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The Other Art of Computer Programming

A Visual Alternative to Communicate
Computational Thinking

Interview with Focus Group 3000

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Interview with Focus Group 3000

Melanie

Okay, so I'm going to show everyone three different types of pictures, and then you can tell me what you think, which word goes the best with them. So there is communication, or there is meaning making, or there's aesthetics. So, let's just have a quick look, that one, those pictures, is that communication, meaning, or aesthetics? Which word would you pick, just quickly, what's off the top of your head? Hands up for communication. Hands up for meaning, one person, two, three people for meaning, and hands up for aesthetics.

Okay, so most people are aesthetics in here, so that was one, two, three, four, five, six, seven, eight, girls for aesthetics, which is what I got for the results [1.02] it's, you know, and aesthetics. So this one, let's have a look at this one, this is Seymour. He died two months ago, I am so sad because I wanted to ask him some questions. So he invented logo, that name which we did in computer geometry, and that is one of the first computer robots. It was called a turtle, and they used to get the three year olds to program it, so they knew that really young children could program, after they did this exercise with them. So, what word would you use to describe Mr. Papa, is it a communication picture, a meaning making picture, or is it aesthetic? Does look good? Hands up for communication.

Student

What do you mean by communication?

Melanie

So, we use pictures for different things. So on your iPhone, on the front of it, is a series of pictograms. So it's faster to press on a pictogram, and know what it means, like a stop signal, than actually read it. So that's fast communication, isn't it? Do you think?

Student

Yeah.

Melanie

Do you agree with me? And then there is different things, like art works. Some art works are really abstract aren't they?

Student

Yes.

Melanie

So you describe those, they look good, and they are aesthetic, aren't they?

Student

Yeah.

Melanie

So like the Mona Lisa, or something like that. And then there is other pictures that are used for meaning making, like a map.

Student

Ohh.

Melanie

So that means something, that's going to direct you somewhere, and take you somewhere, you don't look at it because it's pretty, it's got a function.

Student

Oh.

Melanie

Is that easier?

Student

Yes. [Multiple]

Melanie

It's hard to understand pictures, isn't it, but if we can get everyone to agree on what the role of pictures are, then we can get information in quicker, to people's brains

Student

So is the first one actually meaning, and not aesthetic?

Student

Yeah, probably.

Student

Yeah.

Melanie

Yes, but we have gone past it. So, that's okay. There is no right or wrong answer, to me. So what do you think this one is?

Student

Aesthetic. Yes. [Multiple]

Melanie

I think it's aesthetic, too, so I'm going absolutely agree with you on it, but then I don't have to agree. What about this one?

Student

Meaning. [Multiple]

Melanie

Meaning making? Who says communication? It's quite quick isn't it, because it means what the word says, it's a distraction. Right, so three people for communication. Who says aesthetic, who thinks it just looks good and there is no other function for it? No one thinks its aesthetic anymore. Okay, that's good. Okay, so this is your results for what you thought the role pictures are in [3.57], and everyone thought they were

mostly aesthetic. About a third of the class thought it was communication, which is what I expected, because you are all on iPads, or iPhones, aren't you. So you are looking at pictograms, and things like that, for a quick understanding. But most people think its aesthetic, which is fine. So do you have any reasons why you think thought it was aesthetic? Yes?

Student
I think it's probably because I am so used to pictures being things to look at that are pretty, and learning from, like, reading stuff, so it's probably new for us, the picture [4.37].

Melanie
I think that's a great explanation. Does anybody want to add anything to that? Does anyone want to add anything, no? You are so good, you know, I've got a couple of girls' schools and this one talks. So I said, "Can I please come back and ask them some questions?" [Laugh] They are, but the other one is slow, so, and I just thought, "Oh, please can I talk to them."

Okay, duel coding theory. So how do you feel about the circuit?

Student
Ahh, it was …

Student
A bit different.

Melanie
Different?

Student
[Kind of, a wire in the sand. 5.22]

Melanie
That is the inside of every computer. It's one, or zero, and then they do millions of circuits on top of it, and it's all abstracted, and then every two years, we shrink the amount of things we can store on a resistor, so it gets tinier, and tinier. But I mean, that's basically all it is, and those tables there, the difference is [5.45] out of ten. So it was … it could [5.47] than what we do now. So did you feel … did the picture and the table go together? Did you understand what was being asked? You know how some of the gates are and gates, and some of the gates are manned gates, did that work, or was that confusing?

Student
It was confusing.

Student
There was too many …

Student
I think [Overtalk]

Student
I think if it's things in the shape of a hand and all the [6.11]. [Overtalk]

Melanie

Okay, so you want the words in that actual table?

Student

Yeah, then you don't have time to, kind of, think about, "Oh, this sheet goes with that, then it goes with this operation."

Melanie

Okay. That's good. Did you consider the table, and the circuit diagram, together when you were reaching the conclusion? This is actually really early engineering, too. Like this is the way they teach engineering, when they bring it into high schools, so they go the picture, and then another way of communication, as well. So, did you look at the table and picture together?

Student

Yeah.

Melanie

Because it would have been too hard to try and work out? Okay, great. Nearly finished. Right with the binary tree, could the pictures have been reorganised so that it was easier to spot a pattern?

Student

Yeah.

Melanie

How could I have drawn that better, everybody? Because, I am trying to represent sequence, or order?

Student

I think it's pretty good.

Student

I think it looks fine.

Student

You can see that the charts going down to the one, and the two, and the three, and four.

Melanie

So, I will give you another example that I gave to another school … can I just rub this off?

Heather

Yeah.

Student

It's awful.

Student

I don't even know what adequate means …

Melanie

Which?

Student

… for me.

Melanie

I might be able to explain a little bit better, like this is the way computer stores information, so it's got like nine there, and then it's got, maybe, a minus there, and its got a two there, and a three there. So it's all stored like that. So when it goes through and retrieves it, it'll go down and it will get the nine, and then it will get the two, and the three, and it'll put those in brackets, so it's two take three. So that's how it retrieves the order of the information.

Student

So it's like a sum, kind of?

Melanie

This is too … it's hard for me to explain binary trees, I struggle with it, but does that explain it little bit clearer to you?

Student

So it's kind of like a specific order …

Melanie

Yes.

Student

… you are creating order.

Melanie

So is there a way of drawing that better? Because what you are doing now, for me, is you're are designing the curriculum, for year eights, next year. Okay, so …

Student

Oh God.

Student

Pressure.

Melanie

… is there a way I can do that better?

Student

Well, I think it … with the black path thing, that was cool, but [8.51] actually it. I think. I can't [8.52].

Melanie

Yeah, I think that I should make the … once it has gone through the node I should actually make it fainter, and I should bring out the node that's current … really [9.02].

Student

Oh yeah, the circuit.

Melanie

So use capacity.

Student

Oh yeah.

Melanie

Yeah, the circuit. So once … so, in the second box across, make that really light, and the top one.

Student

So make it orange one, more understandable and, and then pink one …

Melanie

Yeah, I think I need to use more [9.18] here.

Student

Oh I … oh I got it.

Melanie

Are you okay with it?

Student

Yes.

Melanie

And also, put it all on one page, because what happens is, that is a Sudoku for that order of traversal through the nodes. It is so big in computer science, isn't it Heather

Heather

Yeah.

Melanie

So, basically, so the way I just did the curriculums, is they are comics, they are a special type of comic, called an instructional comic. So, everyone thought they learnt facts faster with comics. Most people thought that. Why is that? Does anyone want to add anything, yes?

Student

I think it is more visual, so we understand more, because of the kind of pictures, and things.

Melanie

Yes, I am just checking that my phone is on. Great.

Everyone thought that learning comics would be easy for them, is that true?

Student

Explaining stuff with pictures, is easier than explaining something with words, or, like, to read stuff, because I know how I really like to read the book, and like to watch a video on it and [10.30].

Melanie

So you said cooking, so you like to watch a video, or [Overtalk].

Student

And the same, sewing because reading the instruction book is just so confusing.

Melanie

Right, because the …

Student

The recipes are like algorithms.

Melanie

Yep.

Student

I think that it kind of depends on the way different people learn, because somebody might learn faster with like pictures, and stuff, but some might learn better with words. I think that, for me, I, kind of, like a lot of words but like a picture to go with it. That's just me though.

Melanie

But some people are like that, too. Like, I have a computer science teacher that I work with, and he says, he thinks in code. He doesn't think in pictures, he said he actually thinks in code. So some people are like that. They think in words, and code is words really. So that's okay.

So would you like learning things in the future with comics?

Student

Yeah. Yes. [Multiple]

Melanie

Is there anyone who wouldn't like to learn through a comic? Yeah.

Student

Words are so much easier.

Melanie

Words are easier and … yeah?

Student

Well, I don't know, like, I feel like a video would be better.

Student

Labelling work, or …

Student

Yeah, like the ones who can't have it.

Student

… like what steps to do.

Student

Yeah, like [Overtalk] could heroes, like in a …

Melanie

That's good.

Student

Like, in sewing when you get Miss [11.48] to actually show you. [Laugh]

Student

Yes, that was so true.

Melanie

When you are doing that, watching the Khan Academy, do you let it play through and you know it, or do you stop it?

Student

I stop it.

Student

I stop it.

Student

I play through it.

Student

I play through.

Student

Actually, no I play it through once, and then do an exercise [Overtalk]

Student

[12.02] a question and forget it, so then I go back on and stop it.

Melanie

Right okay.

Student

And answer those questions.

Melanie

I like the Khan Academy too, I think it's good.

Student

Yeah.

Melanie

Anyone else, on anything?

Student

Well, I think the comics quite cool, but I think maybe like more words, with a bit more words in there. Like the comic with pictures to go with it.

Melanie

Yes.

Student

I find comics quite hard to understand …

Student

I know.

Student

… just because like sometimes, although they are simple, same as [12.35] the information of words could probably fill in …

Melanie

Is that they layout, are you talking about the layout of the comic. Like you don't really understand the order, or you … is it the pictures that you don't understand? [Laugh]

Student

It is just sometimes the pictures don't fill in the information, like words could be able to.

Melanie

Because it's really open isn't it, the interpretation, because I have got some comics and I look at them, and done by a man in New York, and it takes me a while. I need to look at them to really understand what is really going on. Yep?

Student

I find that it's easier with words, because they say something, or explain it. You have to use words to explain it, and so it's kind of … and I … some isn't clear, but I visualise words more.

Student

Yeah, it's like, when I like, for example, I memorise something, I actually visualise the words that I am seeing.

Student

Yeah, that's weird.

Student

That sounds really weird.

Student

Why does that … I do that.

Student

You realise you visualise what you do see.

Student

If I see a picture, then I would rather have book of pictures, and a couple of, like, headings. It makes me like to imagine it more, so I think about it more, use my brain a lot.

Melanie

So that imagination is important to you, and that picture, like the graphic novel [13.58]?

Student

It's easier. On the book that you want to make the activities, I think if you have lots of words [14.06] just headings and, "This is for this" [14.08] quite helpful.

Melanie

Yep, that's great.

Student

I feel like, for me, probably a comic, and then words explaining what it means.

Student

Yes.

Student

So it's like the picture helps me remember what it is, and the words help me understand.

Student

Yep.

Melanie

That's good information, that's really great information. So, people want to use comics more often when they learn. I think we have already covered that. Does anyone want to add anything to that. These were the trends that came out, the statistical trends from all the schools, but I am only letting school talk about it.

So do you expect to learn something about programming, if you learn with comics?

Student

Yes. Yes. [Multiple]

Melanie

We do expect to learn something. What would be the reason? We have already given reasons haven't we?

Student

I have got lots of information out of comics.

Melanie
Okay, next one.

Student
When you say comics, do you mean like pictures with words?

Melanie
I mean, like the ones I showed you that I did. Remember when you did your thing, they are different, they are more specific than a normal comic. They are called an instructional comic.

Student
Oh yeah.

Melanie
But a lot of people are looking at teenagers, and saying, "Oh, they like it because it is emotional," or something like that. But I like to use it because it's just knowledge transfer. It's quicker for Heather, and I, to get information into people's brains that way, so that is why I am looking at it. Not for any other reason. Yep?

Student
I think that probably the content's just quite hard as well. I think it probably could be added to.

Melanie
Is that the picture is difficult to decipher?

Student
Well, not necessarily, I think just like a different way of learning would still be hard for us to learn because [Overtalk].

Student
Learning is hard.

Student
I don't think … it's not all to do with [16.13]

Student
No I don't.

Melanie
Girls, just a quick question about … ladies, why am I calling you girls? Just about the narrative design. Are you interested in the stories in computer science? Like, do you know how the first bug was discovered? It actually … I'm going to … your teacher, here's a poster of Grace, who invested the first compiler, and she also invented … she helped John Noman solve the quadratic equation that invented the atom bomb, but that's a bit sad so we won't talk about that. But she … the first bug, was an actual moth that flew into this machine, that was about twice as big as this room. It was very big. It was taller than this and twice as long. In Harvard in America, so it wasn't a bug, it was a moth.

Student
[Overtalk] it was as big as this room.

Melanie

So they couldn't find out what was wrong with it, so, and that's actually the bug had actually taken out the machine, and stuck in a board, and she says this was the first bug.

Student

Oh, it's like a literal bug.

Melanie

And then Alan Shearing loved … his favourite book was Snow White, and he ended up poisoning himself with an apple. So that's a bit gory, but are those stories interesting?

Student

Yes. [Multiple]

Melanie

To weed into the curriculum, they are, aren't they.   Okay, last page.   What about games, like games in comparison to learning with comics?

Student

Yes.

Melanie

This is an interesting area at the moment, so if I could put a timer on each page, and I was timing you, as you completed each page, how would you feel about that?

Student

A bit rushed.

Student

It would be better if you just worked at your own speed.

Melanie

Give you a bit of a headache?

Student

Yes. [Multiple]

Melanie

Don't want that?

Student

Like what April said, we wouldn't be able to take it all in. [Overtalk]

Melanie

Otherwise you can't take it all in.

Student

People do naturally work at different speeds, and like, someone, like might work faster, like, the others.

Melanie

Yes.

Student

Sometimes I think it would be good to understand the [18.40] but if you have to do it faster you won't do better, and I think [Coughing 18.44]. When you are learning you get no time limit and then at the end [18.49] that helps you to test your brain.

Melanie

Right so some people are okay with the timing, and some people don't want it. What about achievement badges, with each unit? So if you did the [19.02] or grammar, and things like that, you would get a little bug as a badge?

Student

Yeah, that would be cool. [Overtalk].

Melanie

What if you couldn't get your teacher's attention, what if you could contact them, or message them, on the machine instead of putting your hand up?

Student

That's cool.

Student

Yeah, that's cool.

Student

But then if I message would they come and like stand over …

Melanie

Well, you might just be able to send her a message, an anonymous one, or one with your name on it, "I need help on this," so no one could see it? And what about a score at the bottom of your page to test it as you go?

Student

Yes. [Multiple]

Melanie

Okay, that's it ladies, thank you so much for your contribution. I am sure we have got a lot of valuable things in that, and … how do I stop this?

END OF RECORDING