Neuroscience and gaming

Professor Leanne Chukoskie and Professor Pamela Cosman

Talking *points*

Knowledge & Comprehension

1. What is autism spectrum disorder?
2. How do mentors support participants on the ReGame-XR programme?
3. What are the differences between hard and soft skills?
4. Why do people with autism benefit from clarity around expectations?

Application

5. What questions would you ask Leanne and the team to learn about the measurable impacts of the internship on participants?
6. Many people with autism can detect patterns in complex situations and hold intense focus for long periods of time. In which careers can you imagine these skills being highly desirable?

Analysis

7. What changes could employers make to the working environment to make it more accessible for employees with autism? How easy or challenging would it be to implement each of these changes?
8. Why do you think neuroscience is moving further towards 'systems thinking' rather than focusing on the functions of different parts of the brain?

Evaluation

9. What do you think the 'ideal' of a fully equitable and accessible workplace looks like? What barriers are currently preventing such a workplace from being a reality? To what extent do you think they can be overcome, and how?
10. Leanne, Pamela, Ara and Pierre all bring different areas of expertise to the Neurodiversity in Tech project. Which area interests you the most, and why? Which advice given by the team is most useful for you personally, and why?

Activities

1. Autism spectrum disorder in the workplace

Take some time to re-read Leanne's article and research online to learn about the challenges faced by people with autism in the workplace. This article advises employers on how to make the workplace more accessible for those with autism spectrum disorder: **www.autism.org.uk/advice-and-guidance/topics/employment/ employing-autistic-people/employers**

Now, design a poster aimed at training employers to accommodate people with autism and make their experience of work more accepting and enjoyable. Think about:

- What level and quantity of information do you want to include?
- How can you make your poster informative without being overly patronising?
- How can you convey that autism spectrum disorder can present itself in many different ways?
- How can you communicate why it is important to accommodate people with autism?
- How can you make your poster engaging and eye-catching?

More *resources*

Pamela recommends a number of YouTube channels for accessible introductions to topics in engineering, mathematics and science:

StuffMadeHere
▶ www.youtube.com/@
StuffMadeHere

Veritasium
▶ **www.youtube.com/@veritasium**

SmarterEveryDay
▶ **www.youtube.com/@
smartereveryday**

Primer
▶ **www.youtube.com/PrimerBlobs**

CNC Kitchen
▶ **www.youtube.com/CNCKitchen**

3Blue1Brown
▶ **www.youtube.com/@3blue1brown**

Leanne's expertise combines neuroscience and game design and development.

She recommends the Society for Neuroscience's 'Brain Facts' sub-site, which includes plenty of accessible information and resources about how the brain works: **www.sfn.org/sitecore/content/Home/BrainFacts2/Brain-Anatomy-and-Function**

To learn more about the art and science of game design, visit Games@Northeastern: **games.northeastern.edu**

Ara specialises in user experience research.

For support tools for starting game design and development, she suggests visiting Game Developer: **www.gamedeveloper.com/audio/38-great-resources-forgame-developers**

For more advanced information about game development, Ara recommends GDC Vault (**gdcvault.com**) which includes a video and presentation library showcasing speakers from the Game Developers Conference panels. You can choose between a free and a paid for library – both provide fascinating insights from game industry professionals talking about their own game projects.

2. Video games and eye movement

Design an experiment that examines the hypothesis of whether a person's level of experience playing video games affects their gaze or eye movement when playing a game.

You will need:
• A laptop/computer with a webcam
• Eye tracking software (find a list here: **imotions.com/blog/insights/trend/free-eye-tracking-software** – you may want to experiment with different software to find which best suits your needs)
• A straightforward online game (this list can get you started: **www.edtechreview.in/trends-insights/trends/best-online-educational-games-for-high-school-students**)
• Willing participants who agree for their eye tracking data to be recorded.

Think about how to design your experiment in a robust and meaningful way.

You will need to:
• Measure people's existing video game experience/ability (e.g., through a survey or through assessing their score(s) on a certain game)
• Devise a standardised video game experience (e.g., a set time playing a specific level of a game)
• Consider the parameters of eye movement you want to measure (e.g., speed of movement, gaze hotspots, etc.)
• Record and anonymise data
• Process and present your results.

Undertake your experiment and present your findings. What conclusions do you come to? What further experiments would help make your results more valid? What further experiments would you want to do to learn more about this type of interaction?