

VIEW to the U transcribed
Season 2, Women in Academia, Episode #1
Professors Jodie Jenkinson and Shelley Wall, and PhD candidate Andrew Gauthier

Shelley Wall (SW): Both your work and my work in bringing games and comics to bear on research that we're doing in the Institute of Medical Science and the Department of Biology I think people are just starting to see the incredible potential of incorporating play and creativity into the acquisition of serious knowledge and even quantitative, factual knowledge.

Things like comics and games use a whole different part of the brain. They harness people's creativity and engagement in a really different way than more traditional kinds of learning in undergraduate education or in patient education. There's an incredible power in that. And I think people are starting to see that there's a fun element and that's the power of them but that doesn't make them trivial. In fact, that makes them incredibly creative, powerful vehicles for communication and for learning.

[Theme music fades in]

Carla DeMarco (CD): Comics, gaming, visualizations, healthcare, learning, and communication integrated via visual media in science and medicine. On this edition of VIEW to the U we will explore all of these concepts with another trip down the hall to the Biomedical Communications department here at U of T Mississauga.

You will hear a familiar voice, that of Professor Jodie Jenkinson, whom I interviewed last year on the podcast. She will be joined by her colleagues Professor Shelley Wall and graduate student Andrea Gauthier. These three academics are helping me kick off Season two of VIEW to the U. This year in 2018 we will feature women in academia at UTM from a range of our 15 departments.

In this first episode we cover a bit of Jodie Jenkinson's work, which includes looking at how the design of animations and interactive tools may be used effectively for learning. We also find out more about Shelley Wall's work in comics and graphic medicine in relation to visual communication and Andrea Gauthier's exploration of employing games to improve learning outcomes.

Both media, comics, and gaming are not the low art or recreational diversions they may have been regarded in the past. Both are having a moment, particularly in pedagogy and research.

[Theme music fades out]

Last October 2017, the Games Institute based at the University of Waterloo – yes, that's right a Games Institute here at a Canadian university and it's been

around since 2011 – hosted a media literacy panel made up of gaming scholars that was an exploration of how play and gaming develops critical thinking and digital literacy skills.

The proliferation of the graphic novel as a genre over the past couple decades is proving that it is a medium with longevity. On an episode of the 99% Invisible podcast that just dropped January 23rd, 2018, in an episode that I cannot recommend highly enough, cartoonist and theorist Scott McCloud talks about his scholarly definition of comics as, and this is a quote, "juxtaposed pictorial and other images in deliberate sequence."

He says that pictures are text, pictures are meaning, that they are not just illustrations, that every visual decision has consequences, and that good visual communication should speak and be silent. These are all statements that would no doubt resonate with today's guests.

Hello and welcome to VIEW to the U, an eye on UTM research. I'm Carla DeMarco at U of T Mississauga. VIEW to the U is a monthly podcast that will feature UTM faculty members from a range of disciplines, who will illuminate some of the inner workings of the science labs and enlighten the social sciences and humanities hubs at UTM.

Jodie Jenkinson is an Associate Professor and Shelley Wall is an Assistant Professor in the Department of Biomedical Communications at UTM. Andrea Gauthier is a graduate student from the Master of Science in Biomedical Communications program. Today's interview starts with an excerpt of Jodie's past interview on VIEW to the U from August 2017. To hear the podcast in its entirety please visit our Soundcloud page.

Jodie Jenkinson (JJ):

Research in a BMC lab is really focused on visual communication and how that impacts learners. So much research and learning is devoted to text and imagery, or animation and text, or interactivity and text, but it doesn't focus on the individual components that go into making a visualization, and how those can be manipulated to either hinder or foster learning.

In my research lab we really do look at how the design of animations and the design of interactive tools may be used effectively for learning. Again, it focuses as much on the perceptual aspects of learning; how color and tension cuing devices, like using arrows or other devices, to direct the viewer's attention, how those things affect learning in different learning contexts.

I think because visual assets are so complex and detailed it's often difficult to tease out exactly what it is that might be drawing one's attention or what it is that's contributing to the learning. We use a number of different research methods to get at that. We use eye tracking to look at where the viewer's visual attention is focused and also things like pupil dilation to determine cognitive load in viewing the material.

We also use verbal protocols. We get viewers to think aloud while they're watching animations or using interactive tools. Then we use traditional experimental test instruments like pre- and post-tests. As well, we conduct focus groups with students. Often, you'll conduct an experiment and the results might not be quite as compelling as you think but that doesn't mean that there aren't other questions, deeper questions, you can be asking.

We'll conduct focus groups often as a follow-up to studies to try and *really* characterize student's understanding of things, the impact of the visuals, their misconceptions. That's a big factor. What we do is really looking at student misconceptions around life sciences education.

CD: I'm just going to ask you to state your name. Then also a brief overview of what you do for your research.

Andrea Gauthier (AG): My name is Andrea Gauthier. I am a PhD student at the Institute of Medical Sciences in Biomedical Communications [BMC] specifically. My research looks at how we can leverage game design to facilitate learning in the medical and life sciences.

I'm looking at how games can enhance education, facilitate learning in various domains. Specifically I'm interested in failure and the role that failure plays in learning. Games are actually a really great vehicle to encourage failure in a positive way. My research dovetails nicely with Jodie's. Jodie is my supervisor. Her research looks quite a bit at student's understanding of randomness.

Although they can describe molecules as moving randomly and they understand the principles of Brownian motion their understanding breaks apart when they're trying to extend that to cells and cellular events. I decided that I'd investigate negativity and the role of negativity in learning or conceptual change in this area. Specifically games can really expose how students think. If you engage them in an interactive simulation then they're going to be performing actions that they think are correct to achieve a certain goal.

If you let them act on their current understanding and then they see that the system doesn't respond in the way that they're expecting then it reveals the misconception to them. In that way, they're failing and then they can start to build a new understanding on top of that failure. That's the premise of what I'm doing.

There has been much research showing that if you just get students to interact in a simulation without getting them to confront their misconceptions head on then the same change doesn't occur. We've been comparing students who are engaging in a game that specifically tries to get them to fail versus a control, interactive simulation, molecular simulation.

In comparison to a baseline group we're seeing significant change in the gaming group whereas we don't see that same amount of change in the control group. It harkens to the specific benefits of failure in the game.

CD: Are you actually designing the game?

AG: Yeah. We've had a couple of BMC graduate students involved in the design and the development of ... It's called Mol Worlds built in Unity.

SW: I'm Shelley Wall. I'm an assistant professor in the Biomedical Communications program in the Department of Biology here at UTM. My main area of research right now is actually in comics and medicine. How comics as a mode of visual communication can be used in healthcare and in medical education.

CD: Could you talk a little bit about how you got into this field? Because I think you started out more at OCAD or something, right? In the arts?

SW: Yeah. I did a doctorate in English literature and brought a lot of feminist theory into that doctoral research in a past life. Then went to OCAD. Then came into this program and ended up working on a module for Sick Kids about intersex conditions, which tapped into but also really propelled my interest in gender-based analysis and practice.

I've always been interested in women's health and how gender works in biomedical representations. Right now I'm working more ... I'm drawing on my background as a literary scholar and I'm really interested in ... I'm *still* interested in gender but I'm working specifically in narrative, how narrative works in visual communication and narrative specifically in the form of comics, which is a growing field called graphic medicine.

Which is sort of at the intersection of health humanities, literary study, medical education, patient education. All the different areas where visual narrative combining text and image can be deployed either as a way of, for medical students, for example to read graphic memoirs of illness to humanize the illness experience for them, to bring in that element of the individual, of lived experience to kind of complement all of the epidemiological data that they're confronting or using comics as a way of transcending language barriers or comprehension barriers in patient education.

CD: I find it so fascinating that you started out in literary studies because to me when I hear literary studies I think so much about text. Then now there's this component of comics and graphics. Was it a real shift for you then to shift to comics or graphic novels?

SW: It was a shift in that I thought I had left behind my humanities hat. Then to discover that there is a huge role for the humanities in biomedicine ... I mean,

health humanities, medical humanities, whatever you call them, the importance of that is really being recognized now.

There's sort of a shift back to think, "Oh, I can use all of this experience that I have in narrative analysis and literary theory and bring it to bear on work that actually then plays a role in clinical practice and in the patient experience." It was actually incredibly exciting to see those things stitched together again.

CD: With comic books was that something that you were drawn to earlier on?

SW: I read comics as a kid and then rediscovered them as an adult after. I discovered graphic novels.

CD: Has gaming always been an interest of yours?

AG: Yeah. Definitely. I grew up on games. I was in the N64 generation. I've been playing games my entire life. I had a bit of a hiatus when I went off to undergrad. It's a real pleasure now to be back into it as a PhD student. Kind of throughout my undergrad career and Masters, games have always come in in some shape or form.

When I was in undergrad I developed this game for the library. They do these facilitated study groups. I was a facilitated study group [FSG] leader for a course called Scientific and Technical Terminology. I developed a board game based on Cranium. I called it Brainium. It's essentially just a trivia thing but it really got people in the course engaged in coming to these groups. The coordinator for the FSGs said it was the most well-attended study group in history. That may have changed by now. That was several years ago. It kind of communicates the power that games can have.

That was really cool. That was a very strong thing for me to get into the games research. When I came into BMC I looked at gaming in anatomy learning. As a BMC student first-year you take a very intensive anatomy course. The thing that sparked my idea for a game in that area was that our anatomy course instructor, Dr. Riley at the time, he said, "The best way to study vascular anatomy is to imagine you're in one location in the circulatory system and you need to get to another place in the circulatory system and try to name each vessel as you go along. When you stagger then you know that's where you need to develop your knowledge" or that's where the studying needs to be.

I built a game based on that concept called Vascular Invaders. My first study experience or research experience was with that, looking at student usage of a game, volunteer usage over the course of a week before their exam and to see how their studying habits changed when given a game versus given a similar control application. That was my Masters' experience and I've just built on that in the PhD realm with Mol Worlds in terms of molecular randomness and helping students understand that. M-O-L, Mol Worlds, as in molecular world.

- CD: Oh, I just love this idea, though, about the gaming thing because I went to an ROP fair. They had all these students that were involved with these research opportunity programs but same thing. As a totally different thing from the usual posters, these students had worked on creating this ... It was a board game but it was to take two high schools and maybe grade schools but again getting students to learn in this other more fun way.
- AG: I feel like no matter what the game, no matter for what course it might be for, it's all about failure. No matter what, whether you're designing specifically because you know that you want failure to teach something or to facilitate conceptual change, no matter how you design a game it's always going to contain an element of failure and that's going to be the driving factor behind its success. Building positive failure.
- SW: This has never occurred to me before but both your work and my work in bringing games and comics to bear on research that we're doing in the Institute of Medical Science and the Department of Biology, I think people are just starting to see the incredible potential of incorporating play and creativity into the acquisition of serious knowledge and even quantitative, factual knowledge.
- Things like comics and games use a whole different part of the brain. They harness people's creativity and engagement in a really different way than more traditional kinds of learning in undergraduate education or in patient education. There's an incredible power in that. I think people are starting to see that there's a *fun* element and that's the power of them, but that doesn't make them trivial. In fact, that makes them incredibly creative, powerful vehicles for communication and for learning.
- AG: I think a much more memorable experience.
- CD: Yeah. Absolutely. One of the first graphic novels I read was *Maus* by Spiegelman. There's certain things that stuck with me and it's telling a very serious story but in such a creative and different kind of way that I can't say enough about that as a medium to communicate things.
- SW: Yeah.
- AG: We did a survey with an undergraduate biology class where the professor has integrated a series of animations. Very course curriculum-aligned animations. Then we asked how those affected textbook use in the course. A vast majority of students said they just stopped using the textbook completely or significantly reduced their use of the textbook. These media are fantastic but they do have I think some consequences, reading-wise anyways.
- SW: Well, there's still that issue of quality control. It's not like, "Oh, any animation will do" of course.

AG: Absolutely.

SW: That's what a lot of your research is about, right? What's the quality of the stimulus? I'm sure that's always a consideration. Scholarly discourse, too, takes different forms like curating an exhibit instead of writing an article.

[Theme music]

CD: Coming up: Women in Academia. Jodie, Shelley, and Andrea talk about some of the challenges and opportunities they have encountered, as well as some of the mentors who have inspired them in their respective academic careers along the way.

I opened up this next part of the interview with Jodie, Shelley, and Andrea to ask about any obstacles or challenges they may have faced, gender-based or otherwise, but also if they have words of encouragement for others looking to pursue a career in academia, as well as any notable mentors who may have inspired them over the course of their work.

JJ: I think the bigger challenge in our field has always been operating within such a highly specialized field. You're struggling so much to make people understand what it is that you actually do, and that it's an applied field within a research environment can be an additional challenge. We already have all of these challenges lined up before us.

I can't speak for Shelley, or for Andrea, but I don't feel that I've encountered the kinds of challenges that women typically do. Having said that, it's interesting to me that if you look at the men in our program with the exception of one, they all have children.

The women who have come through our program as faculty none of them do. I think that's curious.

SW: With one exception.

JJ: Who is one day a week. My great mentors, Linda Wilson-Pauwels, Margot Mackay, neither of them have had children, and I think that's a bit telling.

CD: I find even seeing the student cohort here it is usually primarily women, though, here.

JJ: In Canada that is the case that it's predominantly female. I think it's a field that you can go into and still plan a family.

AG: Is it also the case a lot of the students coming into our area have backgrounds in biology, and just in general there's this 70/30 split, at least in Canadian undergraduate biology courses.

JJ: That's a good point. Between women and men?

AG: Between women and men. Generally, 70% are female. It could be a bit of a mixture of both of those factors.

JJ: In the United States in our field, though, I think the programs are dominated by men, and the faculty as well.

SW: And the profession as a whole thinking of the Association of Medical Illustrators meetings. It seems pretty gender-balanced I'd say.

JJ: I agree.

SW: One of the opportunities that has meant a great deal to my career in BMC has been gender-based research, and so bringing a feminist perspective to bear on looking at visual communication in medicine and in medical education. In that regard, some of my mentors have been people like Gillian Einstein, who was running the collaborative graduate program in women's health, and does a lot of gender-based research into neuroscience and other aspects of healthcare. [Dr.] Pat McKeever, who is a researcher at Holland Bloorview. So a lot of really incredible women who work at that kind of intersection of feminism, gender studies, healthcare, communication.

AG: I started out my undergrad in scientific and technical illustration at Sheridan College. Actually, that brings me to a mentor. Kathryn Chorney, who is ...

JJ: We're all cheering in the background.

AG: Kathryn Chorney is a graduate from the Biomedical Communications. I think she was in Jodie's year actually. Graduation year.

JJ: We were classmates.

AG: She's a teacher at Sheridan. She teaches scientific illustration specifically. She was the one who kind of introduced our class to the field of medical illustration. That's what sparked my interest right from year one when we did human anatomy. I look back at those illustrations and they're absolutely horrible but that really propelled me on my journey towards medical illustration, preparing a portfolio, and really directing my future studies to towards getting into BMC. Yes, she was kind of pivotal in my entire career path.

CD: You're representing our grad student today and I just wondered if you could speak a little bit about if you've faced any obstacles. You're relatively new in your academic career but also ... This is something I want to ask all three of you but what sort of tips you might have for people who are just embarking on or thinking about an academic career? What you could say to give them some encouragement?

- AG: I don't know if I've faced obstacles specifically towards myself being female. I think those are maybe yet to come if I think about having children in the near future. I don't really know if it's best to get a full-time job and be able to go on maternity leave or if you squeeze it in between research contracts, how that all works. I'm not sure if there's actually resources available at the university to help people deal with that.
- As we were discussing, none of the female faculty members have gone through that process. There's no examples to follow. I'm sure that there are plenty of mothers currently teaching.
- JJ: When I think about the women who have mentored me they've been incredibly focused and tenacious women. In particular, I'm thinking about Linda Wilson-Pauwels. But I'm not sure that there was a healthy work/life balance there, and if that were the advice I would give someone like Andrea. Make sure you maintain that healthy balance. You can be focused and achieve things without losing sight of the wider perspective.
- CD: Just a shout-out in this next bit that I referenced the Raw Talk podcast from U of T's Faculty of Medicine from an episode last year that featured women in STEM.
- CD: Actually I think that came up in the Raw Talk about how women aren't good at delegating. Also, letting the dust build up underneath the bed. Some things gotta give sometimes, right?
- JJ: That's so true. Dust is our friend.
- SW: It's also a larger cultural issue in academia where it's hard to give yourself permission to have that kind of balance. In BMC I think we're incredibly lucky that the culture within our program recognizes that. As an example of something we were talking about before we started recording, the fact that women take on a lot of the emotional labor in families and not at the other end but further along in the life trajectory.
- Andrea, I and I know Jodie we've looked after elderly parents and have been incredibly lucky that our director, that Nick Woolridge, has been completely understanding about how not only does that take time but it also saps your intellectual and emotional energy for a period but that that's a part of life and it's a really important thing to be able to give yourself over to without feeling like you're going to lose your job because you felt like you had to attend to your family.
- JJ: That's very true. Yeah, that's so true. If I can speak to Andrea's gifts, her many gifts, I think in many ways Andrea is a mentor to grad students in her own program and they see what she's doing and the exciting research that she's doing. It makes them realize that there is life beyond BMC and that it doesn't

necessarily mean going right into industry. I think it's really good for students to see that.

SW: In terms of women in academia I think that's another way in which we're anomalous in that this is for most people a professional Masters' degree, preparing people for professional life outside the academy. And so pursuing this graduate degree and then staying in the academy, it's not the kind of normal trajectory that I think a lot of graduate students in research programs are assuming is going to be in their future.

AG: It'd be really great if more BMC Masters' grads went into the PhD stream because that's the only way the field will ever advance in the research realm.

CD: When I ask about mentors and role models Shelley is quick to respond.

SW: I have to say and I'm probably speaking for Andrea, too, but Jodie has been a role model.

AG: I agree.

CD: With regards to Jodie as mentor, Andrea added later on that Jodie has been a mentor to many Biomedical Communications students because she is one of the first faculty members in the field to perform empirical research into why they do what they do, why they make the design decisions that they do, and that, quite notably, Jodie is one of the first biomedical researchers to investigate how different design decisions actually affect learning, which is important to advance the field both academically and professionally.

Shelley also added that Jodie is a dedicated teacher and a sought-after research supervisor. She and Andrea, as supervisor and PhD candidate, demonstrated the possibilities of doctoral-level research in their field, a highly significant first for the academic discipline of biomedical communications.

As a peer, Jodie is always raising the bar higher and she does this all in addition to service work, public outreach, while being a lovely, calm, funny, approachable human being and someone that Shelley is honoured to call a friend.

I can tell you from working down the hall from BMC, and from an outsider's perspective, you definitely feel the department's sense of community, collegiality, and the respect they have for each other as they work together either on their own projects or in collaboration.

[Theme music]

I would like to thank everyone for listening to today's show. I would especially like to thank my three guests Jodie Jenkinson, Shelley Wall, and Andrea Gauthier for coming in to speak about their work in the BMC program, and for bearing with me as I tried my first attempt at a multi-person interview.

A big thanks for also helping me to kick off this new season in such a great way.

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Thank you!