transcript

00:00:02

Speaker 1: OK, now I'll just get on with the questions that I have. So first one is all about higher order thinking skills. What is your definition of higher order thinking skills in relation to your courses that you teach?

00:00:16

Speaker 2: Well, I have to Google that a little bit. Maybe because I never had this kind of, uh, theoretical knowledge of that. But when I think about higher order, I think about combining stuff. You know that you are not going in depth into any specific topic, but you are trying to find the connection so that is how I perceive the the concept of higher order thinking, you know? So but I'm not sure if I'm right or wrong.

00:00:58

Speaker 1: So as you said, there is obviously there is no right or wrong answers. There are different theoretical frameworks, obviously from education and sciences point of view. But it is all about what from the application point of view, a teacher perceives and teaches them is what Iam interested most in. So we just heard about, I'm expecting a proper definition. But in your own course, how do you what kind of skills that you expect from students and how do you perceive it is what I'm most interested in?

00:01:28

Speaker 2: Yeah. It's really about critical thinking, right? Because they can they can look at the subjects of different subjects and, uh, be critical enough to to to understand, you know, what is specific from that subject and what is like overlapping with the other subjects, you know, in trying to find the interfaces.

00:01:52

Speaker 1: So, yeah. So. If I understand correctly the skills that that you're interested in, if I may. What kind of courses do you teach?

00:02:07

Speaker 2: Uh, well, the courses that I teach, do they rely a lot either on project management, uh, systems engineering. And the. And product design and development process, so there they are, like it, like one of those like umbrella courses because they don't go in depth into any specific topic. But no, they go in-depth into their topics, what their topics like, their overarching. So, yeah, great.

00:02:45

Speaker 1: So if you see some patterns in these three courses, for example, you said critical thinking and the ability to combine and see connections between knowledge and everything. So do you see that these are the two overarching kind of a skill that you expect students to develop apart from, you know, content and process knowledge that they gain?

00:03:10

Speaker 2: Yeah. Besides that, I would say systems thinking,

00:03:13

Speaker 1: systems thinking, Yeah, um, may I know what you mean by systems thinking?

00:03:18

Speaker 2: Uh, well, if you look at the system, a system is normally like a combination of

This speech-to-text was created by www.amberscript.com

transcript

parts, so you should understand the whole. And also the system always interfaces with the super system, which is the environment. So when you have these systems thinking, you try to also see the whole how this whole interact with the environment and how the inner parts inside of the hold, they contribute to each order to create the final system. So it was just this kind of like a, uh, perceiving the structure in the connections.

00:03:57

Speaker 1: That's. So I'm from what your response I kind of understood critical thinking and systems thinking and the ability to combine basically and see patterns and connections amongst different elements of a knowledge. What do you think? Ah, do you teach them explicitly these skills in your course if you do so, what kind of strategies do you use?

00:04:25

Speaker 2: Uh, if I'm teaching systems engineering, it is completely explicit. And, uh, then I use the systems engineering theory and tools like software tools that help them to create the models to different types of models and to and to make sure that these models, they are coherent among each other. This is like, uh, if if I teach project management, uh, it's more like, uh, the way around, you know, I give the challenge and then by executing or by solving the challenge like of my creator, the project plan, you know, or executing the project down. They realize, you know, the need of, you know, connecting all the parts, like if you have a scope, uh, your schedule is created to deliver the scope and you have the budget. The budget is for acquiring the resources that are going to execute the schedule that are going to deliver the scope. So then they gradually they they build, uh, this understanding, it's not something something that I give it them upfront. And for in for teaching, uh, product design and development. What I'm using right now is, uh, the idea of just in time and learning. Uh, because I use a game, so I start the course without giving any theory. So the game, it follows most of the course. And uh, each week they they like, they go through one development phase. So they have the challenge of the phase where like, if it's, for instance, conceptual design, it is about creating the product concept. So the idea of the game and then I have the cards here is that they have heavy issues and they have techniques. So the idea is that they are going to work together as a group. And and then they are going to acquire by answering quizzes and they are going to acquire techniques that they think would work well on that phase. So the techniques they have different traits and and capabilities, and in each round they are going to draw some issues like randomly, they are going to draw some issues, then they are going to double check if the techniques that they've chosen, they are enough to solve the issues. Mm-Hmm. Uh, in this way, that is rework. So it's more complicated and that there is risk and and uh, and other things. But the idea is that they are going to reflect on their choices. Right. They're going to reflect on the choices they made, the results, the the the the the achieve it because I'm not going to grade them according to winning the game right, I'm going to read them according to the reflection right that they're going to make. So this is one thing. Uh, when I teach project management well in all my courses, if I'm deviating from what you from what you ask it, please, please tell me, okay? You know, in courses I use flipped classroom. Mm hmm. So I have the micro micro lectures and the quizzes with the theory. So in project management, there is a course long project. So and then I'm the program manager, so I don't teach, I just coach and and and give them general instructions because they are responsible for like the classes we like, like this year, a hundred and

transcript

something students. So they are there are groups of nine students and each of them, they are responsible for planning the development of one subsystem of the same product. So they have to like work within the group. They have to work across the groups because they have to guarantee that they are using the same types of resources, that they are guaranteed that they are delivering the interfaces, that the orders are obeyed. And and each person, each of the nine, nine people within the group, they have a different role. So they also produce different stuff. So it it's like a like when the student gave feedback, it was a 100 students project because everybody has to talk to everybody. But even though everybody has its own his or her own, you know, specific responsibility. Mm-Hmm. So I'm one of those guys. This is the approach

00:09:29

Speaker 1: of so much of them is actually revolving around kind of problem-solving techniques and ability to formulate a solution and then check and then verify you reflect on it and then change it. And you kind of scaffold this process. So to say with the kind of if you have like the cards and questions.

00:09:51

Speaker 2: Yeah, because because the problem is never 100 percent it, even though the problem is open, the the problem is, uh, within the context, right? Because if I'm talking about you or your problem is to plan a development, so it is under the the context of project management. So like these tools and techniques, they are available either in the quizzes. Sorry, either the videos, either in the learning materials, so they have the choice of of choosing, you know, different approaches. If the problem is systems engineering like it's about modeling a when a specific system, then if I use a language like systems modeling language, the language has its own limitations right it has. Like these the standards which are the what are the models? Uh, the semantics and syntax. So they use that. So, you know, it's always a little bit bounded, right? It's not 100 percent open. Yeah.

00:11:00

Speaker 1: Yeah, totally agree. Great. So my next question is about challenges. Mm-Hmm. Obviously, in your class, not all the students may be able to reach the expected level that you expect them to reach.

00:11:15

Speaker 2: Yeah.

00:11:16

Speaker 1: And what do you think are the reasons for, you know, for some students to not able to develop these skills at the expected level apart from motivational factors than speaking? What do you think are the challenges for students to develop these skills?

00:11:33

Speaker 2: I would say that motivation factor is the main one. So I know that's the part that that you that you mention it. Uh, but I would say that some students, they are too focused minded, so they did their mindset there, the way they do mind work is really into the detail. So, so some of these people, they get frustrated because it's not about the detail is about the whole, you know, and and then it leads to motivation at the end. But what I am trying to say that you have this mindset. But it's really rare. OK. Uh. Communication, I would say that

This speech-to-text was created by www.amberscript.com

transcript

it's a challenge, right, because I always I'm always dealing with groups within groups. Uh, you have the project group, uh, you have. I normally use a functional group besides the project group because you have the project groups is responsible like in that case, next example responsible for planning a subsystem. OK. But and each person in the project group has a different role. Yes. Which means that the different project groups, they have different people taking the same roles. Right? You have the schedule manager from Group A, from Group B, from Group C, and so it goes. So this scheduled managers, they should join also in a functional group. To discuss, because normally they are the ones that create the rubric. Yeah, I just give them like a frame, you know, a general rubric, but they they create the detailed rubric, so they have also to work together so. So and this year I also had like students from Brazil. Hmm. There was the problem of the time, time zone and everything else. So the communication is something that it's always challenging. And especially in this COVID situation, need

00:13:53
Speaker 1: in communication is essential. Yeah, especially for group related interdisciplinary projects. And it is going to be another level of communication and understanding

00:14:04
Speaker 2: and and uh, and. Well, the I would say that some students the the through the years as as students, they are used to like in UT to have projects, you know, multiple projects and everything. But the projects are quite well defined and they are super boxed, so they use it to have like detailed instructions for everything, which is not the reality, right? If you if you try to mimic the reality there are general structures, but not detailed instructions. So some students do really get frustrated with that with the uncertainty. Yes, and especially with the ambiguity,

00:14:53
Speaker 1: certainty and ambiguity. And do you think and you think that these are kind of a limiting factors for their development?

00:15:04
Speaker 2: Yes and no, because I. Like, uh, like this, this one course, uh, the project management I got like two years ago, uh, a real feedback that lots of students they complained about the, uh, the the assignments, the project assignments because they were too ambiguous. So then I decided not to remove the ambiguity from the assignments, but to improve the course in a way that the course embeds some better practices for for solving people's problems. So that's the way I introduce it to self-regulation to the socially shared regulation of learning, because then they create their own rubric stand to have more chances, you know, to solve the ambiguity as as part of of the of the course itself.

00:16:01
Speaker 1: Mm hmm.

00:16:03
Speaker 2: So at the end, the feedback that I get and and I get like lots of feedback is that they really, uh. Well, in the beginning, they are really lost. But through the videos, you know, the lectures, the questions and answers, the feedback and everything else, they end up, you

know, learning, so so did they really appreciate that they they really give the feedback to the courses? This specific course is completely different from the other ones. And yeah.

00:16:39
Speaker 1: OK, so here you kind of propose that uncertainty and ambiguity, obviously are kind of limiting factors for their progress. But if you give enough intervention to enable them to deal with such uncertainties and ambiguities

00:16:58
Speaker 2: they solve. You need to be active on that. Yeah.

00:17:01
Speaker 1: Yeah. And also, you said about the mindset of the students specifically as one of the crucial factors for, you know, yeah, progressing detail versus having a whole mindset, etc.. How do you kind of tackle this kind of a mindset related attitude related problems?

00:17:22
Speaker 2: Well, they don't have really a choice because the course is this one, and I don't have anything in too much detail, but lots of things that they have to to connect like. It's like a complex system, you know, simple things, but like lots of connections. Uh. Well, what I try to have is to have this, this this project with like I always have, like either a project or during the game, it's not just one round, it's not just one assignment you have like different assignments with with a with a complexity gradation. Right? It starts with with something that is more defined by nature, you know? And then it comes to something less defined it. So I try to warm up.

00:18:18
Speaker 1: Nice. Great. Thank you. I mean, it gives kind of at least in the context of your courses, some some sort of an overview for me in terms of challenges and the possible interventions that we could help our make to help students. For teachers, what do you think are the challenges in helping students to attain such skills?

00:18:42
Speaker 2: Well, it is about it's time consuming, it's time consuming in terms of preparation. Yeah, and it's time consuming during the execution because if you if you are dealing with ambiguity and if you don't like it, give feedback like just in time. Hmm. The students are going to really get frustrated or they might, you know, go to a completely different direction. Yes, because solving ambiguities is about to. Trying to find a, you know, similar and possible solutions, and normally you look at yourself, you know, the knowledge that you have and you might try to use a hammer where a screwdriver would work better, but you don't do that because you don't know. So this is, I think that the main challenge for the teacher is it's time consuming. I wouldn't say like a time in terms of like days and days, what it comes like a scattered, you know, you receive like a during the day, you know, some emails, some requests that that you cannot like delay the answer.

00:20:05
Speaker 1: So the major challenges are about the time and giving feedback on time. Yeah, yeah. . And apart from that, in terms of teaching strategies or methods, do you think students are equipped enough or sorry teachers are equipped enough in terms of enabling or overcoming? As you said in your case, you have some interventions to overcome

This speech-to-text was created by www.amberscript.com

transcript

ambiguity and uncertainty, but also for communication and mindset. Do you think teachers are equipped enough to deal with the, you know, strategy related challenges, not just.

00:20:44
Speaker 2: Well, this is this is really difficult to say because like each course and each teacher has his or her own style and the course brings like inherent, you know, shapes in terms of the different challenges. But what I would say is that I feel that the UT is quite where we equipped it to support us because I can tell about the the flipped classroom, the videos and stuff. You know, this is something that I've never done before, and they learn it together with the with the guys from from Celt. Uh. Yeah, but. But in the same way, you should you should be eager to change, right? Yes, indeed.

00:21:34
Speaker 1: Great. Thank you. I think that covers the higher order thinking skills. Part of my questioning. And now I have the yeah, this less brief are more short format oor section of the interview, which is more interdisciplinary research. Hmm. So how do you define interdisciplinary research in your context? Well.

00:22:03
Speaker 2: For me, inter-disciplinary is to is to not not want to look at, uh, the different disciplines but understand how they enforce our conflict with each other. You know, we like I might have positive or negative influence. So for me, it's really, uh, go in direction of of understanding how these different disciplines they are supporting or conflicting.

00:22:41
Speaker 1: Nice. So in view of that, yeah, your understanding of interdisciplinary research, do you think any particular set of skills are needed in order to develop such understanding and the ability to do interdisciplinary research that are not being often explicitly taught in classrooms?

00:23:06
Speaker 2: I come back to critical thinking because I think that critical thinking is like a yeah, , it's super important to talk to anyone. Yeah. Uh, anywhere.

00:23:22
Speaker 1: But before proceeding, I just would like to clarify. So that is why I mentioned that are kind of neglected in terms of in university setup in educational classrooms, do you think critical thinking is not given enough importance?

00:23:41
Speaker 2: I think I think it is. Uh, but it depends on the scale because in general, uh, if you have if you have like disciplines that are quite specific. OK, you you practice critical thinking in that limited scale. Uh, if you have, uh, well, like it is very well bounded projects you you are limited to that. But I think that we have less less courses that you play critical thinking, combining disciplines, you know, combining content, not normally you decide over when a specific content that is well-defined, but creating this bridge, I think we have less. Yes.

00:24:36
Speaker 1: So critical thinking in the context of interdisciplinary practices.

This speech-to-text was created by www.amberscript.com

00:24:41

Speaker 2: To put it, yeah. Yeah. Because what I bring is not the experience from the teaching, but we did experience from the practice it is it is like when you have this professionals that they are super good in their own areas, but they have difficulties to perceive how the other areas they can hold their interface or how they can work together or leverage each order. So it happens a lot.

00:25:10

Speaker 1: Great. Nice. So. My next question is all about project based learning, the new emergent of challenge based learning in terms of developing critical thinking and other skills related to interdisciplinary research, basically. How do you see the role of project based learning and challenge based learning and developing such skills? Is it?

00:25:40

Speaker 2: I have a real difficulty to to really discern project based learning from challenge based learning. OK, I know that challenge based learning is the new buzzword. You know, it's fashion to say that. But if you look at the theory that you have micro challenges and that you have all these types of challenges. I only see the difference when you have specific situations that don't fit to all of the courses in which you can have problems coming from the industry or from outside, then. Well, this is a challenge that you teach much more like challenge solving or more like solving than the theory for like the theory behind it, the solution. Right? Because you come with the wind, right? Because sometimes the challenges are little bit to the north, a little bit to the east, you know, and that's it. But I forgot your question.

00:26:44

Speaker 1: I said the role of a be project based learning, challenge based learning in developing skills related to interdisciplinary research and practices.

00:26:55

Speaker 2: Yeah, I think. Well, I think the role is it's like if, if, if within the challenge or within the project, so within the scope of the of the problem that you are going to solve. Uh, you know, the solution is not to. Like, it's not only coming from applying one is specific discipline. So it is it is like if if you have problems that, you know, approaching this problem and trying to solve this problem, if it requires different perspectives, then then I see a way to increase critical thinking and everything else.

00:27:38

Speaker 1: Hmm. So just coming back to the previous question as well, the one I guess related to skills apart from critical thinking, is there anything that you think or comes to your mind that are significant for interdisciplinary practices?

00:27:57

Speaker 2: Well, you should be open minded, right, to choose to really, well, Like, try to understand the other perspective. Yes. Right. And uh, and I would say like goal oriented, so you should you should aim to deliver the value to deliver, uh, the result. . More or less like regardless because, you know, maybe for delivering the results. This is not enough, so I have to try to find something else or extra. Right. And uh, and sometimes people are really task oriented. So do they really try to do the thing what they are less oriented to, to create a real result? You know, I just say, wow, I did it as as scheduled and I did. I follow the recipe, but

the recipe didn't deliver it the best thing. And it's the problem of the recipe. It's not my problem. And I would say that it's also your problem for not trying to change the recipe.

00:29:09

Speaker 1: Indeed, indeed, very much understood. So it's kind of like busy versus productive definition at the very simplistic way. Yeah. Yeah. To get something out of it. And even if the procedure doesn't yield and it is our responsibility to change and see, how can we make it happen? Nice. I think I've completed the entire discipline aspect. My final question is all about metacognition. Do you have an understanding of what metacognition is? And if so, there's significance in terms of higher order thinking skills?

00:29:44

Speaker 2: Well, I stumbled into this word from time to time, but I don't remember at all. I don't have a clue

00:29:52

Speaker 1: so I can just give you an explanation. You definitely know it is just a word that is not, you know, disciplinarily familiar. So metacognition is nothing but the ability to reflect and understand your own thinking processes. So how do I actually think how I formulate solutions, how we understand them? So it's your ability to understand your own thinking and reflect and try to change how you behave based on your thinking processes? It is. That is the kind of gist of metacognition. And how do you see the importance of this skill, this ability to, you think, at a meta level in developing higher thinking skills that we just discussed before?

00:30:34

Speaker 2: Well, I think it's it's important it's in the core of the self-regulation, right? Because, uh, if we're discussing about self-regulation, if you go to socially shared self-regulation, it's the first feedback that you have to give. It's is the personal feedback, right? You have to have to reflect yourself upon your result and upon the way that you achieved the result and you try to frame, you know, or to improve it somehow. But then you have other feedback from the peers from from from the lecturer or from whoever. But what I think that you only create new mental models, uh, if you're capable of applying this kind of reflection because it is not like, uh, like if I have if I have a mental model for solving one specific type of problem, normally the solution, it follows a sequence of steps. Right. And if I don't have a clear like a reflection on how it works, it's more difficult for me to break down. You know, just mental model into smaller steps and then create a new one. Mm hmm. So. This is yeah. I think it's super important indeed.

00:31:57

Speaker 1: Is there any other ways do you think that you can develop this ability in students?

00:32:05

Speaker 2: I think the I think that the only way through reflection, right? I because you should you should reflect on, on on what you've done.

00:32:16

Speaker 1: Yes, indeed. Indeed.

transcript

00:32:18
Speaker 2: If you don't have this time to stop and reflect, you only go forward and and at the end I think you learn less, right? Because you just learn. One one like a final result, but you don't get like the bits and pieces like the the just why, you know, like why you're doing that, you're not just like I'm doing because I'm doing.

00:32:44
Speaker 1: Yeah, it's a great thing. We both are on the same understanding. Yeah, on the same lines of understanding. Thank you. So, yeah, I think with that question, I finish my interview. OK, thank you very much for contributing. It was actually lovely and precise and short. Very valuable. Thank you very much for your time. And do you have any remarks and comments?

00:33:13
Speaker 2: Right now, I don't have, but I might have in the future, because what happens is the following I have lots of initiatives regarding like improving education. And uh. And like, like I'm right now writing in a book chapter in this in is what I discuss about this project management course. You know, this evolution, the thing about the feedback and blah blah blah. So this is something that I'm really interested. So I know now that you are in this direction. So maybe in the future, I'm I'm going to to to to ask your opinion about something. And yeah, and especially because you are in this transdisciplinary/interdisciplinary avenue, which is which is like, uh, the way my courses, uh, they go anyway.

00:34:10
Speaker 1: That would be my pleasure actually to. Yeah, the other their chance to again interact with you and gain much more insights and also try to contribute something, if I can. That would be nice.

00:34:21
Speaker 2: Thank you.

00:34:22
Speaker 1: Yeah, then thank you very much. And yeah, it's been a lovely conversation for me. I hope I didn't take much of your time.

00:34:28
Speaker 2: No, no. Completely. OK.

00:34:30
Speaker 1: Great. Thank you, then. And have a rest of the nice afternoon and wonderful holidays.

00:34:35
Speaker 2: You too. You too. And success with the thesis?

00:34:38
Speaker 1: Yeah, indeed. Thank you very much. Well, I.