

F^xA Empowering Learners with Dyslexia to Reach Their Potential in STEM



Presented by:
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Shape of the Day

- ▶ Dyslexia: What is it and how does it impact learning?
 - ▷ Q & A
- ▶ Teaching practices: Empower learners through applying inclusive strategies.
 - ▷ Q & A
- ▶ Assessment Practices: Empower learners with dyslexia to demonstrate strengths and knowledge.
 - ▷ Q & A



HELLO!

I am Erin Kline

I'm inspired to help learners of all ages achieve their potential.

You can find me at
ekline@fraseracademy.ca



HELLO!

I am Amanda Vincent,

I'm inspired to support my son, my MSc students and everybody else with the superpower of dyslexia.

You can find me at:
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What Do
These
People Have
in Common?



Let's Chat
Dyslexia!

When you think of dyslexia
what comes to your mind?



Dyslexia is a specific learning disability that is **neurobiological** in origin. It is characterized by **difficulties** with accurate and/or fluent **word recognition** and by poor **spelling** and **decoding** abilities. These difficulties typically result from a deficit in the phonological component of language that is often **unexpected in relation to other cognitive abilities and the provision of effective classroom instruction**. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge.

IDA Board of Directors, 2002

**So what is the impact
of dyslexia?**

**Approximately
1 in 5 people have dyslexia.**

20% of these people go on to
post-secondary.

Why is this?

**STEM
Superpowers
of Dyslexia**

Harness the dyslexic advantage to:

- ▶ Think big picture



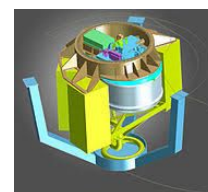
- ▶ Interconnect ideas
in novel ways



- ▶ Solve problems
with creativity



- ▶ Apply complex
spatial reasoning



Challenges of Dyslexia

- ▶ Reading extensively when accessibility options are limited
- ▶ Skim reading
- ▶ Writing labs, research papers and essays
- ▶ Note-taking in class and in the field, particularly by hand
- ▶ Following complex instructions without clear step-by-step instructions/models
- ▶ Recalling independent facts out of context during examinations (for example fill in the blank or multiple choice questions)

Experiencing Dyslexia

When Reading is not Automatic t say /th/

Magnetic resonance imaging (MRI) and other techniques illustrate quite concretely that poor readers are struggling with the basics, sounding out and recognizing words bit by bit. Good readers, however, have developed word identification habits that are supported by the posterior or back areas of the brain. The “poor reader” patterns change when remediation is successful.

Slides from:
Melissa Farrall, Ph.D., SAIF
Jane Ashby, Ed.M, Ph.D, A/AOGPE



“Imagine a dyslexic from London meeting the queen of England. It’s mind-boggling stuff, but that shows how much potential you have.”

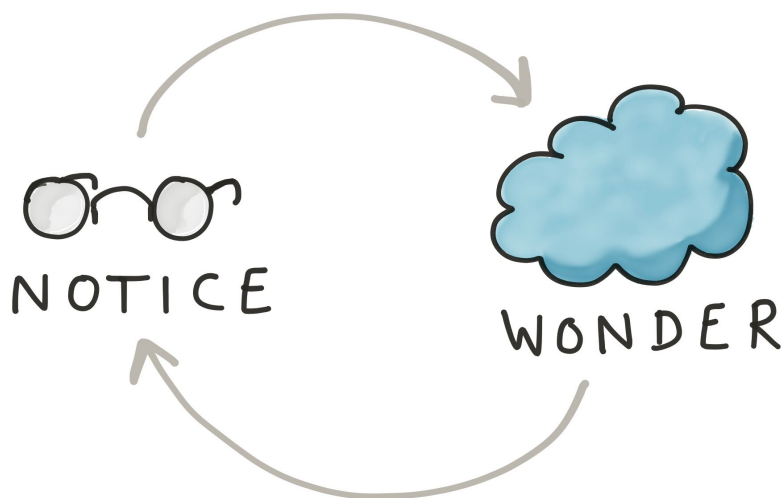
– Maggie Aderin-Pocock on receiving the MBE



DR MAGGIE ADERIN-POCOCK
Space Scientist

Looking back at my school days it was quite a chequered story

What are some of the ways described as 'thinking differently' that are helpful in STEM fields of study?



Teaching Practices: Empower Learners with Dyslexia

Beyond student advocacy; applying inclusive practices.

Myths Surrounding Dyslexia

Dyslexia is not associated with the following:

- ▶ Low IQ
- ▶ Laziness
- ▶ Indifference
- ▶ Carelessness



Superpowers of Dyslexia

- ▶ Big picture thinking
- ▶ Interconnected thinking
- ▶ Lateral thinking
- ▶ Creative problem solvers
- ▶ Brilliant spatial reasoning
- ▶ Observant of surroundings
- ▶ Highly empathic
- ▶ Communication and storytelling

Shake off the “dysteachia”!

Support learners through
accommodations and
adaptations.

Let's Talk-

Accommodations and Adaptations

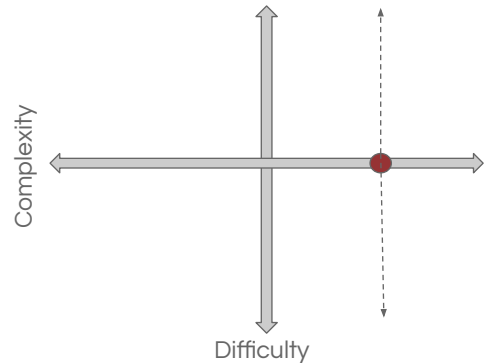
Accommodation -

- ▶ Providing supports that make learning accessible



Adaptation-

- ▶ Maintaining the complexity of expectations while adjusting difficulty



Accommodations

- Extra-time for exams
- Extra-time for essays/paper
- Provide lecture notes/slides
- Provide new vocabulary before lectures
- Audio textbooks/articles
- Recording lectures (audio or video)
- Allowing students to record lectures
- Using highly legible fonts
- Using adequate spacing on assignment outlines

Adaptations

- Clear, concise step-by-step instructions
- Provide visuals to accompany instructions (pictures or videos)
- Chunking assignments into manageable parts
- Providing templates and/or graphic organizers
- Checkpoints to ensure understanding
- Repetition and review (formative assessment)
- Multiple options for assessment (oral, visual, artistic)

Accommodations

Providing supports that make learning accessible.

How are you already
accommodating learners in
your classes successfully?

5 Simple Accommodations

1. Course content available by multiple means including books/articles, audiobooks/recordings, videos/podcast by scholars
2. Provide assignments and readings in formats accessible to text readers
3. Provide notes/slides/ vocabulary for learners ahead of time
4. Use adequate spacing on assignment outlines (min. 1.5)
5. Use easily legible fonts such: Verdana, Arial or Quesrial

**Make Course Content
Accessible!**



Adaptations

Maintaining complexity of content while adjusting the difficulty.

How are you already adapting
to learners in your classes
successfully?

**2 Beneficial
Types of
Adaptation**

1. Scaffolding
strategies



2. Formative
Assessment

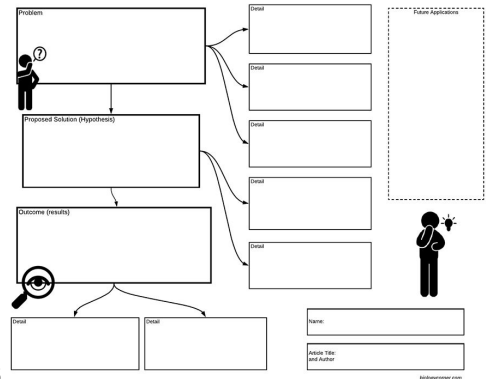


Scaffolding

Power of Scaffolding

Supports to engage and complete complex multistep problems and assignments with relative ease.

- ▶ Clear multi-step instructions (with checkboxes if needed)
- ▶ Graphic organizers and templates for assignments
- ▶ Chunking with successive due dates



How are you already scaffolding for learners in your classes?

What Does This Look Like?

Step-by-step Instructions

Date: November 23, 2021

Erin Kline

Dyslexia 101

Making Assignments Accessible

This will clarify how you can provide students with clear step-by-step instructions that include a checklist. You can edit current assignments to fit this format.

- ❑ 1. Set your steps up to include checkboxes and numbers for steps.
- ❑ 2. Use 1.5 spacing for your assignment.
- ❑ 3. Use 12 point font in Verdana, or Arial.
- ❑ 4. Use clear concise language for each step of point presented.
- ❑ 5. Include only one instruction per bullet.
- ❑ 6. If it is a lab or assignment that lends itself to the possibility include a visual to demonstrate the step.
- ❑ 7. Use the same principles when outlining modeling examples and solutions.

What does this look like?

Effective "Chunking"

- ▶ Divide the completion of assignments into smaller chunks to be completed sequentially.
- ▶ For example:
 - ▷ Annotated bibliography (Sep. 15)
 - ▷ Outline of research paper (Sep.30)
 - ▷ Draft of paper or presentation (Oct. 15)
 - ▷ Final draft (Oct. 21)



Why Use Scaffolding?

- ▶ Have structures in place to support all learners
- ▶ Increase ability to meet expectations set out
- ▶ Promotes effective learning

Formative Assessment

The power of repetition and review.

Formative Assessment

Formative (Learning)

- ▶ To gather and provide feedback to guide teaching and learning



Summative (Measurement)

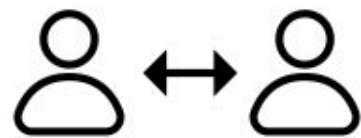
- ▶ To measure the level of proficiency that has been obtained



Formative Assessment

Student Enacted

Based on self and peer advice and feedback, coached/facilitated by the educator



Teacher Enacted

Educators gauging readiness of students to move on, provides feedback



What types of formative assessment do you use in the learning environment?

What Does This Look Like?

Teacher Enacted

- ▶ **Exit Ticket** - Write down before leaving answers to reflection questions or a 3-2-1 exit slip: 3 "Things I learned", 2 "things I found interesting", and 1 "question I still have"
- ▶ **Text Highlighting** - students are asked to highlight sections of a text that illustrate a concept. They share why they chose that text in groups or as a class.
- ▶ **Check for Understanding** - Plickers.com, iclicker.com, Polleverywhere.com, Google forms/Flubaroo, whiteboards
- ▶ **Parking Lot** - students record questions about a learning target engagement on sticky notes on a digital wall like Linoit or Padlet

Student-Enacted Strategies

When teachers are talking,
students are listening.

When students are talking,
students are learning.

What Does This Look Like?

Student
Enacted

- ▶ **Back 2 Back** - students are asked to stand back to back, are given a question to consider in 45 seconds of silence, then asked to discuss their answers or thinking with their partner.
- ▶ **Think, Pair, Share**
- ▶ **Partner Quizzes** - students work on the first question together and provide each other feedback, then work independently on a new question exercising the same concept.
- ▶ **Revision & Drafts** - students are given opportunity to revise work following self, peer, and teacher feedback.

Jigsaw

What Does This Look Like?

Student Enacted



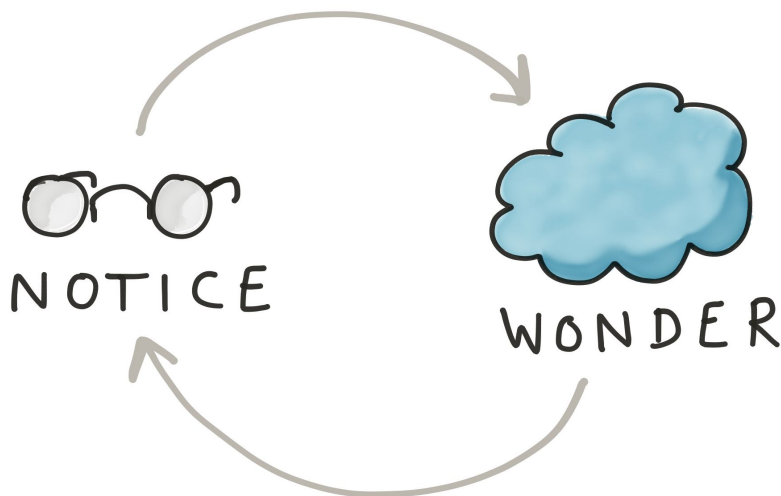
Why Formative Assessment?

- ▶ Actively monitor student progress and needs
- ▶ Provides students with greater self-awareness as to their progress
- ▶ Engages students to apply their knowledge and skills collaboratively

Let's Reflect
and Share...

Record the following:

1. One new accommodation you plan to implement
2. One new scaffolding based adaptation you plan to implement
3. One new formative assessment adaptation tool to try.



Assessment Practices: Empower Learners with Dyslexia

Beyond student advocacy; applying inclusive practices.

Which Media Do You Use for Assessment

Let's take a poll:

- ▶ Written multiple choice
- ▶ Written short answer
- ▶ Written essay
- ▶ Oral (ie. podcast, storytelling)
- ▶ Visual media (ie. video or presentation)
- ▶ Artistic media (sculpture, music, art, dance)



Why Consider Different Media for Assessment?

Superpowers of Dyslexia

- Big picture thinking
- Interconnected thinking
- Creative problem solvers
- Brilliant spatial reasoning
- Highly Empathic
- Communication and Storytelling

Empowering Types of Assessment

- Oral (ie. podcast, storytelling)
- Visual media (ie. video or presentation)
- Artistic media (sculpture, music, art, dance)

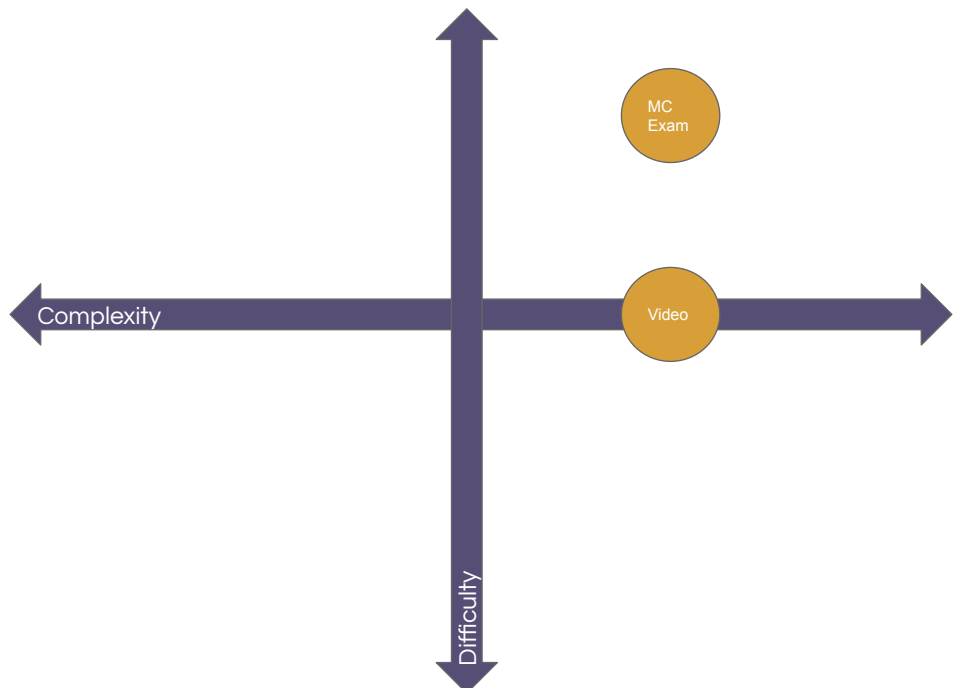
Challenges of Dyslexia

- Text heavy exams and tests
- Extensive reading
- Recalling independent facts during examinations (fill in the blank or multiple choice questions)
- Writing labs, papers

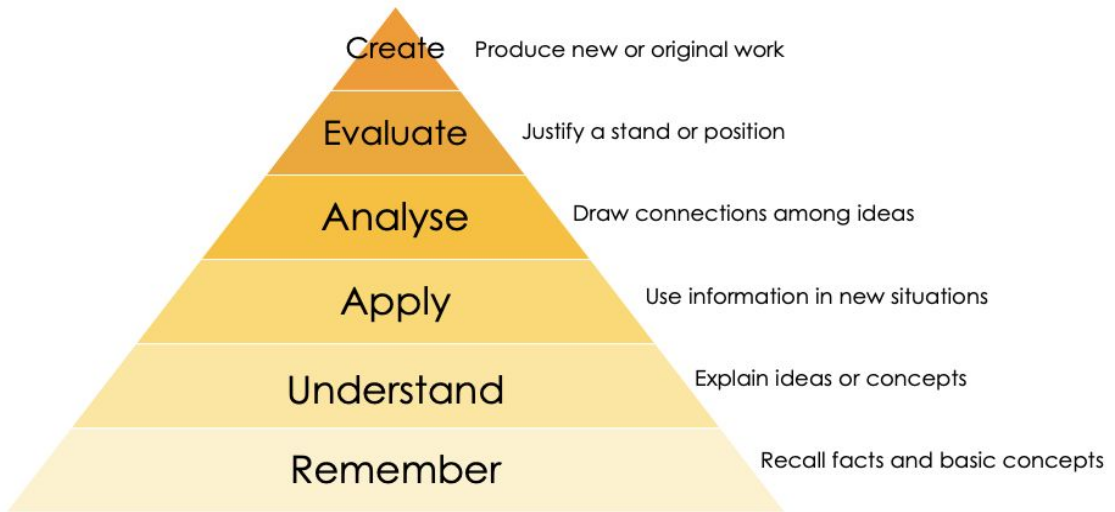
Discouraging Types of Assessment

- Written multiple choice exams
- Written short answer exams
- Written essays

Complexity Versus Difficulty



Bloom's Taxonomy



Rethinking My Teaching and Assessment

BIOL 420: Ocean Conservation and Sustainability

- ▶ Term project *
- ▶ Oral presentation*
- ▶ Blog
- ▶ Haiku
- ▶ Teaching each other
- ▶ Twitter
- ▶ Reflections *
- ▶ Policy briefing *
- ▶ e-Portfolio (website) *
- ▶ Final exam *

*** diverse media**

Applying Multi-media Assessment

“FINAL EXAM: The final examination has a take home/open book format. **Prepare answers for only two (2) of the seven (7) possible questions.** You may submit your exam in one of three formats (per question):

1. essay (\leq 1000 words),
2. podcast (\leq 10 mins) or
3. video (\leq 10 mins).

If you choose a podcast or video, indicate your intended audience, which should be adult and intellectually strong. If you wish to present another format for your exam, you must obtain approval from Amanda.”

Building Rubrics to Work Across Media

Rubric for assignments/exam

Outstanding 90-100

- ▶ excellent critical thought is evident
- ▶ all topics covered with just the right detail
- ▶ very well organized, easily followed and understood
- ▶ offered me a new angle on the issue ... etc

Very Good 80-90

- ▶ good original critical thought is evident
- ▶ content covers all topics but with uneven detail or coverage of content
- ▶ well organized, good flow, quite easy to follow and understand, key points clear ... etc

**Possibilities
for Large
Classes**

1. Reduce the number of multiple choice questions; consider more short answers^{a.}
2. Provide a recording of multiple choice questions^{a.}
3. Consider oral exams for students who disclose their learning differences

**Context is
Important**

Be realistic...

What changes in assessment are available to you?



What is Possible for You?

Let's reflect...

Take a moment.



How might you change one upcoming assessment to be more inclusive?

In Conclusion...

Empower All Learners!

Celebrate strengths

Accommodate and adapt as possible

Provide flexible media for assessment



Questions, comments ...

Any last questions, thoughts



We welcome your feedback

Please take a moment to complete the form.

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