SUPPORTING PUPILS WITH VISUAL IMPAIRMENT IN THE PRACTICAL SCIENCE

Biochemical Society – Diversity in Science Grant 2022

The Gordon Schools, Huntly
Aberdeenshire
Applicants are required to provide a post-activity report (500 – 1000 words) by 31 October 2022. This should give a brief overview of the project, including photographs where possible. The report may be posted on the Biochemical Society website and printed in The Biochemist, so all necessary permissions for the use of any supplied images and names must be secured before submission.

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WHAT DID WE DO?

Pupil Support Assistants working at a remote rural school in Aberdeenshire were able to learn more about supporting pupils with visual impairment in the science classroom. Money from the Biochemical Society’s Diversity in Science Grant was used to purchase a range of equipment, including a large print labeller, new goggles, measuring cylinders, food dye and waxed string sticks.

**Figure 1** Pupil Support Assistants from Aberdeenshire Council taking part in a workshop on Supporting Pupils with Visual Impairment in the Practical Science Laboratory
Figure 2 Equipment purchased with the Diversity in Science Grant to enable Pupil Support Assistants to better support pupils with visual impairment in practical science labs.

Figure 3 An example of the improved labelling made possible with the purchase of a large print labeller.
HOW DID WE DO IT?

Staff participated in a one-hour workshop, to learn more about different types of visual impairment, including eye-based visual impairments such as nystagmus and brain-based visual impairments like CVI (Cerebral Visual Impairments). The pupil support assistants were able to get hands-on and compare and contrast the new and old equipment while using a range of goggles modified to simulate different impairments such as a loss of central field, a loss of peripheral field or an overall reduction in contrast sensitivity.

HOW DO WE KNOW THE TRAINING WORKSHOP WAS SUCCESSFUL?

We asked the workshop participants how confident they felt at the start and the end of the workshop.

![Graph showing self-reported confidence at supporting pupils in practical science](image)

**Figure 4** Graph to show participants self-reported confidence at supporting pupils in practical science.

A questionnaire at the start of the workshop and at the end demonstrated the impact of the session, participants were able to name a wider range of visual impairments and had a greater awareness of the impact this could have on pupil learning.
PARTICIPANTS KNOWLEDGE OF VISUAL IMPAIRMENTS AT THE START OF THE WORKSHOP

macular degeneration
glaucoma
cataract
blindness

colourblind
laziness

dry eye
detached retina
retina
eye

PARTICIPANTS KNOWLEDGE OF VISUAL IMPAIRMENTS AT THE END OF THE WORKSHOP

cerebral visual impairment
long sight
short sight
cataract

lower visual field impairment
reduced visual field
reduced contrast
dorsal stream dysfunction
fovea

retinopathy
colourblind

reduced sensitivity impairment
cerebral visual impairment
contrast
cerebral visual impairment
macular degeneration
FEEDBACK FROM PARTICIPANTS WAS OVERWHELMINGLY POSITIVE

“Very good! Very informative, made me think about pupils that may have conditions”

“Really informative, videos and using the visually impaired goggles really helped see from their perspective”

“I learned so much about different visual impairments”

“Very interesting, useful and thought provoking”

“I have learned lots from this session about conditions I was not aware”

“The new tactile measuring cylinders and waxy string were v. helpful”.

CONCLUSIONS

The workshop also gave PSA staff the opportunity to feedback to science staff about the importance of having support materials available. An unanticipated benefit of the workshop was that several PSA staff noted that they themselves have a visual impairment and that the resources that were beneficial for the pupils were also of use to them.

The improved resources are now in regular use in our science classrooms, benefiting teaching and learning in our science classes.
Supporting Practical Science for Pupils with Vision Impairment

Pupil Support Assistants and Science Staff
The Gordon Schools – Huntly
2022
Universal Design

If you make things easier for one group of people, you often improve things for others as well.

Grant of £500 to purchase new equipment
Aberdeenshire Council - The Experts

Additional Support Needs, Inclusion, Equity and Wellbeing

Sensory Support Services
Aberdeenshire Sensory Support Service is a peripatetic service staffed by:-

- Teachers who specialise in working with pupils with a hearing or visual impairment
- Communicators qualified and experienced in using either British Sign Language or Braille

https://asn-aberdeenshire.org/sensory-support-services/

Can you name any visual impairments?

- Short sight / Long Sight
- Cataracts
- Retinopathy
- Glaucoma
- Nystagmus
- Retinitis pigmentosa
There are 2 categories of visual impairment

Eye Based
- Ocular Visual Impairment
- OVI

Brain Based
- Cerebral Visual Impairment
- CVI

Different types of OVI’s and CVI’s

<table>
<thead>
<tr>
<th>OVI (Ocular / Eye Impairments)</th>
<th>CVI (Cerebral / Brain Impairments)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short or Long Sight</td>
<td>Lower visual field impairment</td>
</tr>
<tr>
<td>Cataracts</td>
<td>Simultanagnosia</td>
</tr>
<tr>
<td>Glaucoma</td>
<td>Optic ataxia</td>
</tr>
<tr>
<td>Nystagmus</td>
<td>Hemi-inattention</td>
</tr>
<tr>
<td>Retinitis pigmentosa</td>
<td>Reduced contrast sensitivity</td>
</tr>
</tbody>
</table>
## Differences between OVI’s and CVI’s

<table>
<thead>
<tr>
<th></th>
<th><strong>OVI (Ocular/Eye)</strong></th>
<th><strong>CVI (Cerebral/Brain)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Often Stays the Same</td>
<td>Changes minute to minute</td>
</tr>
<tr>
<td>2</td>
<td>Can deteriorate over time</td>
<td>Can improve over time</td>
</tr>
<tr>
<td>3</td>
<td>Easier to diagnose</td>
<td>Harder to diagnose</td>
</tr>
<tr>
<td>4</td>
<td>Increasing Text Size can help</td>
<td>Decreasing Text Size can help</td>
</tr>
<tr>
<td>5</td>
<td>Hearing can compensate</td>
<td>Hearing can be impaired</td>
</tr>
<tr>
<td>6</td>
<td>Pupil is aware of difficulties</td>
<td>Pupil can be unaware of difficulties</td>
</tr>
</tbody>
</table>
Science lab without visual field impairment

Science lab with a lower visual field impairment
Science lab with lower visual field impairment and reduced contrast sensitivity

Can you see who comes in the door?
What if you could only focus on one object at a time?

In mainstream schools CVI is likely to be three times more common than autism.

CVI
On average, at least one child in every class of thirty.

https://cviscotland.org/mem-portal/cvi-prevalence-paper-cvi-project-findings--31-03-2021
CVI-SIM
Cerebral Visual Impairment Simulations
There are many types of visual impairments

https://vimeo.com/647187016

CVI SCOTLAND
Sharing and Developing our Understanding of CVI

ABOUT CVI SCOTLAND WHAT IS CVI? RESOURCES LESSONS BLOGS & NEWS CVI READING TOOL

Understand CVI Assess CVI Support CVI

Quick Website Tour WATCH NOW
It’s time to experiment!

It’s Feedback time...
Thank you for your time

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Scotland has one of the most sophisticated systems for recording visual impairments in children in the world.

Approximately 0.07% of children in Scotland have a CVI diagnosis. That means, from these findings, that for every child in Scotland with a CVI diagnosis, there are likely at least fifty who remain undiagnosed.

From this study, we also learn that of these undiagnosed fifty, 40 (80%), are likely to be struggling at school.

https://cviscotland.org/mem-portal/cvi-prevalence-paper-cvi-project-findings--31-03-2021