**VO Selected Topics in Geoinformatics-20231204\_083156-Meeting Recording**

0:02  
Visible right now In case you cannot see my screen, then then please just just, yeah, let me know.

0:11  
OK, perfect.

0:11  
Then let me just rearrange my windows and now I'm ready to go.

0:16  
Perfect.

0:16  
Then good morning from my side and yeah, to this lecture.

0:22  
In this lecture series, selected topics Geoinformatics.

0:25  
And usually when I hold this lecture, I try to begin with the fact that I'll announce that the topic is a bit exotic in the framework of Geoinformatics.

0:38  
Exotic.

0:38  
And so far, because we're not talking about coding today, we're not talking about spatial analysis, we're not talking about statistics.

0:46  
But we're talking, yeah, about, let's say, a conceptual view on a not really a theoretic, but but on a conceptual side about a topic, namely education.

1:01  
Because I and I want to introduce myself for just a couple of seconds.

1:08  
So my name is Roberta Roberta Fogler and I used to work at the Department of Geo Informatics here at the University of Salzburg a couple of years ago.

1:17  
Since a couple of years I work at the Department of Geography, which also changed a bit in the last years.

1:24  
And right now my affiliation is the department of of Sociology and Social Geography.

1:29  
And I work in the education domain, namely geography education.

1:34  
So usually my lectures are targeted at future high school teachers in geography.

1:41  
And that's my background, so to say.

1:43  
And yeah, my research topics are about, and that's where we jump in right here.

1:50  
Yeah, Geoinformatics, namely Geomedia in the classroom.

1:54  
So using Geomedia as a, yeah, let's say learning tool.

2:00  
And that's also the topic about this lecture today, namely the concept of spatially enabled learning.

2:08  
So a bit of a concept, the theoretical background, some some background information and one example, namely an implementation in the right now running U3 Green project.

2:19  
And I'll say a bit about that at the end of this talk.

2:23  
So to be honest, I don't know anybody of you in case I did not confuse anything.

2:30  
So in case we already met each other somewhere, then then please, yeah, I hope it was not ungentle that I did not know anybody or I think I don't know anybody.

2:44  
So I guess nobody of you already heard this lecture for me because I did this a couple of times in the last years.

2:52  
So what I want to talk about is Geo Media and Education.

2:57  
And to give this a bit of a context, there are discussions running since now almost 20 years since Geo Information Technologies emerged and became widely available.

3:12  
So I'm not talking about the the 80s where it was a small expert system.

3:17  
So about the last 15 to 20 years when tools like Google Earth for example emerged and easy to use and available tools.

3:26  
Also the development started that the education domain, namely teachers yeah, started to discover Geo information as a tool for the classroom.

3:39  
And over a couple of years, there are many concepts emerging or there were many concepts emerging.

3:46  
And just to briefly sum that up, to give a overview, there are many concepts, many initiatives and when you review them then you can say there are mostly three types of concepts using Geo information in the classroom.

4:04  
The first one, and that's why I listed this a bit Gray, is yeah, none of these concepts would say from themselves that Geo information serves as an autotonic purpose.

4:18  
This is a category I built because there are many, many concepts and many papers, many studies, many initiatives, many approaches for using Geo information in the classroom and secondary education without any reasoning.

4:33  
And so the argument and the concept behind and all those studies is we use Geo information in the classroom.

4:41  
To use Geo information in the classroom.

4:44  
Yeah, thinking that Geo information itself generates A surplus value.

4:49  
And This is why I listed it a bit grey here because from an education and didactical domain, this is a bit problematic because there is no concept behind.

4:59  
So everything we think in the classroom, we think from a didactic perspective, and anything we do in the classroom, we try to do some reasoning.

5:08  
So why do we do this and that 'cause we want to reach some goal, in the most case educational goal, of course.

5:16  
Another big group of concepts you can find in the literature is the second one listed on the slide here.

5:24  
And this comes mostly from science education.

5:27  
And the common denominator of all those concepts is we use Geo information and probably also GIS in the classroom to Foster and develop spatial thinking and yeah, analytical thinking and algorithmic thinking.

5:48  
Yeah, to do some spatial reasoning, Yeah, because as you all know, GIS is a very powerful tool, of course.

5:55  
And all those concepts try to transfer this into school education and using GIS and Geomedia in the classroom to develop some other skills, namely from a science domain.

6:06  
Namely yeah, spatial thinking, analytical thinking and things like that.

6:12  
There are also many concepts, so please do not confuse this and say there is a concept from science education.

6:19  
There are many, but the common denominator of those concept is to develop spatial thinking in an analytical way.

6:27  
In the third group there are also many concepts, for example the Spatial citizenship approach from from Tomasek and Inga Krill.

6:35  
But there are also many other concepts.

6:38  
And these concepts try to, yeah, use Geo media and Geo information in the classroom as a very powerful communication tool.

6:46  
Yeah, spatial communication with interactive maps and things like that.

6:50  
And the goal of those concepts from a didactical perspective is to foster critical thinking and communication skills with Geomedia tools.

7:00  
So this comes more from the domain of citizenship education and targets at communication empowerment in the Classroom, which is also one of those groups.

7:12  
So these three groups, yeah, called two groups and one in brackets, yeah.

7:19  
Most of the concepts to use Geo media and Geo information in the classroom, most concepts you will find out there, you can sum up under those 3 categories.

7:30  
There's a lot of literature and this is just to give you an overview of what's out there and a concept with a bit of a different approach we developed here in Salzburg over the last couple of years and still continuously working on.

7:45  
This is a bit of another approach because all these concepts I show you here have one thing in common because from a structural point of view, they all have the have the goal to learn to use Geomedia to reach another goal.

8:03  
So for example, learning to use Geomedia to develop spatial thinking skills, learning to use Geomedia to develop communication skills, and a concept I want to introduce today, namely the cell test approach Seltzer stands for.

8:18  
Especially enabled learning and teaching across subjects in school has a bit of another approach.

8:27  
So not to learn to use Geomedia to reach a goal, but to just use Geomedia in the classroom to foster learning itself and what we mean with this.

8:39  
I tried to explain, yeah, in the next couple of minutes and slides.

8:44  
So let me start with a couple of examples.

8:48  
And I have to admit, these example are not you anyway, but I think you get the point when I show you this.

8:56  
A couple of years ago I tested this in in several classrooms, for example, just show in kind of a spatial representation like these two.

9:07  
Usually this would work if I show just one, but for now and here it's just to illustrate.

9:13  
So for example, when I show the the the left picture over here and ask students for OK, just shout out what comes to your mind.

9:22  
Then usually some of the students or most of the students say OK, Brexit or a very, very, very old example And then the more than 12 years ago the right picture when you just show this to people then yeah, after a couple of seconds the association Fukushima comes to mind of most people.

9:44  
So the Fukushima incidents bit more than 10 years ago and this is a visualization of the radioactive cloud and it's spatial distribution.

9:54  
OK.

9:54  
I could do this with many, many other examples for it.

9:58  
I don't know, show you a map from Ukraine with some with some, yeah, arrows on it and you immediately get the association of the Ukrainian war or I don't know, refugee situation a couple of years ago, etcetera, etcetera.

10:14  
So when we observe what happened here actually, so showing people some sort of map in both cases.

10:25  
And this map generates kind of an association to a complex topic which is kind of interesting because actually you just see the map, see a special context of a situation and then you immediately have an association of something, in this case for example Brexit or the Fukushima incident.

10:45  
And one we observe this situation from a pedagogical point of view, pedagogical psychology to yeah, illustrate this exactly.

10:55  
Then we can explain this with a theory which is as you see from 86, so more than 30 years old.

11:02  
But a very yeah, well developed and and empirically proven theory from from pedagogical psychology is the so-called dual coding theory.

11:14  
And please do not be kind of confused from the next yeah figure over here.

11:19  
This is a kind of an illustration of the background theory of this dual coding approach.

11:25  
And actually this says nothing more than we as humans and our perception of things and how our brain works.

11:35  
This theory says that basically we collect information with two different channels.

11:42  
Yeah, so one channel is the visual system.

11:45  
So when we see something, we see an image, we see a situation which works visually.

11:50  
Yeah, when we see a picture, for example, like the maps I showed you before.

11:55  
And another system is the so-called auditory system, where we collect verbal information, namely language or when we read text.

12:05  
OK, text is a bit special because text actually is also visual, but we translate it and it from a logic, it works verbally.

12:12  
And the core of this theory says these two systems work completely different, because when we see a visual representation or something, an image, we immediately, yeah, process this information.

12:26  
Also with a visual logic and text we process different.

12:32  
And yeah, the the outcome of this theory, and this is empirically proven in in many many studies are in fact two things.

12:41  
The first thing is that cognitively visual information show way higher memorability and process ability than textual information.

12:54  
So when you when I show you a picture or something you immediately process this and do not have to recode the language behind.

13:03  
And the second thing of this theory is that if you combine both, so if we link an information with a visual representation and combine this with text, then we process this even better because we build off associations in our brains.

13:21  
So for example, if IA very, very simple example and this is a bit silly, but it proves the point.

13:28  
If I want to explain you something about an apple, so it's a fruit, it's round, mostly green, etcetera.

13:36  
Then from a pedagogical point of view, it would be better if I show you a picture from an apple and in parallel tell you something about the apple.

13:44  
This would be way better than telling you something about an apple.

13:49  
And and put the bullet points on a PowerPoint slide where where it's listed, I don't know, it's a fruit, round, mostly green, etcetera.

13:57  
So combining both is even more powerful, combining both channels.

14:02  
And the interesting fact is that visual information also yeah can create some associative structures and then re enable things we already learned or remember.

14:19  
So to just illustrate the the, the power of the visual over the verbal want to have you look on on the next slide and just observe yourself what happens when you see this.

14:33  
So for example, this.

14:35  
Yeah.

14:35  
And when I then show you something like this, okay.

14:40  
It's a bit funny but I think you get the point when I just show you the word or a concept or show you the picture.

14:46  
This is different.

14:48  
And this interestingly works with images of course.

14:54  
Now when I show you a picture of an apple, you immediately have the association.

14:58  
OK, this is an apple.

14:59  
But this also works with concrete terms and concepts and even with abstract terms and concepts.

15:07  
So for example, if I show you a picture of a pigeon with the with the logo of United Nations, you probably get the association of World Peace or something.

15:20  
So which is also very interesting.

15:22  
And from a pedagogical point of view, the actual interesting thing is when we use these both channels when activating memories and things we already learned a couple of days or weeks ago, then yeah, people process this information better and even remember it better.

15:45  
So when I in an educational setting, I tell you something and show you a picture about what I'm telling you, and a couple of weeks later I just show you the picture, Then you immediately remember what I talked about this because we built off this associative structures combining text and the image.

16:02  
Sorry, I forgot to put this this keyword on the slide.

16:07  
So this is so to say the first backbone of the the spatially enabled learning approach.

16:13  
Because spatial representations maps, Geomedia also work visual and when you see a map and there's a topic connected to this map, then this effects help us to to remember this information better and to process this information better and to reactivate this information better.

16:33  
So the first pillar of our approach, this spatially enabled learning is that visual information and this dual coding approach that spatial representation create kind of a special type of dual coding and this helps us to remember information.

16:51  
So please keep this in mind as, yeah, pillar one, so to say of the approach coming to Pillar 2, which is also kind of an interesting effect.

17:03  
And I want to show you something, one of my favorite examples because I'm kind of a fan and over the years, yeah, there are less people knowing what this is.

17:15  
But when I show you this map over here, I don't know who of you knows the Lord of the Rings books or the Lord of the Rings films.

17:26  
And but don't get me wrong, this lecture is not about fantasy books, but it proves the point because I don't know if you saw those movies or read those books.

17:38  
Fantasy story very, very complex because there are many parallel actions and many figures, many persons and it's a very complex story.

17:48  
And what Tolkien did.

17:50  
So the author of this novel, he created a visual representation of Middle Earth.

17:57  
So the place where the story takes place, and interestingly, Middle Earth is not a real place, you cannot go there.

18:05  
And no, New Zealand is not Middle Earth, that's just where the movies were taken.

18:11  
But what this map here does in the context of the story of this books is not to just have a nice image, but to deliver a spatial context to the information in the book, even if the spatial context is not real but fantasy.

18:28  
So to illustrate this, when I read those books 20 years ago, I had the book in one hand and read the story and I had the map in the other hand and always try to to, yeah, check on the map, OK, Those people are just right here.

18:44  
And then they go there and there's the conflict and then they're split up and some go to Mordor and some go somewhere else, etcetera, etcetera.

18:53  
So I think you can imagine what I mean with this.

18:57  
And in this case, this map here does not only represent the story, but helps us to process the complex story by just giving it a spatial context.

19:08  
So imagine the complex Lord of the Rings books.

19:11  
Without this spatial representation it would be way harder to imagine all those things.

19:18  
But when you have this map which gives a spatial context to the information, in this case the content of the books, it's way easier.

19:26  
So this is also visual.

19:27  
Of course comparing to pillar one I showed you before.

19:31  
But this is another point, namingly giving a spatial context to information and therefore helping us to process the information.

19:41  
And interestingly, this works also the other way around.

19:45  
So not coming from an image, but come in for example from an actual place.

19:51  
So I guess all of you know this special setting over here.

19:55  
It's a techno set in summer obviously, and what I want to illustrate with this is just.

20:03  
As an illustration, a couple of years ago I was in a PhD seminar here in Salzburg at the Department of Geo Informatics and one of our colleagues had a presentation.

20:14  
And two weeks later, no one week later I had my presentation.

20:19  
And in my presentation I asked him after your presentation last week, I asked you a question.

20:27  
Can you remember this questions?

20:28  
And he could not remember it.

20:31  
So it was just gone.

20:33  
And then I asked him, do we remember when we two months ago, we're sitting over here on this bench and had a little BBQ to farewell some some some other colleagues.

20:44  
Do you remember what we talked about when we sit there on this bench?

20:48  
And you could remember because it was about politics in Romania, which is kind of interesting because this is a very, very, yeah, marginal situation, so to say.

20:59  
But when I gave him the spatial context, when we sit over there on this bench, do you remember?

21:04  
Then he remembered what we talked, talked about and he could not remember what we talked about one week ago without giving this this very special spatial context.

21:15  
And I think all of you probably had some kind of a situation in your in your daily life.

21:20  
So when you, I don't know, talk about with with a friend or a partner and you have the topic, then do remember we talked about this and I'm sorry, I can't remember.

21:30  
Yeah, we talked about this when we were at this and that place and then you're now I get it.

21:37  
So probably everybody of you had kind of this situation already in this personal life or her personal life.

21:43  
And this is something which is also proven in in yeah, psychology we can say called a.

21:51  
And this is a very, very confusing word, namely the what mnemonic effect, namely that giving a context to an information makes it easier for us to remember this information.

22:06  
And there are many possible contexts you can give to an information and the spatial context.

22:12  
So where did something happen?

22:15  
It's one of the possibilities.

22:17  
And this is exactly the same effect like giving the context via a visual representation of a fantasy book.

22:25  
Even all this also create kind of a spatial context in a real world scenario.

22:33  
I hope I could illustrate this thing that the spatial context helps us to remember something.

22:39  
So I want you to keep this in mind as pillar two.

22:43  
So pillar one was spatial representations and Geomedia and maps create kind of a dual coding due to their visual nature.

22:51  
And the second pillar is that space and place and Geomedia, namely maps deliver also with support of spatial context to an information and then helps us to process this information and when we connect these two things.

23:08  
So the two pillars I tried to explain very briefly here in the beginning to education.

23:14  
Then we can ask, OK, why don't we use these effects?

23:19  
And to admit this was a rhetorical question, because we already used these effects in education.

23:26  
Just imagine a map in a history school book, for example.

23:32  
It's exactly the same.

23:33  
The map in the history school book, yeah, illustrates something of course, but also gives a special context to an information and then helps to remember this and also with a special context in real world out there.

23:47  
So the excursions, for example in school and when you take a school class, go somewhere, observe something in the field.

23:55  
So these are exactly those effects which are used in education.

24:00  
But what I want to propose here is that we could use these effects even better than we did before and especially now.

24:11  
And the reason for that is, yeah, surprise, surprise, interactive Geo information, namely interactive Geomedia.

24:19  
And due to the fact that everybody of you, yeah, is aware of Geo information because you're sitting in this lecture here.

24:27  
So you are not lay people regarding Geo information.

24:31  
You all know what it is.

24:33  
And I want you to observe Geo information as a structure from a from a more everyday point of view and not so far from a professional point of view.

24:43  
And therefore, I want to illustrate the evolution of Geomedia from a also everyday point of view.

24:50  
So what is the role of maps and interactive maps in our daily life?

24:55  
Not in our professional life.

24:58  
And therefore, yeah, have a look at this.

25:02  
So the evolution of geometer from analogue to digital, from digital to Internet.

25:08  
And of course, as you all know, the complete world of Geo information is online nowadays.

25:18  
So the the background to this is, is cloud computing.

25:22  
As you all know, there are applications, there are platforms, there are infrastructures online which makes it way easier to use these tools than for example 20 years ago or even 15 years ago.

25:35  
And due to the fact that Geo media nowaday is digital, has a cloud logic in the background, it makes this way easier to use also for not professional users due to the fact that it's platform independent.

25:51  
So all you need is an Internet connection and a browser.

25:54  
It's more or less resource independent due to the fact that you just need an Internet connection and a browser, another higher performance computer to run your GIS system.

26:06  
And on top of that you also have of course community advantages.

26:10  
It's way easier to get to data data sets, data services compared to 20 years ago when you have to store all the information you want to visualize in your local database for example.

26:24  
And of course we're nowadays also have streaming data, which means that that data is not fixed, so data is changing all the time.

26:33  
And I think you also know this.

26:36  
So connecting all these developments from the evolution of Geo media to a, yeah, everyday perspective and so to say new cartography, then we can observe that the role of maps in our daily lives also shifted a bit.

26:56  
So when you say, I don't know, 20 or 30 years ago, what did maps do in our daily life?

27:03  
It was a representation of something.

27:05  
So for example, you had your maps in your car and before starting the trip you had to look at the map and just OK, I have to drive this and then that road and blah blah blah.

27:16  
You know the situation and as you all know this changed.

27:21  
So maps nowadays not just only represent something but have a completely new logic due to this digital and online background.

27:31  
And I want to illustrate this with another example which is also a bit older, but proves the point I want to make here.

27:41  
So don't have to read this.

27:44  
No worries, it's German.

27:46  
This is just an old screenshot from an old website.

27:48  
As you see it's 2011, so 12 years ago, 12 1/2 years already.

27:54  
But with this example I just want to illustrate something.

27:57  
What you see here is a screenshot from a website from the city of Berlin in Germany and from the local authorities, namely the public health department.

28:10  
And what they did is they collected information about restaurants.

28:17  
So when you go eating and made a list of all the restaurants regarding the criteria of, yeah, is this a clean place?

28:29  
Is the kitchen clean?

28:30  
Is the food fresh from a health perspective?

28:33  
Yeah.

28:34  
And then they collected this information and made a positive list and a negative list so that we as citizens for example could go to this website, have a look at these lists, look for the restaurant I want to go for example tonight and then check OK do they to take hygiene and and and clean the series and things like that and can get this information which is a pretty good service.

29:01  
I think we all agree because from a customer point of view this is interesting information for me.

29:07  
But the let's say usability to get to this information is not that optimal because you had to go to this website, you had to download this list, it was stored as APDF, then open this lists and and then browse through the list and and look for the restaurant.

29:27  
You want to go there, read the report and then probably decide to go there or not to go there.

29:34  
Yeah, So you see the information is pretty good and pretty nice from a citizen point of view, But the usability, yeah, lacks a bit, I would say.

29:42  
Interestingly, at that time, 2011, 2012, the city of New York in the United States had exactly the same service with exactly the same information, but the interface was completely different.

29:55  
In New York it looked that way.

29:58  
So you had a website and an interactive map in the middle which could navigate zoom in, zoom out and look for a location and either looking for a complete location or you take your own location, set the pin, click the go button and then okay please show me all restaurants in a radius of, I don't know 204 hundred 500 meters around me.

30:21  
Then you've got all the points there in the map.

30:24  
Each point is a restaurant and also regarding to the health inspectors information, it's already pre listed or predefined.

30:35  
This is probably too small for you to read.

30:37  
So green point is there are 0 violations regarding health and cleanness.

30:42  
A blue point is there are minor violations and a red point is there are critical violations.

30:47  
So you get the information immediately based on your location and when you click on one point, you get further information about restaurant.

30:55  
You can read the report, you get restaurant contact information etcetera, etcetera.

31:00  
So when we compare those two services, so the example of Berlin and the example of New York, the information is exactly the same.

31:09  
But the the procedure, how this information is presented and how me as a customer can get to this information, this is completely different.

31:21  
And I would say that we all agreed that the solution of New York at that time was way more, yeah, intuitive I'd say due to our spatial context.

31:34  
So show me where these places are from this logic.

31:41  
And what we see here is when we think about what what's the role of the map in this case?

31:48  
The map in this case is not just to show us an illustration of the surface of the earth and showing us restaurant locations.

31:55  
No, The map here serves kind of as a platform to get to an information biospatial logic.

32:03  
And this is completely different than just representing something on the surface of the Earth.

32:09  
And even if we take this to to the probably most famous map nowadays, namely Google Map or Google Maps, then with the following example, and I don't know, I have to admit that this example is from Professor Strobel.

32:28  
But it proves a very very good point.

32:31  
Because when we have a look at for example the mission statement of Google a couple of years ago, when you do a little bit of research then you find this information.

32:41  
So the mission statement of Google is to organize the words information and make it use of universally accessible and useful Google in general.

32:50  
And when we then look for the mission statement of Google Maps, then this mission statement is not something like to provide a free online map to do place finding and navigation or something.

33:05  
The mission statement of Google Maps is to geographically organize the world's information etcetera.

33:12  
So you see these mission statements of Google and Google Maps are exactly the same despite the little word geographically before.

33:21  
And this is from a logic point of view actually exactly the same like the the restaurant example here.

33:28  
So in this case, the map not shows us a special situation, but the map helps us to get to an information by a geographical logic.

33:40  
And this is actually exactly the same what Google Maps is doing, right?

33:45  
So it's not just showing us a map, but it helps us to geographically find information by place as a context.

33:54  
So for example when you have a look at Google Maps and this is all the screenshot already, but the logic is still the same, Google Maps not just just chose as what is where, but chose as information or serves as an interface to get to an information by a special logic.

34:12  
For example when I did this is the example of Uni Park, so it's one of the university buildings in Salzburg.

34:18  
If I ask Google Maps, OK, give me information about Uni Park in Salzburg.

34:24  
It not just shows me where it is, this would, I don't know, an analogue.

34:29  
An old map too, right?

34:32  
Just telling us where something is, but it not just tells us where it is, but gives us, yeah, additional information.

34:39  
Yeah, as you all know, we get the link to a website for example, we get the information how many people are there, we get pictures, we get reviews and all those things.

34:49  
So the role of Google Maps here is not just to show us where is something, but to give us information, information about something.

34:57  
And the logic we look for this information is special.

35:02  
And that's the huge difference between analog and old maps and new interactive maps.

35:09  
So we can sum up that nowadays in the digital world, maps serve as kind of interactive platforms to get to information and the interface to get to to this information is the concrete location.

35:26  
And when we now sorry for the maybe complex story, when we even set something on top of that and connect all this to mobile devices, applications and services.

35:42  
Then we see that for example when we open Google Maps at our smartphones that the difference is this blue little dot in the middle and you all know what they stand for.

35:55  
The blue dot in the middle of the map is our own location and when we combine this logic that maps serve as platforms to get to information with mobile devices and our concrete location then this logic works.

36:12  
Interestingly completely other way around.

36:16  
So I don't know who of you knows.

36:18  
This is just one example this Pokémon Go game.

36:24  
There are many other games out there but they all have the same logic.

36:27  
These augmented and location based games where, yeah, the real world out there actually is the playground so to say, with a digital augmentation in this case to.

36:41  
I don't know, I never played it and I don't know the story.

36:44  
But to catch one of those Pokémon creatures, and this is not only virtual so to say, but to catch some of those Pokemons, you have to go to the location where it's located and you go there and then the game recognizes, OK, you are at this concrete place.

37:07  
Now you can catch this Pokémon even if it's just virtually right.

37:11  
So when we take this logic, and this is just one example, every location based service has this logic in the background.

37:18  
So the fact that we get information based on the location where we are right now, in this case it's a game, but every location based service has the same logic comes to the point that space, so real space out there.

37:34  
Interestingly also works as kind of a platform and location as an interface, in this case a concrete place to get to an information.

37:45  
In this case it's a game, in other cases it's an information.

37:49  
For example, I don't know the train schedule when I am at a very special train station or something like this.

37:58  
So to sum all these up, namingly, the new logic and new ways how maps function due to technology.

38:12  
Then we can sum up that, yeah, the pillar free of our concept is this space and maps, so in both directions serve as kind of a platform and place and location services interface to get to an information in both directions as I tried to illustrate in the last 10 minutes.

38:34  
Right.

38:35  
So let's come back to this point where I said, OK, the first two pillars that maps are visual and maps give us a spatial context to an information and therefore we can use these effects in education.

38:49  
And when I said that we can do this better, especially now this is where pillar three comes to place because of, yeah, the effects I just told you naming this platform and location as interface idea and that's what I meant with that.

39:09  
We can do this better now cuz we have tools we had not 10 or 15 years ago, right?

39:16  
Due to the fact that Geo Media also in both directions by the way are interactive or interoperable or flexible and have this interface character which does not work with a map in a school book for example.

39:33  
I think you can imagine, sorry, just someone, everybody entered the room because I'm guest in this office here right now.

39:42  
OK, so when we connect this to education, and now this is the last little X cause to cognitive psychology, why is this better when we take a look at another theory from pedagogical psychology, namely the cognitive load theory?

40:04  
And there are many studies and many effects in the background.

40:07  
I want to reduce this on one effect.

40:10  
So the backbone of this theory is that our brain does not have unlimited resources, so we cannot do unlimited tasks in parallel.

40:22  
This is what is meant with cognitive load and especially in a learning scenario.

40:27  
Every task I have to do in parallel, yeah, distracts me from the actual learning topic, so to say.

40:36  
Yeah.

40:38  
So imagine you're in the classroom and you have to deal with different impressions.

40:44  
So for example, there's the teacher in front who tells you something.

40:48  
This is one load you have to deal with.

40:51  
Then there's your neighbour sitting to you talking something.

40:55  
This distracts you from what the teacher is talking about.

40:57  
Everybody knows this.

40:59  
For example.

40:59  
Then in the outside there is also noise which are all effects which distract us from the learning effect because our brain is busy with other things.

41:09  
This is meant with this cognitive load, and one of the effects in the framework of this cognitive load theory is the so-called split attention effect, which means that the more we have to do to process a task in an educational context, the the more problems we have to to to learn what we actually have to learn.

41:35  
So for example this is also a bit fuzzy, but you don't have to read this in detail.

41:42  
Imagine this task, you have a triangle and the ankle over here is given with 55°.

41:51  
I hope you can see my mouse cursor.

41:53  
So the the the ankle A over here has 55°, the ankle at C has 45° and the task is to find out what the angle between DB and E is.

42:06  
So the angle over here.

42:08  
So how do we solve this problem?

42:12  
Basic geometry, we all know this.

42:14  
So the sum of an angle within a triangle is 180, oops sorry 180 So we take 180 minus these 55 minus the 45.

42:25  
So we get the information that this angle over here 2 bit calculate 45, this is 100, so this angle is 80°.

42:35  
And we know that this angle is actually the same like this angle, so this angle is also 80°.

42:43  
And what I want to explain to somebody how to solve this task over here.

42:49  
Then we can do it conventionally as listed here on the left example, namely put this figure over here and the text below this figure is exactly what I told you before.

43:01  
So how the process, how to solve this problem, which makes pretty sense to name all these angles and then describe the way to solve this problem.

43:12  
But what you see on the right side and there are many studies who have proven that it's way more effective from a pedagogical point of view, namingly to write this information directly in the figure.

43:25  
So you see here, OK, 55 degrees 45 and this over here is 180 -, 55 -, 45.

43:32  
So when it's directly listed here in the triangle instead of below the figure.

43:39  
Chris, coming back to cognitive load, the difference between those two is in the left example, I have to yeah, watch the figure, then go below, read the text, think about the text, go back to the figure and I have always have to yeah, code and recode the information which is listed below this figure and then the right example.

44:03  
The information is directly at the point and I do not have to jump around so to say.

44:09  
And studies have shown that people process this information way better when it's presented like the right example.

44:17  
And this is called the split attention effect.

44:19  
Naming the the example of the left figure, our attention is split namingly to the figure and the text below.

44:28  
And here we have all at the same, and I'm sorry for all the crossroads I took here.

44:35  
Coming back to Geomedia and the fact that I'd said we can use these effects better right now due to technology is a very, very simple fact that maps nowadays are interactive.

44:50  
So imagine I want to show you something in a classroom setting and show you this with a map in a conventional way.

45:01  
And you have the map, you have the signatures, and you have a legend on the somewhere on the side of the map.

45:07  
So you get the information, look at the map, see OK, there's for example a blue dot and then you have to go to the legend and say OK, blue dot stands for OK, this and that.

45:18  
Then you go back to the special context and you always jump around exactly the same like in the triangle example before.

45:25  
And when you do this in an interactive digital map, then yeah, there's just the pop up.

45:30  
So if I want to know what an information stands for in an interactive map, I just click on it and it tells me right?

45:38  
And this, Yep, coming back to the example shows us also the possibility to minimize this split attention effect.

45:47  
So I get information at the point and I don't have to do anything else like in a analogue map.

45:55  
So to keep that kind of in mind, we can call it as kind of Pillar 3A, because it's actually linked to the interface character of of of modern Geomedia.

46:07  
That in the way that maps are digital and interactive, we can minimize this split attention effect with modern Geomedia.

46:16  
And this is actually what's new.

46:19  
So when I try to sum up this theory background so the same, then we had the pillar three, that place and location service kind of interface between me and the information I'm looking for in a spatial logic and especially when it's digital then we can minimize this attention effect because I get information on point.

46:44  
And when we combine this with the other two pillars I told you at the beginning of the presentation, the spatial representations create a special type of dual coding due to the fact that it's visual and pillar 2 that's based in place and Geomedia deliver a supportive spatial context to an information.

47:01  
And when we combine this with the place location as interface idea and the minimizing split attention effect with modern Geomedia, then this is actually the backbone of our approach to spatially enabled learning.

47:17  
Namingly what the actually the core of this approach is that we just make use of web-based spatial representations namely digital and and and interactive Geo media to support interaction, communication and documentation of learning contents in in educational environments by just connecting complex complex learning context to a spatial dimension.

47:45  
So just giving a spatial context to an information and then yeah foster the learning itself with combining this through an interactive spatial context to this information or when we want to illustrate this when you remember what I showed you with the with the mission statement of Google Maps and this isn't that's something we publish.

48:09  
This is just to illustrate.

48:10  
That's why I show you this analogy here, namely the the, the geographically organized, the points information that make it universally accessible and useful, mission statement of Google Maps.

48:21  
And when we transfer this to education that we could say that the backbone of the census approach is to geographically organized learning content and make it university accessible and useful by, as mentioned, just using location as an interface to link action and attention to learning goals.

48:41  
So when you for example tell something in a history class, then we could combine this with an interactive map and not just telling what happened, but also interactively illustrate where it happened and deliver a spatial context in an interactive way and therefore foster learning.

49:00  
So that's the idea behind this approach or behind this idea, so to say.

49:08  
So to sum this up, what's actually new in this approach?

49:13  
Is that what I told you in the very beginning of this presentation that recent concepts or initiatives to use Geomedia or Geo information in the classroom all had this logic to yeah, learning to use Geomedia to reach another goal.

49:32  
The idea of Celtas is a bit different, namingly that we not learn to use Geomedia or GIS to reach a goal, but that we just use Geo media in the classroom to foster learning itself.

49:44  
So that's the difference between this, this spatially enabled learning approach towards other concepts which are out there.

49:53  
OK, so this is, so to say, our research framework and the idea behind this, Yeah, concept or approach.

50:03  
And of course there are many, many domains we can do research.

50:07  
And we did do research.

50:08  
So for example, we developed some use cases.

50:12  
I'll illustrate this in a couple of seconds.

50:15  
We have to look at user requirements, for example.

50:18  
Of course we have to integrate this in pedagogies and curricula.

50:22  
We can develop a typology of, yeah, how to add the spatial context to different topics because not every topic is the same, etcetera, etcetera.

50:34  
This is what we've done on the last years, which was also a very, very huge part of my PhD thesis a couple of years ago.

50:41  
And no worries, I don't have the time to show you all this what we what we did there over the last years.

50:48  
But just to illustrate what we, as I already said, also did our many use cases where we tried to implement this concept.

50:58  
And an example I want to show you here is one of my ex colleagues.

51:04  
She now works in school as a teacher.

51:08  
And what she wanted to do is, yeah, an introduction lesson to globalization.

51:14  
And you could do this in a classical way.

51:18  
So for example, in every geography school book has one page about globalization and the introduction to this.

51:25  
And mostly it's either illustrated by the journey of AT shirt or the journey of an iPhone.

51:33  
So for example, the journey.

51:34  
So the cotton comes from here then.

51:39  
Yeah, the, the, the T-shirt was produced here, then it was shipped over there to do the coloring and then it goes to, I don't know, Central Europe to a store to be sold.

51:50  
So these are the classic examples which are good to illustrate something, but let's be honest, from a classroom perspective, they are just boring, right.

51:59  
And what she did and I helped her a bit with this map application.

52:05  
It's OK.

52:05  
I want to do this introduction lesson to globalization on an everyday example of my my very concrete school students.

52:14  
And she asked them to do a little task.

52:16  
So to reflect, OK, what media do you use in your everyday life?

52:21  
On which devices do you use this media?

52:25  
Where does the device coming from?

52:27  
Where is the company located, which sells the device and where the company is located from the media companies, etcetera, etcetera.

52:37  
And then we build up little application with RTS online, little survey application.

52:42  
So the students use this application to do research, OK.

52:46  
For example, I use Instagram on my, I don't know, Samsung smartphone, whatever.

52:51  
And then they put this information on a digital map and this is what you see here.

52:56  
And this worked in real time in the classroom.

52:59  
So there's a map showing the, let's say, yeah, media situation of her very school class in real time.

53:10  
And actually, this is just nothing more than what I told you before.

53:15  
What she did here is delivering A spatial context to a abstract topic, namely globalization on the example of Geomedia usage and Geomedia.

53:27  
Sorry, media media usage.

53:30  
And not just from everybody, but from her very school class.

53:35  
And this is exactly or nothing more than what I showed you before naming the delivering A spatial context in an interactive way to a topic you want to talk about in school.

53:47  
Yeah, OK.

53:48  
There are many other, yeah, use cases we ran over the last couple of years.

53:55  
I don't want to illustrate all this because it takes a couple of time.

53:59  
But they all had more or less the same logic to use interactive maps to give a context to a, yeah, concrete subject you want to teach in school.

54:10  
In this case it was globalization and having a look at the watch by the way, I know I'm not quite sure how how long was this scheduled, An hour or a bit more than an hour?

54:24  
I think you have still time if you want to use a bit more like till 15 two.

54:30  
OK, perfect because at the end.

54:34  
So this is one example, very small example and a bit taller example I want to illustrate in the last couple of minutes of this presentation.

54:43  
Here is a project we are running right now which is about, yeah, urban green, so green spaces in urban areas and the focus on young people and youth.

54:57  
It's a three years project we are running right now with many partners and many partner schools and this could also be seen as an example or an implementation of this spatially enabled learning approach, even if this is a bit more in a yeah, complex setting because it's a research project we are running right now.

55:17  
So the goal of this project are from a first point of view child in youth friendly cities, but with a very special focus on urban Green.

55:29  
So actually what we want to know or try to research is what role does Urban Green parks, meadows and etcetera etcetera, what role does this play for young people?

55:44  
How do they see those places, Are those places important for them or not and if yes, in which manner.

55:51  
So this is what we try to find out in this project and The thing is that why we have this very special focus that teenagers demands are often not sufficiently known on urban landscapes.

56:07  
The second thing that teenagers agers requirements are significantly different from those of adults.

56:14  
I think it's also pretty clear and the problem is that adults do not know or do not understand teenagers requirements or only poorly when it comes to the design of urban landscapes.

56:29  
In our case we'll focus on Urban Green that that there is a lack of information and we want to create child in you friendly cities.

56:38  
We firstly have to understand the demands of young people and this is what we try to do in this project with focus on Urban Green.

56:48  
So there are basically three goals.

56:51  
So the first thing is that we want to gain some basic knowledge about the importance of urban green for child, children and and young people.

56:59  
We then in the second step wanted to create a web-based and child and youth centric application to collect this information which is actually a place based survey.

57:11  
I don't know who view knows so we want a free application for ideas online.

57:15  
This is what we actually use here to yeah, gather information with this tool.

57:21  
OK, where are concrete green places in for example Zilesburg which are interesting for young people?

57:29  
And just asking young people works that just poorly and so far, because when develop and such an application, we have to work with young people together, because otherwise they see the application, don't understand it and then skip it.

57:44  
So and develop this application was the 2nd project goal and the third is of course to to gain all the information and then to analyse the information and to communicate it to local stakeholders for example.

57:56  
So the structure of this project, don't be scared, you don't have to read this in detail, it's just to illustrate the the project plan is that at first sight we did a literature review and then try to gather information about urban green and young people and activities of young people in urban landscapes.

58:18  
This is what we did it in first couple of months of the project did also some small surveys to to to ask school students for example and sorry this is German, but to the fact that this project is running in Salzburg and the the school classes are German speaking.

58:36  
So first thing for example we did is that we asked young people, OK, what are the main activities for you in an urban landscape.

58:43  
And this was, by the way, our first surprise because the most significant activity in urban landscapes for young people is just taking a walk, which was kind of surprising for us because we didn't expect this, because taking a walk sounds like, yeah, I don't know, old people or something, but this is something young people really do nowadays.

59:07  
I mean this is probably a side effect of the the Corona pandemic over the last couple of years.

59:12  
But yes, this was the first surprise we got out of out of this project, did some other things to ask them, OK, what is annoying in this idea?

59:21  
And this was not that surprising because the main categories over here were traffic, pollution, yeah, people or other people and their behavior etcetera, etcetera.

59:31  
So this is the first thing we collected in this project to get a basic idea about the relationship of young people and activities in urban landscapes towards urban green and taking this information in combination with working directly together with school classes.

59:50  
Then we had the second project step over here to develop this survey application with survey one to three.

59:58  
And as I mentioned before, we did not just create or design the survey application from our perspective, but we included school classes.

1:00:08  
Namely 6 school classes did some different activity formats to create this survey application.

1:00:18  
And just to illustrate to the fact that yeah, the information we want to gather is a bit complex.

1:00:25  
So this is the whole survey, yes.

1:00:28  
Not to read this in detail, this is just to illustrate.

1:00:30  
And as you see, this is complex.

1:00:33  
So we asked for a concrete location and a description of this concrete location with this survey.

1:00:38  
And this survey, yeah, was built when we worked with school students directly together to be sure that this is suitable for our target group.

1:00:50  
And there we have different formats.

1:00:53  
We go to workshops in school class.

1:00:55  
We have internships from those school classes.

1:00:58  
We have internship camps for a couple of days.

1:01:01  
We work together so different formats to directly work together with the target group.

1:01:06  
In this case, young people age 14 to 1718 roughly and this is the result of this survey application which it was finished up last summer, the summer 23.

1:01:21  
And right now we're in the third project step that we're still collecting some data.

1:01:26  
But after that we of course will analyse the data and communicate the data.

1:01:32  
And we also will do this together with school classes, so in different workshops in in in school class directly.

1:01:40  
So we did not already start the analysis phase.

1:01:44  
But yeah, I see we we already gathered some information, so we now have I think 720 roundabout, yeah entries in our survey which is still open.

1:01:59  
So we run it a bit.

1:02:00  
We want to get, I don't know, like 1000 or something, where we then can analyse the data and say, OK, where are green spots in urban landscapes?

1:02:11  
OK, here we are zoomed into Salzburg and then have a look at OK, which places are mostly reported and then have a look, how are they described and what do young people like to do there, what not, what is important, what not, etcetera, etcetera.

1:02:26  
So this is from our research point of view, but coming back to the school workshops run in this project we of course use all these tools, use the Geo information, use the Geo media to discuss this in the school workshops.

1:02:42  
So the next steps in this project are that we visualize and communicate the data and do this also together with school students.

1:02:52  
And even if this example is a bit more complex than the example I showed you before, but the idea behind is actually also pretty much the same naming the that we try to foster active learning.

1:03:06  
And in this case, it's kind of active learning, cause 'cause young people deal with urban landscapes, their own judgement of urban landscapes.

1:03:15  
Then of course on the fly get yeah, an idea of, but other people might see this differently.

1:03:25  
So you target also conflicts in urban landscapes, etcetera, etcetera.

1:03:30  
So in the backbone is actually that we try to foster active learning with the help of Geo information.

1:03:36  
In this case it's our application and the visualization of the data.

1:03:39  
In the case before, it was way simpler to just visualize and contextualize your own personal school class globalization map, but the idea behind is actually pretty much the same.

1:03:51  
So 2 just use Geomedia and Geo information to foster learning in a school class environment.

1:03:59  
And that is the idea behind this especially and enabled learning concept.

1:04:05  
We.

1:04:05  
Yeah, continuously developing since a couple of years.

1:04:12  
OK.

1:04:12  
Thanks Anura for the additional minutes.

1:04:15  
That was actually my presentation.

1:04:18  
I have a couple of minutes for Q&A.

1:04:21  
SI don't know how long this this session is is scheduled because I then have to go to directly another workshop, but I think there are still rooms for some questions if they're awesome.

1:04:35  
So by now thanks for your attention over the last approximately 70 minutes and I'm happy to answer questions if they're awesome.

1:04:44  
Thanks a lot.

1:04:44  
Bye now.

1:04:46  
OK, thank you very much, Robert.

1:04:48  
It was really very interesting and of course very clear the way you are presenting is always I think it's easy to understand and thanks for this.

1:04:55  
And I'm looking at if anyone has a question here, so everyone who is here can just unmute and ask questions as I don't see any questions in chat window.

1:05:08  
OK.

1:05:10  
So actually I want to say that your topic actually very, very important for our project also the vision because we are going to bring Geo special technologies in other disciplines which are not till now we're dealing with this all Geo media and special thinking.

1:05:33  
And this is I think it's really great for our people who also I think attending today some of them your lecture.

1:05:42  
So I don't know if they would have any questions regarding this.

1:05:47  
So my question would be actually do you think it's also good to integrate just special media to other disciplines and because you are more bringing the topic for the learning at school, but that's.

1:06:07  
So I think it's also from our point of view, it's also would be good to bring it into the other disciplines like history like you were mentioning.

1:06:17  
Yeah.

1:06:18  
And what about other disciplines which are not really specially don't Look, we don't have explicit spatial logic, right?

1:06:31  
OK, yeah.

1:06:34  
So I'm not sure if this is the core of a question, but but there are two structural dimensions.

1:06:40  
So the first thing is different subjects in school, for example.

1:06:46  
So of course we have geography.

1:06:48  
OK, Geography is about space and place, So check.

1:06:52  
I tried to illustrate it with, for example, history, because OK, everything we learn in history classes about something that happened in history.

1:07:04  
OK, all this happened also somewhere.

1:07:06  
So history of course is easy to imagine to use maps and interactive maps, but there are other school subjects for example, which are not that at first sight directly linked to this.

1:07:22  
So for example biology, if you talk about a biotope or something which is also spatial, A biotope is always somewhere.

1:07:31  
So you can illustrate, yeah, biological topics in a spatial logic.

1:07:38  
But for example, you can also use this in in, in language classes.

1:07:43  
So in a different, yeah, dimensions so to say.

1:07:48  
So I don't know, imagine an English class and you talk about a region in England.

1:07:54  
OK, Then it's obvious you can use maps to illustrate this and and foster the learning process.

1:08:00  
But also when you for example read a book, so you can put the book in a spatial context.

1:08:07  
So where was it written?

1:08:09  
Where did the author live?

1:08:11  
Etcetera, etcetera.

1:08:13  
But also from a content point of view that I don't know, depends on the book.

1:08:19  
You you take the places in the book, put it in an interactive map and then use these effects.

1:08:25  
So actually there is OK now even in mathematics for example on a not abstract way.

1:08:34  
But when you illustrate something you learn in mathematics with the real world example, which also mostly has a spatial dimension to it, as you can actually use it in every school subject depending on the topic, and most of the topics have somehow a spatial connection, there are very very very very few which are not suitable.

1:08:58  
For example, I don't know grammar in English.

1:09:00  
OK, grammar does not as a special context, but this is one one topic.

1:09:06  
But most of the topics you can link to a special context, yeah, and another dimension which came to my mind.

1:09:13  
I'm not quite sure if this was the core of your question, but when you take the logic to other domains out of education for example, this also would work.

1:09:24  
I would say curse, yeah, every educational setting in classroom is also a communication setting.

1:09:34  
Learning in school is always communication between different people.

1:09:38  
So when you transfer the logic of the spatially enabled learning putting a spatial context to information and take it out of the educational sphere to any communication setting, then the effects and the structure actually is exactly the same.

1:09:54  
Because every communication setting on the other way around is always also kind of educated education, not necessarily formal, but I don't know if you have a meeting with someone you always get new information and getting new information is actually learning.

1:10:14  
So our everyday life is full of learning and full of implicit educational settings.

1:10:19  
So you could also transfer this to many other domains public communication to yeah, I don't know pretty much everything where kind of an information is communicated to other people.

1:10:35  
Sorry, that was a very long answer.

1:10:37  
Thank you very much.

1:10:38  
Actually it was very interesting ideas and I think inputs to think over.

1:10:43  
Yeah.

1:10:44  
And I think it's also not every maybe topic is can be specially connected, but most of yam in different disciplines.

1:10:53  
So at the moment I don't see any hands and no one would like to ask questions.

1:11:01  
And I think it was very clear and interesting topic today.

1:11:06  
Thanks a lot, Robert.

1:11:08  
And I would like I just wanted to say glad to hear and thanks for having me.

1:11:16  
And in case, yeah, yeah, always happy to help you and in case there are no questions, it's like kind of good today because I directly have to jump to the next presentation downstairs.

1:11:26  
So thank you very much and have a nice weekend to all have a nice weekend.

1:11:32  
We have still two more lectures this year and three more next.

1:11:37  
Yeah.

1:11:38  
Bye for now.

1:11:39  
OK, bye and have a good start in the week everybody.

1:11:42  
And thanks again.

1:11:43  
Thank you.