Introduction to Civil Engineering Profession
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Lecture – 19
The Big Picture

I Gitakrishnan I am a faculty in the transportation engineering division within civil engineering department. And so, today you know I am going to give a talk about the big picture the earlier we may talked about life skills for a civil engineer. So, you know I have put in my perspective here and yeah we will see how that goes and let us keep it interactive you have questions you can ask me questions as well.

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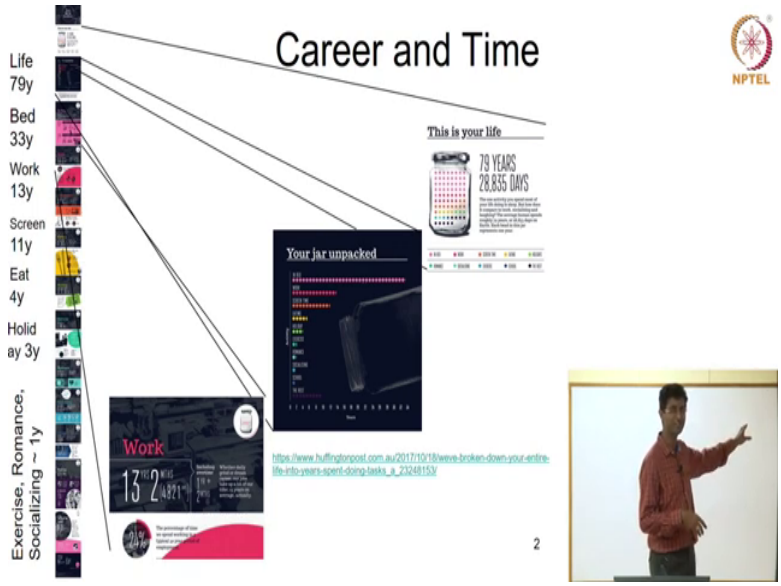

So, on an average you know people may live about 70, 80 years yes. How long of this time you know do you spend doing different activities? How long do you sleep you know in your

lifetime? One third all right. So, it is said that you know you sleep about 33 hours, 33 years right if your life is 79 years ok. its more than one third why? Your childhood is slept more right? Again when you grow older maybe you will be sleeping more maybe now, you are not finding enough sleep all right. And if you talk about work how long do you think you would be working? How many years are you working in your life?

And its zero no right. It said about 13 years you spend working you know of your lifetime ok. That is a substantial portion right? So, that that is actual number 2 after sleeping right? So, most of what you are going to be doing throughout your life right besides sleeping is working right? And then you have other things interestingly you know screen time comes out to be the next major activity we do this includes watching TV right, surfing the internet on your mobile phone social media all of that put together right? That is substantial we do not even realize that right?

I will talk more about that later and of course, you do other things like eating, holidaying and so on right? And of course, exercising, romancing, socializing right? All that is also part of what you do right? So, a substantial portion of your time you are actually working. How much do we think about what we do right what should be my career because this is what really defines most of your waking time in your life ok.

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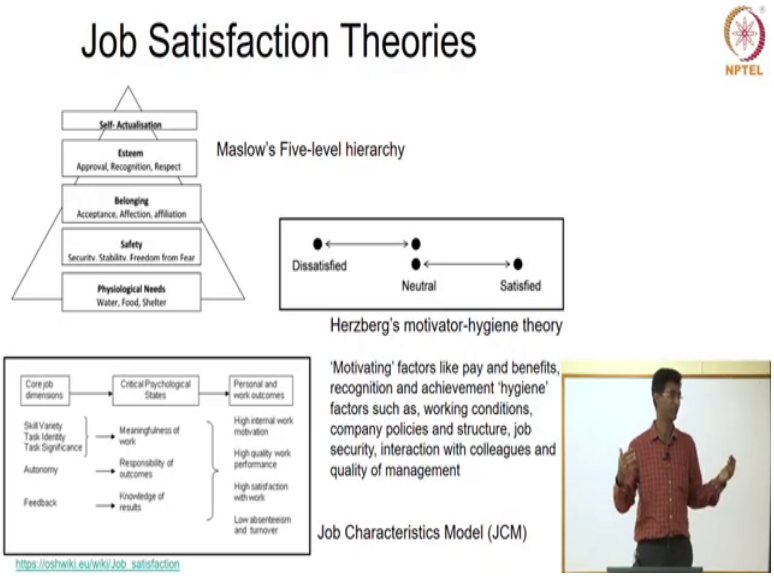

So, it turns out that another different job satisfaction theories around, so, one of the theories is based on Maslow's triangle all right. It talks about it as the hierarchy of needs ok. Every individual has a hierarchy of needs it starts with what we call as basic needs all right. So, what are the basic needs food right housing clothing ok. So, many of our decisions are actually driven by this basic need ok. So, this is what you can say is the first hierarchy.

Then people think about safety right? Once this is satisfied they start thinking about how to have a safe life right? How to have a secure life? So, maybe if you have food you start thinking this is good food alright will it not upset me stomach things like that ok. Then it moves to something called as belonging right? We are all social animals even though social animals we need other others we need relationships ok.

So, your decision kind of start evolving to satisfy the third level of another hierarchy the need ok, and then people talk about esteem how you feel about yourself all right, self-respect is part of that ok. And then Maslow's says as a level called self-actualization right. What is self-actualization? All your decision are driven by maybe something you know that you believe in from inside you not necessarily something based on these other four levels of the hierarchy ok.

So, the same theory is also used for job satisfaction right? People say you kind of evolve in terms of your jobs alright initially it is about physiological need you need a job. So, that you can pay for your food your shelter right all of these, then maybe you are looking at something much more you know you want to have stability in your job you want to have a secure job right. Some people call it the government job that is right you know that is nothing like a completely safe permanent job right its always relative. And then you know you are talking about it is my job giving me satisfaction right am I doing something good for the you know society.

So, these are questions that you start asking right. And then you also think about is this job giving me you know recognition am I a being appreciated for what I am doing right. So, these questions become important as well and then self-actualization we really do not know what; that means, when it comes to jobs ok, but lot of people said you know this high level hierarchy is not really explaining a lot of the experimental evidence when it comes to how people choose jobs right.

So, people came up with another theory something called as motivator hygiene theory right? What this states is you could actually move from being neutral to satisfied or dissatisfied yeah. And this scale is not continuous right you could actually have satisfaction and at the same time have dissatisfaction with your job all right.

So, it is very interesting it is not a continuous scale it is not like if you are satisfied you are not going to be dissatisfied you could actually have both elements right? And people came up with different motivating factors which lead to satisfaction things like of course, your pay right your

recognition how you are feeling in terms of achievement right. These are all motivating factors and then you have hygiene factors which actually result in dissatisfaction that could include things like what is the working condition do you like your work environment right?

How is the interaction with colleagues? Are you enjoying your time with your colleagues because more than maybe you are you know better half you at least spend more time with your colleague because you are spending most of your life working all right.

So, these are aspects that one has to look at is what you know Herzberg's theory you know in his theory. Perhaps the most widely accepted model you know for job satisfaction is the job characteristics model. So, what this says is there are certain core job dimensions this includes you know your skills or just your skills the variety of skills how am I able to learn and apply different skills that is something that is important yeah and it talks about task identity right task significance how important is a task and how unique is a task ok.

Do you like being the cashier behind a bank maybe some people do, but you know most people think that is too monotonous right? that identity is too narrow ok. So, you want to have you know some broader identities right. So, you look for jobs which give you opportunity right to experience these broader identities right.

We also talk about autonomy are you able to work alone right individually ok. So, that is something you know is one of the core job dimension and then feedback. Do you get chance to improve right do you get constructive feedback. Feedback not necessarily to put you down ok, but feedback to actually you know help you improve ok. So, these are core job dimensions and they say these job dimensions actually map into certain psychological states. So, things like meaningfulness, how meaningful is my work.

So, maybe as a civil engineer you know based on the talks that you heard. So, far you find you know. So, civil engineers really say that there is some meaning to what I do ok. There is a greater purpose to what I do as a civil engineer right? So, as a civil engineer is perhaps very easy to see you know meaning in the work that you do yes. So, that is a psychological state and responsibility of outcomes are you given the responsibility for the are you appreciated

there somebody telling you that this bridge was built by certain such a person all right that happens, but may not be you know other factors all right, other jobs that cannot happen as much right and knowledge of results right?.

So, do you know what is happening? Do you know what the conclusion is? Do you know what the results are? Ok there are jobs in which you have no idea right I am just say you know you are just a cog in the wheel you really do not know all right what is happening maybe that is what is making the wheel rotate right.

Awareness of that is also important in a job ok. And of course, these lead to what are call personal and work outcomes right. So, you have good motivation to work right you have good performance which is you know important. And you have high satisfaction right we will see what that is and also you know you can measure it using low absenteeism.

So, if you been liking these lectures then we have maybe more students attending yeah or maybe it is the attendance which is making you drop right, but you know these are measures that you can use to see how you know the job you know how successful you are in the job how meaningful the job is for you right? And so on ok.

So, this is perhaps the model that is mode most widely used. And whatever career you choose right I would encourage you to think about these aspects ok. Whatever career you pick how does it fit within these different elements right?

And what is meaningful for one need not be meaningful for another it is about finding what is meaningful for each of you right? So, hopefully you know there is stay in civil engineering or you decide to move on its a informed decision right? It is not a decision that just based on chance, but you think about you know these theories and then see what maps best. So, we talked about meaning.

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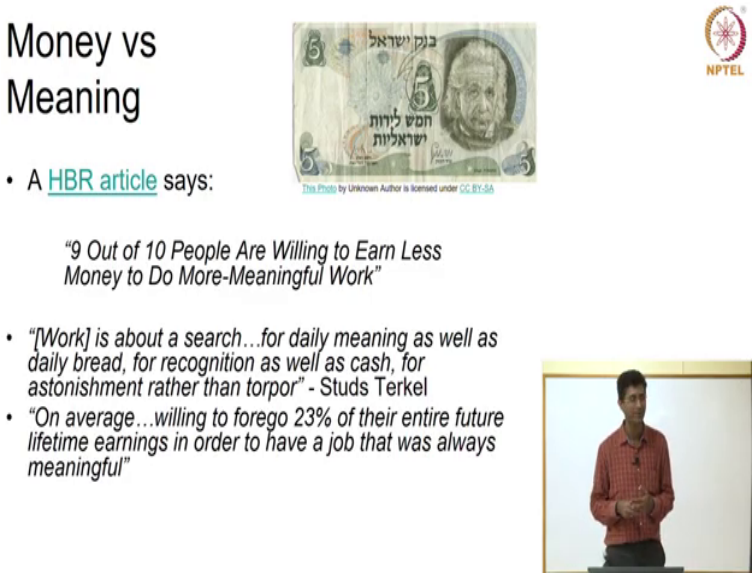

So, people talk about jobs as I want to earn money all right, because it true that money is what drives people towards jobs or is it the meaning of the job? How many of you think money is what drives people? Ok, how many of you say meaning drives people the rest of you can wake up ok.

So, there is a recent article you know which said that 9 out of 10 people are actually willing all right to earn less if they can find more meaning in the work they do ok. That is ninety percent of the people alright and is very nice quote in this particular article right work is about a search it is a search for daily meaning besides daily bread ok. So, earning money is only part of working all right. So, we want recognition as well as cash right and you want astonishment rather than torpor ok

So, you want to feel every day you know I really love what I am doing I really like what I see rather than oh my god I have to go to work today. So, somebody asked me you know when will you retire ok. In IIT is there is a retirement age it is 65 years, but you know instinctively I said I will retire the day I start taking one step at a time when I am going to work all right.

I typically take two steps at a time. So, that is just I want to get to work right that is the motivation that is the joy I derive you know I am looking forward to work ok. That is very different from oh my god I have to go to work today all right.

So, that is a big difference right? And you know it is again in the study they actually quantify how much people are willing to give up for meaningful work right? And they came up with the number that people are willing to forgo 23 percent of their earnings if they can find a meaningful job right?

Again you know nothing against other disciplines, but several civil engineers you know over the last 10 years I have been here students like you they graduated they took up a job in a non-civil engineering area and within a couple of years they came back to my room and I said they said I am looking to shift back to civil engineering right.

Maybe I will do higher studies can you give me a recommendations right. So, these are people who are earning well right, but they said I am willing to forgo my earning to have a more meaningful job all right. So, money is not the only motivation ok. So, think about how meaningful your work can be. So, that is about money and meaning.

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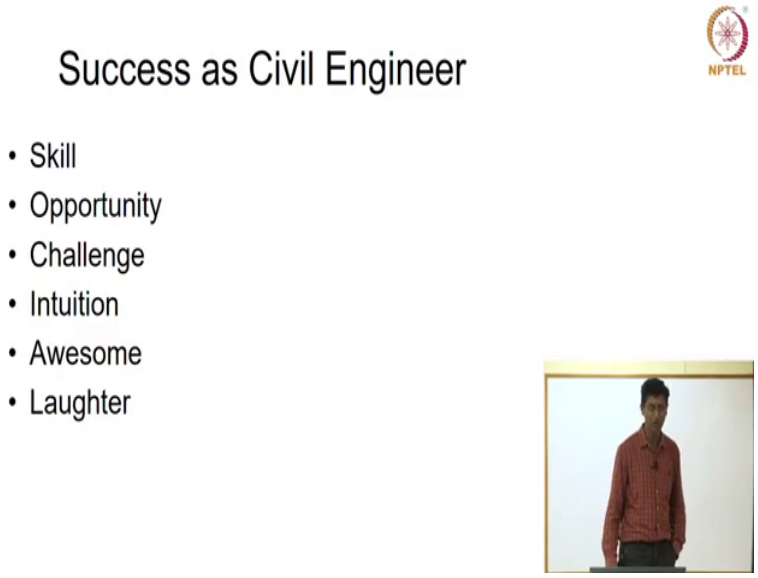

I will talk about you know success as a civil engineer right slightly more specific, but this could also be as an engineer or you know any other carrier for that matter ok. So, just to make it easy to remember I came up with an acronym I am calling it social ok.

Let us see what social stands for the S is for skill. I will talk about skill the O is for opportunity you always hear this right? You know I am not getting the opportunity, but I am going to give a slightly different take on opportunity because its important ok. The C is for challenge ok. So, is our challenge is good or bad challenge is are good how many say challenges are good that is nice to see ok.

How many say challenges are bad few we will see how you know will see might take on right and of course, you can have your take you can share what you think right. And then I am

going to talk about intuition because there is something that is very very important you know and is often underplayed right and is. In fact, looked at you know in a negative sense right?

As engineers we are actually told to make decisions based on facts right not based on intuition. Again I will provide a slightly different take on intuition right? And you know a S for awesome right. So, I am sure you know you have been awed by some of the lectures before alright some of the achievements in civil engineering as really you know awed you is felt wow that is so amazing all right.

So, I will talk about some of that and l is for laughter ok. At the end of the day you know you have to be enjoying what you are doing alright you should be going back home smiling right? If that is not happening you really need to think about what is the you know what is it you are doing is it really giving you the joy right.

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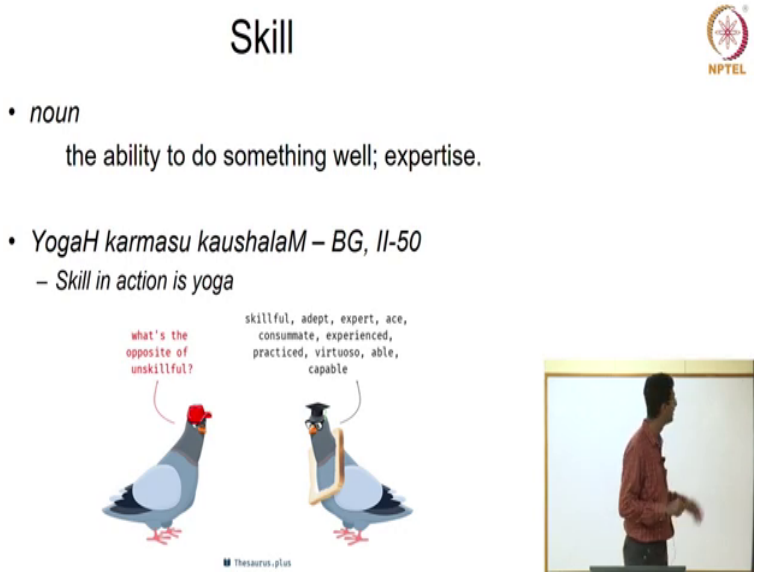

So, I will take you know few minutes I will talk about each of this right. So, when you say skill the dictionary definition of skill it says the ability to do something well right. So, you could do something 10 years back you know or 15 years back I could cook, but you know.

I will be the only one eating what I cook all right, but after know 4-5 years of when I was living alone in a foreign country and practice cooking right. Now, I can say you know my wife will also risk it right she will also share the meal with me ok.

So, it is about doing something well it is not just about doing something ok, that is skill right in the Bhagavad Gita you know they say yogah karmasu kaushalam right. What does it mean? Skill in action is yogah right that is what I said in the Bhagavad Gita tool alright and what is the opposite of being unskilful right or different terms right being skilful of course, being an expert all right.

So, if you find a lot of the faculty here alright in our department, they are so happy to do what they are doing that is mainly because you know they are experts in their field right? They are well known in that particular area and they are very skilful and what they do right. So, being an expert alright and being experienced right practiced I will talk about this as well ok. How do you develop skill by practice by practice right by repeatedly doing it ok.

You want to achieve this you know the first year it takes several years yeah.

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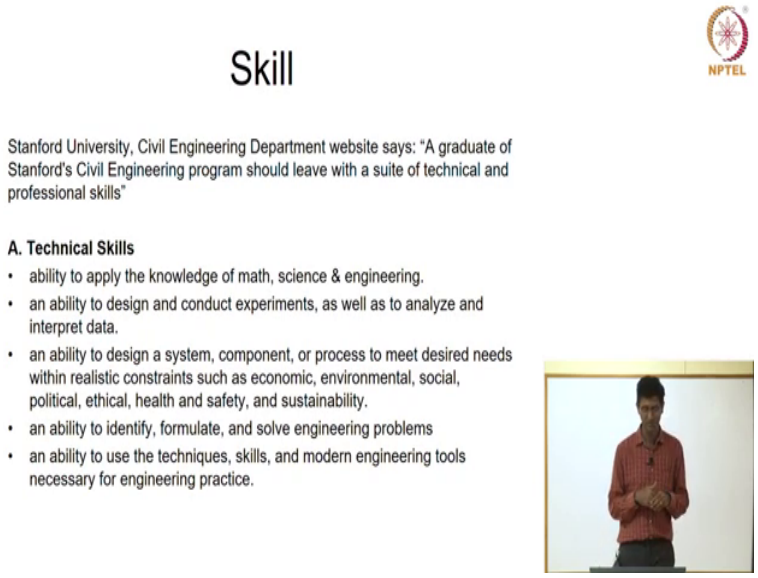

Stanford university in their civil engineering department website actually states what is its motivation for education right for civil engineers ok. It says that you know a civil engineering graduate should leave with a suite of technical and professional skills and it states some of the technical skills that they ex expect their graduates to have right? They have to be good in math they have to be good in science right? They have to be good in engineering.

So, all these are important alright they say they should also be good and designing and conducting experiments ok. You will know that right it also said that there should be good in analysing the data ok. So, you know the latest goal as I say is data right. So, we know that thousand years back gold was of lot of value right? gold was the metal which was valued alright for last hundred years what is valued what is valued in the world.

Student: Oil.

Oil right oil was a gold for the last 100 years or so right? Next 100 years what are people saying data they are saying is the next gold right. So, you really need to have the skills to work with data analyse data right. So, data is going to be the next gold right. So, they say that you know that is something that they emphasize in terms of technical skills right and of course, you have to design systems components several kind of needs it should not only be economic it should also be you know sustainable from an environmental perspective from a social perspective and so on all right.

So, that is a skill that you are expected to have and you know you should be able to identify formulate solve engineering problems a lot of things you will do here in classrooms are solving problems ok, but in the real world it is also about identifying problems what is the problem I should solve yeah. So, of course, if you take up graduate study so you become a masters or a PhD student all right. You will find that a good part of your PhD life is actually spent in identifying problem all right.

So, that is important as well to identify and then formulate solve the problem right? And another skill they talk about is using tools right all the tools that you can use to come up with your design to come up with your analysis. So, that is important as well there is absolutely no doubt you guys will do great on these you are all good in math you are all good in engineering alright you will perform exceptionally well with respect to these technical skills.

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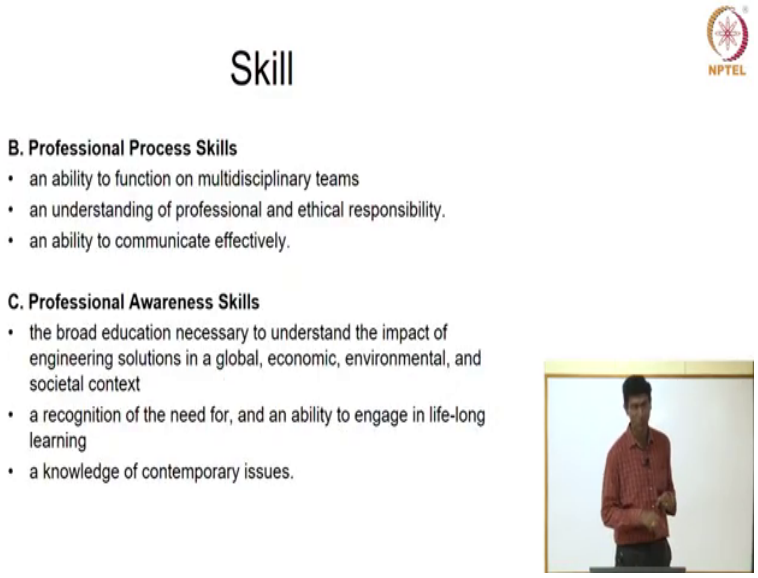

But what we need to work on is usually our professional skills ok. So, these are equally important if not more important right. There is another Stanford study which actually says 90 percent of you know the reason for getting a job is actually your professional and social skills or they call it as soft skills only 10 percent is you know the technical skills ok. Because most people do well in technical they are all equally good, but when it comes to social and you know professional that is where the differentiation really happens right.

So, what are some other professional skills they talk about working in teams not just teams multidisciplinary teams right. so; that means, understanding others perspective being a coordinator others perspective right? It is important ok.

They talk about professional and ethical responsibility did you have a talk on ethics in engineering ok. So, maybe at some point you will be exposed to that alright it is very very

important as engineers you will be making fairly big decisions in your life and ethics plays a major part in deciding the right decisions ok. So, it is not just economic, but has to be ethical right. So, that is something that is important that the skill to have and then communication I keep emphasizing this all right.

No matter what job you take up substantial portion of your job will be spent in actually communicating what you are doing more than what you are doing will be spending time speaking about what you are doing explaining to people what you are doing justifying what you are doing all right. So, that is a very important skill again there are programs you know in our curriculum which address that you should seek out you should see how you can improve your communication skills right? And then they also talk about certain awareness skills alright they talk about broad education knowing a lot of things that is important all right.

And you know lifelong learning is something they emphasize ok. So, you are learning does not stop here you know it continues. So, how to be a lifelong student and some knowledge of contemporary issues not just being compartmentalized to civil engineering, but knowing what is happening in society in the world around us right all these are skills ok.

So, you need to see how you can develop these skills while you are here and all these will help you become a successful engineer right?

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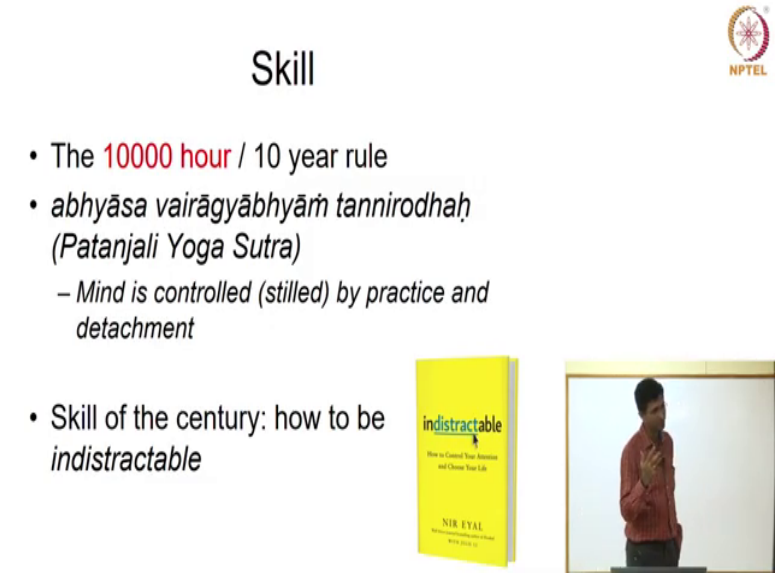

How many of you heard the 10000 hour rule ok. So, how much small he was basically a psychologist and you know a social researcher you can say he won you know a Nobel prize in economics and he came up with this rule.

He said if you have to become an expert in any area in anything you do right you should have practiced it for 10000 hours alright. If you done something for 10000 hours you are guaranteed to be an expert in that area that is what he said right. So, what are the 10000 hours translate to right approximately about 10 years. So, I have just completed ten years as a faculty here. So, I can claim to be an expert faculty just kidding right, but that is the timeline it takes to become an expert right?

So, people are impatient you know they are they give up very easily within 2-3 years of a job they say oh this is not for me alright many times a job you are saying is not for you because

you have not been skilful enough in the job right? When you become skilful automatically you will start doing excelling in your job you derive satisfaction from it all right. So, stick to something for 10 years if you really want to be an expert that is what it says and again this is another quote from our literature right. So, it talks about abhyasa and vairagya all right.

So, it says that the mind is actually controlled by practice and detachment right? Abhyasa is practice right vairagya means detachment right. So, as we started this talk you know 35 minutes there are at least 6 or 7 cell phones that went off the challenge today is much more right? To be focused this more difficult in today's world then it was maybe 20 years ago right.

There are more distractions again how much more actually spoke about this all right. The challenge to making you know focusing and having attention is too much of information. So, what you have through your cell phones through the internet is actually a deluge of information all right

In spite of that if you are able to keep yourself you know focused right, then it is said that is the skill of this century ok. What is the most important skill you can have in the century a lot of people you know behavioural theories and you know occupational theorists they said the skill of the century is to be indestructible I am telling you it is so difficult.

So, you know how difficult it is you start studying right 10 minutes and then you pick up your phone and your messaging hey how much have you finished alright happens naturally, if you can put that away if you can have certain detachment right that turns out to be a very important skill to have and that will of course, you know lead to success in your career.

So, it is something that you can practice there is actually a book by that name a best-selling book called indestructible right. So, you can look that up there are techniques which you can learn how to be focused how to pay attention right how not to get let your attention get diverted ok.

So, that is about skills the first essence social right. Next is opportunity. So, people think opportunity is luck right we should be lucky to have an opportunity right, but here are three

very nice quotes on opportunity right I already had a Einstein picture I have one more, so that Einstein is saying opportunity lies in the middle of difficulty what does it mean?.

So, if you want opportunities seek out difficult problem right? Seek out difficult you know challenges right. When you start seeking difficulty then you will find opportunity if you going to shy away from difficult if you just going to be happy sitting where you are alright yes you are not going to get the opportunities ok.

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So, Einstein is kind of hinting at where you get opportunity right? And then you know there is a comedian Multan Barle right he says if opportunity does not knock build a door ok. So, you heard the saying right opportunity knocks once right or opportunity knocks only once that is the saying as the popular saying ok. So, he is a comedian he is just you know flipping that

around he saying if you are not getting knocks from opportunity maybe you do not have a door right.

Build a door then you will find the opportunity knocking right this is also telling you that building a door is like maybe acquiring a new skill right? Learning something new once you start doing that then you will find opportunities open up if you are going to be stuck with what you have and what you know and if you are saying I am not having any opportunities alright maybe you need to build you know more doors once you start doing that opportunity it will come your way right? That is a very interesting quote as well right

And, the third quote you know is from Thomas Edison right the famous scientist again opportunity is missed because it is dressed in overalls and looks like work ok. So, essentially what he is saying is the people who work will definitely find opportunity right.

So, it is not about opportunity it is more about hard work its more about skilling yourself its more about skilling yourself in difficult areas when sharing into difficult problems ok. So, you know when you make a career choice right think of what is difficult right think of how you can expand your skills right. Think of putting in those extra hours of work and when you do that I am telling you are going to have. So, many opportunities alright it is good to have multiple things tend to choose ok.

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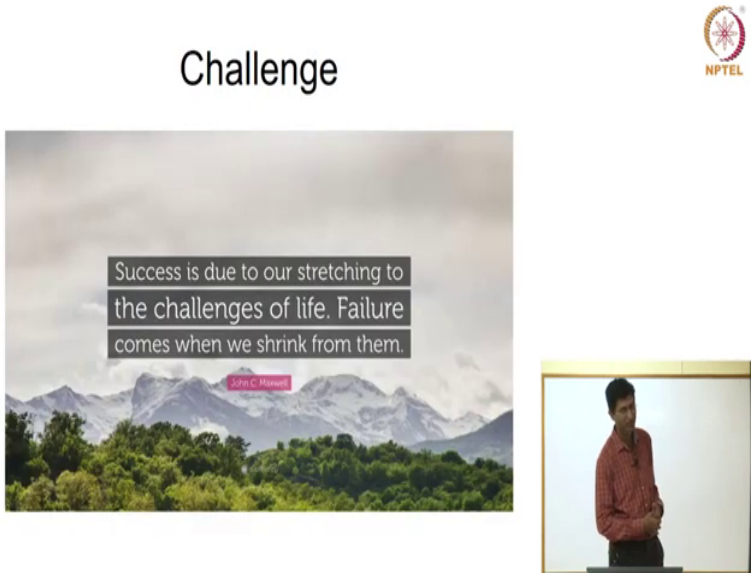

So, that is the O in social. Then I come to C alright which is challenge ok. So, everybody has challenges in life right some people are successful some people are not so much right? So, this is basically saying people who succeed are the ones who are stretching arrive to meet the challenges and failure is basically people who are you know shrinking away from those challenges ok.

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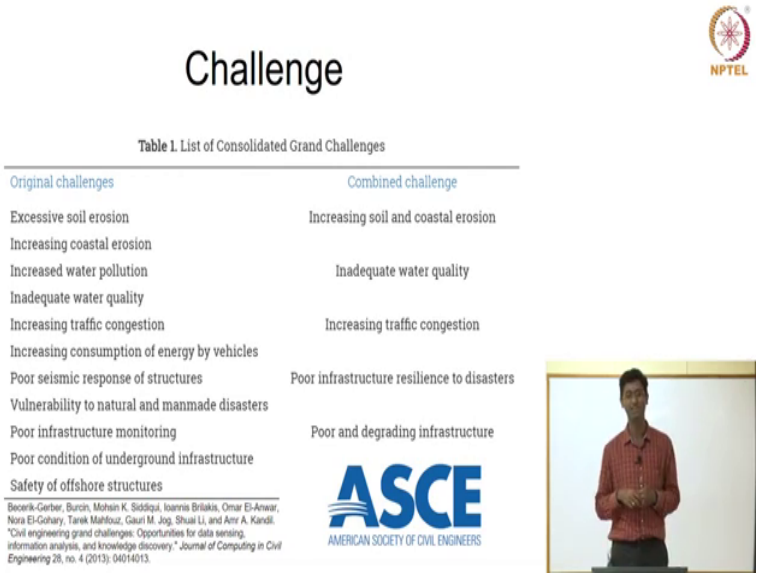

So, seek challenges and stretch yourself. So, I was just looking for challenges in civil engineering has its been shared with you before no ok. So, there was actually research article in one of reputed journals in civil engineering ASCE stands for American Society of Civil Engineers. So, they publish a whole host of journals on research articles technical articles in civil engineering and this particular article looked at grand challenges in civil engineering. So, if there is an area of engineering which is got really grand challenges huge challenges right.

I think its civil engineering ok. So, they just list some of the challenges you know things like excessive soil erosion that is the challenge all right. Coastal erosion that is a challenge just last week there was an article which said you know Chennai will get submerged or majority of section Chennai will get submerged, not just the coastal areas even imperial areas are going to

get submerged in Chennai all right. If you do not act on climate change ok, that is a major challenge if you think about it right?

And you know water pollution is a challenge water quality is a challenge right? There is not enough water again in Chennai we face that problem right traffic congestion is a challenge energy consumption for this vehicle vehicular you know a propulsion that is a challenge right? And perhaps related to pollution and traffic is also add quality right what is been happening in Delhi? Yeah that is a challenge as well and all of these enough small challenges these are these are huge challenge these are grand challenges right?

Any challenge you take up in civil engineering an act is actually grand right nothing small about it right? And of course, when you talk about structures right how to make them resilient? So, you know there was typhoon recently in Japan alright still the damages were so less, they said you know the speeds were about 200 kilometres per hour the wind speed in the typhoon right when we had in Chennai about 2 years back because about 150 I cannot imagine what would happen if we had a 200 kilometre per hour in typhoon in Chennai right?

It can be hardly serious disastrous ok. So, how do you come up with infrastructure that can with stand these kind of calamities right? And again because of climate change right some researchers are saying these challenges these calamities are coming up much more frequently you are having more cyclones now, right more floods now than much you know maybe appears back hundred years back right.

So, if you talk about civil engineering grand challenges are up plenty right? Pick any one and you can make a huge contribution alright in your career and when you solve one of these alright you have impacted millions of people's right? For 100s of years maybe right what can be more satisfying than something like that right.

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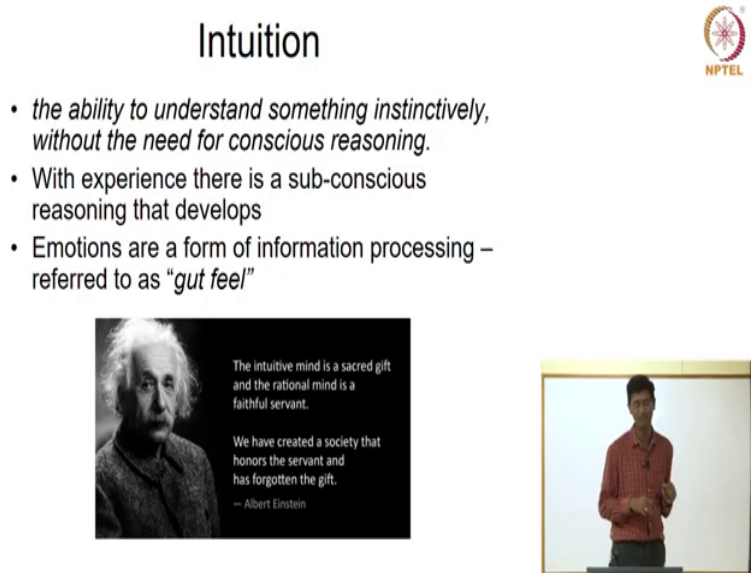

So, think about grand challenges and our area definitely has grand challenges ok. So, that is SOC then I have I in social right intuition ok. So, again if you know dictionary defines intuition as ability to understand something instinctively right you know it what I know what it is that is intuition all right. And in fact, they also say without the need for conscious reasoning ok. So, what does conscious reasoning mean applying your logic all right.

So, we think you know we were told as scientists we must apply our logic right we must be scientific in our approach ok, but let us hear out from one of the greater scientist of you know the last century Albert Einstein right? He said that intuitive mind is actually a sacred gift right just as a rational mind there is a faithful servant right.

So, he is saying the logical thinking is like a faithful servant right, but the intuitive mind is actually the sacred gift ok. So, we have created a society that honours the servants and has

forgotten the gift ok, imagine this he said maybe 100 years back right? Now, it is even more so ok. You are discouraged to think intuitively you are asked to go by logic by data one way right, but to a large extent logic trance cannot transcend beyond what we know right? And knowledge discovery happens beyond what we know ok. So, you have to take you know a jump a leap into the unknown all right.

And that comes from you know intuition right and this intuition something that is completely devoid of reasoning is intuition something which is you know nothing to do with the conscious reasoning mind right? Because when you put it that way it sounds like a negative thing alright, intuition seems to be something unreasonable, something like a reflection, but you know a reflex action.

Student: (Refer Time: 35:17).

Absolutely right. So, latest research on intuition is actually saying that you know it is not something which is magical, intuition is not a magical happening right? Intuition is actually what you develop with experience ok, but it gets embedded into your subconscious mind. So, it does not come up to your conscious reasoning subconsciously you make decisions right and people actually call intuition also has a gut feel right? I have a gut feeling that I should do this all right. So, it turns out that you know latest research which is looking at basically you know what is in your gut the bacteria in your gut.

All right they are saying that has a very very close link to how your brain no response right. So, the bacteria gut is actually determining what your brain is thinking right? That is again latest research right? So, when people said gut feel maybe they were you know too far away from the truth maybe that is a link between what is in your gut with this bacteria's and what you are thinking alright people are still researching it, but yeah its an emerging area right?

And people are saying your emotions are not bad you know people say do not be emotional when you take a decision. How many of you have heard this? All right. Do not take decision emotionally yeah people are actually now again research is showing that emotional is actually a form of information processing right. So, emotion is actually helping you make decisions ok.

So, you know rather saying do not be emotional I think people need to say involve your emotions besides your intellect in decision making all right.

Because quite often than what that could be the differentiator right between a great decision and a not so great decision right? I just want to share small you know happening in my own you know life. So, you know I was maybe your age I would I was just finished my class 12. And I had given j e exam alright and unfortunately I did not clear the j e exam alright unfortunately I do not know right looking back now.

And what happened was I had instead cleared another entrance exam which was called in those days the Roorkee entrance examination alright the r e e ok. And yeah 15 years back or 20 years back I am that old 20 years back Roorkee was separated it was not part of the IIT system and they had their own set of entrance exams ok. And I had given the Roorkee entrance exam only because of you know everybody also it giving with no interest I had no idea of going to Roorkee right this is too far all right.

And, but I did not clear j e and I had not applied to any of the other colleges and so i was stuck in a situation where I cleared Roorkee entrance and I had not clear you know IIT j e. So, my dad said you know I spoke to some friends right looks like you know Roorkee is a very good college its very old university let us go there and see what happens ok.

So, I went there I had no intention of studying there. So, you know all I said was I did not have very good rank I said I am going to fill up a rank, which is the fields which have you know only top rankers choosing right basically computer science electronics and that is it right. Then somehow you know my dad said you know something is telling me that you know you should fill up civil engineering alright I said why you know do not know something is telling me you fill it civil engineering right. So, does his intuition right and then I thought about it right.

I had no enough of a particular civil engineer as well who ended up doing you know transportation as a specialization masters. And then works for united airlines and alright that is

why he said maybe you know I will have a carrier in united airlines if I do civil engineering right. So, let me fill up civil engineering right.

Just before I went up for my counselling I filled up civil engineering right, but by then my dad had done a very quick calculation it turned out that civil engineering admission was already over right? And beyond civil engineering they had a branch which they called you know pulp and paper or something like that and I am some people choose methodological as well.

So, he said pull up you know right pulp and paper engineering also has an option you can always upgrade next year right. And I am furiously fighting with my dad and all that and. So, I say I am going to cut out pulp and paper and I am cutting out civil engineering as well right.

And I was going up right then I cannot know something, but gut feel made me say that leave about civil engineering I will cut out pulp and paper because anyway I am not going to get civil engineering because the seats are over right the quota is filled ok. So, I go up to the stage I give them the my preference.

And they say congratulations you can go pay your fees you have got civil engineering, I have like oh no whether you have got it wrong that is been a mistake right I do not want civil engineering ok. I want to go back and I will prepare for j e again I will you know I want to study in IIT madras I am from Chennai.

So, I said I want to go to IIT madras right, but you know that was what happened all right. And today when I look back I am so grateful for the decision alright that I did not cut out civil engineering ok. I am so happy that I actually went up you know I did civil engineering I am also happy I studied in Roorkee all right.

And you know rest is history right? That is an example from my own life of you know how intuition the gut feel all right? There is something that can lead you to great decisions all right. So, trust to some extent please your gut feel ok, but of course, you know gut feel should come from experience right? Do not go and say I have a gut feeling this structure will collapse ok.

When professor devdas menon or you know professor gita is saying now the structure is going to stay do not say you know my gut feel says it will collapse right. So, gut feel does not you know measure up to experience if you had enough experience if professor gita is says yeah I have a gut feel there is a problem in the structure then you should listen to it all right.

So, be careful alright with using this gut feel do not just go about brandishing your gut feel all the time alright ok.

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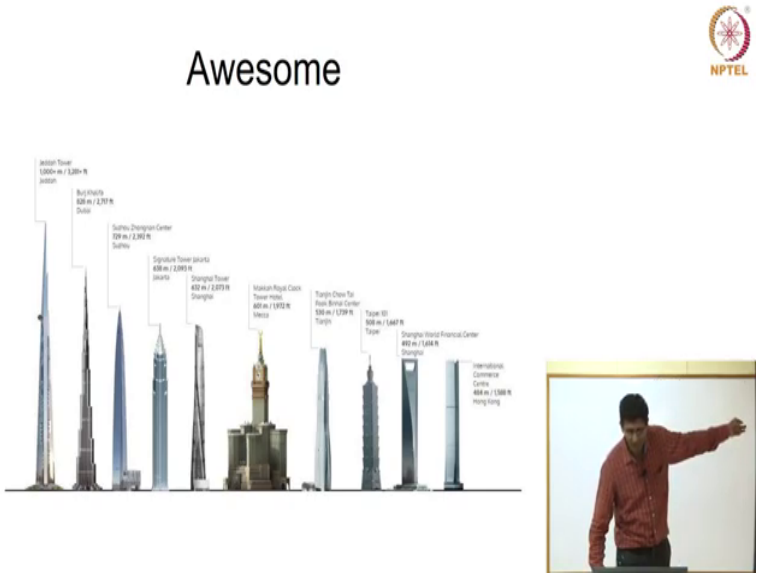

So, that is intuition ok. Then awesome right we already saw civil engineering challenges also grand right? Any time you go see these buildings right you feel awed by it right? So, I am sure you would have seen some of these in the talk's earlier right? And you know the Jeddah tower is going to be a kilometre tall right? Just imagine massive structure like that right.

It really brings that feeling of wow right in us. So, this is all done by civil engineers is not it statues all right.

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So, again when you go look at it the first time I saw the statue of liberty you know I was like amazing all right. Why do not we have something like this in India alright luckily we have it over the last 15-20 years or so most of the. In fact, the previous slide on tall buildings there is only one from the US right?

In fact, this does not even list right if you look at the top ten buildings there is only one from the US. The rest all in Asia ok. Again when I start the started studying civil engineering none of them were in Asia or maybe one right the Hong Kong one may be I do not know right. So,

it is all in the last 20 years it is transformed you know Asia as a destination right as a economic power ok.

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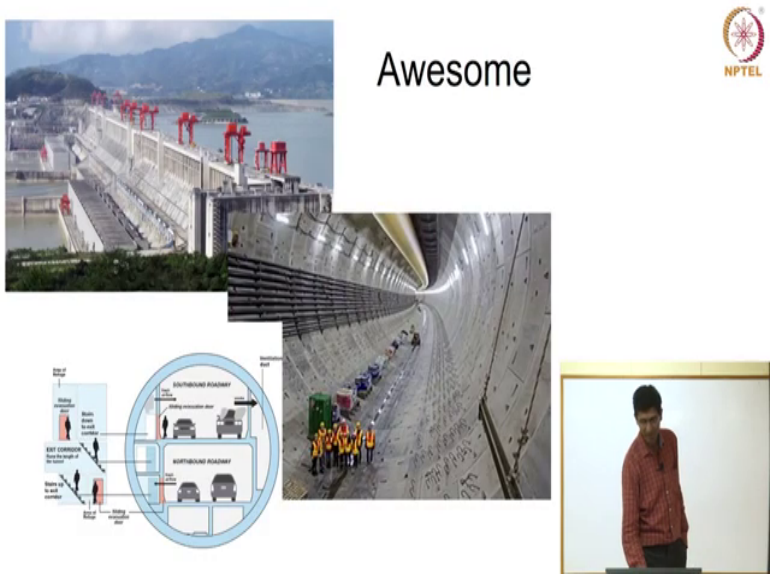

Dams tunnels, So, this is a tunnel that is being dug up in Washington state in the US and look at the size of it the people standing there look at the tunnel that was dug by a big you know tunnel you know boring machine right called bertha ok. And that is how it is going to look like you going to have two levels of traffic moving right?

It is going to cut across the city right. It is going to reduce you know traffic congestion right? So, civil engineering projects by nature are awesome right? I just start you know getting yourself involved in some of these right feel the grandeur feel the size feel the scope of the impact that you can have right.

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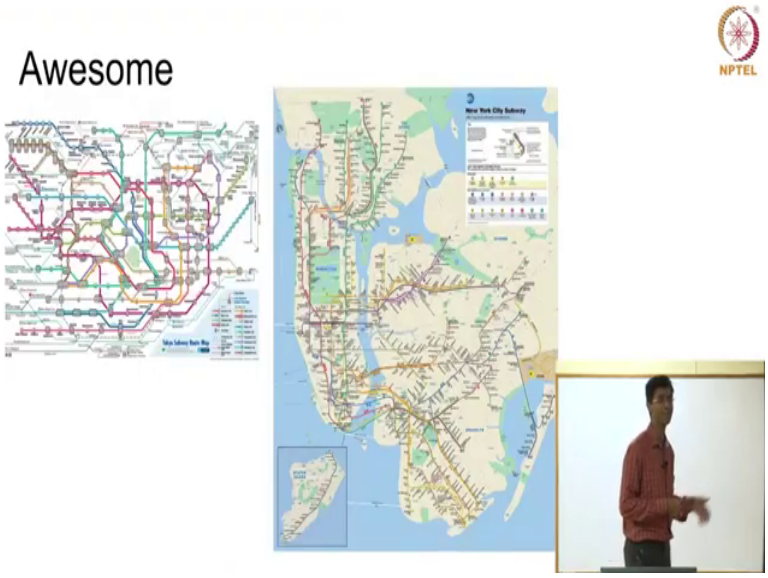

So, and you know transportation that is my area right. So, these are some underground metro subway you know maps this is for Tokyo that one is for New York right to moves people right. Transportation is the backbone of economy in any city right, good transport system there is what moves everybody all right. So, building these planning for these right is done by civil engineers again right.

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Sadly satisfying ok, and then the final L in social which is laughter at the end of the day you know, we should enjoy what we do here are just some jokes for civil engineers alright I am sure you have some too right I would be happy together ok.

And yeah with that I will stop my talk if you have questions I can take them, if you have some jokes to share I am happy to laugh with them right ok.

Thank you.