Lecture No. # 09
Tables, Charts, Graphs

Good morning.

Good morning sir.

Are you all right?

Yes sir.

Lovely, so, we are coming almost towards the end of the first part of the course. Do you remember what the first part of the course was or is? The first part of the course I say it would cover some basic principles of presentations and public speaking. And, all along this month I have try to tell you that anyone of us can become an effective presenter if you get organized, if you prepare well, if you speak slowly, if you respect your audience, and come well dressed, greet them, smile to them some basic principles of the civilized society. Is that ok? Yes or no? Is that ok?

Yes sir.

Right, I hope you know whenever you get an opportunity, you will practice these things. Your second cycle of presentations will begin on the first of February and May and it may take 2 days. I have already told you about the topics, I have already told you how many minutes you will get and I have also told you how to prepare about it.

Do you have any questions? If you have any questions, please ask now about the topic, about what you are expected to do, about how you will be evaluated. Do you remember? Do you remember, yes or no?

Yes sir.

So, I am coming almost to the end of this series of lectures and discussions. And last week, I told you about no matter what your topic, how you can get, how you can prepare for the topic, how you can research your topic, And how you can get organised. Do you remember that? And I told you that, you could always take somebody else's data do you remember the pearl of the east coast story?

Yes Sir

I am sure you do. It is so easy to laugh at the others is it not? Is it not easy to laugh at others.
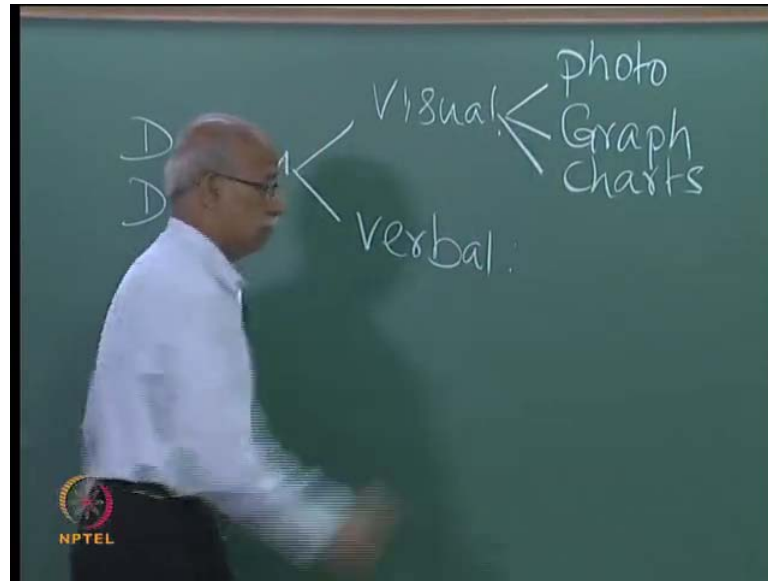
So, you know is it or is it not?

It is

Yes it is so easy, but do not make the same mistake. I am I am not telling you, you cannot use others data you can. Nobody has a copyright on knowledge, no matter what commercial proponent say, but you cannot use others data without acknowledging that others have to use it this is how they got it. And, there is nothing like checking it, bringing your own data, bringing your own stuff. Just as you would not wear others shirt, just as you would not steal others water or mobile phone, there is no point stealing others data, and when you use others data without acknowledging the same, then you are guilty of stealing those data, do not you ever do that.

The second point is, there can be all kinds of data to present. There can be a statistical data, numerical data, there can be visual, there can be verbal, all kinds, there can be photographs, what is a good way of presenting data of various kinds?

This word is singular in Latin. Means fact, and plural is data facts, just as criterion and criteria, phenomenon and

phenomena

Stadium and stadia. Like that Latin like any other language has singular and plural in our language we have in Telugu and Malayalam, Hindi and Tamil. We have singular and plural do'nt we? So, you can have variety of data, there can be visual, verbal. It can be visual. Can you give me the example of a visual data some forms of visual data like I said photograph anything else?

Videos

Graphs, charts you can have photo, you can have graph, you can have various kinds of charts. They are best presented visually. You can have verbal data, data in words who said what? Martin Luther King the other day we heard him say, I have a dream, you might want to quote him. That is, verbal data data for words. The point now, the question now that you have to ask yourself and only you can answer that question is, what data What sort of data can be presented best in what manner. Please write. The question that we asking and trying to answer today, Are you with me?

Yes sir.

Everybody please.

Yes sir.

Did you have a good breakfast?

Yes sir.

Lot of people do not seem to have had breakfast. The question that we are asking and I am trying to answer today is as follows. What kind of data can be presented best in what manner? Am I clear to you? Sure, I do not see a smile on your faces, I find you tensed, did you not sleep well last evening, last night, last morning actually. Do you understand the question? Say yes or no

Yes sir.

Ok, can anyone of you please repeat the question to me? What is the question we are dealing with today?

What kind of data can be present in what manner?

What kind of data can be presented best in what manner?

What are we discussing today? Please, last bench on my right hand, third bench please.

Yes.

Is that what you have learnt in one month do you speak so rapidly? Come again, please loud voice, slowly come again please.
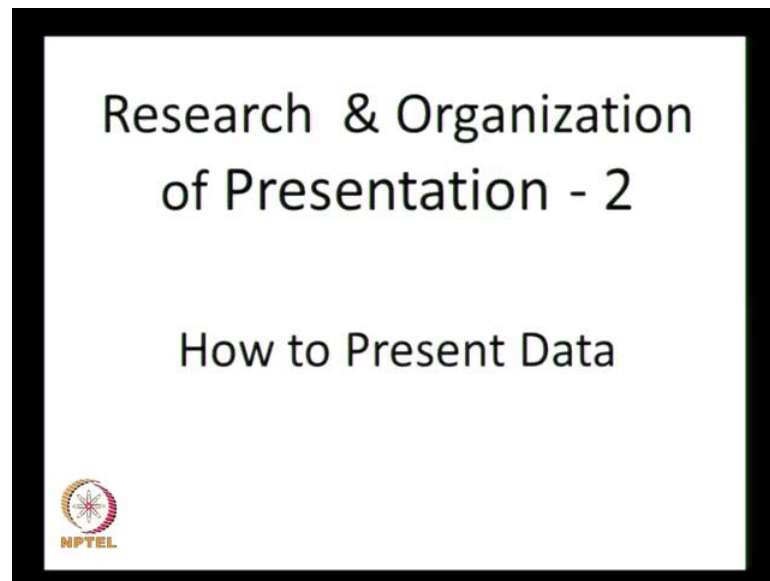
What kind of data can be presented best in what manner?

What kind of data can be presented best in what manner? When you want to take tea should you take it in a plate or in a cup? Should you take it with your fingers or with a spoon? But when you are eating porridge, when you eat thayir sadam should it be take in a cup or in a plate? You can take it in any way you like. Any kind of data can be presented in any manner, but the question is, what manner will be best? Anything can be presented in any manner.

Lot of people come to the classroom in any kind of dress. They make no distinction between bedroom and classroom. But we know as civilized human beings that there is a certain kind of dress for a certain occasion. Something will go best on this occasion something will not go best on the other occasion. Similarly, all kinds of data cannot be presented in the same manner with equal effect equally well. Some kinds of data will go well in one manner; other kinds of data will go well in another manner. Is that ok? Yes or no?

Yes sir.

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That is what we are talking about, How to present data? How to get organised? Last week, we talked about message, contents. Unless you have something to say, nobody will hear you, all your dress, your smile, your confidence, your slow tempo is good for nothing. If you have nothing to say, but if you have something to say, then the second question is, how I can say that best? Is that ok? Let us go on. Let us look at some ways.

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For example, let us look at tables, what can tables do? Tables can give you basic simple information, look at the slide I have presented here and I am sorry, the fonts could have been a little larger, but well I packed in a little too much, it could have been fewer. I am trying to tell you that even a great king like Aurangzeb. How many of them were non Muslims? How many of his generals? Any one please, can you read the members aloud.

How many of his generals were non Muslim? Can you see the numbers? This table tells you about race and religion of Aurangzeb's generals. Aurangzeb was a king, a Muslim king who ruled over India in the late 17th century. Many of the generals were Muslims, but many were also non Muslims, how many of them were non Muslims? Some were Rajputs, some were Marathas, other Hindus, total Hindus, etcetera. I have not given you the total no I just left it for you to do.

Now imagine if I try to give you this information verbally, would it go equally well? Suppose, I close it and I say do not look at close your eyes, imagine that you are not looking at and there is no data now. I am telling you Aurangzeb have 36 Turanians and 25 Iranians, but number of Turk generals in his empire was only 7, but he had 18 Rajputs. It would appear to you as a confusing jumble of numbers; but if I tell you the same thing with two parameters, the same thing with two parameters. Number 1: their ethnic background, but if I if I present these data to you in the form of a table then they go best.

I have two columns; one is the parameter the race, the religion. All Muslims did not come from the same race, what different races they came from? The table tells you they were many of them were Iranians. Who were the others? There were Turanians there were.

Afghans.

Afghans there were.

Indian Muslims.

Indian Muslims whatever that meant. There were other Muslims, non Indian Muslims, Africans. So, the total number of Muslims generals, he had was 53 the total number was.

Everybody please the total number was.

53

The total number was.

53

What was it?

53.

53

53

The total number was Muslims generals he had was 53. And similarly, he had Hindu generals from a variety of backgrounds, many of them were Rajputs, some others were Marathas, there were Brahmin generals, there were other kind. So, that is why the table says race and religion. The point I am making is the following; that tables are good for presenting numerical data, which relates to some other parameters, which relate to data or plural, which relate to other parameters like in this case race and religion.

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Decennial Growth

of Maithili Speakers

Year	Maithili Speakers	Decadal Percentage Increase
1971	6,130,026	-
1981	7,522,265	22.71
1991	7,766,921	3.25
2001	12,179,122	56.81

Look at something else another. Have you heard of something called census of India. How frequently does it happen? Every 10 years. Every 10 years the government of India counts its people, and also collects information regarding their language they speak, regarding whether they live in a village or in a city, whether they are men or women etcetera. Whether, they are Muslims or Hindus or Christians or Buddhists etcetera. So, here you I am presenting some data to you. What are the parameters I have taken? Tell me.

3

3

Year and speakers, and percentage increase. Table is a very good form of presenting all of these. Whenever, you have lot of parameters and lot of numbers to present. Even if you do not have the help of a computer or a power point even if you only have a blackboard, write it there. Some of these data go best visually. Some of these data, numerical data in particular please write, numerical data are best transmitted visually or verbally? Visually and when you present data keep quiet.

Let your class, let your listeners watch it, do not try and read. In the year 1971 we had 6130026 Maithili Speakers, no need. Let them watch it, but if you want to draw, if you want to make some general points, you can draw their attention look at the percentage increase in different years. It is amazing why it fell down in 1991, but once again picked up in 2001. Is it the case that lot of people who had not reported this language as their mother tongue reported it in the 2001 census or suddenly Maithili Speakers every family had a dozen children. You can raise these points, you can highlight the differences, and you can highlight the trends. Are you with me? Are you awake?

Yes sir

Lovely, really you are great. So, tables help you in presenting numerical data with various parameters, with various factors. How do graphs help? What are graphs meant for? Tell me. How do graphs help? What kind of data can be presented best through graphs?

(( ))

When you show comparisons, when you show trends, for example, when mobile phones came on this campus. The earliest I recall is about 1999, when the students had started

having 1999 or 2000 one or two students hardly. By about 2003 or 2004 there were at least one or two mobile phones in every wing of every hostel. In 2012, do you have a friend who does not have a mobile phone? Yes
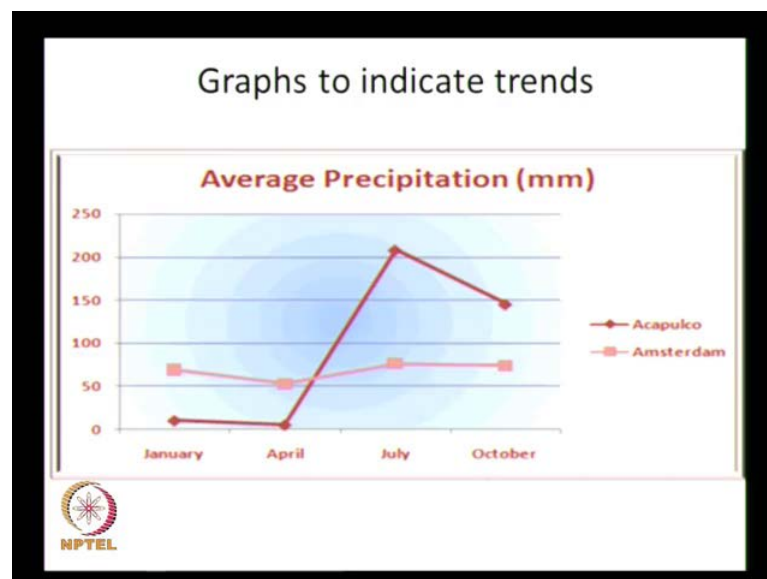
Yes

Yes lovely, I like to meet him or her.

Him.

I will definitely like to meet him and felicitate him; he must be a great guy. The pressure of fashion, the pressure of the peer group is so much that lot of people do even useless things say for example, imagine when the shirt sticker came here rather than be here, but because, somebody made it fashionable. So, lot of the people start it wearing their shirt stickers here. Similarly, is not that we need phone on a continual 24 hour basis but sometimes I had feel that mobile phone has become a part of our body.

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So, you know graphs are good, graphs are wonderful for presenting trends. In this case, can anyone please tell me what what is being presented? Average precipitation what is precipitation?

Rainfall

Rainfall. Can you describe the data to me please as you look at it; imagine that you are present in the data on my behalf. Can one of you please stand up and speak and the

camera will pick you up. Anyone of you please come on now. This is the class in spoken English, and I want to see if you can speak. One of you please, describe the data to your class.

Acapulco had very less rainfall in the month of January and April, but it had about 200 MM of rainfall in the month of July and around 150 MM in the month of October. Amsterdam, on the other hand had consistent rainfall around 50 to 100 MM in all four months.

Ok. Graph is a wonderful medium for presenting data. Sometimes you use abbreviations in visual form which is fine, but when you speak just has my friend did now, he did a wonderful job. And maybe we can clap for him, but he could also have expanded m m what is m m? What does m m stands for?

Millimetre.

We know that, but even then in the verbal form because verbal clue must come for as long and as slowly as possible. So, compared with m m millimetre would take several more nano seconds. These are basic, thumb rule principles. Why some speakers are able to say the same thing better than some other speakers? Not that they are much more to say, not that they have found something which others have not, but may be they are better organised, they have given thought to all of these things. Are you with me?

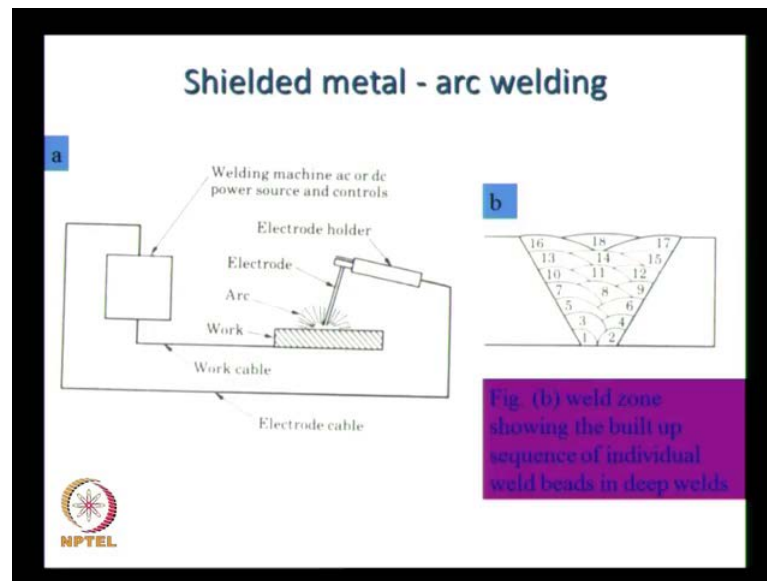Yes Sir.

Let us look at something else.

Diagram. Has everyone here done a course in engineering drawing?

Yes sir.

Now no matter what you do? The organisation of a machine, the design of the machine, layout of a plot, the layout of the township, no branch of engineering or science including social science is such that does not need to use layouts, drawings, diagrams. Now you can try, close your eyes and I am going to describe the diagram to you.

Close your eyes, imagine you do not look at it, imagine it comes to you verbally. Now shielded metal arc welding method for Shielded metal can follow the following principle. On the right hand it can have an electric holder and on the left it can have an empty box like cylinder. But at the base there will be the lathe which will work and in this entire thing can be kept on the work table. Open your eyes now. Do you get the same picture as you get now? Watch this clear and now or my description of it.
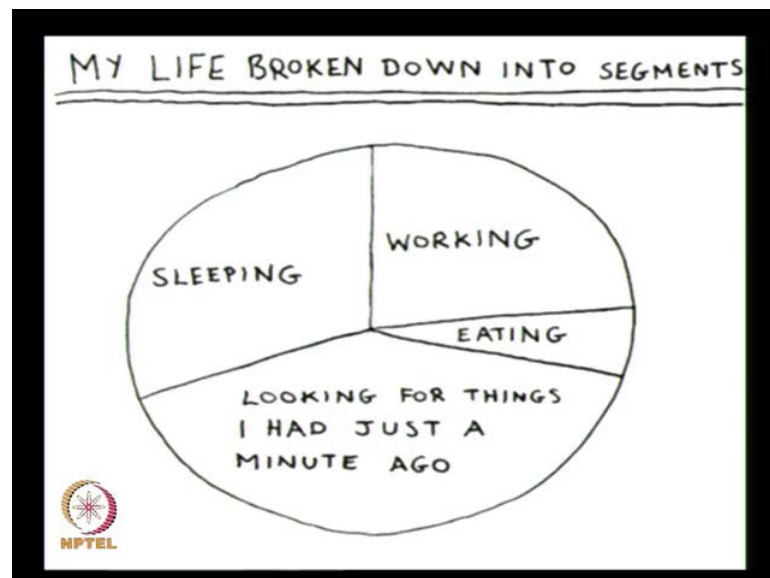
Some of these things go even if you do not have computer, even if you do not have pen and paper. I come from a village and I have seen masons those who build houses or the farmers who are going to buy new plot of land about how they would cultivate what? If nothing else they take a piece of a stone or they pick up a pebble and draw lines on the earth in the sand to indicate, to mark, how they are going to use a particular plot of land? What kind of crop will be cultivated in which part of the plot?

The diagrams are wonderful objects for presenting relatic position. When you say right or left, it is difficult to imagine whose right? Last evening I visited a friend and my

friend told me my house is on the left, as I entered I was trying to find the house on the left, and the house is on the left did not bare the number that I had been given. Because, I forgot to ask I should have asked, whether it would be on my left as I enter or on your left as you come out, do you see the point?

So, some of these things can be confusing; and in the high stake engineering enterprise such as when you launch a rocket or when you launch a ship an ocean going liner you just not have this kind of confusion. You cannot afford it. You have to be very precise precise to the nano seconds to the milli milli meter and be very specific. So, diagrams are the best methods for presenting layout, sketch, and design relative position etcetera.

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Let us look at something else. What kind of chart is this?

Pie chart.

What is pie chart good for?

Distribution.

Distribution of what? Distribution of percentage you are close to it but not close to it not quite correct. What is a pie chart best for?

100 percent breaking it as a small small segments

Portions. Thank you very much. What is your name?

Dinesh.

Dinesh, please capture my friend. Now do not shield your smile, remove your hand. I want a camera to capture your smile. Pie chart is a wonderful medium for presenting. So, for example, many of us faculty members you may have heard, and watch the debate on the faculty male. Heated debate is going on some people are saying wow! so close sudden. It is an offence to my sense of joy, my sense of beauty, and suddenly there are animals there are lot of friends say we hurt the deer, we hurt the monkeys, we hurt the ants, and we hurt the flies.

There are some faculty members in a very great minority whose most students also once in a while need to have or deserve to have some fun. The best way you can present these data, you can also have tables, you can have diagrams, you can have graphs, and you can do anything. But the best way to present these data would be the pie chart. Have a pie chart. Faculty members that support the closer of sarang 99 percent, faculty members that say sarang should go on 0.5 percent, undecided 0.5 percent.

It says in one one slide and you got the entire picture. Drawing is the language of engineering, it does not require French, it does not require Latin, it does not require Hindi or Telegu or English. One diagram, one chart can give you the exact portion of any issue at a stake. The point is you see and that is where the wisdom comes in. All of us know these things, do not we? Say yes or no.

Yes sir.

It is like any great truth. All of us know these things. But then, we are in such a hurry that we quiet often do not even pause and ask ourselves. I am going to make a presentation today, what kind of shirt I should wear? What kind of trousers I should have? What kind of tools I should use for presenting data? What data will go best? Where I should keep quiet? What do these data tell you? What does this pie chart tell you about? Who do you think is it about?

Your life Sir.

My life I wish I could sleep as well, my sleep is now equal to what I have said here for eating. I randomly, but I thought I was writing about, I was describing the life of an average under graduate students on this campus. So, pie chart is a wonderful way. There can be similarly all kinds of, there can be Venn diagram, there can be Bar charts, there can be come on tell me.
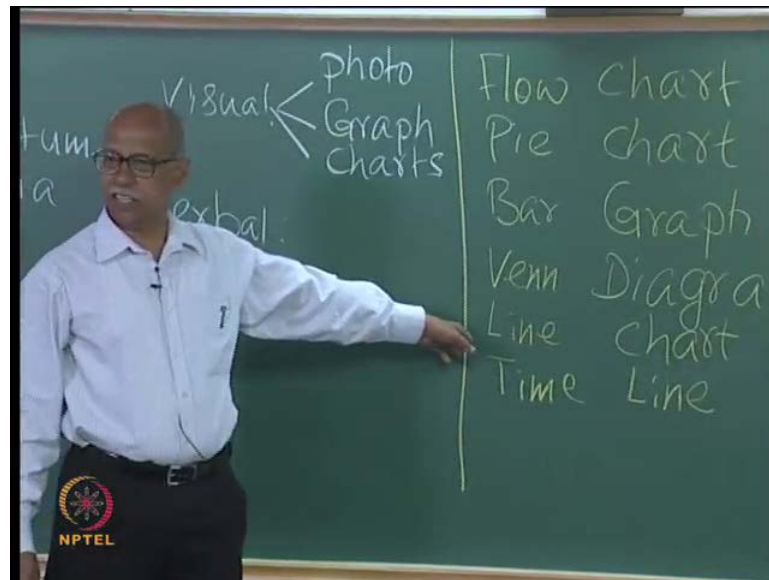
Flow charts

Come on please tell me the names, write make a lists of them.

Bar graph

Can you make can you make an exhaustive list, I will give you 2 minutes and I will request my friends to pan their camera on to one of your note books so, write big hands. Make a list of what are the various ways you can do them, and what you would use them for? Also write for example, pie chart showing portions, bar charts showing what? Ask yourself. For every little way of presenting data ask yourself, what it is good for? I will give you exactly 2 minutes, your time begins now.

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Tell me what kind of charts have you got?

Flow Chart

Flow Chart next.

Pie Chart

Pie Chart next

Bar Graph

Bar Graph next

Venn diagram

Venn diagram, speak slow, give gap between these two words, what are we talking about?

Venn diagram

What are we talking about?

Venn diagram.

Take a nano second pause, but that nano second pause will do wonders. It is like a little salt in in sambar. Bar graphs, tell me the spelling of diagram everybody.

D i a

D i a Everybody together please come on

D i a g r a m.

It very rapid come again in slowly please what is it?

D i

What is it?

V e n n d i a g r a m

Venn diagram next Line Chart what is line chart? What do you use it for?

(( ))

Same as come on again please

Same as it is we used for presentation.

The graphs, any other

Time line

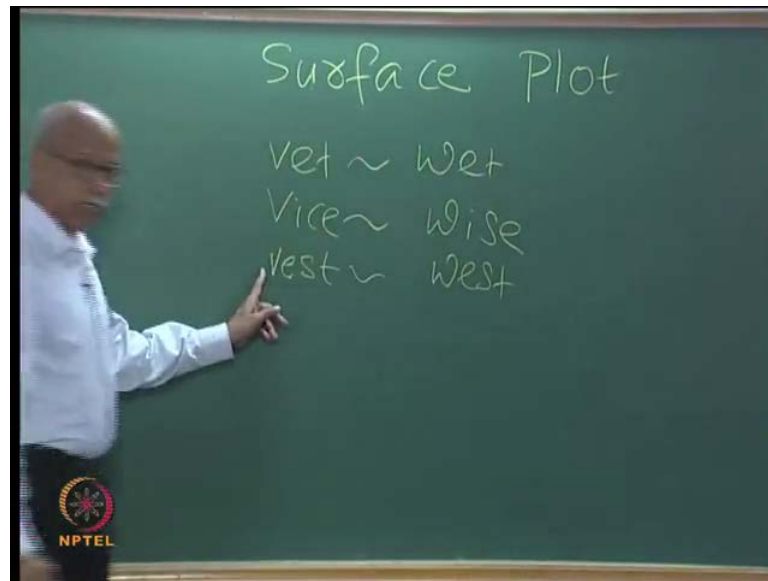Is it different from any of these?

Yes

Is it?

Yes

Any other thing?

(Refer Slide Time: 34:02)

Surface plot sir

Sorry.

Surface plots

Can you give me the spelling please. Again slowly

Surface s u r

s u come on stand up please. Let the camera catch your handsome face once again.

S u r f a c e plots surface plots

Give me the spelling please.

P

P

L

L

O

O

T

S

S

Because we have not written anything in the plurals; can I make a small point? Lots of scientists say, nearly all engineers talk constantly about numbers, and letters of alphabet, and please believe me; I will present you data next week. Many of them make mistakes with these very basic things. Our pronunciation of letters of alphabet, we say a b c d e f. Is not a b c d what is it? is...

A

What is it?

A

Next

b

Next

c

Next

D

D

D

Next

E

Next

F

Next

G

Next

H

Most mispronounced letter in India. Lot of people pronounce it here as h or in the north as h It is not h or h, it is h

What is it?

H

Once again

H

Next letter

I

Next

J

Next

K

Next

L

No, it is el.

el

It is not long, it is short. What is it?

el

Next

M

Next

N

Next

O

O It must come from your throat, your lips must go round. Babu, please catch all the lips.

O

It must be o

O

I want all lips round there

O

As in oh God.

Oh God.

Once again please call God.

Oh God

Some people as saying oh God. God would not answer, round your lips say, please watch.

Oh God .

Oh God.

That is O

Next

P

Next

Q

Next

I

Next

S

Next

T

Next

U

Next

V

V

Let your lower lip close to your upper teeth please. One sound which is extremely v, one English sound which pure non English speakers can produce correctly. I am going to request by friends behind the camera to watch your lips.

V

Again keep saying it.

V

Everybody please. Do it for one minute every day for the next two weeks honestly. This is one sound lot suffers in India. Do not distinguish between words like vet and wet.

What is this?

Vet

But this is

Wet

In this case lips are flat vet.

Vet

In this case lips are rounded wet.

Wet

What is this?

Vet

Everybody together please

Vet

What is this?

Vice

But this is

Vice

What is this?

Wise

What is this?

Vest

And what is this?

West

Next letter after a v

W

Next

X

Next?

Y

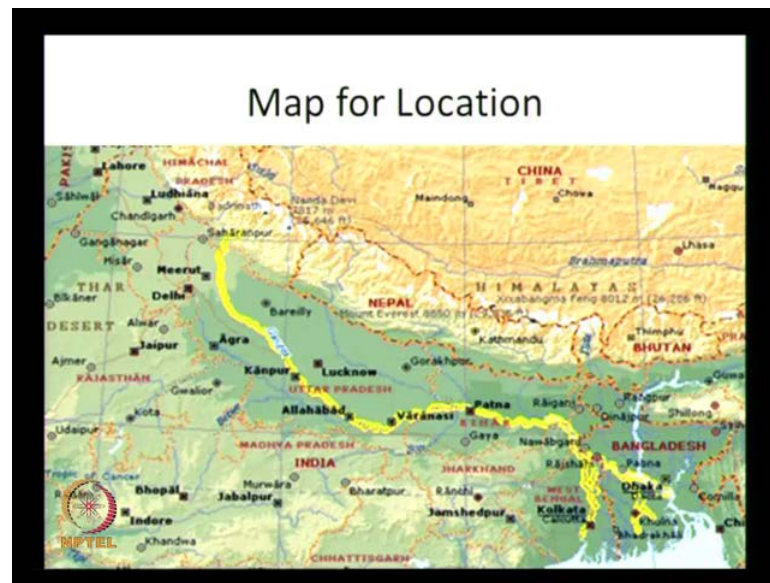Y it is a very long letter what is it?

Y

Next

Z

Are if you speak at some Americans then it is zee otherwise, z. So pie chart is a good medium for presenting

Portions

Portions or percentages, but it is not that you cannot use it for other things

The point here is what is best?

You can also use maps. I have asked you to use a map to show the place you come from. I will show you the map of the place I come from. This obviously, is as you may have noticed the Ganga basins, the great plains of India know as Gangetic plains or some people also cal it as plains of Ganga and Brahmaputra. You might see that Ganga rises somewhere in the Himalayas at about 16000 feet or so, and comes through etcetera etcetera via Luck now, Varanasi, this is Patna, which is somewhere towards the last quarter of the Ganga and my home is about 140 kilometres to the north towards Nepal from Patna. Now this is not very clear, this is large map. I should therefore show you smaller map.

This is what a meant by non Google map, smaller map, I have now given you an idea of the area between Patna and Nepal. This is the area between Patna and Nepal and I come from a place marked Darbhanga. Can you see it on the map?

Yes

I should keep quiet and allow you to look at it for a minute. When you show maps let your audience for a few seconds I will give you 3 seconds, just mark the number of rivers and the little towns that are there.

You might have noticed that this region between Ganga and Nepal, between Patna and Nepal is crisscrossed by rivers. Actually, if it had a still closer map it would show more rivers. It has only showed major rivers there are smaller (( )), streams, actually in my part of the country you can hardly crossed 20 kilometre stretch without crossing a river. It is highly flood prone in every 3 months a year. We suffer great miseries, but I want to show you the region which is the flood proned region.

So, you see I have shown you the course of the river Kosi. Can you see it? Can you mark the river Kosi on the map? Can you see on the top of the map? Then similarly, there is the river Ganga, Can you seen the Ganga somewhere? And can you see other towns in between. So, map a well marked map is wonderful wonderful way of showing locations.

So, map is a good way of showing location but sometimes, say for example I have been interested in the history of floods in my part of the country. Can I be personal for a

minute? Floods bring the end of everything as civilization. The distinction between young and old, the man and woman; the mother and son it would reduce you to misery and savagery. There is no water to drink, there is no water to cook, there is no place where you can answer the call of a nature and yet all of us have to do that. The dogs have to survive, the snakes have to survive, the human beings have to survive, your buffalos and goats have to survive. What do they do? Where do they go?

I have been interested in the history of floods and I find that ever since we started building dams on rivers there have been more and more miserable floods. I have been interested in the history of floods, I have also written articles, I have worked with my colleagues from hydraulic sensible engineering, and they have help me gather data, and my current conclusion is that entire north India particularly, Gangetic basin would become a chronically flood found place unless, the dam at Tehri is removed and unless the barrage at Farakka is removed.

I have enough conclusive engineering evidence to convince you, and convince any impartial listner that these two dams and barrages are doing no good to anyone. They are only going to vein the river Ganga as south Indian rivers died because of several dams and north Indian rivers would also die.

But there is no way I can describe, no matter how much I tell you about the misery that people suffered can equal to one photograph. If I showed you one photograph of the kind of suffering people have do to floods, it will be equal to the verb is one photograph is equal to

Thousand

A thousand words actually could be ten thousand words.

Look at ten thousand words; this is the town of Seheresa a town of about 250000 people. The only place they can go to is rooftop, and not everybody has roof top. This I have taken from Google or on the net, and no harm acknowledging. I do not meet to tell you look look I took by camera; I applied for leave and went to Seheresa and click photographs that would be ridiculous.

You do not need to reinvent the wheel, the wheel is there, use it, but acknowledge. This is somebody else data, but it does make the point. The point is, that floods can be stopped; they must be stopped; why? Look at the human cost you will any day prefer living without electricity, without water supplied into your bathroom, to living with fellowmen in these conditions.

So, the photographs make those points, those human points which cannot be quantified numerically. Do you agree?

Yes

When you make the next presentation you want to tell me in my city it is this, that is why I allowed you to bring how many photographs? One only one photograph, that one photograph are to be so telling that it can captures all the emotion, other things capture and present information.

Is that all right?

Yes

Are you with me?

Yes

Am I clear to you?

Yes sir.

Any questions please?

No sir.

So, kindly prepare thank you have a good day.