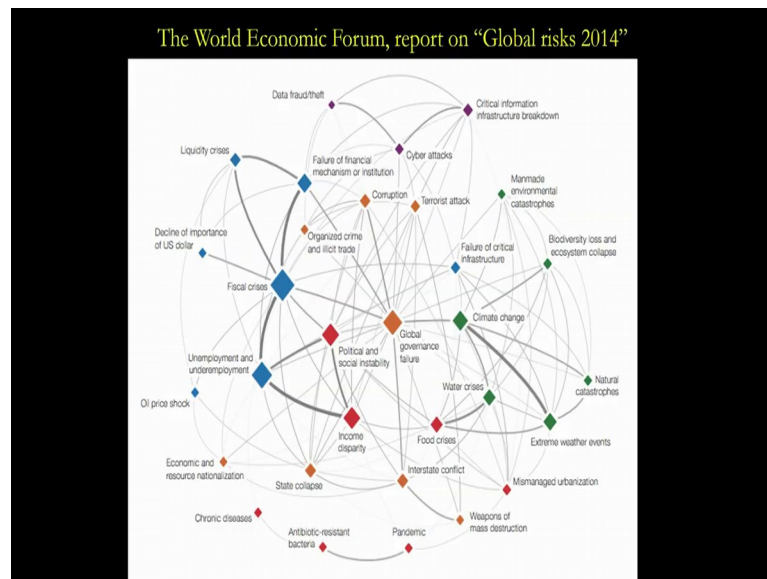


Artistic Exploration in Scientific Research And Technology
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Lecture – 16
Importance of Interdisciplinary Approach

Hello friends. Till the last class, we have seen five different folk arts of India, we have seen the techniques, the motive, the belief system around them. Today let us see what is Interdisciplinary Approach towards learning, we in this course are looking towards encouraging interdisciplinary work. Today in this class let us see what is interdisciplinary means, what is the interdisciplinary education means and why it is important to incorporate folk art in education. So, you might have come across the word interdisciplinary. What does it mean?

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So, it tells a more and more belief that the world today is interdependent, you cannot think of one idea or one concept or one problem in isolation you have to think it as a whole. This is a map released by the World Economic Forum in the during in its report of Global risks in 2014. Here it shows that if it think of one problem in the world you cannot think in isolation you have to see the whole picture and one problem is related to a very many things. Just for example, look at climate change; climate change is related to

extreme weather events, water crisis, biodiversity loss and ecosystem collapse natural catastrophe.

This paradigm is again related to very many other things like manmade environmental catastrophe, natural catastrophe, failure of critical thinking infrastructure etcetera. So, you can see that the world today is more and more interconnected, more so because of globalization and you cannot address an issue properly without seeing the entire picture that is why the need for interdisciplinary approach is more and more understood.

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M. Nissani (1997) and M. Appleby (2015):

- More meaningful learning experience
- New opportunities resulting from cross-overs between two disciplines
- Demonstrating real life applications
- Varied perspectives
- Flexibility in problem solving
- Bridge the communication gap between professionals
- Critical thinking
- Building confidence
- Greater creativity
- Transferable skills

So, M Nissani in his 1997 published work 10 cheers for interdisciplinary a case for inter discipline knowledge and research and M Appleby who later worked on Nissani's work in his paper what are the benefits of interdisciplinary study. Have pointed out 10 things are very many things which talks about the importance of interdisciplinary approach towards learning and towards understanding; they are more meaningful learning experience.

If you have a interdisciplinary approach you get a more holistic understanding towards learning, you do not understand one problem in isolation or devoid of other things around it, but you understand the whole picture around it. So, this is the benefit of having interdisciplinary approach towards learning. New opportunities resulting from crossovers between two disciplines; so, it is said that new knowledges are created in the frontiers of the disciplines.

So, when you bring two disciplines together there is opportunity test chance of creating new knowledge, new knowledge systems. So, there is opportunity or that of creating new knowledge when you have an interdisciplinary approach. Demonstrating real life applications; so when it is said that disciplines sometimes are not capable of handling real life issues, they are not related to real life they are theoretical. But, when you bring interdisciplinary approach there are possibilities greater possibilities of addressing real life issues it is a real life application, it is much more in when you have a interdisciplinary approach.

Varied perspectives; so you are not looking at a problem from one perspective, we are looking at a problem from very many different directions. So, this is the benefit of having a interdisciplinary research. Flexibility in problem solving; so there is much more flexibility, there is much more scope, there is much more the range is quite more when you have a interdisciplinary approach. Bridge the communication gap between professional this is quite understood that when you are having interdisciplinary approach, the different disciplines, different professionals can come together to solve a problem or to talk about one issue. So, there is the communication between different professionals.

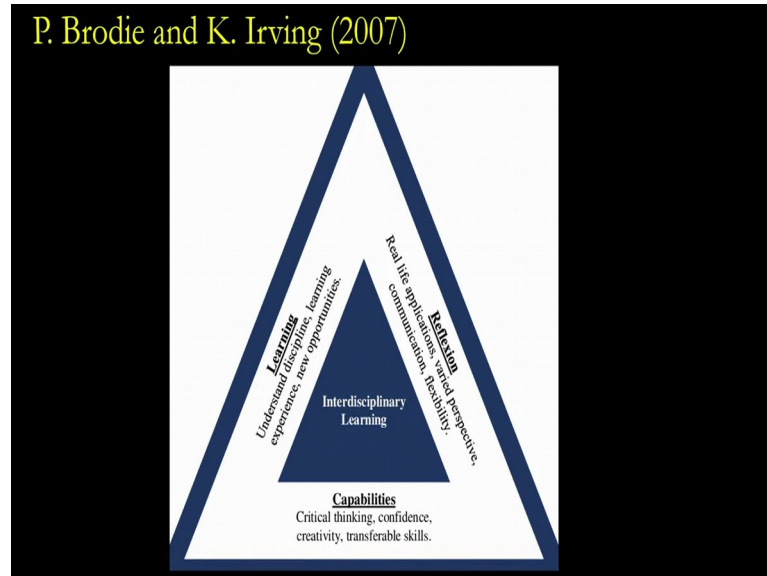
Critical thinking this is also very important that when you have an interdisciplinary approach you are looking at a problem thinking from very many different viewpoints, so it enables critical thinking around the issue. Building confidence; so it also builds confidence among various practitioners, various stakeholders. So, because you are you are collaborating it very many different areas.

Critical creativity, so it creates gives an opportunity to have greater creativity it is not linear thinking, it has a multi multiple of thinking possibility. So, it gives a platform for greater creativity. Transferable skill this means that this knowledge which is produced when you have an interdisciplinary approach towards it, it can be transferred, it can be handed down from one person to other or one in one research to other. So, these are the benefits of having in the interdisciplinary research.

So, why interdisciplinary research has been propagated in recent time? It is because it is more and more believed that one discipline is not able to address all the issues faced in the rapidly globalizing world, we have to see a holistic picture, we have to address

issues from a more wider perspective that is why we need interdisciplinary approach towards understanding an issue or learning.

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So, this is a model created by Brodie and Irving in assessment in work based learning investigating a pedagogical approach to enhance student learning, this is a paper which is published in 2007. They have put forward this triangle model which talks about interdisciplinary learning on one hand on one arm is learning and the other is a reflection, in the third is the capabilities.

In the learning it is understand disciplines learning experience new opportunity. So, when you have this interdisciplinary approach towards learning you are understanding disciplines, learning experience new opportunities. So, students when they have when they understand a issue from different perspective they not only know what other disciplines are about, but they know more what discipline they are studying in a more specific way, they understand what the root their discipline mean in the broader context of other disciplines.

So, this is an advantage of having an interdisciplinary learning that they understand their own discipline better these are the other disciplines. Reflection, real life application, varied perspective, communication, flexibility. So, as we have already discussed in the points that the interdisciplinary learning also encourages real life applications it is more able to address real life issues and varied perspective it take takes into account various

perspective. So, it is much more rounded it much more depth it has much more depth, communication, so there is a lot of sharing between different disciplines, different practitioners.

So, there is much more communication between the disciplines, Flexibility it gives you a flexibility to use different tools from different disciplines. So, it has a lot many range rather than having the tools of a single discipline. So, these are the advantages of having interdisciplinary approach. Last is the capabilities, it enhances critical thinking, confidence, creativity, transferable skill. So, when you have interdisciplinary approach towards learning it gives you this many capabilities of encouraging critical thinking, encouraging confidence because other disciplines are the areas also rather than your discipline alone.

Creativity that is it gives you flexibility of including different tools or different methods or different points from other disciplines also which gives creative platform. transferable skill that is, it can be used as I am aid or a handy skill that can be transferred for further research or further problem solving methods.

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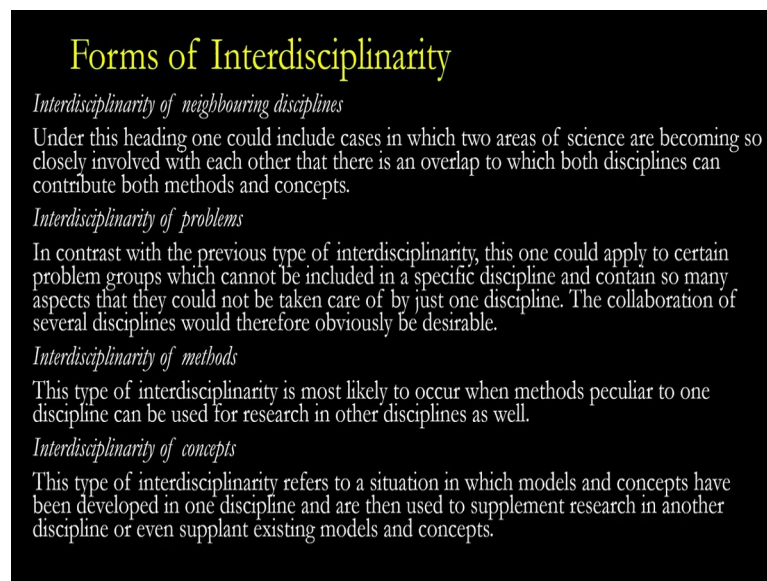
P. Hughes (1985)

The argument for interdisciplinarity is not that disciplines presents a false theory of knowledge but rather that they are not (and never will be) a complete statement if we take them on their own. It is in the interconnections, the integration that they attain their most effective use.

So, P Hughes in 1985 in a same paper interdisciplinary in general education an Australian case study this was the name of his paper. He said that the argument for interdisciplinary is not that disciplines presents a false theory of knowledge, but rather that they are not and never will be a complete statement if we take them on their own.

It is in the interconnections the integration that they attend their most effective use. So, P Hughes said that having a disciplinary approach is not a disadvantage in its own right, but inter discipline is much more advantageous. So, disciplinary approach will give you only one perspective or only one thought process, what a interdisciplinary approach will open up many more vistas it will open up many more ways of thinking. So, this is this is one advantage of having an interdisciplinary approach towards learning.

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Forms of Interdisciplinarity

Interdisciplinarity of neighbouring disciplines
Under this heading one could include cases in which two areas of science are becoming so closely involved with each other that there is an overlap to which both disciplines can contribute both methods and concepts.

Interdisciplinarity of problems
In contrast with the previous type of interdisciplinarity, this one could apply to certain problem groups which cannot be included in a specific discipline and contain so many aspects that they could not be taken care of by just one discipline. The collaboration of several disciplines would therefore obviously be desirable.

Interdisciplinarity of methods
This type of interdisciplinarity is most likely to occur when methods peculiar to one discipline can be used for research in other disciplines as well.

Interdisciplinarity of concepts
This type of interdisciplinarity refers to a situation in which models and concepts have been developed in one discipline and are then used to supplement research in another discipline or even supplant existing models and concepts.

So, forms of interdisciplinary; so, of interdisciplinary of neighbouring. So, how what can be the ways of having interdisciplinary approach towards learning? So, there are four ways interdisciplinarity of neighbouring disciplines. So, more and more in science areas in a recent time to see in that it is more advantageous to include the knowledge or tools of other disciplines. Like a biophysics would integrate biology and physics the tools of biology and physics to problems solve issues and because it is more advantageous to use tools of different disciplines.

So, these are some of the ways in which in interdisciplinary can be practice. So, interdisciplinarity of neighboring disciplines under this heading one could include cases in which two areas of science are becoming so closely involved with each other that there is an overlap to which both disciplines can contribute both methods and concepts. So, not only in science even in social science and humanities what is seen that these

advantages to use tools and methods of different disciplines to understand a problem better or to address a problem better.

So, this is a interdisciplinarity of neighboring disciplines, that is you are using the tools of related disciplines closely related disciplines to come together. So, there can be interdisciplinarity of problems. In contrast with the previous type of this is this interdisciplinarity this could apply to certain problem groups which cannot be included in a specific discipline and contains, so many aspects that they could not be taken care of by just one discipline. The collaboration of several discipline would therefore; obviously, be desirable. So, there are certain problem groups which cannot be address specifically or could not be address appropriately by tools of one discipline and we have to borrow tools and understanding from other disciplines.

So, there is you are using interdisciplinary approach towards solving a problem, so this is the second type of interdisciplinarity. Third is interdisciplinarity of methods, this type of interdisciplinarity is most likely to occur when method peculiar to one discipline can be used for research in other disciplines as well. So, I can give you an example of cultural study which gives which is thought to be a interdisciplinary area of knowledge yeah you have the flexibility of using tools of very many different disciplines, so and to understand a problem or to address a problem.

So, the methods can be brought the methods of history, the methods of psychology, the methods of legal studies can be brought to address a problem. So, this is the third area where interdisciplinary research can be done that is interdisciplinary of methods this is how interdisciplinarity can be brought about that is by bringing methods together methods of different disciplines together. Interdisciplinarity of concepts this type of interdisciplinarity refers to a situation in which models and concepts have been developed in one discipline and are then used to supplement research in another discipline or even supplement existing models and concepts.

So, here in this fourth method form of interdisciplinarity the models that is developed in one area of knowledge in one discipline can be used to address issues of other disciplines. So, this is borrowing in the concept or borrowing the model from one discipline to address certain issues of other discipline. So, these are the four ways in which interdisciplinarity can be brought about.

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P. Hughes (1985) proposes four forms of curriculum integration, a classification similar to that of Pring (1971)

Interdisciplinarity through correlation of subjects

There are many ways of correlating subjects. Subjects are considered as one dimension of a three-dimensional set whose other dimensions are learning processes and learning environments.

Interdisciplinarity through themes, topics or ideas

The use of a theme as an organising or integrating element can be used to show how different disciplines interrelate in the elaboration and illumination of the theme. This both assumes a disciplinary base and strengthens the understanding of the disciplines themselves as they are used in sequence or in concert to pursue a given theme or topic.

Interdisciplinarity in practical thinking

There are, however, areas of the curriculum which do not fall into traditional subject areas. These are in the main practical areas whose importance is made clear by individual or social demands. The approach will not be interdisciplinary in the sense of seeking an integration of different disciplines, but rather of helping students develop a capacity to operate effectively in the particular field. Civic education is a case in point.

Interdisciplinarity through the learner's own interested inquiry

A further variation of approach is to make the learner's own interested inquiry the basis of the curriculum. This, by its nature, cannot be a discipline-bounded approach, since an area of inquiry will not necessarily confine itself in such a way if it commences with the interests of a student. It will be an interdisciplinary approach where a variety of relevant disciplines is used to illuminate and structure the inquiry.

So, P Hughes proposes four forms of curriculum integration classification similar to that of Pring who had talked about this in 1971. So, this is about interdisciplinarity in curriculum how we can incorporate interdisciplinary approach in our education system. Interdisciplinarity through correlation of subjects there are many ways of correlating subjects; subjects are considered as one dimension of three dimensional set whose other dimensions are learning processes and learning environments.

So, you can bring about interdisciplinary by correlating subjects. So, the subject, so the subject form one angle of the triangle and other triangle can be a learning process and learning environment. So, you are creating an entire concept which on which on one hand has subjects, other hand has processes and the third hand has the environments. So, this is how we can bring about correlation of subjects in your curriculum.

Interdisciplinary show themes topic or ideas, the use of themes as an organizing or integrating element can be used to show how different disciplines interrelate in the elaboration and elimination of the team. This both assumes a disciplinary base and strengthens the understanding of the disciplines themselves as they are used in sequence or in connect to pursue a given theme or topic. So, you can bring interdisciplinary by putting focus on the themes topics or ideas.

Suppose there is one team; suppose there is we are talking about environment. So, how has environment we will studied in science, how has environment we studied in social

science or humanities, how has environment been studied in legal studies? So, you are talking about a problem from different perspectives different; different disciplines. So, this is how interdisciplinarity can be also brought about in our curriculum.

Interdisciplinarity in practical thinking there are; however, areas of the curriculum which do not fall into traditional subject areas these are in the main practical areas whose importance is made clear by individual or social demands the approach will not be interdisciplinary in the sense of seeking an integration of different discipline. But rather of helping students develop a capability, capacity to operate effectively in the particular field, civic education is a case in point.

So, you can encourage to students to think about to think about a problem practically how to bring about change or how to bring about radical thinking in certain areas. So, this is about practical thinking you are talking from very many different prospective. So, that student develop attitude towards think thinking practically more pragmatically towards the issue.

So, civic education is one case which where different into different point of view can be brought about to encourage students to think thing practically. Interdisciplinarity through the learners own interested inquiry. A further variation of approach is to make the learners own interested inquiry the basis of the curriculum. This is in nature cannot be a discipline bounded approach, since an area of inquiry will not necessarily confine itself in such a way if it commences with the interest of a student. It will be an interdisciplinary approach where a variety of relevant discipline is used to illuminate and structure the inquiry.

So, learner has its own questions he has its own concern, the learner can pursue it by himself or herself by taking interest on their own and they can pursue the inquiry through various perspective. So, this would not necessarily come under the traditional education system or tradition and education curriculum, but here the onus is on the learner himself or herself. So, these are the four ways I know proposed by Hughes that interdisciplinary approach can be brought now brought about in our curriculum.

So, now let us come to the core interest of the course that is the folk arts and let us understand why folk art needs to be incorporated in interdisciplinary education system.

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Identity

Globalization has started a process of deterioration of cultural diversity. The capitalism driven cultures are exporting their values to the minor non-western communities where the vulnerability of their internal economy matches their cultural vulnerability, menacing 'national identities' (Smith, 1995).

Most often globalizing forces have been associated with the deteriorating of cultural identities, victims of the homogenizing power of the western consumer culture. This view tends to interpret globalization as an extension of western cultural imperialism.

The first is the identity I am listing out few points these are not exhaustive point, but which I think are most relevant and most important, why folk art should be incorporated in a curriculum? And it should be studied by very many other disciplines also. So, globalization has started a process of deterioration of cultural diversity this is a argument that has been put forward by many scholars saying that globalization has brought an onslaught to the cultural diversity at the cultural diversity has been eroding more and more because of globalization.

The capitalism driven cultures are exporting their values to the minor non western communities where the vulnerability of their internal economy matches their cultural vulnerability menacing national identities. This is an argument put forward by smith saying that capitalism with its strength of financial strength has brought about a change which has mostly affected the culture of small smaller communities and the western communities culture has been overriding the smaller groups culture.

So, it is this is why globalization is is thought to be eroding identities. Most often globalizing forces have been associated with the deteriorating of cultural identities, victims of the homogenization power of the western consumer culture. This view tends to interpreted globalization as an extension of western cultural imperialism. So, when we talk about globalization we are talking about a more connected world where nobody is

big or small where everyone is equal, but many scholars have pointed the out that this is not actually.

So, in reality it is actually one culture overpowering the other western culture being the more powerful culture overpowering the smaller community, so smaller cultures. So, this is where folk art comes in folk folklore comes in why we should take why we should take folk culture seriously it is because it entails our cultural identity, it contains its the essence of a cultural identity that is why we should be taking the folk culture, the folk art more seriously. So, because it contains our identity, it contains our traditions our beliefs, so we should uphold this preserve this.

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Second is and its close to one heart, it is very close to our heart we immediately relate to it when we see a painting from our region, when we see a dance from our region we immediately relate to it is close to our heart.

So, this is also true because the folk art or the folk customs come from the community themselves they are not bordered from others or they are not trusted by others, it comes from the community them self and that is why they are so close to ones heart.

So, this is one can I see the example here like the governments when they want to convey some message to the masses, they usually use folk art. For a long time the government has been using folk art the folk drama, the folk dance, the folk songs to

communicate the message of health and hygiene regarding diseases, science communication to the masses by using folk art.

So, this is because the folk arts are very closely associated with people's life they can relate easily when they see an folk art. So, this is another reason that folk art should be taken seriously and it should be incorporated in a curricular system and should be studied along with others.

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Vast area of traditional knowledge

Many tribes of India are examples of unbroken unity with the environment; Bhil tribe's age old *halma* tradition of conserving water, Bishnoi tribe's religion of nurturing wildlife, Dongria Kondh tribe's regard of the hill range as their ancestor, there are numerous similar worldviews of Indian tribal groups that consider humans in continuity with nature. At the present times when we have reached the edge of crisis in regard to our environment and nature, it is only judicious that we begin to take cognizance of tribal philosophy and their way of living.

Vast area of traditional knowledge, many tribes of India are examples of unbroken unity with the environment Bhil tribes age old halma tradition of conserving water, Bishnoi tribes religion of nurturing wildlife, Dongria Kondh tribes regard of the hill range as their ancestors, there are numerous similar worldviews of Indian tribal groups that consider humans in continuity with nature.

At present times when we have reached the edge of crisis in regard to our environment in nature it is only judicious that we begin to take cognizance of tribal philosophy and the way of living. So, folk folklore is a vast area of knowledge it contains a vast area of traditional knowledge and if it is, if it has to extinct it will be a loss of a lot of years of knowledge and years of wisdom. So, we have seen example that many of our tribal groups in India I have just given a example of the from the perspective of environment.

But there are other things also like the medicines are there like folk cuisines are there, folk methods of giving, the folk methods of solving problems, then folk methods of you name it like architecture. So, many method methods and tradition traditional knowledge as they; so, if this knowledge has to die down it will be a loss to the entire humanity. So, we should take these are the three points that I have pointed out why we should be taking folk art and folk culture more seriously and it should be integrated in our curriculum.

So, friends today we have seen how the importance of interdisciplinary approach towards learning in the next class we can see how we can actually bring it together to have a dialogue with one another. We will see from bringing science and technology to go together with folk art and see what responses it builds, what results we derive. So, this go through its slides and look at the importance of having the interdisciplinary approach and also think about how you can talk about science and technology from using a folk art perspective.

See you in the next class.