



## **Interdisciplinary Approaches in Secondary Education: Integrating Knowledge for Comprehensive Learning**

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### **ABSTRACT**

The interdisciplinary approach of secondary education integrates knowledge, methods and views from other disciplines to promote critical thinking, creativity and problem-solving skills to face difficult real-world situations. This method, based on the interconnection of information, is becoming increasingly important in India's educational reforms, as noted by the National Education Policy (NEP) 2020. It encourages teamwork, comprehensive learning and practical application of principles, as shown in STEM, environmental studies and health sciences. Benefits include deeper learning, higher engagement and readiness for complex global issues. However, its implementation in India faces barriers like rigid curricula, poor teacher training and assessment problems. Professional development programs, adaptive curriculum designs and new evaluation systems are part of the solution. Examples from Indian education systems, such as STEAM and localized interdisciplinary themes, indicate the ability to expand learning and prepare students for changing future demands.

Keywords : Interdisciplinary, Approaches, Secondary Education. .

### **Introduction Meaning of Interdisciplinary Education**

The concept of interdisciplinary education has become an important component of current educational frameworks, especially in the secondary education sector. It is a model of education, where subjects are taught independently. The traditional model of education is increasingly giving way to more integrated, holistic approaches representing the interconnectivity of information in the real world. Interdisciplinary learning allows students to use concepts from several academic areas to solve issues, connect ideas and generate new information, so developing critical thinking, creativity and teamwork.

Recognition about the value of multidisciplinary education is driving education changes at all levels within India. The National Education Policy 2020 indicates the need for curriculum to be flexible and integrated so that it can be seen in the light of what interdisciplinary learning is all about. This paper

will observe the importance of multidisciplinary approaches in secondary education, benefits, problems and actual applications in India.

#### **Definitions of Interdisciplinary Approach:**

- According to the National Academy of Sciences, interdisciplinary research is defined as researchers from different disciplines who come together to address complex questions that cannot be solved by a single discipline (2005).
- According to Repko (2012) in *Interdisciplinary Research: Process and Theory*, interdisciplinary research involves addressing vast or complex topics that cannot be covered by a single discipline. It takes knowledge and methodologies from other areas to create a more comprehensive perspective.
- Interdisciplinarity according to Klein (1990) *Interdisciplinary Communication* is the combining of concepts, theories and methodologies of various disciplines toward new understanding, emphasizing teamwork and cross-pollination across disciplines.
- According to Gibbons et al. (1994) in *The New Production of Knowledge*, interdisciplinarity is the integration of knowledge from different sources into new forms of knowledge that are not bound by disciplines.
- According to Choi and Pak (2006), interdisciplinary research is a problem-solving strategy that integrates theories, methodologies and viewpoints from several disciplines of study to address difficult real-world problems.

#### **Concept of Interdisciplinary Education**

Interdisciplinary education combines information, methods and viewpoints from two or more academic fields to handle difficult problems or themes. Unlike traditional teaching methods that compartmentalize disciplines like physics, math, history and literature, interdisciplinary approaches encourage students to discover the links between them and comprehend how different fields of knowledge complement one another.

Interdisciplinary learning is much more than just subject integration, which calls for teamwork among teachers, departments and even institutions. It is an education system that cultivates skills essential in the twenty-first century, increasingly, the qualities that are needed for dealing with real-world difficulties requiring diverse approaches. Education today must not only prepare a student for tests but for life's challenges that often call for a multiple solution.

#### **Key Characteristics of the Interdisciplinary Approach:**

- **Collaboration:** Interdisciplinary efforts of scholars and practitioners from many disciplines.
- **Integration:** It integrates the methodologies, theories and information of other fields as part of a coherent system.
- **Complex Problem-Solving:** Often used in the discussion of complex matters that cannot be understood or solved within the confines of a single subject.
- **Flexibility:** This combines and adapts concepts from multiple domains according to the problem being dealt with.

#### **Interdisciplinary Approach in Education**

An interdisciplinary approach to education is the merging of different areas or disciplines to give a comprehensive understanding of a topic or situation. Such an approach emphasizes the fact that real-

world problems often require knowledge and skills from more than one discipline. By combining disciplines, students can develop critical thinking, problem-solving and teamwork abilities.

### **Importance of Interdisciplinary Approach**

To that effect, in today's complicated and interconnected society, an interdisciplinary approach is extremely crucial. Most of these problems we are facing and their solutions are related to other fields. For example, climate change, health and economic injustice must be solved through the synergy of other expertise. Education should prepare students to fight the complicated problems and thus do well for their societies.

### **Benefits of Interdisciplinary Education**

Interdisciplinary education has many advantages, such as:

1. Better understanding: By intermingling difficult subjects with other subjects, students can have a better understanding of those difficult subjects.
2. Better critical thinking: Interdisciplinary education allows students to think critically and make connections between many courses.
3. Interdisciplinary approach to stimulate creativity: By combining information from several fields, students stimulate creativity and innovation.
4. Better preparation for real challenges: Students are better prepared to face realworld obstacles when they approach challenging problems from multiple angles.

### **Examples of Interdisciplinary Education**

The examples of interdisciplinary education include:

1. STEM Education: Combines science, technology, engineering and mathematics to provide a comprehensive understanding of technological topics.
2. Environmental Studies: Biology, chemistry, economics and policy are all integrated to help students understand environmental challenges.
3. Health Sciences: Biology, chemistry, psychology and sociology are needed to understand health and healthcare.

Interdisciplinary approaches are fundamental for student training, for education, which is capable of meeting challenging real-life problems head-on. Merger of disciplines helps to educate the student in-depth, developing them into better thinking beings by giving scope for their imagination and creativity in resolving real-world issues.

### **Application in Education:**

In educational contexts, this is an interdisciplinary approach. Here, science, mathematics, literature, history and the arts are linked in order to foster the processes of critical thinking, creativity and a more linked knowledge of the world. For instance, a science teacher could collaborate with an art instructor to help their students develop and build scientific models or investigate environmental issues with scientific inquiry and creative expression. The multidisciplinary approach offers richer experiences as the students learn in one process and in some respects, better prepared than most students to meet what goes on in life: deep learning and thinking beyond the borders.

### **Importance of Interdisciplinary Learning in Secondary Education**

1. Relevance to Real-World Problems: Real-world issues do not fall under discrete topic areas, nor should education. Climate change, public health challenges, social inequity and technological advancement all demand input from a variety of disciplines. For instance, climate

change requires science (to understand environmental impacts), geography (to understand geographical patterns), economics (to assess the costs and benefits of different policies) and political science (to develop and implement policies). Interdisciplinary education equips students with the wherewithal to face such complex problems by teaching them how to draw upon multiple disciplines. All of these concerns are complex issues in India that require an interdisciplinary approach. For instance, finding sustainable solutions for managing garbage in urban areas involves an understanding of environmental science, engineering, political science and economics.

2. **Developing Critical Thinking and Problem-Solving Skills:** Interdisciplinary learning involves the process of allowing students to look at problems from several perspectives and develop solutions that might include ideas from a range of disciplines. This process enables the students not only to understand the material but also use their knowledge in solving real-world situations. Critical thinking is one aspect of multidisciplinary education, because students are always called upon to analyze, evaluate and synthesize knowledge from multiple sources. A study carried out by Rai and Tripathi in 2020 found that interdisciplinary approaches improved significantly the problem-solving skills of secondary school students in India. In addition, their creativity and innovative thinking increased when they were taught with integrated learning approaches.
3. **Fostering Collaboration and Communication Skills:** Interdisciplinary learning teaches students to look at problems from various angles and to come up with solutions that involve ideas from multiple disciplines. It allows the students to not only understand the material but also to apply it in solving real-life situations. Critical thinking is a crucial element of multidisciplinary education, as students are always challenged to analyze, evaluate and synthesize knowledge from multiple sources. In a study undertaken by Rai and Tripathi (2020), the researchers established that interdisciplinarity greatly enhanced problem-solving skills among Indian secondary school students. The other finding of the study was the increase in the levels of creativity and innovative thinking when students were taught by integrated learning approaches.
4. **Encouraging Creativity and Innovation:** Interdisciplinary education stimulates creativity because it encourages students to think outside the box and connect seemingly unrelated ideas. In traditional, single-subject instruction, students often tend to memorize knowledge in a very structured framework. Interdisciplinary projects require students to innovate, come up with new solutions and look at problems from new angles. A quintessential illustration of how interdisciplinary approaches generate innovation is through the induction of STEAM education, which stands for Science, Technology, Engineering, Arts and Mathematics in India. The addition of arts in the supposedly strict STEM course has developed new avenues of creative problem-solving and creativity.

#### Benefits of Interdisciplinary Learning

1. **Holistic Understanding of Concepts:** Interdisciplinary education gives pupils an overall view of the world and shows how different academic disciplines intersect and contribute to solutions to real-world problems. In a renewable energy project, for example, knowledge of science—such as the physics involved in renewable energy technologies—would be required—economics about cost and economic feasibility, geography on the identification of energy plants locations and knowledge of social studies about how the policies of energy create an impact on society. This all-inclusive approach allows students to have an understanding of the world in interconnection rather than a limited prism of one discipline.

2. **Enhanced Engagement and Motivation:** Students are more likely to be motivated and engaged when they see relevance in what they are learning. Interdisciplinary learning connects the curriculum to real-world challenges, making education more relevant to students' lives. In India, where most students live in rural areas, learning that addresses local issues such as agriculture, water management and healthcare can increase student motivation and engagement. For instance, curriculum in Karnataka State Secondary Education Examination involves multidisciplinary issues like sustainable environment and public health to be aligned with the overall global and national sustainable agendas.
3. **Better Retention of Knowledge:** When students can make connections between knowledge from various disciplines, they are likely to retain and apply what they have learned. Interdisciplinary learning has been found by research in the *Journal of Educational Psychology* to improve long-term retention because it helps students engage in deeper processing of the material, as opposed to rote memorization (Sharma, 2019).

### **Challenges in Implementing Interdisciplinary Education in India**

1. **Teacher Training and Professional Development:** One of the biggest challenges of interdisciplinary education is the lack of teacher preparation. Many educators in India are trained in specialized subjects and may not have the skills or knowledge to teach across disciplines. To address this end, the National Council for Teacher Education in collaboration with the NCERT has started to promote an integrated teacher training program but there is a long way for ensuring that all teachers in the country are equipped properly to implement interdisciplinary approaches in their teaching practices.
2. **Curriculum Constraints:** Indian curricula in state-run institutions are often demanding and test-centric. This makes it difficult to implement interdisciplinary approaches. The NEP 2020 emphasizes flexibility in the curriculum and it is expected that in the near future, there will be greater scope for innovative, interdisciplinary teaching. Schools and educational boards should link the curricula with the skills and competences required in the twenty-first century. These include adaptability, creativity and critical thinking.
3. **Assessment Challenges:** Assessed interdisciplinary learning is hard. Traditional exams focus on isolated knowledge of subjects, where interdisciplinary projects require a presentation of the ability to incorporate many skills from different subjects. For example, some schools in India are experimenting with a model of project-based assessments: students are assessed for being a great team player, problem-solver and innovator for creating solutions. Yet still, such assessments have spread a long way.
4. **Resource Constraints:** Most Indian schools, especially in rural areas, are not equipped to properly carry out transdisciplinary projects. This includes physical facilities (laboratories and libraries) as well as human resources (qualified teachers who can teach a wide variety of subjects). The SSA, which aims at delivering education to all children, has focused on the infrastructural development, but problems still persist.

### **Practical Examples of Interdisciplinary Education in India**

1. **STEAM Education in Schools:** There are various schools in India that apply the STEAM approach by bringing arts and STEM together, thus encouraging creativity and innovation. For instance, at Vasant Valley School, Delhi, art, science and technology come together as students are motivated to design and build prototypes of renewable energy systems. This work gives an example of how the student can use his or her creativity and technical abilities to resolve environmental issues.

2. Project-Based Learning in Environmental Education: The Green School Initiative, which is managed by different state governments, is a good example of interdisciplinary learning in Indian schools. This initiative brings together students who study environmental science, geography and social studies to plan and implement waste management, water conservation and energy efficiency initiatives. These initiatives often involve interaction with local communities and government agencies, thus providing students with practical, hands-on learning opportunities.
3. Thematic Teaching in History and Literature: Many schools, nowadays, introduce history along with literature. While a student is reading about the Independence Movement, for instance, he reads Rabindranath Tagore and Sarojini Naidu works to gain an insight into the social-political setting? This kind of thematically designed teaching helps pupils absorb historical happenings and their cultural importance.

### **Conclusion**

Interdisciplinary approaches to secondary education hold numerous advantages such as enhanced critical thinking, collaboration and problem-solving abilities, especially when tackling the complex challenges of India in the form of environmental sustainability, healthcare and urbanization. Though the implementation of such approaches may have some barriers, it is possible to overcome these barriers through successful tactics such as teacher training, flexibility in curriculum and new technologies in teaching. Educators enlightens students with a holistic understanding of reality by integrating information and capabilities of other disciplines, hence getting them ready for later successes in academics, the world of work and all aspects of life. By instilling an interdisciplinary outlook in students, intellectual growth will be complemented and the nation's prosperity benefited.

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