

An evaluation of Learning About Neurodiversity at School (LEANS)

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#LEANSproject



THE UNIVERSITY
of EDINBURGH

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The LEANS research team:

Dr Sarah McGeown, Dr Dinah Aitken, Fergus Murray, Prof. Will Mandy, Liam J. J. Peacock, and Prof. Sue Fletcher-Watson [PI]

The educator participatory design team:

Amy Nic Thaidhg, Chris Rigby, Erin Marie Tschiderer, Fiona McBryde, Joan McDonald (Posautive), Kate Bradley, Kirsten Duncan, & Sarah Douglas

Our amazing illustrator: Claire Hubbard (@emseeitch)



Disclosure: LEANS received funding from Autistica to help support the resource development and release.

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What is LEANS?

- LEANS is a **new resource pack** to introduce neurodiversity concepts to mainstream primary classes in an accessible and engaging way.
- **Designed for ages 8-11**
- Curriculum is **teacher-delivered** over ~1 school term
- **Whole-class programme:** neurodiversity includes and affects everyone!
- Available for download free, worldwide, right now!
<https://www.ed.ac.uk/salvesen-research/leans>



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Resources are grouped into topic units

1. Introducing neurodiversity
2. Classroom experiences
3. Communication
4. Needs and wants
5. Fairness
6. Friendship
7. Reflecting on our actions



Multiple types of **resource items** with complementary roles (hands-on activities, stories, videos, posters)

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LEANS goals: Going beyond “the facts”



- **KNOW:** To increase **knowledge** of neurodiversity terms and concepts.
- **THINK:** To create more positive **attitudes** towards neurodiversity and neurodivergence.
- **DO:** To increase individuals' positive and inclusive **actions** within the school community, following participation in the LEANS curriculum.

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Evaluating LEANS

“Did it work?”

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Evaluation goals

1. **Does LEANS work, practically?** Assess its acceptability and feasibility in real classrooms.
2. **Does LEANS work as a teaching tool?** Do children learn neurodiversity concepts, and do their attitudes or intended actions change?

"Know-Think-Do" goals

Project goals

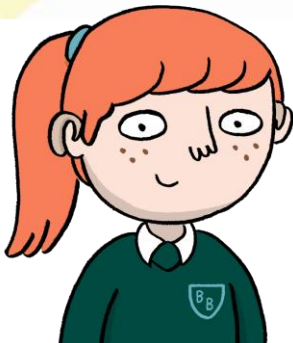
- Use pupil and teacher feedback to **update and revise** the resources before final public release



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LEANS evaluation participants

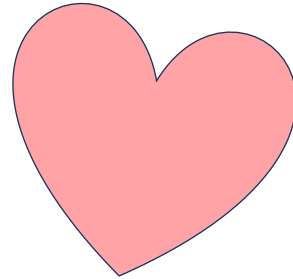
- LEANS was tested in four Scottish schools in 2021, delivered to 8 classes by qualified teachers.
- 139 children completed LEANS, with **62** of these formally enrolled in the study (parent/carer permission for data sharing with researchers).
- Of enrolled participants:
 - Gender reported as female=36, male 26
 - Average child age of 9.84 years
 - 17.74% had parent-reported learning difficulties (some diagnosed, some undiagnosed)



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Thank You!

To our participating schools and classes.
You made a huge contribution to LEANS!



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Study structure

Pre-test

Attitudes and actions
questionnaire (**AAQ**)

Includes 1 "**critical
item**"
(neurodiversity
definition)

LEANS curriculum

**Written teacher
diaries** for each unit

Post-test

Attitudes and actions
questionnaire (**AAQ**)

Neurodiversity
knowledge
questionnaire (**NDKQ**)

Pupil **free-response
questions** (on NDKQ)

Pupil **interviews**

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Pre-registered hypotheses

- Mean **AAQ** scores expected to increase from baseline to outcome.
- Percentage of children passing the **neurodiversity definition item** expected to increase from baseline to outcome.
- Mean scores on the **NDKQ** are expected to be significantly above chance (20%, or a score of 1.6 out of 8 multiple-choice items) at outcome.

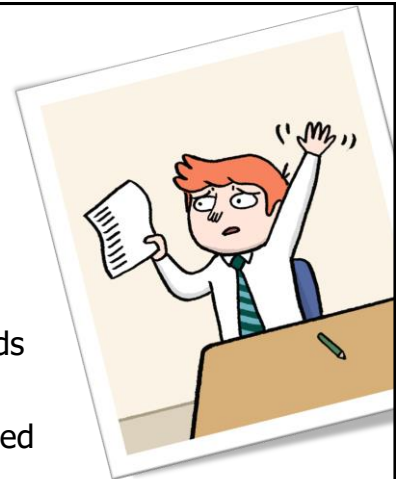
NB: We specified use of one-tailed t-tests

See our pre-registration and copies of quizzes here: <https://osf.io/38jrh>

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Attitudes and actions

- **Multiple-choice questions** asked pupils to make judgements about fictional school situations, or to choose what they thought was the best course of action (e.g. what to do if they think a classmate needs help)
- Post-LEANS, mean AAQ multiple choice score increased from 4.48 to 5.62 ($p < .001$).
- This means that after LEANS, more children endorsed courses of action (or judgements about school situations) that align with the LEANS content.



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Neurodiversity knowledge



- **Neurodiversity target item**

- Before LEANS, **17.7%** of study participants chose the correct definition of neurodiversity (worse than chance!)
- After LEANS, **59.7%** were able to chose the correct definition, an increase of 42%!



- **NDKQ scores:**

- Average score of 5.08 (out of 8) was significantly different than chance level, per a single-sample t-test ($p < .001$)



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Pupil free responses: "What is something new that you learned from doing LEANS?"

"I learned about Neurodiversity and how brains process info differently. Depending on whether they are Neurodivergent or Neurotypical."

"There is a difference between NEED and WANT"

"I learnt a lot more about fairness"

"People are different and shouldn't feel that they have to change."

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“Please continue to teach
children about
neurodivergent people.”



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Teacher reflections on impact 1

"I think that studying LEANS genuinely made an impact on the class. Individual children felt and explained that they recognised themselves as neurodivergent (in different ways) and they appeared to have a 'penny drop' moment.... I think it helped children to have a better understanding of the way others are/feel, and also why learning can be different and is delivered differently to them."

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Teacher reflections on impact 2

"They realised that having a laptop at writing time [and other supports] all allowed children to have the same access to the curriculum...There is a better sense of empathy within the class, an understanding, a tolerance and acceptance."

"Parents of neurodivergent children [were] very happy we were exploring this concept in class."

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Using the evaluation feedback

Big issues:

- High amounts of reading and preparation were a problem, especially delivering LEANS over a short time period.
- Pupils often liked stories, but found them too long (too much listening!)

Big changes:

- We now recommend longer delivery timescale
- Revised the teacher handbook to simplify steps and cut repetition
- Cut **28%** of the total story content

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LEANS is here.



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<https://www.ed.ac.uk/salvesen-research/leans>

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