

Understanding the Learning Crisis, Learner Competencies and impact of Multidisciplinary Learning

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Abstract: Education is the most important tool that allows us to expand our learning ability. Universities and school across the world are the most trusted functionaries known for giving the nations its human capital by developing the intellectual capabilities of its youth. Yet it is felt that there is a gap between education delivery and expected learning outcomes. In India, in the last few decades, significant progress has been made towards universalization of education, yet we are struggling with a mismatch between the skills that employers seek and those that our job seekers have. Taking an insight from the mentioned references, it is imperative on our part, as a country to take calculated steps to develop learning competencies amongst our children, in a bid to impart quality education. It is felt that students need to develop the skills to become lifelong learners in an ever-changing world and have a future-focused mindset. A number of essential learner competencies have been identified in this study and also an attempt made to explore multidisciplinary approach as a possible option to enhance learning outcomes.

Keywords: Learner Crisis, Competencies, Multidisciplinary Learning, Learning to learn

1 INTRODUCTION

1.1 “Wisdom is not a product of schooling but of the lifelong attempt to acquire it.” – Albert Einstein

There are numerous instances from our past to elucidate that a human being is inquisitive by nature and thrives at the chance provided for a new experience, thought, action or provocation. Societies & Communities across the world have taught the upcoming generations to learn from their past, nature & surrounding eco -system, intuition, and the accumulated reservoir of scientific discoveries and its mathematical analysis. Growing wiser by acquiring the competence to learn, unlearn and relearn has been the most practiced and successful dictum as of now. The most trusted bodies for preparing youth for life are schools and universities and it is being done with the cooperation of efficient policy making on the part of Government. Looking back into the past, so much has happened over the years that makes one wonder what an impact the growth factors must have had, to generate great momentum in the learning pattern.

1.2 In India, in the last few decades, significant progress has been made towards universalization of primary education, access to school and infrastructure, teacher-pupil ratio, improvement in girls’ enrolment, etc. However, our poor educational outcomes and inefficient education systems are eliciting deep concern from all stakeholders. Our primary schools fail to provide students with appropriate cognitive skills like numeracy, literacy, problem-solving ability and general scientific knowledge. Our secondary and tertiary level institutions, including technical and vocational education and training, remain inadequate and poorly structured, and cannot cater to the emerging job market. We are struggling with a mismatch between the skills that employers seek and those that our job seekers have.

In a report named Education for All, Towards Quality with Equity INDIA Published by NEUPA in association with UNESCO, the results of NAS for Class III conducted in 2012-13, showed that in India, overall Class III students were not able to answer 36% per cent of language items and 34% per cent of mathematics questions correctly. These are the (5.1.1) issues that need increased attention in quality-related deficiencies in ECCE (Early Childhood Children Education) in our country.

1.3 According to Educational Statistics at a Glance, published by MHRD, GOI, 2018, the Gross Enrolment Rate (GER), that is total enrolment in a specific level of education, expressed as a percentage of the eligible official school-age in the year 2015-16 is only 24.5 %, in Higher Education (18-23 years), compared to 99.2% at Primary level (6-10 years). This indicated that the GER in higher education for India is lower as compared to developed nations because a large population of students in the relevant age group is simply not eligible to enroll in colleges because they have not successfully completed the higher secondary education.

Data Source: Department of Higher Education, MHRD, Government of India

Gross Enrolment Rate (GER): Total enrolment in a specific level of education, regardless of age, expressed as a percentage of the eligible official school-age population corresponding to the same level of education in a given school-year. School-age Population: Population of the age group which officially corresponds to the relevant level of education.

Table 13: Gross Enrolment Rate (GER): 2015-16

Level	ALL			SC			ST		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Primary (I-V)	97.9	100.7	99.2	109.5	112.4	110.9	107.8	105.7	106.7
Upper Primary (VI-VIII)	88.7	97.6	92.8	97.8	107.7	102.4	95.4	98.2	96.7
Elementary (I-VIII)	94.5	99.6	96.9	105.3	110.8	107.9	103.4	103.1	103.3
Secondary (IX-X)	79.2	81.0	80.0	83.9	86.9	85.3	73.7	75.4	74.5
Senior Secondary (XI-XII)	56.0	56.4	56.2	55.8	58.0	56.8	43.8	42.4	43.1
Higher Education	25.4	23.5	24.5	20.8	19.0	19.9	15.6	12.9	14.2

Data Source:
For School Education: National Institute of Educational Planning & Administration, New Delhi
Figures related to School Education are provisional.
For Higher Education: Department of Higher Education, MHRD, Government of India

Educational Statistics at A Glance

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FIGURE 1 GER 2015-16

1.4 Although more children than ever are enrolled in school, far too many are not learning. The brief notes that the lack of resources available for the poorest children is exacerbating a crippling learning crisis, as schools fail to provide quality education for their students. As quoted in a report addressing learning crisis submitted by UNESCO, The nation is set to become one of the youngest nations in the world by 2030, with around 140 million people expected to be in the college-age group. Sadly, the country does not have an educational landscape to harness the true potential of their youth to meet the challenges of a global economy. But not only in India, is the world-wide situation similar too.

1.5 “No challenge is greater than that of the learning crisis. According to the World Bank, 53 per cent of children in low- and middle-income countries are “learning poor” – they cannot read and understand a simple story by the end of primary school. The UNICEF Education Strategy acknowledges that at current trends, by 2030, 420 million children will fail to attain basic skills in childhood, and 825 million will fail to attain basic secondary-level skills. In 2019 UNICEF spent 1.2 billion on education to tackle the learning crisis.”

1.6 According to the Global annual results report 2019: Goal Area 2, declared by UNICEF, “There is a large gap between what students are learning and what the job market is looking for. The current curricula are outdated. At current rates, by 2030, of the 1.4 billion school-age children in low- and middle-income countries, 420 million will not be on track to learn the most basic skills in childhood, and 825 million will not be on track to acquire the basic secondary-level skills they need to succeed in life, school and work”.

1.7 According to the New Education Policy, which was approved by the Union Cabinet of India on 29 July 2020: “To close the gap in achievement of learning outcomes, classroom transactions will shift, towards competency-based learning and education.” (mhrd.gov.in). Taking it ahead, in his address on School Education in 21st century under NEP 2020, the Indian Prime minister Narendra Modi said: It is necessary to develop a greater learning spirit, scientific and logical thinking, mathematical thinking and scientific temperament among youngsters. In order to truly transform education from an industrial-age model to a model of system-wide empowerment, organizations must be willing to go beyond second order change. Learning is the constant; resources, learning experiences, instructional support, resources, effort, and time may vary. The power of competency education is in its system-wide infrastructure that creates the necessary feedback loops to ensure students are learning.

1.8 The Objective of this paper are:

- 1 To recognize the learning gap or crises prevalent in India
- 2 To identify the learner competencies
- 3 To study the impact of multidisciplinary approach in education

3 LITERATURE REVIEW

3.1 Leadership is an important competency of 21st century

As per an article published by Michael L. Anderson Fangwen Lu (2017), in HBR, titled, “How Leadership Experience Affects Students”: Leaders tend to have higher cognitive ability, more self-confidence, and more motivation or drive and receiving a leadership position made a student more likely to rank effort as the most important determinant of academic success. They were correspondingly less likely to credit teachers or parents as important factors.

It is important to realize that Leadership is an important competency of 21st century that must be worked upon so that we may get better results in academics performance of students.

3.2 Leadership Competency Entails High Academic Outputs Too

According to a paper published by Valerie Miles-Tribble from Walden University, US, (2015) on the topic "Assessing Student Leadership Competencies and Adequacy of Preparation in Seminary Training":

Self-assessment of scaled competencies provided indicators of leadership potential through demonstrated aptitude and self-awareness of capabilities. Adequacy of preparation for Academic excellence is related to, affected by, or influenced by student rated leadership aptitude or competencies. There appears to be a good relation between the academic outputs of students who were assigned some leadership positions or the other in the class as the self-assessments, willingness to do and the environment created helped them to acquire competencies.

3.3 Learning to Learn as a Key Competence

In a paper titled Learning to Learn as a Key Competence and Setting Learning Goals by Laura Rožman and Andrej Koren, self-regulation learning is a way of learning that enables to develop the competence learning to learn. Learning to learn is the ability to pursue and persist in learning, to organize one's own learning, including through effective management of time and information, both individually and in groups. This competence includes awareness of one's learning process and needs, identifying available opportunities, and the ability to overcome obstacles in order to learn successfully. Mesároš, Mesárošová and Mesárošová (2012, p. 490) claim, that we need to understand intrinsic and extrinsic motivation in order to understand individuals' learning strategies. The strategy means to become the most effective learner and to maximize one's chance of achieving high grades. We have to understand that this competence relates to motivation for learning, learning goals, preferred ways of learning, learning strategies, cooperation with others and so on (Hoffmann, 2008, p.175). It means that we as learners become aware of all this concepts and are able to adjust them if needed. As learners we also have to be responsible for our learning. Attitudes which (adult) learners will need to follow to develop learning to learn are (Hofmann, 2008, p.177):

- self-motivation for learning,
- inner willingness for personal development and changes,
- self-awareness and self-confidence,
- positive attitude,
- Willingness to motivate and support others.

3.4 21st Century Skills in a digital world

The paper titled-21st Century Learning Changes to Knowledge Acquisition in a Digital World by Dr Carolien van den Berg, reviews the skills required in a digital world by knowledge workers and the teaching and learning environment to enable 21st-century learning in order to address the misalignment between what is taught in formal education versus what is required in an innovative, digital world. The umbrella term used to describe the type of skills that students will need to develop in the digital economy is "21st-century skills" (21st CS). The framework clarifies knowledge as foundational (to know), meta (to act) and human (to value).

- Foundational knowledge consists of core content, cross-disciplinary and digital knowledge.
- Meta-knowledge is knowledge "to act" using creativity, innovation, problem solving, critical thinking, communication and collaboration
- Human knowledge includes job and life skills, emotional intelligence and cultural awareness.

Students need to develop these skills to become lifelong learners in an ever-changing world and have a future-focused mindset. A focused approach was followed to make the students aware of their social imprint.

3.5 Skills needed for success in life

In a report given by UNICEF, titled Adolescent education and skills, the Skills needed for success in school, life and work are:

- Foundational skills: Foundational skills, namely literacy and numeracy, are essential for further learning, productive employment and civic engagement.
- Digital skills: Digital literacy enables children and young people to use and understand technology, search for and manage information, create and share content, collaborate, communicate, build knowledge, and solve problems safely, critically and ethically.
- Transferable skills: Also called "life skills," "twenty-first-century skills," "soft skills," or "socio-emotional skills," these allow young people to become agile learners and global citizens equipped to navigate personal, social, academic and economic challenges. Transferable skills also help young people affected by crisis cope with trauma and build resilience. They include problem-solving, negotiation, managing emotions, empathy and communication.
- Job-specific skills: Also known as "technical" and "vocational" skills, these are associated with occupations and support the transition of older adolescents into the workforce.

3.6 Diversifying interests and opportunities

According to a publication titled Web Resources released during Shiksha Parv organized by Ministry of Education GOI, "Drawing inspiration from ancient universities like Taxila, Nalanda, Vallabhi and Vikramashila, it has been recommended to establish large and multi-disciplinary universities and higher education institutions or clusters. Multi-disciplinary Education and Research Universities i.e., MERU will be set up with the aim of achieving world-class quality education. This will enable the development of qualified, versatile and creative youth in every part of the country."

In many ways, today's young adults are more aware, decisive and responsible for their own futures. Beyond schooling, as students

step into the world of higher education, it becomes the duty of modern universities to have an educational arena that fosters discovery, growth and most of all, keeps the flame of interest eternally ignited. All this, and much more can be achieved through a multidisciplinary approach. this possibility of a multidisciplinary education lets students Learn more, at once, thus consciously breaking down boundaries between disciplines. Strong mentorship lets them grow as a student, individual, and member of society. Moreover, it helps to diversify interests and opportunities.

3.7 The Multidisciplinary approach in school curriculum

In a book named Meeting Standards Through Integrated Curriculum, the author Susan M. Drake and Rebecca C. Burns, mentions that “Innovative educators concerned with improving student achievement are seeking ways to create rigorous, relevant, and engaging curriculum”

Multidisciplinary approaches focus primarily on the disciplines. Teachers who use this approach organize standards from the disciplines around a theme. Integrated curriculum is used to refer to an instructional method and materials for multidisciplinary teams of teachers to organize their instruction so that students are encouraged to make meaningful connections across subject areas. English, mathematics, science, social studies and career technical teachers all collaborate to plan and present lessons that center around a central, career-themed issue or problem (Steinberg, 1997).

She further says that, what makes multidisciplinary students stand out to employers is the rich view of the world that they develop, the wide range of perspectives they will have encountered during their studies, and the combination of subject areas they have studied that could offer more flexible career choices.

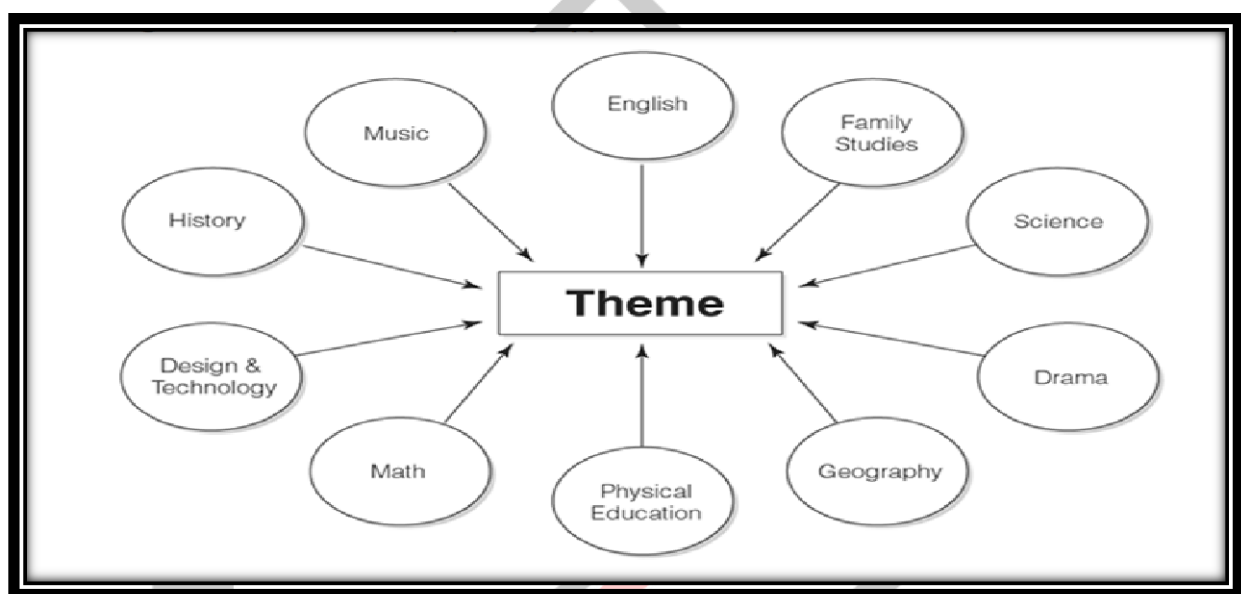


FIGURE 2 The Multi-disciplinary Approach

An Effective Multidisciplinary Integrated Curriculum can be designed to improve learning, in three following manner:

- Academic and Technical Rigor Curriculum is designed to address real world context (e.g., community and workplace problems) and address issues that matter to the students;
- Applied Learning Units engage students in solving problems that call for competencies expected in high- performance work organizations (e.g., teamwork, problem solving and communication);
- Active Exploration Units are made to extend beyond the classroom by connecting to internships, field- based investigations and community explorations; Adult Connections Units help to connect students with adult mentors and coaches from the community's industry and postsecondary partners;
- Assessment Practices Units involve students in regular performance-based exhibitions and assessments of their work;
- Evaluation criteria reflects personal, school and real-world standards of performance (Steinberg, 1997).

For teachers-Preparing students to work with and on multidisciplinary teams enhances their interpersonal skills sets, empathy, and marketability as future professionals and engaged citizens (Being able to appreciate others' personal and professional perspectives creates critical thinkers and well-rounded graduates.

3.8 Multidisciplinary project activities connect between education and working life in higher education/universities

There is a research paper named Students' learning experience in a multidisciplinary innovation project performed on professional higher education students in Finland by Laura-Maija Hero and Eila Lindfors

A multidisciplinary innovation project described in this study is a pedagogical way to connect school to the practices of society and work life. These results provide encouraging findings for organizing multidisciplinary project activities between education and working life. Working at the boundaries of different disciplines and networks seems to push students to act creatively and proactively and take responsibility for their actions and learning. The findings show a picture of a real-life learning experience of active experimentation (Kolb, 1984), where the learning outcome is impossible to be defined in advance in much detail, where the

immersion and engagement to project work is obvious and the problem space is unlimited and unpredictable (cf. Johnsen, 2016; Gilbert, 2011; Biffi et al., 2017; see also Dewey, 1938, 1916/1985). The findings suggest that curriculum design should enable networked, student led and teacher supported pedagogical innovation processes. Such an involvement shall lead to better results as active experimentation would lead to better retention and good outcomes in terms of outcome of education.

3.9 The transferable skills gained through multidisciplinary study

According to a journal of Open University, Scotland, titled, Multidisciplinary study: the value and benefits, building your own multidisciplinary approach to learning and developing these important skills will enable the students to study in a way that suits their own style of learning, motivations for study and personal interests. Some examples of the transferable skills gained through multidisciplinary study are Critical thinking, Self-management, Adaptability, Analysis and problem solving, Communication and literacy, Application of information technology, Flexibility, Synthesis of ideas.

4 METHODOLOGY ADOPTED

Multidisciplinary curriculum is studying a topic from the viewpoint of more than one discipline and solving a problem using a different disciplinary approach (Klaassen, 2018). For example, reducing the CO₂ emissions from a car can be achieved by studying how to develop fuel chemistry or by studying how to improve car engine performance. Instead of teaching Unification of India only in the chapters of History, in a single discipline, it can be taken up in multiple disciplines like health education, language, IT, science, art etc., which certainly enables better understanding and retention. Inculcation of leadership qualities amongst students helps them to enhance their personality quotient, giving them better results in their overall performance in schools and Universities.

Based upon these premises and the supporting Literature Review, a few pilot surveys and case studies were identified which are appended here.

4.1 Survey A survey was conducted to find out about awareness about leadership competency amongst 13–14-year-old students, studying in an NCR school in grade 8, with reference to submissions in 3.1. The students were found well aware about it and

- 73% wished to acquire leadership competency.
- 25% wished to acquire leadership in the field of academics
- 68% wished to have more socio-emotional skills to become a leader
- 32% wished to be helped in acquiring competence in Decision Making as a competency. Reflection-Most of the students are aware of leadership competencies and wish to acquire it.

4.2 Survey With the understanding that Competencies are combinations of attitudes, skills, and knowledge that students develop and apply for successful learning, living, and working, (Ref 3.4) a survey was conducted on 12-13-year-old students studying in grades VII, to find out if they were aware of Competencies to learn and if they were making efforts on their own to imbibe them. The results of this pilot project showed that:

- 74% confirmed to be aware and working towards developing their critical thinking skills
- 86% agreed to be working to improve their Creativity, Communication Skills & Problem- Solving skills
- 70% students are working to make their collaborative skills better
- 48% students are working towards making Cultural & Global Citizenship skills better
- 51% students are working towards making Personal Growth & Well Being

Reflection-Most of the students make efforts to work towards developing their 21st century competencies

4.3 Survey Another study done with the students grade 7 & 8, to understand the relationship between leadership qualities and academic outputs. (REF 3.2). The results were as follows:

- Out of 85 students who answered the survey, 90% had been given leadership position in school and almost all of them had enjoyed it too.
- 61% of those who attempted, had scored above 90% marks in their Terminal examinations, only 30% had scored above 80% marks.
- 90% of those who attempted the survey were able to accord a good balance between academic pursuits and classroom leadership responsibilities like, class monitor, prefect or council member

Reflection-There is a positive relation between leadership qualities and academic outputs.

4.4 Survey In a pilot project survey conducted on secondary school teachers to get an insight about Multidisciplinary approach being used in schools the results were quite encouraging. (REF 3.9)

- 99% teachers said that they used Multidisciplinary approach in classroom, and felt that it engages the students better and leads to holistic learning.
- 52 % teachers felt that its largest learning outcome were Inquiry, curiosity, experimentation
- 48% felt that the learning outcomes were either-Play and learning as an integrated whole, Expression and decision-making, Scientific and technological perspective, Communication and negotiation with peers, Recognizing fantasy and reality

Reflection: Most of the teachers said that Multidisciplinary approach leads to holistic learning.

4.5 CASE STUDY: In a bid to engage students in a participatory, active and project-based learning involving multiple discipline like geography, history, science, art, language and mathematics, service- learning projects were taken up as a pilot project in a

particular school, in Haryana, India, in class IX. The students worked in groups, and reached out to the community, with the help of teachers to acquire concepts beyond the domains of their textual knowledge. The students researched, conducted surveys & interviews, and presented their learning with the help of tools of technology. (REF 3.7)

Incorporating Science: In the research, students dealt in detail about the Rainwater harvesting systems that range from simple rain barrels to more elaborate structures with pumps, tanks, and purification systems. The nonportable water can be used to irrigate landscaping, flush toilets, wash cars, or launder clothes, and it can even be purified for human consumption. The students studied the lay out plan of rain water harvesting plants of their localities.

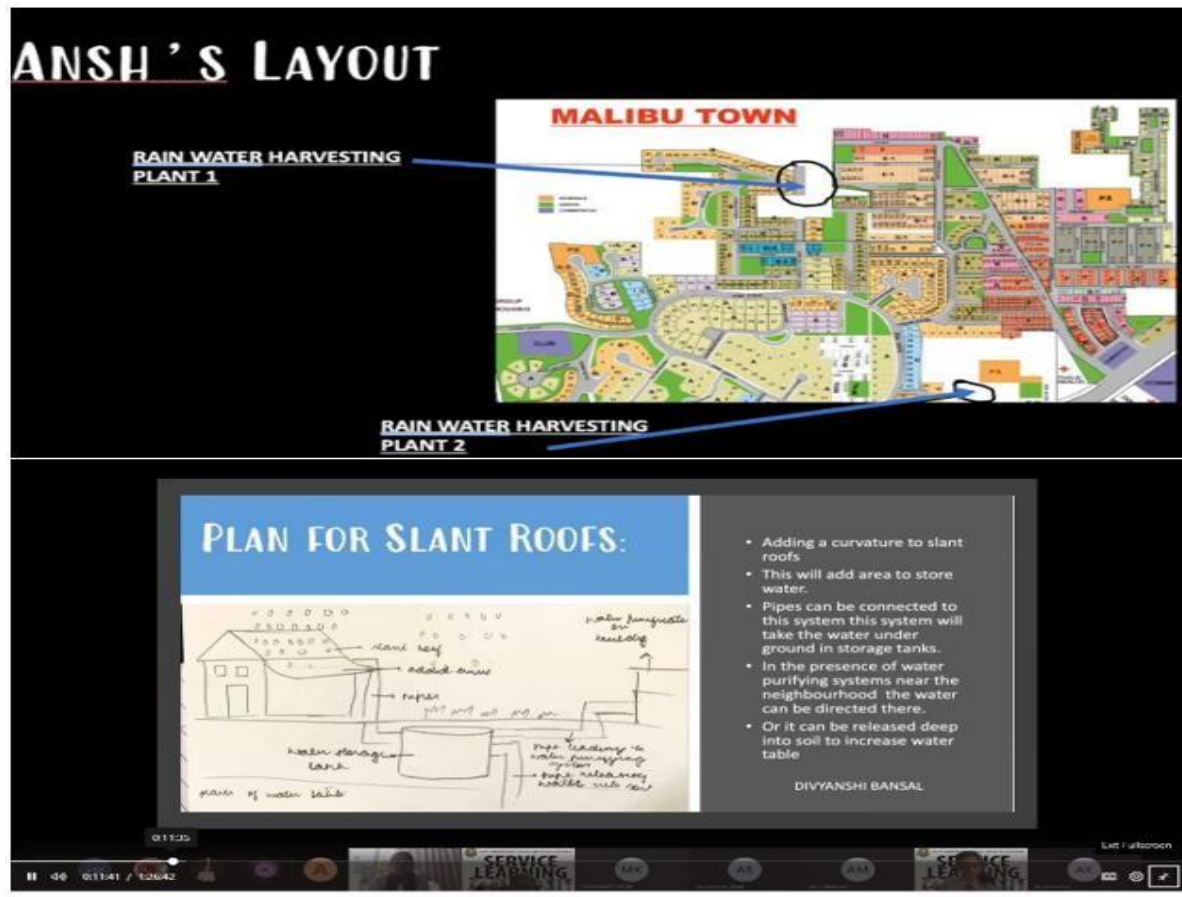


FIGURE 4 Rain water Harvesting Example

Incorporating Mathematics: The students did the survey on the pattern of water usage in the urban areas & analyzed and illustrated the survey results through Pie-graphs. They also calculated the average expenditure on the rain water harvesting structures.

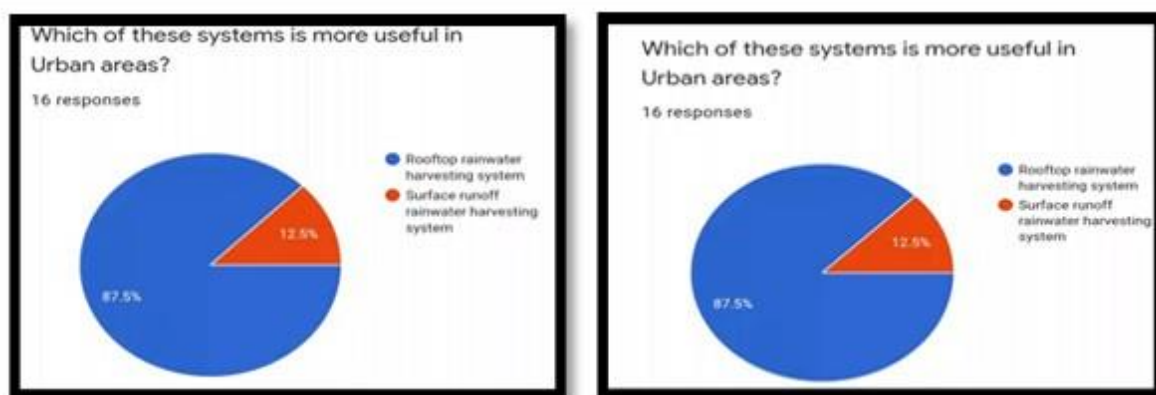


FIGURE 5 Water Usage Pattern Study

Incorporating History, Geography & Art: The students studied about the Baoris of Rajasthan and how in ancient times, the practice of harvesting water was prevalent in the state of Rajasthan. They also visited Faroukhnagar Baori, a heritage site near Gurgaon



FIGURE 6 Incorporation of water saving practices in History, Geography & Art

Incorporating ICT: In the entire presentation session the students used many ICT tools to display their piece of work. The ICT tools that were used are; Power Point presentation, Info graphs, Video, Survey etc.

The results of the action research done on 253 students who were part of the case study mentioned here, some inferences drawn were:

- 1) 78% students felt that they learnt more from the project presentation that involved active learning than from textual knowledge
- 2) Regarding meeting the learning outcomes,
 - 34% felt that they learnt through Mentorship-working in collaboration with others,
 - 21% could apply Self-Teaching,
 - 27% could Develop practical skills,
 - 12% Problem Solving skills and
 - 6% Connect with Academics
 - 88% of students enjoyed integrating more than one discipline in multidisciplinary learning.
- 3) Regarding what did they enjoy the most through multidisciplinary project,
 - ✓ 33 % enjoyed activities including communication, integration and negotiation with peers,
 - ✓ 28% Integrating science, cultures and environment for community and
 - ✓ 20% Inquiry, curiosity, experimentation, joyous learning activities

Reflection-The study indicates that the impact of the service learning, a multidisciplinary activity was immense and helped students to learn for life.

CONCLUSION

India is a country, known for its rich heritage and a culture of scientific innovations and discoveries, yet over the past few decades, the gap in between the what is taught and what is learnt, is pointing towards the emergent learning crisis, making it necessary for us to reflect and come up with a more focused and practical approach. There is a need to move away from rote learning towards competency-based education and achievement of learning outcomes. The classroom transactions need to shift, towards active and

outcome driven education with a focus on creative & critical thinking, collaboration, communication and problem solving. Some of the Learner competencies that should be emphasized upon are leadership, learning to learn, and digital competence, which are essential in 21st century. As inferred from the surveys and Case Study done, along with inferences from Literature review, it can be concluded that to improve students' understanding and make the learning process more productive and enjoyable, they need to experience the connection between different subjects of the respective curriculum. In this multidisciplinary approach, teachers fuse skills, knowledge, or even attitudes into the regular school curriculum. Pedagogical reforms including practices such as hands on problem-solving cooperative or team-based activities lessons requiring multiple forms of expression and project work that draws on knowledge and skills from several domains shall definitely get us desirous results. The multidisciplinary approach can actually help in learning more at once, provide strong mentorship support and Diversify interests and opportunities for students. It should be explored more in a bid to make education holistic in nature and fulfilment of an average Indian's dream of a progressive nation.

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