Introduction to Lean Construction
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Module-1
Lecture 30
Explore relationship between WS Categories and Productivity; Summary

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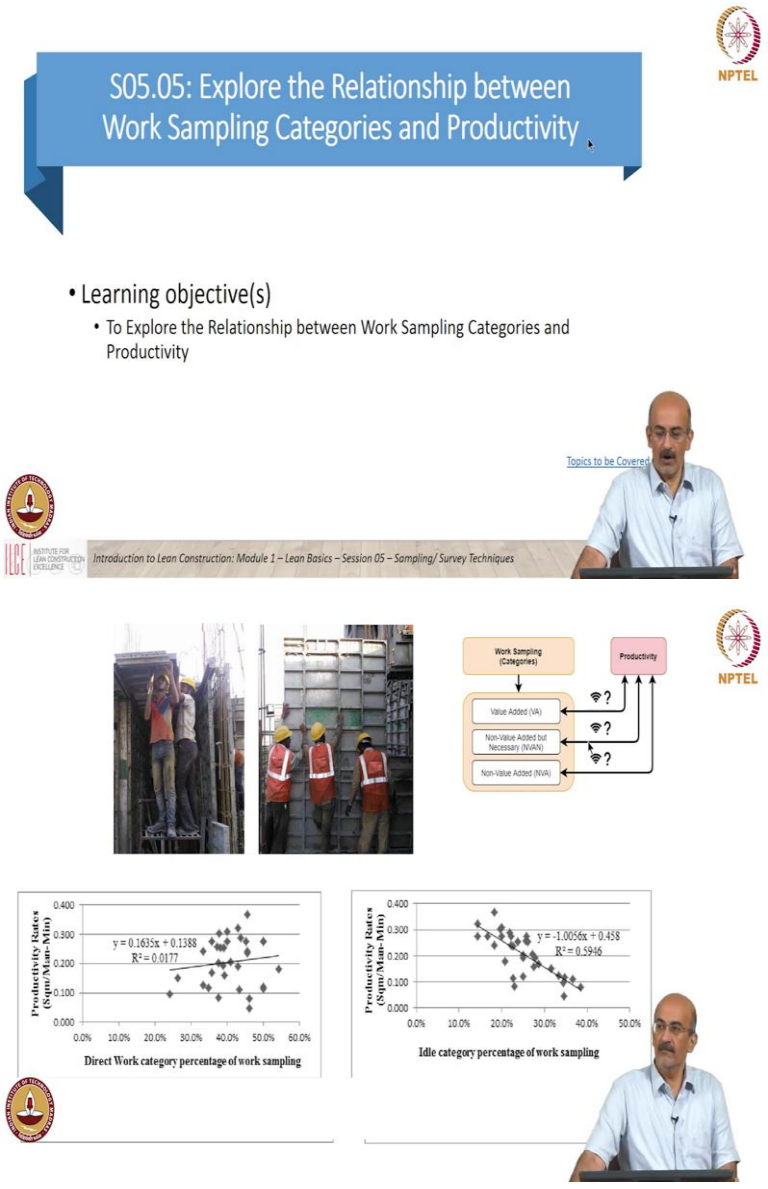

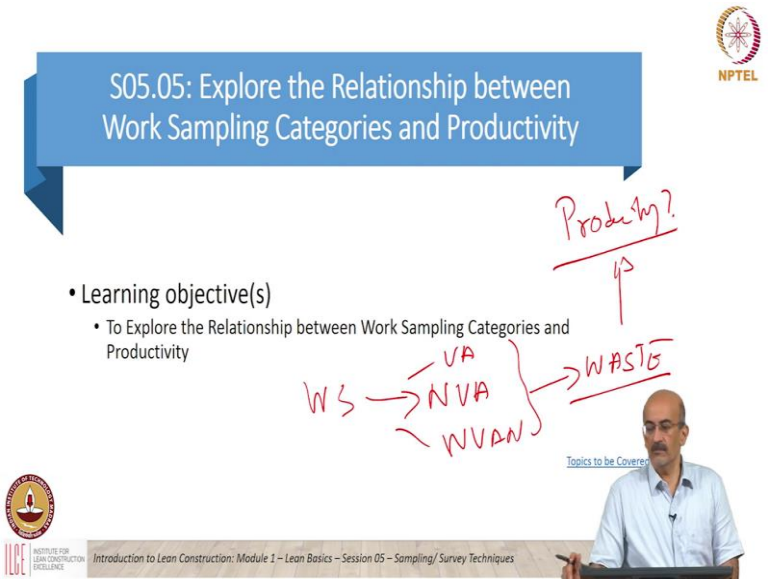

Now, ultimately we said that work sampling has to lead to waste. So, we can see some ways right now, because a work sampling leads to non-value added goes to waste, right? Now, the question is how does this relate to productivity?

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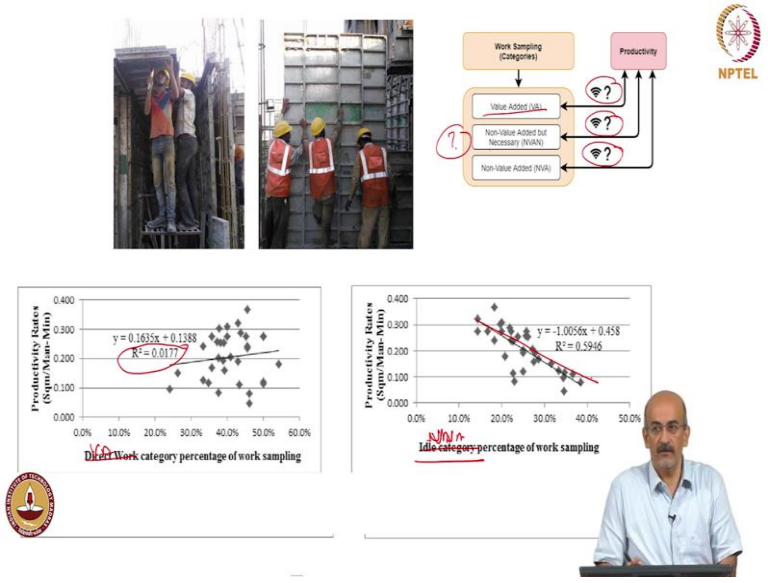

So, this is some a study we did some years back, we studied and we asked ourselves this question, because it is a relevant question to ask. We did the aluminum formwork, we studied a crew for you know, for as a part of one of our MTech projects and then what you can see here is, So, the hypothesis, what would be your hypothesis in this case? What would you assume?

Student: If there is a more wastage then productivity is less.

Professor: Right. So, here we have value added, non-value added. What does the relationship between productivity? Between value added and productivity, what do you think relationship is?

Student: Directly proportional.

Professor: It should be directly proportional. That is more value added, the more productivity. Now, between this I will put a question mark, non-value added and productivity.

Student: Inversely proportional.

Professor: Should be inversely proportional. So, this is exactly what you see here. So, direct work is actually value added, this is value added and work sampling, you can see as a value added increased the dots show the actual productivity measurement and the line shows the best fit, and you know that R square shows the coefficient of regression.

Now, what do you think of this R? Not very good. So, we were not able to establish a strong correlation between direct work increase and productivity, but on the other side when we took idle or non value added, actually this is non value added and or let us keep it idle and productivity we found that the more the idle time the productivity decreased.

So, one thing is clear, if I go to site and find lot of non-value added on my site, then my productivity my productivity measurement system is going to be showing a lower productivity. If I find a lot of value added work going on my site, my productivity measurement system need not necessarily show improved productivity, why?

Student: Some work may feel like value-added but.

Professor: Right. So, one is that they can be a categorization problem, that is why I have seen value added but not. Any other reasons?

Student: Repetition.

Professor: There can be rework going on which is actually not contributing to productivity, but my work sample cannot classify rework, good. Anything else? So this is where Lean becomes important. Just because people are busy it does not mean that the whole work is coordinated and going forward. Busy people does it, so the, it is a people are busy is good, but there is more to be look at from the underlying perspective. That is why you need multiple systems to be able to keep your eye on how the project is.

So again, looking at work sampling, it is not meant to be it is meant to complement the productivity measurement system and all this is meant to complement finally, the project management system of CPM earned value this that etc. All of them work kind of in in sync, not this or this or this. The reporting levels for the earned value systems is that very high level, periodic reporting is monthly.

If I prepare my Earned Value report for now, when is the data relevant? Not today's data, yesterday's data, it is about a month old. My productivity measurement system is about one week or two weeks old. My works sampling should be only a few days old. So, you get the feel of where it goes.

So now again we come back to this whole business of I mean between Test cricket, One Day International and T-20. Earned value is equivalent to reporting for test match. Slow over five days you can you know report it in a, it does not matter you know even you lose one wicket on this thing nothing is going to or you bat 10 maiden overs. Any change? Not too much of impact, depending on the objectives. One Day International?

Student: matters

Professor: Yes, it might matters, you, what is your monitoring system? How frequently do you want to know your run rate and all that?

Student: Each over.

Professor: Or each over is good enough. And you have to keep track of it. You come to T-20?

Student: Every ball.

Professor: Ball by ball you have to keep track of what you are doing. So, this is similar to that. I am not saying work sampling is doing ball by ball tracking, but even your productivity measurement system can do ball by ball tracking, because of the information systems that are coming in place.

But you need to do all of this in a project, you need to keep the long range plan, you need to keep the medium range and you need to keep the short range and variety of tools help you to do this.

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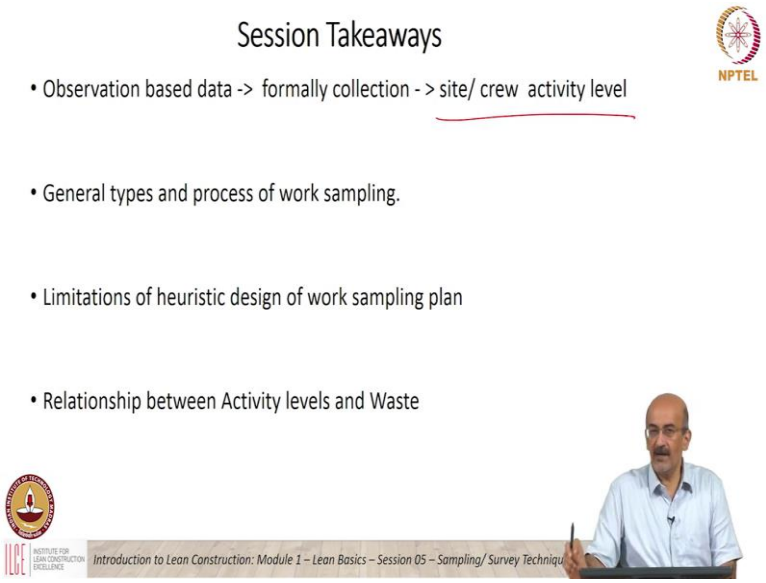

So just to summarize the session, we saw how we basically take observation based data, make it formal, to be able to see site and crew level activities, that was kind of where we started. We talked about general types and processes in work sampling, whether it is crew based sample, tour based sample, you know, the different types of observations we have on it, all of it. We talked about sampling, formally. You understand that real formal statistical sampling is scientific, it is a basis, we are not advocating that for these sessions because of the uncertainties in construction.

And we are going with more heuristic sampling. Heuristic sampling does not mean you should be tardy or you know, just anything you want. There also, there is a certain design, which we talked about, and we had to stick to that design. And ultimately, if you do all of this properly, you will get a level of activity on your site. And that can kind of give you an indicator of waste on your site. And once you know there is waste on your site and your eyes open and your team's eyes open to the extent of waste on your site. Other ways, there is more justification to apply lean concepts and be able to try to reduce this waste through other tools and techniques. So with that, let me close the session.

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