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RESEARCH ARTICLE

HANDS ON ACTIVITIES: ROLE OF METHODS OF TEACHING AS MEANS OF INTERDISCIPLINARY EDUCATION

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Abstract

Teaching and learning are a system of whole with the various parts including objectives, outcomes, methods of teaching and curriculum. This does not concern with just an individual but with a system, society, nation and sometimes even the whole of the universe. Each find its space in other whereas the other constitutes each unit in itself. In order to meet the general as well as specific aims of education we are suppose to be interdisciplinary as well as multidisciplinary in practice. The hands-onactivities-based method of teaching play the crucial role in achieving moretowards all sorts of goal and objectives at one time. It ensures the head, heart and hand engagement referring to cognitive, affective and psychomotor domain respectively. It prepares the child for the upcoming life and meet his vocational and professional aim. Hands on activities play a huge role in pedagogical, andragogical and heutagogical aspects of education. The hands-on based approach is a complete means to empower the interdisciplinary face of teaching as an art as well as science.

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Introduction:-

Every system is complete within itself, and this is how the nature maintains its balance. We all share a common platform or common structure organising us within system and maintain the equilibrium. The balance of nature and the balance of life. Human have enough within itself for survival and do not need other being to be alive yet we need family, friends, society and organisation: the components and sub components of society and every small unit of this hierarchy is important. We are complete within self yet we share a part of everything around and hence so the several further processes of our life including education. Education is an art of teaching as well as science. Within itself, it behaves as process and product at the same time.

Education: The sum up perspective

Education has a vast scope in the life of human beings. All the aspects and dimension of life and covered under education. It is a life long process from cradle to crave. It is concerned with holistic development of the individual, which include physical, mental, emotional, social, aesthetic, ethical, intellectual, social, spiritual, and vocational development. Education focuses on the maximum development of character and personality of the individual in coordination with its culture and environment.

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Interdisciplinary Approach: Educational Policies

The very illustrated National Policy of Education (2020), in its draft says that Education should be holistic in its aim and multidisciplinary in its function. To balance the knowledge and job mismatch there is high demand of skill-based learning and outcome-based teaching learning process. Hence, there is high demand of situation towards interdisciplinary education.

It is the irony of the situation that an engineering graduate is even sent for 14 days training before being hired for a call centre. It is difficult to understand why there is such wide gap between education and skills. The high ratio of educated employees or rather we say literate employees is matter of concern, especially in contemporary Indian education system

Educational institutions must reassess their roles and position themselves for the future. The institution should teach them only 80% within and rest 20% should be on their own, flexible, passion based, interest based which empower their skill and will them capable of leading a complete life as product of education. A flexible yet guided learning environment since beginning will give some space to think innovation in teaching and learning. Institution should inspire the learners for commitment and competency towards future of their own and society. It is not actually what you teach but how u teach is important make the child learn and not to memorize the content. This policy hence also gives importance to improvement of examination system in India. In addition to the policy highly recommend the need of vocational education and its implementation since secondary level. This will be led to the perfect collaboration between industry and education. The interdisciplinary approach of education will surely fulfil this purpose.

National Knowledge Commission (2007) took the initiative to cater the challenges of 21st century with an aim of development of vibrant knowledge society. Where vibrant knowledge includes books, technology curriculum and other multifaced of education like radical changes, promoting domestic research and innovation. This commission under the supervision of Sam Pitroda talked about the knowledge pentagon, enhancing knowledge application, access and participation. It says leverage information and communication technologies to enhance grievances and improve connectivity.

National Curriculum Framework (2005), initiated the constructivist approach, skill-based learning, and learning by doing approach in teaching learning process. It emphasizes on holistic and multidimensional approach in learner and learning perspective.

The National Policy on Education (1986) had made establishment of DIETs, CIEs and IASE for the improvement of teacher education and further the process of teaching learning processes. For the same the Kothari commission (1964-66), recommended the various courses like bridge courses, refresher courses, orientation programs etc. to empower education enough to fulfil the gap between knowledge and skill, learning and development, system of education and industry. Moreover, this gap needed to be fill so that education and national development goes hand in hand.

Interdisciplinary Education: In the view of UNESCO report

The UNESCO's report (1996) of the Delor's Commission on Education, talked about the wide aspects of education and thus it touches every important corner in broad perspective.

To accommodate these aspects in practice or the classroom situation it is important to incorporate them into the ways and content of teaching. The means that is the methods, techniques and strategies of teaching play significant role in achieving, either broader or narrower aims of education.

According to Gandhiji's definition of education, "By education I mean an all-around drawing out of the best in child and man- body, mind and soul".

Since even the aims of education holds a multidisciplinary perspective, the teaching learning process as well as the outcomes and methods of teaching must be designed and implemented via curriculum so that it goes in a interdisciplinary pathway.

The UNESCO report (1996) on Delor's commission talked about the holistic aims of education and emphasised on the interdisciplinary facets of education to achieve them. According to Shrimal and Sharma (2012), In their study, the students decided to pursue a lifelong education and at the same time be equipped with the required qualifications and skills for future employment opportunities. There is a big difference between the world of work and the world of teaching because our teaching method keeps students away from real life situations. Imitating the outside community in the classroom and adopting a holistic approach taking into account the intellectual, moral, cultural and physical dimensions of the personality, an ideal change in the approach to education to make it productive and socially stable. The Delor's Report sees education as an agent of positive change, requiring students to be open-minded and flexible so that they can easily adapt to the demands of a cut-off competitive world.

It states that learning needs to be interactive, experiential and participatory and should be based on spirit and experience with interdisciplinary means and end. Only then will it complete the comprehensive development of the 'perfect being'.

Education as whole

In the study of Svetlana Nikitina (2006), Cross-disciplinary analysis – examines an issue typically germane to one discipline through the lens of another discipline (i.e., how physicists explore music, sociological perspectives on the purpose of religion).

Multi-disciplinary analysis – examines an issue from multiple perspectives, without making a concerted effort to systemically integrate disciplinary perspectives.

Inter-disciplinary analysis – examines an issue from multiple perspectives, leading to a systematic effort to integrate the alternative perspectives into a unified or coherent framework of analysis.

We explicate what it would mean to take an epistemologically responsible approach to interdisciplinary education, one in which epistemological commitments are explicitly integrated into the content and structure of the curricula and pedagogy. In recent years we have seen a proliferation of interdisciplinary institutions, departments and training programmes, all aimed at meeting a global demand for individuals capable of producing high quality syntheses from disparate sources and types of information. To meet this demand, we believe that educators must develop the competencies that will enable them and their students to create high-quality interdisciplinary syntheses and instil the values that will positively dispose them toward that end. As Gardner explains, 'The synthesizing mind takes information from disparate sources, and puts it together in ways that make sense to the synthesizer and also other persons. (Gardner, 2007).

Interdisciplinary Education

Metaphysical base

Hicks (1981), the founder of the Interdisciplinary Humanities Programme and former Rector of St Paul's School, in his book *Norms and Nobility: A Treatise on Education*, When we teach to a group of learners, it is important to know about them, their individuality, differences, speciality, diverse needs etc, so that we would arrange the learning materials in that way. In the same way, for the learning outcomes to be achieved to its fullest, the learner must be aware of what they are studying, the origin, the existence the applicability in the reality of that particular knowledge.

This interconnection between content and its metaphysical perspective holds the interdisciplinary approach in its base. Suppose when we talk about worshipping trees in Hindu mythology, we say that conservation of plants and animals for ecological balance and environmental conservation. The sociology and environmental science go hand in hand. Similarly, the postures of Namaz in Muslim's while praying, explicit the postures of asana, the one of path of yoga in Astangik marg.

Epistemological base

Interdisciplinary syntheses are among the most epistemologically complex endeavours that humans can attempt. This complexity arises primarily from the deep differences of perspective that must be bridged in order to carry out interdisciplinary projects. That is, different methods and disciplines frame different perspectives and thus generate different kinds of knowledge. Interdisciplinarity entails integrating more than one of these perspectives to generate a kind of higher-order knowledge that is more than the sum of its parts. These elements cannot simply be tossed together in an interdisciplinary course (or research programme) like so many ingredients in a salad. Rather,

successfully carrying out such a process of perspectival integration requires epistemological sophistication. The need to provide citizens with a scientific culture is a recurring theme in education. Relevant work, whether in the form of discovering the basics of scientific knowledge or tracing the history of a particular discovery, can be a way to make science more accessible, Students who cannot question the most important subject in science” (Ruth ,2003).

In what follows we draw on the work of Piaget and Habermas, two expert interdisciplinarians. These authorities aid in characterising the epistemologically significant differences between methodological perspectives that make interdisciplinary synthesis such a complex educational enterprise. In light of these complexities, we propose the value of taking a pluralistic attitude toward various methodological perspectives, one that entails a stance of openness toward all relevant methods to ensure that no perspectives are unduly highlighted or unduly marginalised.

In the words of CaseyJones, in the modern curriculum The interdisciplinary approach is an important and challenging technique .this approach led to the synthesis of more than one discipline which will led to the creation of collaboration of teachers and students with enhanced the overall educational experience. However, there are many pros and cons of interdisciplinary education. The inferior pedagogy of traditional methodologies that concentrate specifically on only one discipline has many more limitations. The interdisciplinary approach provides many benefits that develop into much needed lifelong learning skills that are essential to a student’s future learning.

1. Creativity: the interdisciplinary education will allow the child to have maximum exposure of educational process with an interconnected approach in learning.
2. Divergence: the ultimate divergence in the approaches of learning will led to exposure and hence will further enhance divergent and off the way thinking. A little flexible curriculum will give rise to entrepreneurship than learned unemployed.
3. Convergence: the interdisciplinary classroom accommodates the multipassionate kids with multiple abilities, there is space for everyone to grow, and every one to find their area of interest and pursue the one.
4. Life skill: the interrelated learning at one place is helpful in learning the hidden moral values behind every teaching. Foe example the concept of unity and democracy while learning about politics and civics.
5. Multisensory engagement: interdisciplinary approach led to the involvement of multiple senses through vicarious and diverse experiences.
6. Awareness: the inclusion of disciplines in one learning experience activate the senses and uplift them aware of self and hidden surrounding systems.

Role of methods of teaching: in strengthening pillars of learning

The methods of teaching are like the weapon in the hand of teacher, which will embrace his teaching and ensure the learning to achieve its outcomes to its fullest. Taylor concludes, “Interdisciplinary work by both educators and students may broaden students' knowledge of history and diverse cultures. Including the arts in social studies instruction may have pedagogical benefits as well because the inclusion would facilitate differentiated instruction” (Taylor, 2008).

Methods of teachings promoting interdisciplinary approach:

1. Heuristic method
2. Premack model of teaching
3. Cooperative teaching
4. Parallel teaching
5. One teaches one drift teaching
6. Collaborative teaching
7. Cooperative teaching
8. Team teaching
9. Panel discussion
10. role play
11. Gaming

The above all can be broadly accommodated into hands on activities-based teaching.

Hands on Activities: the multidimensional approach

Hands on activities is a method of teaching, based on the constructivist approach.Hands-on activities is defined mainly as any instructional approach involving activity and direct experience with natural phenomena or any

educational experience that actively involve students in manipulating objects to gain knowledge or understanding (Haury&Rillero, 1994).

Activities used for teaching-learning would be different from topic to topic, in accordance with the changing needs of learners, changing needs of the content materials, changing needs of the time, changing demand of the society and facilities available for teaching-learning process, for example, experimentation, puzzle, song, quiz, dance, measurement, observation, brain storming, group competition, debate, preparation of improvised apparatus, creative use of available low-cost materials etc.

Achieving Interdisciplinary in Practice within four walls

Hands on activities-based teaching make the interdisciplinary practices possible within the four walls of education. For example if we teach our student the reactivity series with the folk song, this method with integrate the child with local culture.

Engagement of head, heart and hand

the involvement of head as cognitive domain, the hand as psychomotor domain and the heart as affective domain will optimise the teaching learning processes.this was also advocated by the Piaget theory of cognitive learning.

Self -efficacy booster

When the child performs activities and the successive achievement of outcomes and recognition uplifts the child's level of motivation as well as his self-efficacy level.

Outcome based learning

According to Dale's cone of experience, the learning by doing gives the maximum outcome of learning and then visuals, which become least by hearing.

Importance of interdisciplinary education

Youngblood (2007) states thatinterdisciplinary approach is important because "being in one discipline which cover physical andsocial sciences as well as humanities as other will be considering interrelations between realms ofknowledge". Staples (2006) explained that Environmental Sciences need an interdisciplinary approach due to the poor "state of environmental education and the need for improvement in ecological literacy".

Training of multiple senses

With the interdisciplinary approach in teaching the child is the fully engaged in the process of learning which makes the teaching to achieve its immediate as well as long term objectives, for example if the child is taught about cultural diversity and is asked to prepare a project on analysis of marriage rituals. This investigation will connect the child to ethnicity, community participation, the theory of structural functionalism as well as how the culture has been evolved since long. The whole sociology will be considered in just simple project.

Meeting the local and global aims of Education

The local aims or rather we say that the immediate objective of education is to prepare a child to learn and grow and line their life with dignity in the equilibrium with social, mental and emotional aspects with interpersonal coordination. It also involved the development of child innate potential and let him earn to serve the self .But ofcourse world is a familyand hence the development of each individual let to the development of whole world, making it a better place , either as innovations and discoveries or knowing the inner self. Someway or the other interdisciplinary education provides the sense for man making education.

Industrial and Occupational Development

With the help of interdisciplinary approach when a teacher make his teaching expanded either getting into circumference of other discipline or bringing them into his discipline, he is doing the rainbow job. The child will be able to find his area of interest and aptitude. The child may able to find the things he enjoys, the subject he is enjoying,the hidden job /profession and every aspect that would serve him the best and society as well.This act as a power booster to the role of teacher and empowered his position. With hand on activities the child will become capable of finding his initial skill and the passion as well as differentiate between his dream area and capability of achieving the same. Maybe we can say that its help to realize how far we have come and how much is yet left to cover.

Mutual growth mechanism

When the teaching is implied with hands on activities, the concretization of concepts along with practical timing, the maximum learning takes place. If we engage local craft as vocational training (suggested by NEP, 2020) this will empower local trade at global level.

The recognition of local craft and involvement of community into the same will surely empower the education/school and community relationship.

This will also pass on the art of ancestors and the technology of today and this will end into a magical blend, helpful to the cultural as well as economy of the nation. In addition to the role of school and methods of teaching, involving the local community is the decision with multiple outlooks.

Dawn Youngblood, the author of "Interdisciplinary Studies and the Bridging Disciplines", and Laura L. Duerr, author of "Interdisciplinary Instruction", both agree that methodology is the key to interdisciplinary success, with a broad spectrum which is not limited to the domain of content material or textbooks alone. Interdisciplinary techniques are not only important for a student to learn any one single discipline or solve problem in a synthesized manner, but it also enriches a student's lifelong learning habits and pattern in relating and analysing things, personal and professional growth as well.

Concerns with Interdisciplinary method of Teaching

Like everything else in the world of nature, the advantages of interdisciplinary investigations are not without their impediments. Rahul Kanakia, writer of the article named "Talk out benefits of interdisciplinary approach, as well as some pitfalls", cites Donald Barr as saying "teachers who centre around interdisciplinary examinations disengage themselves from the centre of their field," "conversely, interdisciplinary investigations centre around the edges of a field, which brings down a scholastic's notoriety according to his friends and damages his odds for residency" (Kanakia, 2007).

The other concerns in having the interdisciplinary approach as a part of this education system are as follows:

1. The required freedom is not there in our system of education.
2. Eventually the irony of our education system is being rigid, what to give how to give and how much is the outcome, make the person feel like draining themselves while taking any innovative steps.
3. The lesser flexibility in the part of curriculum.
4. The management as well as the system is very much rigid in achieving only what specified in curriculum.
5. However, the much have improved the management and administrative support to the teacher to imply any new strategy is not welcoming always.
6. Sometimes it is inconvenient to convince the stakeholders with multiple sort of thoughts and viewpoints, the one that is useful in one way may not be welcoming by the other one.
7. The less recognition of his efforts from the society and hierarchical system act as an obstacle for the teacher.
8. It will not be completely wrong if we say a teacher in today's era though hold prime position in society, yet are neglected in every second way, the profession of course hold the prime position but not the professionals.
9. The lack of motivation and position of teacher and this profession in the society.
10. The assumption of not able to go for any profession will go or teaching, and hence the most under look profession.

Conclusion:-

A child in nature always deserve the best, irrespective of the family he born, riches he has, school he went and the teacher he got, the society and educational processes must ensure his development to the fullest via innovative approaches and methods of teaching. The interdisciplinary approach of teaching serves this purpose at its best and that is motivated behind for the teacher, purpose of education process, and outcome of the interdisciplinary education.

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