increase product range	Ice creams of different	Number of varieties generate

	ons		varieties of ice creams Measuring skills, application skills	Increasing customer satisfaction Buying and Selling	flavors, colors, scoops and cones are procured A stall is arranged on an important day in school	with given number of flavors Selection of theme to sell Revenue generated
Maharashtra	Linear Equations – Application of it in two variables	Tea Making	Statistical skill Tea Making skill Communication skills	Budgeting, Planning, Sourcing, Market entering	Determine exact proportions of Tea Powder, milk, water and prepare tea	Students prepare 10 cups tea and present cost, price and profit etc

Table: 3Excerpts from vocations embedded in Science Curriculum

State/UT	Concept	Vocation	Skills	Entrepreneurship	Activity	Assessment
Manipur	Long distance transport of water – Role of	Making Multi Color Roses	Cutting and making skill Team Work	Planning the activity Budgeting	Students will take white rose, cut the stalk	Rubrics on creation of rain bow

	Vascular tissues in water conduction		Aesthetic	Market identification Buying and selling	with horse blade into 3 or 4. Dip in water of different colors and understand the upward movement of water	roses. Activity Assignment
Assam	Chemical Reactions and Equations-balancing and measurement of materials	Making of Make-up product using natural flowers and vegetables	Concept skill about balancing and measuring and equation Skill of using different colors	Budgeting Market entry knowledge Pricing and costing of product	Students gather materials like beetroot, roses, jasmine oils etc. carefully measure and grid and allow to dry Make products and sell	Theoretical assessment on balancing equations Time chart study of activity Marketing rubrics
Punjab	Sexual reproduction in flowering	Farming and selling	Identification of albuminous and non	Team work Space		

	plants – Post Fertilization structure and events	peas	albuminous seeds Identifying different pea seeds Gardening skills Nurturing skills	economics Understanding time utility Multiple forms and usages of peas		
Telangana	Challenges for improving Agriculture – Organic Farming	Organic Fruit Juice Seller	Skills of Cuisines Hospitality Team work Identification Critical Thinking Distribution of Tasks	Branding of the product – organic juice Creation of USP Cost calculation Market Making	Students procure organic fruits, make juice and sell in a school event.	Knowledge about Nutritional values and health indicators. Knowledge about supply chain practices
Gujarat	Magnetic Effects of Current – Magnetism, Solenoid	Armature Coil Repairing	Using compass needle Determination of magnetic force Making coils Creative thinking	Apply the knowledge of magnetic force in making solenoid	Magnetic effect of the current will be explained. Solenoid is made with North and South polarity	Project to construct simple motor Ask to make solenoid in class Ability to use electric

					Armature Coil is made	appliances is observed

Table: 4: Excerpts from vocations embedded in Social Science Curriculum

State/UT	Concept	Vocation	Skills	Entrepreneurship	Activity	Assessment
Goa	Tertiary and Quaternary Activities	Retailer	Active Listening Customer service Retail sale skills Persuasion skill Product styling	Organizing skills Profit – loss calculations	Students are asked to form into groups to pool money and organize stall on a festive occasion in the school. They run a campus mart.	Detailed project report Profit and Loss account Feed Back of buyers
AP	Village Production Structure	Selling vegetables door to door	Vegetable farming Cutting skills Packing skills	Logistic management Cost calculation Fixing price with margin Customer relationship	Students grow small veg. farm as group activity, or get vegetables from nearby farm, cut them, pack and sell in the neighborhood	Formative assignment Business model presentation Awareness about rural products

				practices		
Jharkhand	India in Globalization – China Toys in India	Toy making and Selling	Toy making with hands Aesthetics Coloring – adorning Awareness of culture	Concept of Dumping Online marketing Promotion of product Product description writing Trading	Students in groups pool money, bring raw materials for making toys that depict local folk characters and sell on a festive day.	Project report USP Rubrics on toy making Strategy followed in marketing
Mizoram	Drainage system in India	Bamboo irrigation	Critical thinking Problem Solving Out of box thinking Skill of Utilizing available resources	Students create micro bamboo irrigation system Pioneering in preventing water wasting	Students collect bamboo from forest They arrange axe, other woods for erecting bamboos. Connect the bamboos to water springs and water the school garden	Project assignment Knowledge about Water Management
Nagalan	The Story	Clay	Creative	Cost, Price and	Students	Workmansh

d	of First Cities – Harappan Civilization	Mug Making	thinking Math skills Pottery Decision Making	Profit calculation Time Management Customer perception	pool the air dry clay, fabric painting, Brush, knife spoon etc Under teacher's guidance they make mugs and paint on them after drying. They organize a stall in school	ip Beauty & Novelty Aesthetics – Rubrics Project Report

Table: 5: Excerpts from vocations embedded in Languages Curriculum

State/UT	Concept	Vocation	Skills	Entrepreneurship	Activity	Assessment
Telangana	Film& Theatre – Rendezvous	Portrait making Writing biographies of eminent people & Podcast	Research skill Reading skill Content generation Active listening Presentation skills	Students understand social media mechanics They learn to shoot, edit, speak and posting in catchy way. They get ease of digitalizing	Students are divided into groups and asked to make biographies They interview, read and do research and digitalize	Rubrics on Quality of content Viewership gained Originality

Sikkim	The Last Leaf – Theme of Friendship and Sacrifice	Making Friendship Bands and Trending accessories	Aesthetics Designing skills Team Work	Planning & Organizing work Negotiations & Communication Buying and Selling	Students pool money, get material from wholesaler Make friendship bands and sell on the eve of Friendship Day	Project Report on Activity Creativity in promoting and selling
West Bengal	Llyas – the story of a man who became poor and took job in rich man's house where he saw a carpet and recollects his properties	Carpet Making Jute Carpet making popular vocation in rural Bengal	Hand knotting Sewing Cutting Measuring Team Work Ability to split work in small tasks Communication	Planning Scheduling Work Market survey for cheaper raw materials Bargaining	Jute Braid, Jute strings, needle, glue etc are procured and carpet is made with the help of expertise	Formative assignment Rubrics on beauty, theme etc
Maharashtra	The Three Questions - theme about hermit digging and living	Seed Bank	Culinary Arts Waste Management Preservation	Commercialization of waste Online Marketing	Students in groups collect seeds from kitchen waste, dry them in	Product Range Quality of preservat

	in a place with vegetation		skills Time Management Critical Thinking	Grows as seed technologist	proper season. Pack and sell through App/online/ stall	ion Packing
Manipur	SagolKangjoi (Local Name of Polo Game played in traditional costume)	Traditional Costume Designer for playing SagolKangjoi	Stiching skills Ethnicity Observation Creativity Influencing	Hiring people from rural back ground Competitive advantage Local Market Exploration	Students in groups gather knowledge about designing costumes from their elders. Make the product and sell in the nearest market	Rubrics on Ethnicity Quality of Product Receipts on Sales

Discussion:

Individuals learn best through direct experiences that engage their senses, emotions, and intellect. Therefore, experiential learning is a dynamic educational approach that emphasizes hands-on, immersive experiences as a primary means of learning. Kolb's experiential learning theory presents a cycle of four elements. They are concrete experience, reflective observation, abstract conceptualization and active experimentation in the order. A brief description of the four elements is in the following way. Trying new things, stepping out of comfort zone and facing problems provide the hands-on experience entails some learning. The second phase that is reflective observation is a mix of action and feelings which gives a chance to observe by pondering on action and analyzing on 'what went right' and 'what could be improved'. The third phase is 'abstract conceptualization'. Once the defining characteristics of the experience are identified and understood, the necessary modifications of steps can be planned for repeating the action. It is essentially a brainstorming exercise for success. And the 4th phase in the line is 'active experimentation' where it is to get to experiment the new ideas by forming a plan of action. Hence, in one way it can be stated that first and third phases are the two ways of grasping the experience. The two other phases –

namely, reflective observation and active experimentation are the ways of transforming experience. In this way participants are actively involved in the learning process through applying knowledge in the real world contexts. It is extensively approved that learners who are actively participating in the learning progression and take interest in their academic education are more likely to achieve higher levels of learning (Wang et al., 2021)[18].

In educational institutions educators can leverage can leverage experiential learning to bridge the gap between theory and practice so that students can contextualize academic concepts in the real world scenarios. On the other side, Gandhiji's educational philosophy – Nai Talim insists on construction of small and self reliant communities with his ideal citizen being industrious, self respecting and generous individual living in a small cooperative community. A teacher of Nai Talim is envisaged not simply as professional constrained by curricula, but becoming one among the pupils in the process of transforming knowledge and essentially it is two-way. The crux of Nai Talim as rightly emphasized by Vinoba Bhave – famous follower of M.K. Gandhi is overcoming distinctions between knowledge and work. New Education Policy envisages an education system as the best possible blend of both frameworks.

It is therefore clear that 'as action' part has to be integrated with each lesson which is taught as a part of curriculum. Researchers are given the task of generating such vocations and developing the entire plan of executing them along with the cognitive content of the curriculum. It is necessary to connect the concepts with some or other income generating avenue, so that while learning the lesson the students either individually or as groups initiate an income generating activity and get along with it. The lesson plan describes the method of doing it step by step. The set of precautions are also specified for every task in a view that teacher gives students sufficient briefing before taking up that activity. The lesson plan ends with 'criteria for assessment based on the kind of task. It may be the awareness of tools or formative assignment or cost calculation or developing rubrics to measure the performance or quality of task and so on.

This whole effort gave rise to altogether a new kind of content. Above Tables present brief summary of few lesson plans with embedded vocational component in methodologies of four subjects. Approximately, all over the Nation 5000 lesson plans have come out with different vocations embedded. Apart from generation of content, the research activity has set a new direction in the minds of teaching community who are undoubtedly the shapers of future society.

Conclusion:

The process is as important as outcome as far as education is concerned. The way we learn is equally important to what we learn. The educational process must be directly relevant to people's lives, on finding solutions to the real problems people are facing. The process must always aim for social transformation instead of social reproduction. The policy framework

must ensure that. Mahatma Gandhi National Council of Rural Education (MGNCRE), in order to create a compatible climate for enabling the shift through required policy change, worked relentlessly for seven years in this direction. As a parallel measure, NEP 2020 aims at shifting towards experiential learning methodology through integrating vocational education in subject methodologies.

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