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Understanding dyslexia

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About this free course

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Introduction and guidance

Introduction and guidance

Welcome to this free course, *Understanding dyslexia*. The course lasts 24 hours and is comprised of eight weeks. You can work through the course at your own pace, so if you have more time one week there is no problem with pushing on to complete a further study week. The eight weeks are linked to ensure a logical flow through the course. They are:

- Week 1: Defining dyslexia
- Week 2: Identifying dyslexia
- Week 3: Explaining dyslexia
- Week 4: Experiencing dyslexia
- Week 5: Supporting dyslexia
- Week 6: Dyslexia strategies in practice
- Week 7: Dyslexia in the workplace
- Week 8: Drawing the threads together

Each week should take you around 3 hours, but remember to work at your own pace. There are no time limits on this course. There are a number of activities throughout the course where you are asked to note down your response. A text box is provided for you to do this, however if you would prefer to record your answers in another way that is fine. If you choose to use the text boxes, please be aware that no one else will be able to see what you write. Your answers are only visible to you.

At the end of each week there is also a quiz to help you check your understanding. And, if you want to receive a formal statement of participation and digital badge, at the end of Weeks 4 and 8 there is a quiz which you need to pass. The quizzes for Weeks 1–3 and 5–7 are designed to help you practise and gain confidence in the types of questions used in the badge quizzes. You must also be enrolled on the course in order to track your learning and reach 100% completion.

After completing this course, you should be able to:

- understand a variety of definitions and perspectives on dyslexia
- discuss some of the different explanations given for the observed symptoms of dyslexia
- recognise the challenges faced by individuals with dyslexia in educational and professional settings
- apply dyslexia-friendly strategies to foster inclusive, engaging environments in both educational and professional contexts
- outline the disclosure process, workplace assessments, and reasonable adjustments for dyslexic employees.

Moving around the course

In the ‘Summary’ at the end of each week, you will find a link to the next week. If at any time you want to return to the start of the course, click on ‘Full course description’. From here you can navigate to any part of the course.

It’s also good practice, if you access a link from within a course page (including links to the quizzes), to open it in a new window or tab. That way you can easily return to where you’ve come from without having to use the back button on your browser.

The Open University would really appreciate a few minutes of your time to tell us about yourself and your expectations for the course before you begin, in our optional start-of-course survey. Participation will be completely confidential and we will not pass on your details to others.

What is a badged course?

While studying *Understanding dyslexia* you have the option to work towards gaining a digital badge.

Badged courses are a key part of The Open University's *mission to promote the educational well-being of the community*. The courses also provide another way of helping you to progress from informal to formal learning.

Completing a course will require about 24 hours of study time. However, you can study the course at any time and at a pace to suit you.

Badged courses are available on The Open University's OpenLearn website and do not cost anything to study. They differ from Open University courses because you do not receive support from a tutor, but you do get useful feedback from the interactive quizzes.

What is a badge?

Digital badges are a new way of demonstrating online that you have gained a skill. Colleges and universities are working with employers and other organisations to develop open badges that help learners gain recognition for their skills, and support employers to identify the right candidate for a job.

Badges demonstrate your work and achievement on the course. You can share your achievement with friends, family and employers, and on social media. Badges are a great motivation, helping you to reach the end of the course. Gaining a badge often boosts confidence in the skills and abilities that underpin successful study. So, completing this course could encourage you to think about taking other courses.

How to get a badge

Getting a badge is straightforward! Here's what you have to do:

- read each week of the course
- score 50% or more in the two badge quizzes in Week 4 and Week 8

For all the quizzes, you can have three attempts at most of the questions (for true or false type questions you usually only get one attempt). If you get the answer right first time you will get more marks than for a correct answer the second or third time. Therefore, please be aware that for the two badge quizzes it is possible to get all the questions right but not

score 50% and be eligible for the badge on that attempt. If one of your answers is incorrect you will often receive helpful feedback and suggestions about how to work out the correct answer.

For the badge quizzes, if you're not successful in getting 50% the first time, after 24 hours you can attempt the whole quiz, and come back as many times as you like.

We hope that as many people as possible will gain an Open University badge – so you should see getting a badge as an opportunity to reflect on what you have learned rather than as a test.

If you need more guidance on getting a badge and what you can do with it, take a look at the OpenLearn FAQs. When you gain your badge you will receive an email to notify you and you will be able to view and manage all your badges in My OpenLearn within 24 hours of completing the criteria to gain a badge.

Get started with Week 1.

Week 1: Defining dyslexia

Introduction

Welcome to Week 1 of *Understanding dyslexia*! This week will lay the foundation for our deep dive into the world of dyslexia. Some key terms and ideas will be introduced, including:

- how society's views on disabilities have changed over time
- two different ways of thinking about disability and the idea of 'intersectionality'
- in-depth exploration of the world of dyslexia definitions.

You'll start your journey by looking at the disability rights movement that took place in the 1960s. This was a pivotal time that greatly influenced how we understand dyslexia today. So, let's get started!

By the end of this week, you should be able to:

- understand how societal views on disabilities have evolved over time, particularly influenced by the disability rights movement of the 1960s
- describe how these societal views impact the current understanding of dyslexia
- explain different ways of thinking about disability, including the concept of intersectionality
- demonstrate a comprehensive understanding of various definitions and perspectives on dyslexia.

The Open University would really appreciate a few minutes of your time to tell us about yourself and your expectations for the course before you begin, in our optional start-of-course survey. Participation will be completely confidential and we will not pass on your details to others.

1 Our changing views on disabilities and dyslexia: a journey through time

It's vital to consider multiple perspectives here, as our understanding of a topic is enhanced by the comparison of research findings from different viewpoints. This course shows how research from cognitive, biological and neuropsychological perspectives can be combined to offer a more complete account of conditions like dyslexia. The course therefore presents dyslexia as a 'case study' in how different perspectives might be complementary to each other.

In the UK, dyslexia is relatively common, and you may know about it through friends or family, or your own personal experience. Awareness has not always been widespread, however, and in some countries, there is no recognition or acceptance of this condition. The following section illustrates the dyslexia journey in the UK.

1.1 Disability rights movement

The 1960s was a period of profound social change during which individuals began questioning societal norms. Such a climate supported equality, shattering stereotypes, and barriers. Activists fought tirelessly, transforming societal attitudes and legislation, paving the way for a more inclusive world. A key breakthrough from this movement was a change in how we view disability. Instead of focusing solely on the medical aspects of each condition, there's now a greater emphasis on how societal biases significantly shape our perception and understanding of disability. Their courage continues to inspire and shape our understanding of disability today.

1.2 The myth of dyslexia

Dyslexia is a complex condition that affects the brain (known as a 'neurological condition'), and it can present challenges with reading, writing, spelling, organising, managing time, and remembering things. The term, coined in 1883 by ophthalmologist Rudolf Berlin, originates from two Greek words: 'dys' and 'lexis'.

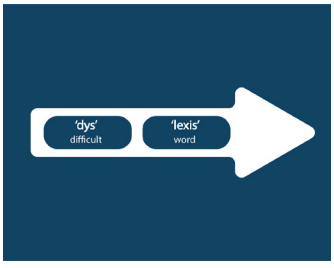


Figure 1 The meaning of dyslexia

He chose the word to denote difficulties with words by patients (Wolf et al., 2024); later on, another two physicians, Morgan and Hinshelwood (based on the work of German ophthalmologist Kussmaul, 1878) used the word to describe a kind of 'word blindness' where people had trouble reading.

Wolf et al. assert that the first explanations were linked to the visual system. Nowadays, we know that dyslexia is not due to vision problems, but because of how the brain works, that is, neurobiology (discussed later in Week 3).

Over the years, understanding of dyslexia has evolved significantly. In the UK, between 1963 to 1972, the Word Blind Centre for Dyslexic Children initiated discussions on dyslexia, leading to the Warnock Report 1978. The report was instrumental in defining dyslexia as disability integrated now in the Disability Discrimination Act of 1995.

Despite progress, dyslexia was initially dismissed as a myth by some, instead being viewed as an excuse for poor academic performance. However, attitudes shifted over time with the Rose Report 2009 and the Equality Act 2010 recognising dyslexia as a real learning difficulty affecting various cognitive functions (this means how the brain works). Yet, perceptions vary globally, with some still viewing dyslexia as a myth or a curse.

Activity 1 What do you know?

Allow about 5 minutes

This activity will test what you already know about dyslexia. Below, you'll find a list of 15 traits. Just drag and drop the ones you think are related to dyslexia into the box in the middle. Give it a go!

This interactive is not available in this format of the course. Please refer to the online version of the course.

Discussion

In fact, **all of these traits** are associated with dyslexia. Of course, not every individual with dyslexia will exhibit each one – the manifestation of dyslexia can vary significantly from person to person. A longer list of associated traits will be explored as you progress through this course.

2 Exploring different perspectives on disability

This section explores the complex nature of disability. It encourages understanding disability through two models which serve as a tool to frame discussions and approaches towards disability. After evaluating these two models, you'll examine invisible disabilities and the role of identities such as gender, age, ethnicity, social class, and sexuality among others (this is called intersectionality), that may affect how we treat people.

2.1 Medical model of disability

From the medical point of view, the term 'disability' is defined as a physical or mental condition that limits a person's ability to undertake normal daily activities. Before the 1960s, society's understanding of disability was largely shaped by the medical model. The model, rather than defining disability, influences society's psychological, political, and economic responses to it. In this model, disability is seen as a problem that belongs to the individual, requiring medical diagnosis and treatment. Instead of addressing the external barriers a person might experience due to their disability, the emphasis is on treating or curing the individual. The model focuses on what is 'wrong with the person', so it can be 'fixed' by medicine or other treatments.

Unlike the medical model and its focus on individuals, the social model highlights the role of society and environment in disability. You'll explore this model next.

2.2 Social model of disability

This model was introduced in 1983 by the disability rights activist and academic Mike Oliver, a wheelchair user himself, and his colleagues. In their book 'Social Work with Disabled People' they redirect the focus from personal limitations to societal barriers; examples used a few times in their book demonstrate structural barriers, such as the lack of wheelchair ramps. This example is still used to demonstrate the environmental barriers which impede disabled people rather than the individual's impairments themselves (medical model). This shows that societal barriers hinder inclusion, and it is the society that construes disabilities.

The social model recognises people with disabilities as a historically oppressed minority group, requiring a universal transformation by understanding disability as a societal matter and emphasising collective solutions. The model focuses on what 'the person needs'; and today, the social model is endorsed by the UK Government Equalities Office which recommends all government departments to use it.

The social model promotes a more inclusive society – and this is something we should all advocate for.

2.3 Assessing the two models

Imagine approaching a building with the intention of entering, only to find that a set of stairs blocks your way. Where does the problem lie in this scenario? Is it the individual's physical limitation, or is it the environment that fails to accommodate diverse needs?

This next activity encourages you to consider the two perspectives: the medical model and the social model. As a result, you'll explore how framing the issue differently can influence attitudes, policies, and ultimately, inclusion.

Activity 2 Analysing a scenario

Allow about 15 minutes

Consider the scenario in Figure 2. According to the two models you've learned about, where does the problem lie?

Figure 2 Where does the problem lie?

Provide your answer...

Discussion

The medical model would suggest this is a personal challenge one must overcome at the individual level with the help of medical specialists. The model says the problem is the person that needs a wheelchair. This example can lay the foundation for discrimination.

The social model would suggest that addressing the external barriers a person experiences is crucial for fostering an inclusive society. The model says that the problem is the lack of consideration in the design of the building.

Having considered the two models, reflect now on the kinds of environment these models could foster, and consider the following questions.

In many environments, accessibility remains a significant challenge for individuals who use wheelchairs. Buildings that lack proper accommodations, such as ramps or elevators, can severely limit mobility and independence. This not only affects physical access but also has profound implications for a person's wellbeing and self-worth.

How might a person's wellbeing and self-worth be impacted?

Provide your answer...

How might an educator's or employer's awareness of the social model of disability reshape their strategies for supporting those with dyslexia?

Provide your answer...

Watch this ten-minute short film called 'Enitan':

Video 1: Enitan (open the link in a new tab/window so you can return here easily)

However, barriers are not just physical. Next you will start to look at invisible disabilities.

2.4 Invisible disabilities

Invisible disabilities, unlike visible ones, are not immediately apparent. They include conditions like chronic pain, fatigue, cognitive variations, sleep disorders, and mental health issues. These individuals often face scepticism or judgment due to the invisible nature of their challenges, complicating efforts to foster inclusive environments.

Dyslexia, as a neurological condition, is one such invisible disability. Dyslexic people may struggle with routine activities like reading a menu at a restaurant or interpreting a graph during a business meeting, and their neurological differences can lead to misperceptions of laziness or unintelligence. These misconceptions can significantly impact their experiences in traditional educational settings, where instruction is primarily delivered through reading and writing.

Activity 3 Considering the two models

Allow about 15 minutes

Investigate the interplay between dyslexia (invisible disability) and the two leading models of disability. Create two specific scenarios involving the same individual with dyslexia.

In the first scenario, place that individual in an environment that reflects the medical model of disability and perceives the individual's dyslexia as a problem that needs fixing.

Provide your answer...

In the second scenario, place them in a setting that embodies the social model, where dyslexia is not seen as the individual's problem and the environment itself adapts to accommodate everyone's unique way of learning and processing information.

Provide your answer...

Now, match these two scenarios to the corresponding model of disability.

Scenario 1

Esther, who has dyslexia, is a student in a traditional school where the curriculum is rigid and standardised. The school views dyslexia as a problem that resides within Esther. She struggles with reading and writing tasks. The school responds by providing Esther with extra tutoring and remedial classes, aiming to 'fix' her dyslexia. Esther is often pulled out of regular classes for these sessions, making her feel different from her peers.

Scenario 2

Adebayo works in a place where dyslexia is not seen as a problem within the person, but rather as a difference that the workplace should accommodate. The workplace uses inclusive strategies that cater to diverse styles. For instance, they provide audiobooks and use visual aids to complement text-based materials, allowing Adebayo to learn and progress in a way that suits him best. They also provide assistive technology like text-to-speech software to help Adebayo with reading and writing tasks. In this setting, Adebayo is not singled out for extra support.

Medical model

Social model

Match each of the items above to an item below.

Scenario 1

Scenario 2

Discussion

Scenario 1 is an example of the medical model of disability. The focus is on what Esther can't do, rather than on her strengths or interests. This approach can lead to feelings of inadequacy and low self-esteem for Esther.

Scenario 2 is an example of the social model of disability. This approach fosters a sense of belonging and self-confidence in Adebayo, allowing him to thrive academically and socially.

2.5 Intersectionality

To gain a more integrated understanding of how disability can be perceived and experienced, it's helpful to consider how categories such as race, gender, class, age, sexuality among others can overlap to create complex systems of advantage and disadvantage. In order to describe how an individual's various identities can intersect to form a unique experience of privilege or discrimination, the social rights activist and academic Kimberlé Crenshaw introduced the concept of 'intersectionality', which has since developed and expanded.

Watch this three-minute video on intersectionality produced by Professor Peter Hopkinson, Newcastle University:

View at: youtube:O1islM0ytkE

Video 2 Intersectionality

The concept of intersectionality suggests that different prejudices can compound upon one another to create a unique experience of oppression. For instance, if the wheelchair user from Activity 2 were a Black woman, her experience would be shaped not only by her disability but also by her race and gender. Beyond the physical accessibility barriers, she might also face general challenges in education or the workplace due to racial prejudices, and as a woman she could also encounter discrimination stemming from gender biases and societal expectations. So, her racial identity could influence how her disability is perceived, and her gender might affect how her race and disability are understood.

Consider this scenario featuring a young woman named Clara, who is of British African descent and has dyslexia. She's currently working in a tech company as a software engineer as a junior programmer. Clara uses a wheelchair due to a spinal cord injury. She is highly qualified and holds a degree in computer science.

Clara applies for a job at a tech company. Despite her qualifications, she faces several challenges throughout the process. The company's office is in a building without proper wheelchair accessibility, making it difficult for her to even attend the interview. This is a direct result of her disability intersecting with societal neglect for inclusive infrastructure.

During the interview, Clara senses that the interviewers are uncomfortable and unsure how to interact with her. They seem more focused on her wheelchair than her qualifications. Despite these challenges, Clara performs well in the interview until she is asked to provide feedback on a confidential paper with some instruction of an app that the company is working on. She was puzzled by all these words on the paper and asked the interviewers to provide her with more time.

She later learns that the job was given to a less qualified candidate. She can't help but wonder if her invisible disability and visible one, together with her race have played a role in the decision, as the tech industry is known for its lack of diversity and racial representation. Furthermore, Clara notices that her gender also affects her experiences. She often finds herself being talked over or dismissed in professional settings, a common experience for many women due to societal gender biases.

In this scenario, Clara's experience of oppression is not just about her disabilities, race, or gender alone. It's the intersection of all these identities – being a black woman with a disability – that shapes her unique experience. This is the essence of intersectionality. It's crucial to foster understanding and inclusivity in all environments to ensure everyone is given the opportunity to succeed. We all must address and acknowledge these intersecting forms of discrimination to promote true equality and inclusivity.

Activity 4 Examining intersectionality

Allow about 10 minutes

Create a specific scenario featuring an individual with dyslexia. Reflect on how their race and gender can impact how their learning difficulty is perceived in a specific educational or working environment, and examine the distinctive experience of discrimination or privilege that might arise from this intersection of identities.

Provide your answer...

Discussion

Imagine Paulina, a Black woman with dyslexia, working in a corporate environment. Now, consider John, a white man with dyslexia, in the same environment. Reflect on how their race and gender might influence the perception of their learning difficulties and the emotional impacts that arise. He might receive more empathy and support due to societal privileges associated with his race and gender. This support can foster a sense of belonging and confidence, positively impacting his emotional state. He may feel more understood and valued, which can enhance his overall wellbeing. Paulina may face stereotypes that question her competence, leading to feelings of inadequacy and frustration. The lack of understanding and support for her dyslexia can exacerbate these emotions, making her feel isolated and undervalued.

A scenario like this highlights the emotional toll that the intersection of race, gender, and learning difficulties can have on individuals. It underscores the importance of creating inclusive environments that recognise and address these emotional impacts to support the wellbeing of all individuals.

3 Dyslexia defined

There are two types of dyslexia: acquired dyslexia and developmental dyslexia. Acquired dyslexia, called ‘alexia’, is caused by trauma or brain pathologies like stroke, resulting in partial or complete reading inability. Developmental dyslexia, often hereditary and present at birth, is typically what people refer to today.

The definition of dyslexia has evolved since the 1880s and remains a debated topic, unlike other neurodivergent conditions like Attention Deficit Hyperactivity Disorder (ADHD), which has universally accepted definitions and clear diagnostic criteria. Various stakeholders, including researchers, advocates, practitioners, and legislators, have contributed to the evolution of dyslexia definitions, each capturing different aspects of the condition. This ongoing dialogue enhances our understanding of this complex condition over time. By looking into all of this, you’ll see how our understanding of dyslexia has changed over the years. But more than that – you’ll have a fuller picture of what dyslexia really is. It’s a complex condition, but the more you know about it, the better you can understand it.

3.1 Tracing the transformation: how the definition of dyslexia has evolved over time

The understanding of dyslexia has evolved over time. Initially, Tansley (1957) and the World Federation of Neurology (1968) defined dyslexia as an ‘inability to read’ despite conventional instruction and adequate intelligence. Critchley and Critchley (1978) expanded this definition, describing dyslexia as a cognitive, usually genetically determined condition, not due to intellectual inadequacy or lack of socio-cultural opportunity. However, these definitions overlooked individuals with lower intelligence scores or socio-cultural disadvantages. Vellutino (1979) argued for a definition that accounted for extrinsic factors leading to reading failure and focused on subjects of average or above-average intelligence without severe neurological damage or other debilitating physical disabilities.

Despite these definitions, dyslexia lost credibility due to its requirement of academic failure for diagnosis, failure to account for the multifaceted nature of dyslexia, and marginalisation of individuals with co-occurring conditions or from disadvantaged backgrounds. In response, the Orton Dyslexia Society Research Committee drafted a more inclusive definition in 1994, characterising dyslexia as a specific language-based disorder of constitutional origin characterised by difficulties in single-word decoding. By 1996, the British Dyslexia Association broadened the definition to include difficulties with motor function, reading musical notation, organisation, and numerical skills.

In 2002, the International Dyslexia Association adopted this definition which is still used today:

> 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.

The longstanding debate over dyslexia’s legitimacy was addressed by the Rose Report, commissioned by the UK government. This report, published in June 2009, independently

reviewed early reading instruction and dyslexia support and identification in England's primary schools. You will now evaluate this report.

3.2 The Rose Report and the BDA: unpacking the definition of dyslexia

The Rose Report was published in June 2009 by Sir Jim Rose, a former Chief Inspector of Primary Education and Director of Inspection for the Office for Standards in Education in England. The Rose Report affirmed the existence of dyslexia and suggested curricular enhancements aimed at improving literacy outcomes for dyslexic students, including: multisensory approaches; a focus on systematic phonics as the cornerstone of literacy instruction; and specialised training for teachers to more effectively identify and support children with that condition. The report also drew from published research and input from practitioners to create a comprehensive definition for dyslexia.

The UK education system as well as the British Dyslexia Association (BDA) followed the definition by the Rose Report. The definition reads as follows:

> Dyslexia is a learning difficulty that primarily affects the skills involved in accurate and fluent word reading and spelling. Characteristic features of dyslexia are difficulties in phonological awareness, verbal memory, and verbal processing speed. Dyslexia occurs across the range of intellectual abilities. It is best thought of as a continuum, not a distinct category, and there are no clear cut-off points. Co-occurring difficulties may be seen in aspects of language, motor co-ordination, mental calculation, concentration, and personal organisation, but these are not, by themselves, markers of dyslexia. A good indication of the severity and persistence of dyslexic difficulties can be gained by examining how the individual responds or has responded to well-founded intervention.

Watch this three-minute video produced by the British Dyslexia Association:

View at: youtube:11r7CFlK2sc

Video 3 See dyslexia differently

The BDA, established in 1972, is a key advocate for dyslexic people in the UK. Its website serves as a starting point for many navigating dyslexia. Over five decades, the BDA has revised its definition of dyslexia to reflect scientific and societal changes. The current definition, adopted in 2010, includes the Rose Report's six-sentence definition and two additional sentences by the BDA board. Let's break down this definition sentence by sentence, in order to build a more comprehensive understanding of the core characteristics of dyslexia.

Practical and cognitive difficulties: the first two sentences of Rose's definition focus on practical and cognitive matters. They outline the challenges dyslexic people face with reading, writing, and speaking, and highlight the role of phonological processing in these difficulties. These aspects are particularly relevant in formal adult education. The definition also notes the importance of phonological short-term memory (verbal memory) and reveals a significant correlation between the speed of naming letters and digits and reading ability.

Specific learning difficulty: the third sentence defines dyslexia as a specific learning difficulty, not an intellectual deficit. Traits like poor working memory or slower verbal processing speed are evidence of environmental barriers, not lower intelligence.

Dyslexia as a continuum: the fourth sentence views dyslexia as a continuum condition, expanding the accessibility of diagnosis and intervention to a broader range of individuals. Even 'high-functioning' dyslexic people face challenges due to their unique cognitive processes. This is particularly relevant for 'compensated dyslexics', who developed coping strategies in early education but may struggle in different settings like higher education. Despite not fitting the typical dyslexic profile, they can still benefit from targeted intervention.

Beyond literacy: the fifth sentence of Rose's definition recognises that dyslexia can affect individuals beyond the literary elements, impacting areas like self-directed study and personal organisation. For example, many dyslexic students struggle when moving from school to a higher education environment, where most elements of their study expect them to be self-directed. In these circumstances, poor personal organisation can have a debilitating effect, for example causing difficulties with planning their academic work or seeking specialist support (even proactively).

Response to intervention: the sixth and last sentence of Rose's definition of dyslexia recognises that the individual's response (or past responses) to well-established intervention can provide valuable insights into their condition.

3.3 Criticism of the Rose Report

The Report aimed to identify dyslexic children's challenges, leading to a definition focusing on difficulties. However, some definitions have shifted from using 'difficulty' to describe dyslexia, recognising that dyslexic traits can balance each other out in certain contexts, like an artist benefiting from dyslexia's creative boost. In educational settings, where learning and assessment involve listening, note-taking, reading, and writing, the term 'difficulty' remains appropriate. To make the definition more inclusive and context-independent, the British Dyslexia Association (BDA) added two sentences to Rose's definition as follows:

> The British Dyslexia Association (BDA) acknowledges the visual and auditory processing difficulties that some individuals with dyslexia can experience and points out that dyslexic readers can show a combination of abilities and difficulties that affect the learning process. Some also have strengths in other areas, such as design, problem solving, creative skills, interactive skills, and oral skills.

While difficulties are acknowledged, abilities are also introduced, followed by a list of areas where people with dyslexia might excel. Five areas are mentioned – design, problem-solving, creative skills, interactive skills, and oral skills – but this list is not exhaustive, nor does it purport to be. It is an illustrative attempt to frame dyslexia as a natural aspect of the human brain, shifting the focus away from a negative, deficit-model perception of the condition.

Amanda Abbott-Jones noted that dyslexia definitions often overlook behavioural and mental health issues, such as anxiety and stress (2023, p. 5). While dyslexia frequently coexists with various neurodivergent and mental health conditions, these complex relationships can't be captured in a single definition. The ideal definition balances comprehensiveness, specificity, objectivity, and conciseness. The British Dyslexia Association's (BDA) definition may achieve this balance, providing an inclusive framework

for understanding dyslexia. However, as the scope of dyslexia diagnosis and intervention expanded, controversy resurfaced.

3.4 Further criticism

As the diagnostic and interventional scope of dyslexia expanded, some controversy emerged.

In 2005, Channel 4 broadcasted a documentary called *The Dyslexia Myth*, which reignited public debate. The documentary argued that viewing dyslexia as a distinct neurological condition hinders effective educational support for children struggling with reading by inefficient allocation of resources at the expense of other children who could benefit from broader and more inclusive literacy programmes. The British Dyslexia Association and the Adult Dyslexia Organisation prepared submissions to Ofcom, claiming the programme 'set back their work by years'.

The debate soon moved to the scholarly sphere, with a critical discourse emerging that questioned the very existence and diagnostic utility of the term 'dyslexia'.

Elliott and Gibbs in their publication 'Does Dyslexia Exist?' referred to dyslexia as a 'social convenience' with 'no clear-cut scientific basis for differential diagnosis of dyslexia versus poor reader versus reader' that can lead to 'stigma, disenfranchisement and inequitable use of resources' (p. 488).

Labour MP Graham Stringer labelled dyslexia as 'a cruel fiction' created by the educational establishment to excuse inadequacies in teaching methods for reading and writing, suggesting that this 'fictional malady' was a cause for poor literacy and contributed to unemployment and criminal behaviour, and urging that 'the dyslexia industry was killed off' (BBC News, 2009).

Despite the Rose Report's conceptual clarification, the debate over dyslexia continued due to ongoing research into other neurodiverse conditions. A 2014 study by Elliott and Grigorenko argued that dyslexia had outgrown its usefulness as a term with too much 'conceptual and political baggage' that has 'outgrown its conceptual and diagnostic usefulness'. They argued that 'individuals should be supported according to their literacy difficulties, rather than trying to label a subgroup of poor readers' (2014, p. 176–8). Furthermore, in 2019, a few UK local authorities started to discourage diagnosis of dyslexia.

Abbott-Jones criticised Elliot and Grigorenko's study for failing to recognise dyslexia's multiple dimensions and spectrum-like characteristics (2021, p. 2). She argued that from a practitioner's point of view, a dyslexia diagnosis provides valuable context and insights for students, affirming its continued relevance. While differing views exist, a consensus on dyslexia's definition is needed to identify those requiring assistance (people with dyslexia and professionals supporting them). A 2020 study called 'Current Understanding, Support Systems, and Technology-led Interventions for Specific Learning Difficulties' by Julia Carroll et al., supported by the Government Office for Science, introduced a new definition of dyslexia.

Remember!

Dyslexia is a *learning difficulty*, not a learning disability, as intelligence isn't affected (NHS, 2022)

3.5 New definition of dyslexia by the SASC (2024)

By the beginning of the new millennium, dyslexia had transitioned from a condition once shrouded in scepticism and relative obscurity to one of the most diagnosed learning difficulties in childhood, with many institutions seeking to provide increasingly more standardised and comprehensive definitions. Therefore, the SASC (SpLD Assessment Standards Committee) announced a new definition of dyslexia in 2024 as follows:

- Dyslexia is primarily a set of processing difficulties that affect the acquisition of reading and spelling.
- In dyslexia, some or all aspects of literacy attainment are weak in relation to age, standard teaching and instruction, and level of other attainments.
- Across languages and age groups, difficulties in reading and spelling fluency are a key marker of dyslexia.
- The nature and developmental trajectory of dyslexia depends on multiple genetic and environmental influences.
- Dyslexic difficulties exist on a continuum and can be experienced to various degrees of severity.
- Dyslexia can affect the acquisition of other skills, such as mathematics, reading comprehension or learning another language.
- The most commonly observed cognitive impairment in dyslexia is a difficulty in phonological processing (i.e. in phonological awareness, phonological processing speed or phonological memory). However, phonological difficulties do not fully explain the variability that is observed.
- Working memory, orthographic skills and processing speed problems can contribute to the impact of dyslexia and therefore should be assessed.
- Dyslexia frequently co-occurs with one or more other developmental difficulty, including developmental language disorder, dyscalculia, ADHD, and developmental coordination disorder.

The definition highlights that dyslexia is primarily about processing difficulties impacting reading and spelling skills. It acknowledges that these difficulties can vary in severity and can affect different aspects of literacy. The definition also emphasises that these challenges are not reflective of a person's overall abilities but are specific to their literacy skills in relation to their age and the standard teaching they have received.

In preparing the definition, the authors did empirical research and thus noted several points that scored highly or in agreement. From these, one can agree on the following:

- 'Dyslexia is primarily a set of processing difficulties that affect aspects of literacy attainment, despite the educational opportunity to learn to read and spell.'
- 'Discrepancies between intellectual ability and literacy attainment is useful indicator of a specific learning difficulty but is not sufficient for a diagnosis in and of itself.'

While we embrace this new definition, it's crucial to remember that our ultimate responsibility – regardless of our personal agreement or disagreement – is to provide support to those in need.

4 This week's quiz

Now that you've completed Week 1, you can take a short quiz to help you to reflect on what you've learned.

Week 1 practice quiz

Open the quiz in a new window or tab, then come back here when you've finished.

5 Summary of Week 1

In this first week of *Understanding dyslexia*, you have embarked on a journey tracing the progression of societal attitudes towards disabilities. This journey began with the influential disability rights movement of the 1960s. You delved into two distinct models of understanding disabilities: the medical and social models. These models provided contrasting perspectives on disabilities, viewing them either as personal challenges or because of societal barriers.

You then considered how invisible disabilities and intersectionality can contribute to a variety of biases. These biases, when combined and linked, can lead to a unique experience of oppression.

Armed with this understanding, you explored the concept of dyslexia, examining how its definitions and recognition have evolved since the term was first introduced. The final section delved deeper into various definitions of dyslexia, aiming to pinpoint key aspects that would lay the groundwork for our comprehensive understanding of dyslexia. Now that you have some clarity on disabilities and a few observations on perception, and a definition of what dyslexia is, you can now move on to Week 2 where you will explore the processes of identifying dyslexia through screenings and diagnoses, which are crucial for providing effective support and interventions.

You can now move on to Week 2.

Week 2: Identifying dyslexia

Introduction

David Grant writes in the introduction to his book *That's the Way I Think* (2017, p. 1): 'You don't have dyslexia, you are dyslexic … It is a fundamental part of who you are.' The issue is that dyslexia manifests differently in different people and can co-occur with other learning difficulties, which might highlight or overshadow certain traits.

This week will examine the identification of dyslexia, either in the form of a screening or a diagnosis. This is an important process because it helps to determine the most effective way to target intervention and support. An assessment will also aid a person's understanding and self-knowledge about who they are. It may explain and help to dissipate the frustration and lack of self-confidence that often arise from feeling 'stupid' for not reaching the expected academic standards that others seem to achieve with ease, even though they know they have the ability. The results of an assessment can therefore be a huge relief and produce a sense of freedom, allowing a dyslexic individual to play to their strengths and avoid weaknesses. At the same time it can be a huge shock, especially if their culture does not recognise or support dyslexia (or other learning difficulties), and does not view them in a positive light. It is important to recognise these aspects of dyslexia that go hand in hand with the assessment.

Receiving a diagnosis of dyslexia or a learning difficulty can bring sadness or anger, especially if it comes later in life. Early diagnosis could have prevented much self-criticism and low self-esteem by providing timely support. However, learning is lifelong, and moving forward is essential. A late diagnosis, though painful, can be a positive step, as dyslexic learners often bloom later in life. Awareness and targeted support can lead to great achievements. As Week 4 will discuss further, many world-changing inventions were created or designed by dyslexic minds.

By the end of this week, you should be able to:

- explain the importance of screening and diagnosis in identifying dyslexia and other learning difficulties, and how these processes help in targeting effective interventions and support
- gain insight into the emotional responses and cultural challenges associated with receiving a dyslexia diagnosis, and how these factors can influence an individual's self-perception and academic performance
- appreciate the significance of lifelong learning and the potential for late-blooming achievements in dyslexic individuals, understanding how awareness and targeted support can lead to significant accomplishments.

1 Screening and diagnosis of dyslexia

Elliot and Grigorenko (2014) cite ‘the need for assessment for intervention rather than assessment for diagnosis’ (p. 580). In this line of thought, dyslexia is a special educational need and a common learning difficulty.

Diagnostic assessment is the only way that dyslexia can be formally identified. It is not a medical condition; it is a learning difficulty. A diagnosis of dyslexia is different from a screening for dyslexia, but both serve a purpose, and can be carried out in person or remotely. A checklist or questionnaire can be the first step in the journey to uncovering dyslexia. A checklist will often be self-directed, but it can be used to provide background (qualitative) information as part of a screening or diagnosis. In this section you will learn more about these processes.

1.1 Screening

A screening can be a quicker method of identification and is usually offered for free, often taking less than an hour and generally giving a good indication of dyslexic traits if they are present. A screening may involve a questionnaire and an interview to collect qualitative information, along with some quick tests of reading, writing, working memory and speed of processing. Qualitative information gathered from a discussion with an individual is always very important and can pick up any co-occurring difficulties too.

There are many different types of screening test. These can be carried out by a qualified specialist support tutor, but they do not need to be done by an assessor or educational psychologist. The screening could also be carried out with an online screener, where an individual will work through a series of tests on a computer which usually produces a mild, moderate, or strong indication of dyslexia. The BDA advises that if the screening test’s results show moderate to high probability of dyslexia, this ideally should be followed up by a Diagnostic Assessment. Let’s now explore this assessment.

1.2 Diagnosis

A Diagnostic Assessment is usually carried out from the age of seven onwards to adults to comply with SASC guidelines (SpLD Assessment Standards Committee – this is the governing body for specialist teacher assessors). A lot of reading and writing is involved in a full diagnostic assessment with up to three or more hours of tests, so it could be inappropriate to put a child younger than seven years old through this, especially as some children are later to read than others.

A diagnosis of dyslexia needs to be carried out by a qualified professional, a specialist dyslexia support teacher or an educational psychologist, and produces an in-depth diagnostic picture, based on a battery of tests carried out to identify strengths and weaknesses in reading, writing, working memory and speed of processing. This process involves quantitative (measurable) data that has been collected alongside qualitative (background) information. To make sure that any literacy difficulties are not down to a visual issue, the person being assessed should have had a sight test in the two years before an assessment takes place.

A diagnosis can be expensive. At the time of writing (in 2025), the ranging price varies from £500-600 upwards and is usually self-funded (paid by an individual, parent or employer), although some charities, such as British Dyslexia Association and Helen Arkell Dyslexia Charity, can subsidise. See links below for some further information.

Organisational support

Due to dyslexia not being a medical condition, a diagnosis assessment is not covered by the NHS. The British Dyslexia Association (BDA) 'from time to time' offers bursaries towards the cost of the assessment. You can also make donations to the BDA via their website or contact them by email at fundraising@bdadyslexia.org.uk. The Helen Arkell Dyslexia Charity may also subsidise an assessment based on need – see their website.

The rest of this section will explore the need for diagnosis and the process more deeply, as it's crucial to understand its importance.

1.2.1 Why the need for a diagnosis?

Have you ever heard the expression 'knowledge is power'? It comes from a Latin phrase (commonly attributed to Sir Francis Bacon, 1597) referring to the importance of acquiring knowledge in general. Another one that you may have heard before is 'when you know better, you do better' (attributed to Maya Angelou, date unknown). This conveys the idea that 'knowing' is not just about accumulating facts, but about understanding and applying them in our daily lives. It is this application of knowledge that empowers us to make informed decisions, solve problems, and ultimately, improve our lives.

Returning to the diagnostic assessment with this in mind, its importance lies in the detailed report it produces. This report can serve as evidence in schools, other educational institutions, and workplaces. More importantly, it reveals the strengths and weaknesses of a dyslexic person. Consequently, the assessment is relevant for:

- exam/access arrangements
- professional qualifications
- workplace adjustments (explored further in Week 7) providing more information for employers, so that employees needs can be met
- financial support from Student Finance England (SFE) to attend university. Students can apply for Disabled Students Allowance (DSA) in the United Kingdom (UK)
- if a student qualifies, approval is needed for DSA funding and a full diagnostic assessment report is required for this. The funding is based on need and does not need to be paid back. If the application is successful a Needs Assessment will follow which will assess what support, including assistive technology (AT), and reasonable adjustments a student might need. The British Dyslexia Association, and other charities, such as the Helen Arkell Dyslexia Charity can help with completing applications.
- self-understanding of one's own capabilities
- self-esteem and motivation (among other things).

Be aware

An assessment cannot be used in a court of law, for instance, in a tribunal or a court case. An expert witness will be required in this situation who will be a chartered psychologist, probably specialising in education.

In general, a diagnostic report will give detailed information and a greater understanding of an individual, a child, or an employee as to their strengths and weaknesses and where support would best be targeted. A diagnosis would also help for comorbidity (which will be covered in Week 4) as it can attribute some of the difficulties to the condition rather than to feeling ‘dumb’. Let’s now move to examine what type of tests are run for a diagnosis.

1.2.2 What does the diagnosis involve?

A diagnostic assessment is not an exam, and there are no right or wrong answers. It is simply trying to find out about an individual’s style of learning, what does or doesn’t work in terms of academic or workplace skills, and to start to build a wider picture of an individual’s strengths and weaknesses.

There are a series of tests involved which explore different aspects, like: underlying learning ability; reading; writing; spelling; handwriting; fine motor skills; speech; language; and auditory processing.

These tests measure and build an overall learning profile, usually based on these four areas:

- verbal reasoning – thinking with words
- visual reasoning – thinking with images
- speed of processing – the speed at which the brain absorbs and responds to information, a lack of automaticity
- working memory – where verbal information is held and manipulated temporarily.

The test results support the diagnosis. A diagnostic assessment can also help to uncover any other co-occurring learning difficulties and identify what reasonable adjustments may need to be put in place. It can signpost to other organisations or to further assessments.

1.2.3 Mood after the diagnosis

People may experience a range of emotions after a diagnosis of dyslexia. Some might feel relief because they finally have an explanation for the difficulties they’ve been experiencing. Others might feel overwhelmed or anxious about what this means for their future. It’s important to remember that dyslexia is a learning difficulty, not a measure of intelligence or potential. The reality is that people of all ages may come to a dyslexia diagnosis aware of their differences – many people state that they have ‘always felt different’. A diagnosis reassures them that they are capable of great things, they just need to find the way they learn best. After all, there is nothing wrong with the person; it is the societal barriers at fault.

2 Signs and indicators

Dyslexia is a learning difficulty with a combination of strengths and weaknesses that can impact academic learning. Listed below are some of the possible strengths and challenges:

Table 1 Strengths and challenges

Strengths	Challenges
Ability to visualise in 3D	Lack of concentration
Vivid imagination/thinker	Distractibility
Motivation	Difficulties with sequencing
Determination	Slow processing
Perceptiveness	Taking notes
Multidimensional thinking	Writing logically
Intuition	Slow reading rate
Problem solver	Time management
Curiosity	Poor listening skills
Creative thinker	Low self-esteem
Original/inventiveness	Organisation
Ability to make connections	Short-term/working memory difficulties
Resourcefulness	

Dyslexia will manifest differently in everyone, but there are some common indicators.

Table 2 Common indicators

Area	How dyslexia might impact your learning
Organisation/time management difficulties	• Difficulties with personal organisation, time management and prioritising tasks • Difficulty finishing exams within the time limit • Can feel overwhelmed
Procrastination/emotional	• Avoiding certain types of work or study • Finding it very hard to get started • Getting distracted easily
Reading	• Slow reading pace and fluency • Re-reading texts to understand them • Frequently losing place in text
Spelling	• Erratic spelling

	• Similar sounds may cause confusion • Difficulty ‘hearing’ sounds
Listening	• Problems with note-taking • Listening and taking notes in lectures simultaneously • Finding background noise distracting
Writing	• Difficulties in organising and structuring written work • Difficulties in sequencing, e.g. alphabet, phone numbers • Restricting written vocabulary and ideas due to known organisational and spelling difficulties
Memory difficulties	• Retaining and recalling information • Difficulties with short-term/working memory, e.g. dates • Often forgetting conversations, important dates, messages
Concentration difficulties	• Difficulty with listening and maintaining focus • Finding it hard to concentrate if there are distractions • Feeling mentally overwhelmed
Spatial/temporal	• Left/right confusion • Finding map reading difficult • Getting confused when given several instructions at once
Number/maths difficulties	• Difficulties in mental maths work • Problems with remembering maths tables • Can have difficulties with telling the time and understanding money
Motor control	• Difficulty with copying • Handwriting difficulties • Coordination problems • Poor pen or pencil grip
Self-confidence/self-esteem	• Low self-esteem and confidence • Knowing you can do something, but not understanding why you can’t perform as well as peers sometimes • Finding some tasks really easy, but being unexpectedly challenged by others
Potential helpful skills	• Good visualising skills • Often thinking of creative solutions to problems • Good verbal ability • Good at presentations and speaking • Ability to link information to the big picture, to a global view • Seeing connections • Seeing inconsistencies • Using analogies and metaphors

3 Children, young people and dyslexia

Recognising the signs of dyslexia early in a child's education is crucial for providing the necessary support and interventions. While teachers and Special Educational Needs Co-ordinators (SENCo) play a vital role in this process, for a wide range of reasons children are not always diagnosed as being dyslexic in schools. Parents can take proactive steps by familiarising themselves with the characteristics of dyslexia and engaging in open dialogue with educators about their child's needs. Additionally, seeking advice from organisations like the British Dyslexia Association can provide further guidance and resources to support a child suspected of dyslexia.

There may be other reasons why a child is not tested for dyslexia at school, despite them struggling with some of the basics. This might be because there are costs to the school once your child is recognised as having dyslexia, as at this point, your child's education will fall under the SEND Code of Practice, which sets out guidance on the special educational needs and disability (SEND) system for children and young people aged from 0 to 25, as well as being covered by The Disability Act 2016. This means that the school must act and provide your child with the correct interventions to help them succeed academically. If your child is not recognised as having a Special Need or formally diagnosed as dyslexic, then they are not covered by these statutory acts and the cost to the school is less.

As you've learned, the impact of undiagnosed learning difficulties on children can be profound, affecting not only their academic performance but also their mental health and social interactions. Without proper diagnosis and support, children may experience increased frustration, leading to behavioural issues that can result in exclusion from school settings. Early identification and tailored educational strategies are crucial for these children to thrive and reach their full potential, highlighting the importance of awareness and resources for learning difficulties. The BDA provide a wealth of guidelines and tips on how one can support their child with homework, reading, handwriting, etc.

3.1 The role of parents in a diagnosis

Parents play a crucial role in the diagnosis of learning difficulties, such as dyslexia, by advocating for their (young and adult) child and seeking appropriate assessments. Taking proactive steps can ensure that their child receives the necessary support and resources to thrive.

When parents suspect their child may have dyslexia, deciding how to proceed can feel overwhelming. The journey often begins with recognising signs and determining how best to seek support. Here are two common routes parents can take to initiate a diagnosis – each with its own considerations and potential outcomes.

Option one

Step one

Make an appointment with the SENCo and present your evidence as to why you think your child may be dyslexic.

Your evidence – what to look for:

> **Spelling** is a key area where dyslexia shows up, more so than in reading skills. If your child struggles to learn their spellings, can't remember them the following week or spells the same words differently within their writing, then these are key

flags. They may also struggle with putting their ideas down in writing and sequencing ideas correctly.

Dyslexia can show up in **reading** with a child not being able to sound out words or blend sounds into whole words. They may get to the end of a passage and not be able to tell you what they have been reading about.

In **maths**, dyslexia can show up with trouble in learning their times tables and being able to work out word problems.

Aspects such as **working memory** or **processing speed** also may be evident and thus, affecting academic performance.

Older children may consistently get low exam results despite appearing to put a lot of effort into their learning, and issues with their writing might be continually flagged up. Aside from those previously noted, common traits are:

- disorganisation
- messy written work and poor handwriting
- may write a lot, without the content being fluent; or may write little (in bullet points or similar), but good-quality content
- using the finger (or some other guide) when reading
- mixing up left/right, up/down, pull/push, letters such as b/d and words such as was/saw

The BDA and the NHS provide a wealth of information regarding signs of dyslexia that may be helpful.

Step two

Never take no for an answer! It can be very difficult for a school to refuse you if you provide good evidence for why you think your child may be dyslexic.

Option two

Go private. Have a formal dyslexia assessment done. Many parents may resort to paying for an assessment themselves. A formal diagnostic assessment explores your child's learning strengths and weaknesses and checks whether the difficulties conform to a definition of dyslexia.

Most importantly, you will take away a detailed report which makes full recommendations for the steps your child's school needs to take to move their learning forward, which also means you know what they should be doing. This makes it much easier for you to discuss your child's needs from a position of strength with your child's teacher and SENCo – and talk through targeted support for your child.

Once the results and potential diagnosis come back – what next?

Many parents are put off doing an assessment for dyslexia because the school says it won't change what they do in terms of helping your child. The reality is that they do change how they help. There are many ways a school can help your child in the

classroom for free – these changes can be a great help for your child, and could be all they need to help them progress at school.

Your child may need extra time in their tests and exams so that they are not discriminated against, and a formal assessment is often the most effective way of showing a school that your child does need this. Your child's teacher will also learn from the report whether your child struggles with verbal instructions; whether they need their learning broken down into smaller parts; or whether your child takes a bit longer to process what they must do.

Your child's teacher(s) will then be better informed about how your child learns and they can plan effective help. Once your child leaves school, they may feel more confident, or they may feel that they would like to continue in the educational journey. You will now proceed to look at the next stage in a child's education.

3.2 Progressing to further education and/or university

In higher education, a university has an obligation to support students with learning difficulties and/or disabilities and offer reasonable adjustments, such as:

- reduced recommended reading lists
- extended assignment deadlines when appropriate (needs)
- prior viewing of lecture slides and presentations
- lecture recording
- additional time allowance for exams
- the use of assistive technology
- the use of a computer in an exam or class
- disregarding spelling and grammatical mistakes, concentrating on content
- support with a dyslexia specialist or specialist learning support person.

These all seem reasonable, but it's important to note that the type of support given by universities differs from that offered by schools. The student, who is not a child anymore, needs to be actively finding help as well as making sure they have the evidence for their needs. However, the evidence required by universities will differ from institution to institution, and they have the authority to decide whether they will accept a dyslexia screening or a diagnosis in order for reasonable adjustments to be put in place.

Approximately 10% of the population worldwide have dyslexia, and about 43% of dyslexic students are not diagnosed until they reach university and often not until the third year, according to a report from the National Working Party on Dyslexia (1999). This could be higher nowadays, as a more recent report suggests that schools in England fail to diagnose at least 80% of pupils who have dyslexia (BBC News, 2019). This indicates that a significant number of dyslexic students might not be diagnosed until they reach higher education with its increased academic workload. Internationally dyslexia is often unknown, and it is therefore less well supported than in the UK and the USA, with many potential students being denied access to further and higher education or told they cannot achieve the standards required (or perhaps believing they cannot achieve them).

If a student feels they have any difficulty with reading speed, structuring writing, note-taking, spelling, organisation and/or time management, they should talk to their personal tutor, the wellbeing or student support team or seek out the dyslexia/learning support advisors. Dyslexia is no reflection on intelligence or ability, and support could have a positive impact on grades and the academic journey. Many cultures do not recognise or support dyslexia or other learning difficulties, and so many students might not have heard of this possible explanation for their difficulties with learning or studying. They might have

low self-confidence from difficult childhood and school experiences, not realising that support is available and that accessing it could help them to raise their grades considerably. Also, many educators in further and higher education are not aware of the signs of dyslexia and other learning difficulties, or of inclusive evidence-based supportive strategies.

Many students from the University of Buckingham feel that they have benefited from the support, as shown by some of their testimonials here:

Testimonial #1

Without your help and guidance in our extra classes I do not think I would have achieved what was only a dream at the beginning; especially after such disappointment in my A-levels. Achieving a First-Class Honours Degree in Politics, Economics and Law is and will be one of my major achievements in life and I would like to thank you for making that dream a reality.

Testimonial #2

I know that dyslexia should not be viewed as a hindrance; in fact, I would not change it (thanks to you I now think this way) I like the fact that I think differently to others.

Testimonial #3

Not only did the dyslexia specialist promote helpful revision techniques, they also helped me in understanding how well-being, a support system, and academic performance intersect with one another. I am forever grateful for the lessons that I have received through the University's dyslexia and academic support team.

Testimonial #4

The dyslexia support has been amazing and has been the sole reason that I have been able to continue with my degree, both with making me feel I can achieve it mentally and also putting in place strategies that mean that I can physically achieve it.

Testimonial #5

Very useful resources which I could read in my own time, such as reading techniques with dyslexia. This has really helped me with my reading at Uni (as there is so much of it!) - I have become more efficient at reading.

Testimonial #6

The dyslexia specialist has been incredibly supportive, helping me to understand dyslexia and from that accepting the condition has become easier. The techniques for writing have been very helpful which I incorporate into my writing practice, of which, I have seen a marked improvement.

3.3 Challenges in identifying dyslexia

Dyslexia is often described as a 'spiky profile', with test results showing a combination of cognitive strengths and weaknesses that underpin learning. A neurotypical learner (someone with no known specific learning difficulty) would have a 'flat profile' with little variation across the test results. The more extreme the spikiness, the stronger the specific learning difficulty.

In a typical dyslexic profile, word reading accuracy, fluency, spelling ability and speed of writing are often weak, while verbal and visual reasoning can often be much stronger than working memory and processing speed. The ‘double’ deficit of a weak working memory and a slow processing speed mean that an individual can easily experience memory overload and take longer to absorb information. However, these weaknesses are no reflection of intelligence or intellectual ability, as the stronger verbal and visual reasoning skills demonstrate (Week 3 will discuss this in more detail).

Dyslexia does co-occur with other learning difficulties, and these will influence the learning profile.

Dyslexia manifests differently in different people. It is difficult to identify based on symptoms alone, and co-occurrence with other learning difficulties can complicate the identification process. There is also a lack of awareness among many educators who are not trained to identify the signs of dyslexia which can result in delayed support. This is especially the case in many countries outside of the UK and the USA, where dyslexia is not recognised or supported within standard education systems (Dyslexic Help, 2024).

4 This week's quiz

Now that you've completed Week 2, you can take a short quiz to help you to reflect on what you've learned.

Week 2 practice quiz

Open the quiz in a new window or tab, then come back here when you've finished.

5 Summary of Week 2

Early screening and/or diagnosis and support for dyslexia can change a child's or student's academic journey, and therefore should be a priority to uncover. However, this ideal is not always achieved and many adults with dyslexia remain unidentified. Many dyslexic people are extremely resourceful and creative and can develop their own strategies to compensate for any difficulties they may have – this can mask symptoms as they grow older, making dyslexia harder to uncover (Learning Disabilities Association, 2023). There is a lack of solid knowledge surrounding dyslexia, in addition to many myths, which can lead to misconceptions and misunderstandings.

Next week you will explore the biological, cognitive and behavioural perspectives that explain dyslexia's symptoms and discover how neurodivergent conditions like dyspraxia and ADHD overlap, shaping our understanding of learning and development.

You can now move on to Week 3.

Week 3: Explaining dyslexia

Introduction

In Week 3, you'll embark on an in-depth exploration of the explanations that have been offered to account for the observed symptoms of dyslexia. You will study the biological, cognitive, and behavioural perspectives that are linked to the signs of dyslexia.

Afterwards, this week will move onto the world of neurodiversity. You'll evaluate how traits of neurodivergent conditions can overlap e.g. dyslexia, dyspraxia, ADHD. Learning about these neurodevelopmentally will explain how these disorders interfere with the learning of academic and/or social skills and encounter some of the same kinds of learning problems.

Brain development is an open process that continues through the life span, and many of the conditions you will study are hereditary. Therefore, this week aims to make you aware of different developmental conditions aside from dyslexia, so that we can create an environment that provides and compensates for neurodiverse people – a social model.

By the end of this week, you should be able to:

- outline different explanations given for the observed symptoms of dyslexia
- understand the term 'neurodiversity', and the range of differences in individual brain function and behavioural traits
- give a brief overview of the four most common conditions and learning difficulties that are considered 'neurodivergent', in addition to dyslexia.

1 Biological, cognitive, and behavioural perspectives

In Week 1, you learned about the evolution of the term dyslexia and the definition of dyslexia, and Week 2 focused on how to identify dyslexia. Building on this knowledge, Week 3 will explore different explanations for the manifestation of dyslexia.

Certainly, there is a complex interplay of different types of influences that collectively contribute to the manifestation of this condition, although a reduced working memory and slow processing skills are common to dyslexia, ADHD and other neuro-differences. To understand it better, we use a framework created by cognitive scientist John Morton and psychologist Uta Frith based on the nature of developmental difficulties, the causal model (Morton and Frith, 1995). The model is a framework that is built upon three interconnected levels: biological, cognitive, and behavioural. It also acknowledges the impact the environment (i.e., the culture in which the person grows up) can have on all three levels. These factors interact to create the behavioural characteristics associated with dyslexia.

Let's examine each of these in turn.

Biological

This level looks at genetic and brain-related factors that might cause dyslexia. It includes the brain's structure and function, and any genetic predispositions. Today, dyslexia is mainly seen as having neurobiological origins, meaning it's related to how the brain works (Wolf et al., 2024).

Cognitive

This level involves mental processes like memory, perception, attention, and speech processing. It explains the mental difficulties that lead to the behaviours seen in dyslexia.

Behavioural

This level provides a model of the difficulty by describing the nature of the behavioural symptoms experienced, e.g. reading difficulties.

Biological and cognitive perspectives offer theories that need testing, while behavioural perspectives are less debated because behaviours can be directly observed. Cognitive perspectives explain how biological and behavioural accounts connect. For example, brain damage (biological) might cause memory issues (behavioural) because the brain can't transfer information properly (cognitive).

Frith also highlights the environment's role (see Table 1). Factors like education, culture, and support systems can significantly impact a person with dyslexia, either by making challenges worse or providing essential support.

Wolf et al. (2024) emphasise how environmental factors affect brain development. They suggest that early changes in a child's environment can impact both their education and brain development throughout life. They believe that changing these environmental factors is crucial in understanding dyslexia.

Table 1 Frith's framework (Adapted from Frith, 1999, p. 193)

	Biological (Brain's structure and function, genetic factors)

Environment (External factors, e.g. school system, family support)	**Cognitive** (Internal processes, e.g. memory, processing speed, language related skills)
	Behavioural/symptomatic (Emotional issues, acting out, resignation)

Note: this table presents these factors as *complementing* each other rather than *conflicting*

You'll now consider some biological and cognitive explanations for various behaviours, before acknowledging the environmental influences on their development.

1.1 Biological explanations of dyslexia

Certain physical traits are often seen in people with reading difficulties, but their significance is still debated. These traits include being male and having subtle neurological and physical differences. Let's delve into these aspects, and ask whether sex differences are fact or myth.

Did you know?

People with dyslexia may have higher rates of allergies like asthma and eczema, as well as other autoimmune disorders. This is possibly caused by the KIAA0319 gene (Dyslexia Research Trust, 2020). While this might seem unrelated to dyslexia, factors like these provide insights into the biological causes when linked to behavioural symptoms.

An intriguing aspect of dyslexia is the apparent excess of males who are affected. Historical medical journals reported over a century ago about 'gifted boys' who suffered from 'word blindness' (Helland, 2020, p. 1).

If it's something you've heard about or considered before, what do you think: are boys/males more affected by dyslexia than girls/women?

Early neuroimaging studies suggested that boys are more often diagnosed with dyslexia than girls. This may be due to several factors:

- In the past, society's expectations of boys and girls were very different with respect to educational achievement.
- Girls tend to hide their difficulties while boys perhaps are more likely to 'externalise' their frustrations.
- Research and samples have been male-dominated.

This reflects a **referral bias**, where boys are more often identified as dyslexic than girls (Krafnick and Evans, 2019). Even when equal gender sample sizes are now used, the interpretation framework continues to depend on theories derived from and composed of males.

Despite evidence showing no gender difference in the heritability of reading difficulties (Wadsworth, Knopik and DeFries, 2000), recognising any other potential gender differences is crucial. This could change our understanding of behaviour, brain anatomy,

and activity in both typical and atypical development. The apparent sex difference still lacks adequate explanation, highlighting the need for more inclusive research.

Behavioural differences

Differentiation between sexes seems to be clearer when exploring behavioural differences (Krafnick and Evans, 2019). Girls display particular strength in domain-general skills, e.g. working memory and visuospatial, and domain-specific skills, e.g. verbal conceptualisation and orthographic coding. Boys display particular strength in verbal reasoning abilities.

Scholars believe more research is needed on sex differentiation. Kraftnick and Evans note growing interest in how sex differences impact disorders, though it's not universally accepted (2019, p. 3).

Let's check out what the last decade or so of evidence demonstrates, in order to identify and assess any biological explanations.

1.1.1 Lateralisation

Unusual patterns of cerebral lateralisation (i.e., the 'division of labour' between left and right hemispheres of the brain) may be linked to dyslexia.

Postmortem and neuroimaging studies show that the left hemisphere's structure and function differ in individuals with dyslexia (Krafnick and Evans, 2019). Altarelli et al. (2013) observed reduced cortical thickness in the left hemisphere of dyslexic children. The evidence shows differences between dyslexic and neurotypical individuals, but not between genders. However, there is no consensus on the specific 'contribution[s] of individual brain regions to dyslexia' (Krafnick and Evans, 2019, p. 4).

Left and right

Early researchers thought left-handedness was common among dyslexic people, but in fact most are right-handed. However, ambidexterity (using different hands for different tasks) *is* more common (Eglington and Annett, 1994).

A fun fact: while we often hear about 'left-brained' and 'right-brained' people, this is a generalisation, since both hemispheres cooperate in most activities. Many language-processing regions are in the left hemisphere, which works on producing understandable sentences, and understanding speech. However, other language functions, like associating emotions with phrases, occur on the right side of the brain.

Figure 1 The left/right brain

1.1.2 Functional resilience

Did you know that conditions like colour-blindness are more common in males? This is due to genes on the X chromosome. Females generally have two X chromosomes (one from each parent), so if one has a problematic gene, the other can often compensate. Males, usually having only one X chromosome, don't have this backup. Future research in this area could reveal some intriguing results.

Interestingly, no specific X-linked genes have been found for dyslexia, dyspraxia, ADHD, or autism. Scientists believe these conditions involve many genes and environmental factors. Studies suggest that females might need a stronger genetic predisposition for these conditions to show up.

This hints at some kind of protective factor(s) in females, but we don't yet know what this could be. More research is needed to uncover the genetic basis of dyslexia.

1.1.3 The brain structure

Scientists have found that the brains of people with dyslexia work a bit differently from those of typical readers (Norton, Beach and Gabrieli, 2015). In most people, the brain's reading network is mainly on the left side, which gets stronger as we learn to read. In a dyslexic reader, there are fewer activations (hypoactivations) in the left temporal, parietal, and fusiform regions.

Volumetric brain: size and shape

Size and shape differences have been found through examination of the brain. Scientific studies have discovered that the brains of people with dyslexia have less grey matter as well as a 'volumetric effects at the gross level in females with dyslexia that are not present in male counterparts' (Kraftnick and Evans, 2019, p. 6).

Building on this research, Kuhl et al. (2020) have made other discoveries. They found unusual folding patterns in specific areas. These areas are important for reading and processing sounds. Interestingly, these brain differences can be spotted even before a child learns to read!

Some findings involve various microscopic anomalies in the actual organisation of brain cells (Galaburda et al., 1985). Studies of brain cells show that people with dyslexia have some cells that are slightly out of place and layers of cells that aren't as orderly. These differences are mostly found in the left side of the brain, which handles language. These 'misplaced' cells (called ectopias) often have more connections to other brain areas, which might explain why people with dyslexia can be super creative.

Think back now to Week 1, and the early definition of dyslexia relating to 'word blindness'. It's time to revisit that idea with a consideration of visual-spatial awareness.

Revisiting visual-spatial awareness

Boys often exhibit greater visual-spatial awareness than girls, but this visual-spatial awareness does not prohibit the development of visual-perceptual difficulties linked to dyslexia.

Many dyslexic individuals report visual symptoms like letters and words appearing to move or blur, difficulties with small, crowded print, and visual discomfort such as glare.

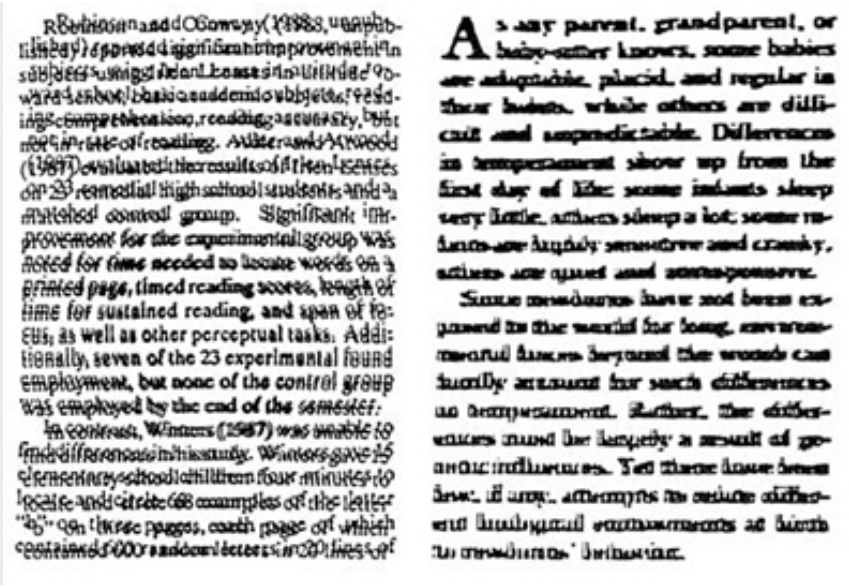


Figure 2 Examples of visual disturbances experienced by some people with dyslexia

Research highlights the role of the **visual magnocellular system** (Stein and Walsh, 1997; Stein, 2022), which is crucial for controlling eye movements and visual attention. Dyslexic readers often struggle with processing rapid visual information, affecting their ability to sequence letters correctly (Stein, 2022).

To help manage these visual challenges, studies suggest encouraging children to play action video games, which improve visual timing. Using colour filters, such as yellow or blue, can also aid in visual processing by stimulating the magnocellular cells (Stein, 2022). Therefore, one recommendation is printing on coloured paper, and using overlays in different formats. It's important to remember though that this isn't a 'one size fits all' solution and thus, finding the optimal colour and shade will take some trial and error.

Visual-spatial awareness can influence how dyslexic individuals process information, but many visual symptoms – like blurring or shimmering text – may be due to underlying eye health issues. According to the British Dyslexia Association (BDA), these should be assessed by a qualified optometrist. While coloured overlays may offer relief, they should not replace a full professional eye examination, as they don't address the root causes of visual discomfort (British Dyslexia Association, n.d.)

Continuing with the structure of the brain, another theory involves the cerebellum, a brain structure essential for motor coordination and cognitive development. The cerebellum plays a significant role in the automatisation of skills, such as rote learning (i.e., learning facts 'off by heart', like multiplication tables) and phonological processing. A deficit in cerebellar function could explain various dyslexic features, including rapid sensory processing issues.

Understanding these brain characteristics and their impact on dyslexia can lead to better identification and support for individuals with this condition.

1.1.4 Genetic explanations: heritability

Did you know that dyslexia can run in families? Studies show it's highly heritable, with a 40-70% chance (Gialluisi et al., 2021; Erbeli, Rice and Paracchini, 2021). For example, twin studies estimate heritability at 60-70% (Ciulkinyte et al., 2024). But finding the exact genes is tricky because each gene that has been related to dyslexia has a small effect,

and they likely work together. Finding these genes is problematic because it needs very large studies, and past research hasn't had enough data to clearly identify them.

DYX1C1 and oestrogen

The gene DYX1C1 is linked to dyslexia (Bates et al., 2010). Interaction with oestrogen (a hormone) has been seen to increase the expression of DYX1C1, suggesting a neuroprotective mechanism in females (Krafnick and Evans, 2019). Altarelli et al. (2013) note that some natural substances in our bodies (e.g. certain steroid hormones), along with other factors that aren't hormone-related, could potentially make women's brains more resilient to challenges.

Nature vs. nurture

According to the Dyslexia Research Trust (DRT), studies comparing identical and non-identical twins indicate that genetics account for about 50% of reading abilities, while the rest is influenced by environment. The gene KIAA0319, active early in brain development, affects areas crucial for reading.

Other studies mention DCDC2, GCFC2, MRPL19 and ROBO1 as being linked to dyslexia (Brkanac, 2007).

Shared genetic traits

Dyslexia, which is highly heritable, shares genetic links with other learning disorders like ADHD, dyscalculia, dyspraxia and others. Research indicates that genes linked to learning difficulties in one domain such as reading, are often connected to difficulties in another domain like math and some psychopathological disorders (Erbeli, Rice and Paracchini, 2021). Comorbidity is present in the genetic architecture of individuals who have a learning disorder, which is evidenced in different locations throughout the genome that is associated with these disorders and thus, can be somehow attributed to shared genetics influences (Georgitsi et al., 2021). Dyslexia, ADHD and dyscalculia often occur together because they share common genetic risk factors, rather than one causing the other.

1.2 Cognitive explanations of dyslexia

Having examined a variety of biological explanations (lateralisation, genes, and the architecture of the brain, among others), you will now move on to consider cognitive explanations for dyslexia.

1.2.1 The phonological deficit (PDD) hypothesis

Have you ever wondered why some people find reading particularly tricky? The PDD hypothesis might have the answer! It suggests that dyslexia is linked to problems with processing speech sounds in short-term memory. This means tasks like mental math, writing, and learning new info can be difficult because they all involve handling speech sounds (i.e. phonological components).

A deficit in phonological processing (slow processing skills) may provide an explanation of dyslexia. This idea builds on the firm theoretical foundation that 'auditory discrimination' is present in dyslexia. People with dyslexia often struggle with tasks like repeating words or naming pictures. This happens because the brain's language areas (mainly located on the

left side) don't work together as smoothly as they should. Imagine trying to play a game with teammates who aren't in sync – it makes everything harder!

Figure 3 The PDD hypothesis

When reading, we need to match letters with sounds. Dyslexic brains find this tricky because of the phonological deficit. It's like trying to solve a puzzle with pieces that don't quite fit. But this issue isn't isolated to people with dyslexia; anyone who finds reading hard might have similar struggles. Learning to read involves understanding phonemes (the sounds that letters make), which isn't something our brains are naturally wired to do – we have to learn it!

To appreciate why a phonological deficit has an impact on reading and writing, first it's necessary to understand how people typically learn to read (see Table 3).

Table 2 The two main routes for learning to read

Logographic Strategy	Alphabetic Decoding Strategy
The word – we learn to associate a spoken word with its written form, without showing any awareness of the sounds that each of the individual letters make	The letter(s) – we learn the sounds that each letter of the alphabet makes, and then learn how to blend those sounds together during reading to work out how to pronounce the word

Strength	Weakness	Strength	Weakness
Enables children to build a large sight vocabulary quickly, which will enable them to begin reading with some degree of fluency	Huge demands on visual memory and does not provide children with a strategy for coping with unfamiliar words	Effective for new or unfamiliar words, enabling readers to decode and understand them	Can be slower for fluent reading of known words compared to whole word recognition Less efficient with ir-regular words that do not follow standard phonetic patterns, e.g. in English there are many words that are pronounced as they are spelled

Have you heard about orthographic mapping?

It's a reading strategy that links sounds (phonemes) to letters (graphemes) and their meanings, helping store words in long-term memory as sight words for instant recognition without conscious effort. Think of it like a video game: matching sounds to symbols to find hidden treasures!

People with dyslexia often struggle with phonological tasks due to difficulties in processing and storing sounds in memory. Research, mainly on English-speaking children, shows that complex letter–sound correspondences in English can be confusing. For example, the sound /f/ can be spelled as 'f' or 'ph', and the letter 'a' sounds different in 'bat', 'part' and 'apron'.

Activity 1 Some examples

Allow about 2 minutes

Take a moment to write down a few words that can be spelled and/or pronounced in different ways, and might cause this kind of confusion.

Provide your answer...

Phonological deficits aren't universal in dyslexia. Languages with predictable letter-sound correspondences, like Spanish and Italian, show that dyslexic individuals can read more easily (Courcy, Béland and Pitchford, 2000; Müller, Saarenketo and Lyytinen, 2000). Since phonological deficit is just one aspect of dyslexia, it's important to explore other cognitive factors too.

1.2.2 The ‘Visual deficit’ hypotheses

In the early 1900s, Samuel Orton coined ‘strephosymbolia’ (derived from Ancient Greek, roughly meaning ‘twisted symbols’) to describe children with reading difficulties who reversed letters; this could involve the confusing of letters such as ‘b’ and ‘d’, or mixing up their positions within a word, e.g. writing ‘was’ as ‘saw’.

From these and other observations, he suggested that their reading difficulties might reflect some kind of visual processing impairment involving incomplete specialisation between the left and right sides of the brain.

You may recall from Week 1 that dyslexia was once called ‘word blindness’, focusing on visual-perceptual issues. Early research sought perceptual factors, but by the 1970s, the phonological deficit model became dominant, linking reading difficulties to language processing. Recently, interest in visual deficits has resurfaced, suggesting they may also play a role (Everatt, Bradshaw and Hibbard, 1999; Whiteley and Smith, 2001; Sigurdardottir, Ólafsdóttir and Devillez, 2021; Stein, 2022). Seymour (1986) highlighted that written language relies on visual systems, and some dyslexic individuals show visual processing weaknesses independent of phonological issues.

It’s important to recognise that visual and phonological problems aren’t mutually exclusive, and dyslexia varies among individuals. Biological and environmental interactions mean the same issue can lead to different outcomes.

1.2.3 The ‘Automaticity’ and ‘rate of processing’ hypotheses

Dyslexia can be explained by difficulties in automatising skills. Automatisation is the process where a skill becomes automatic, requiring less conscious effort, leading to faster and more efficient performance. It refers to the gradual reduction in the need for conscious control as a new skill is learned. Dyslexic individuals often struggle with this, showing less fluency in reading and writing, making more errors, and being easily distracted by other tasks. This issue, termed ‘automatisation deficit’, is particularly noticeable in complex tasks like reading and writing.

Researchers Nicolson and Fawcett (1990; 1994) noted that even skilled dyslexic readers read and write more laboriously and are more prone to mistakes. They also face challenges in mastering other skills, such as riding a bicycle or tying shoelaces. One way to assess this deficit is through rapid automatised naming (RAN) tasks, where individuals name numbers, pictures, or colours as quickly as possible (see Figure 4). Dyslexic individuals typically perform slower on these tasks.

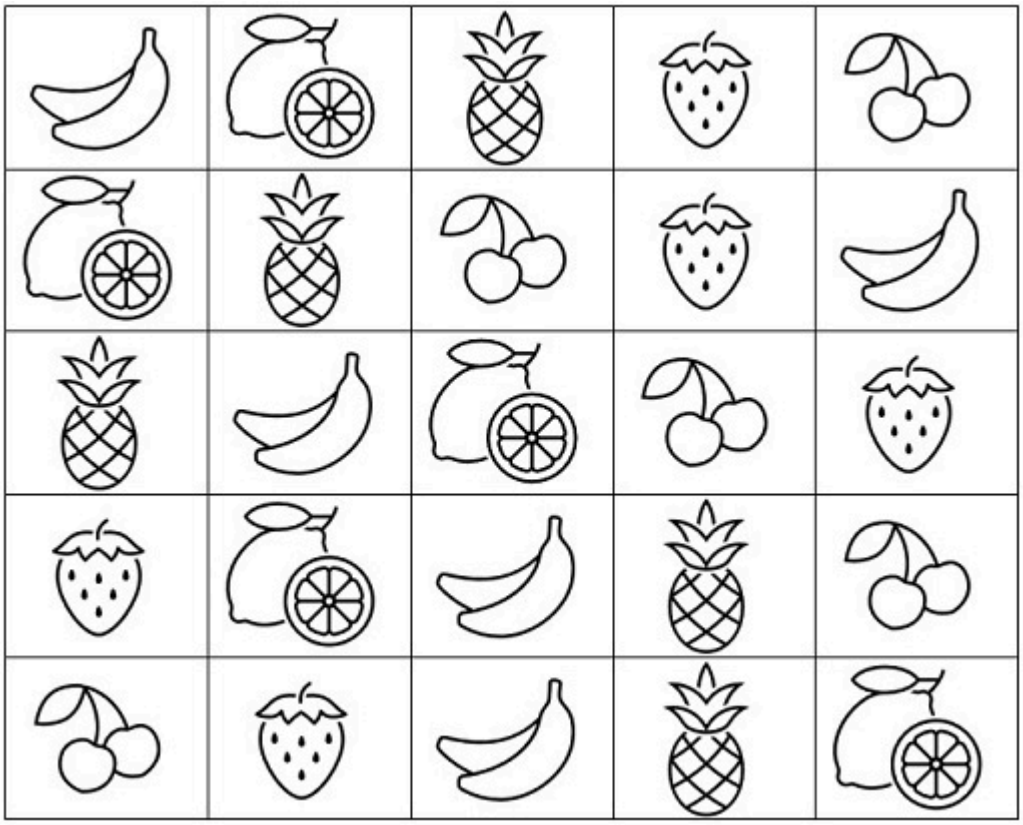


Figure 4 An example of a RAN task for pictures

Now it's time for you to develop one of your own!

Activity 2 Random picture grid

Allow about 20 minutes

Try creating your own visual grid of random stimuli for memory and recognition practice.

You'll need a piece of paper, a pen or pencil, and a set of small images or stickers of a specific type (like animals, fruits, etc.), or you can draw simple symbols. You can also do it in a computer. Here are the instructions:

1. Draw a grid on your paper/computer with five rows and five columns.
2. Choose five images or symbols of the type you want to use. You can also do this activity using other tools such as pasta, dry beans, sweets, etc. In total you should have 25 images/symbols/food staples. Make sure you have a mix of different images.
3. Randomly place one image in each cell of the grid until all cells are filled.
4. Spend a few minutes looking at the grid, trying to memorise the location of each image.
5. After the time is up, cover the grid and try to recall and write down the images in their correct order.

This activity can help with visual memory and the ability to recall and recognise patterns or specific stimuli. It's a simple yet effective way to practice cognitive skills related to memory and recognition.

You will notice that this strategy still requires some phonological processing during the retrieval of the picture names. Wolf and Bowers (1999) suggest that rapid naming difficulties are an additional deficit to phonological issues, explaining reading difficulties even with good phonological awareness. They propose three subtypes of reading difficulties based on the underlying cause. This strategy still involves some phonological processing during picture name retrieval.

Table 3 Reading difficulties subtype

Phonology Group (left inferior frontal and inferior parietal regions)	Rate Group (right cerebellar lobule VI)	Double Deficit Group (less cerebellar activation)
Phonological deficit, but no real problems on the RAN task	RAN task time deficit, processing deficit, but no phonological problems	Rapid naming and phonological deficits cause reading difficulties; combined, they intensify the deficiency

Improving phonological awareness is key for reading difficulties in children, but it may not address all issues if visual processing deficits or ‘rate’ and ‘double deficit’ subtypes are present. Cognitive accounts taken in isolation are incomplete. Helland mentions that the cognitive level is the ‘bridge’ between the behavioural and biological level (Helland, 2020).

While they can be seen to explain dyslexia, cognitive accounts taken in isolation are incomplete.

You will now move on to consider environmental factors.

1.3 Environmental factors

Spear-Swerling and Sternberg (1998) suggest that environmental factors significantly impact neurodivergent individuals. Nutrition – including omega-3, choline, and iron – is crucial for development, with deficiencies leading to learning difficulties. Additionally, the home and school environments play vital roles in a child’s neurodevelopment. This section will examine a few of these factors.

1.3.1 Biochemical

Our bodies need certain nutrients that we can’t produce ourselves, so we rely on our diet to get them.

Fatty acids (EFA)

Research suggests that highly unsaturated fatty acids are essential substances for brain development and normal brain function. These fatty acids are linked to ADHD, dyspraxia, developmental dyslexia, and depression (Richardson and Ross, 2000). They help regulate brain and body functions like cell signalling, immune responses, and cardiovascular health. Two fatty acids, DHA (omega-3) and AA (omega-6), make up 20% of the brain’s dry mass. They are essential for maintaining the structure and fluidity of cell membranes.

Despite their importance, these fatty acids are often lacking in modern diets. Fish and seafood are the best sources of omega-3, but some people may need more due to inefficient conversion.

On one hand, studies show a positive correlation between omega-3 intake and improved concentration and reading performance. On the other hand, high omega-6 intake, common in the Western diet (e.g., sunflower oil, meat and poultry) is associated with poorer reading speed (Borasio et al., 2023).

Activity 3 Researching fatty acids

Allow about 5 minutes

Do some quick online research to find out which foods are high in omega-3 and omega-6. Note down your results here.

Provide your answer...

Past research focused on fatty acids, but now scientists are exploring other crucial nutrients. For instance, choline plays a vital role in brain development, growth, and function. Deficits in choline intake, particularly during key stages of neurodevelopment, have been linked to neurodevelopmental disorders (Derbyshire and Maes, 2023).

What the research says

The Dyslexia Research Trust has found that inefficiencies in fatty acid metabolism may contribute to a biological predisposition to dyslexia, ADHD and dyspraxia.

Fish oil supplements can support cognitive functions and help manage dyslexia.

Including choline-rich foods (e.g., eggs, liver, fish, and certain vegetables) in your diet is beneficial.

So, you need to:
Eat well
Sleep
Repeat

Studies also reveal that deficiencies in minerals and vitamins such as B5, B6, calcium, zinc and magnesium can affect children's ability to read, spell and write (Ndeh, 2023).

1.3.2 Social

Referring back to Frith's framework at the beginning of Section 1, you'll remember that the environment can be heavily influential in each perspective. For instance, we now know that biochemicals are an environmental influencer. This section will explore literacy demands, reactions from teachers/peers and support at home.

Home environment

Adams (1990) suggested that reading aloud to preschool children benefits later reading development. This is supported by Snowling and Göbel (2010) and Massaro (2017). Additionally, Snow (1991) found that children with a 'literate home environment' progress better in reading than peers who were exposed to less 'literate' contexts. This is reported by several studies in different countries, from rural Tanzania to Malta and Austria. Studies show that children's knowledge of nursery rhymes can predict both reading performance and phonological awareness (Eghbaria-Ghanamah et al., 2020; Bdeir, 2022).

School environment

Different reading instruction methods can prevent reading difficulties (Kelly and Phillips, 2022; Kuo, 2023). Similarly, overemphasis on either phonic (alphabetic) or whole-word (logographic) approaches can worsen reading difficulties, because of the need for both skills to compensate for the relative weaknesses of each approach. Empirical studies have shown that children who are 'streamed' into low-ability groups often receive less effective instruction due to lower expectations (Johnston, Wildy and Shand, 2023). Negative reactions in the academic environment can lead to depression and anxiety (Bazen et al., 2023; discussed further in Week 4). Certainly, there is a relation between literacy demands and internalising problems.

Educational support

Accommodations may include 'reasonable adjustments' (Lai & Berkeley, 2012) such as: extended time for an exam, or extended deadlines for submission of coursework (Bolt et al., 2011); leniency towards spelling errors (Gibson, 2012); one-to-one sessions on study strategies, writing structure, reading techniques, time management, mind mapping, memory and concentration techniques (Myhill, 2023). Inclusive assessments and positive teacher attitudes are linked to wellbeing and successful learning (Covarrubia, 2022; Bazen et al., 2023). Lack of support can have an emotional impact, resulting in conditions like anxiety and depression, though research on this is limited.

2 Neurodiversity

The term ‘neurodiversity’ describes the variation in neurological and cognitive function among people. Everyone’s brain is unique, and we all think, learn and process information differently. However, most people show significant similarities in brain wiring, and they are termed ‘neurotypical’ (they have a typical neurotype). About 1 in 7 people think, learn and process information differently, and they are termed ‘neurodivergent’ (their neurotype diverges markedly from 75% of the global population).

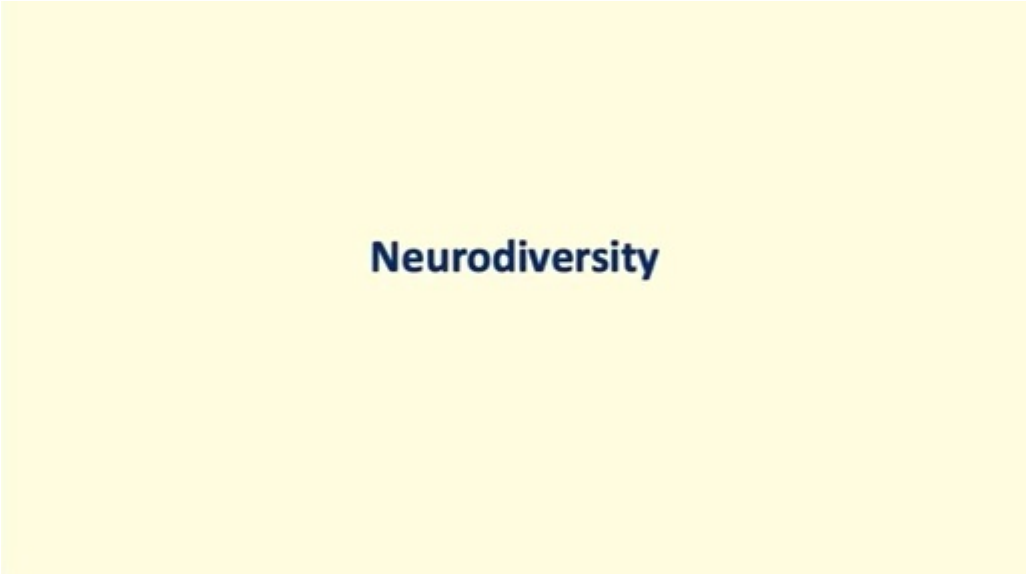
A person in higher education (HE) with undiagnosed dyslexia might excel in reading and spelling, but may struggle with time and attention management. This transition to independent learning and living away from home can be particularly challenging for dyslexic individuals (McLoughlin, 2013, p. 163).

Did you know?

The concept of neurodiversity was coined by Australian sociologist Judy Singer in the 1990s to promote equality and inclusion for neurological minorities. Around 15-20% of the global population is considered neurodivergent (Johns Hopkins University, 2022).

Watch Video 1 for a short visual introduction to the concept of neurodiversity.

Video content is not available in this format.
Video 1 A visual introduction to neurodiversity



Activity 4 Reflecting on neurodiversity

Allow about 15 minutes

Reflect on how the concept of neurodiversity aligns with or challenges the medical and social models of disability. Consider factors such as societal perceptions, accommodations and the emphasis on 'fixing' versus 'accepting' that these models promote. How might the concept of neurodiversity influence how society engages with neurodivergent individuals?

Provide your answer...

2.1 Neurodivergent conditions

A person's neurotype affects how they behave and experience the world. Grouping traits under specific labels often helps neurodivergent individuals understand their differences and live harmoniously in a neurotypical society. Neurodivergent conditions include dyslexia, dyspraxia, dyscalculia, autism spectrum disorder (ASD), ADHD, and Tourette syndrome.

Many neurodivergent people remain undiagnosed, but more are seeking assessments due to increased understanding and acceptance, driven by advances in neuroscience.

In education, neurodevelopmental conditions can negatively impact an individual's ability to learn within environments designed and optimised for neurotypical students. Neurodivergent learners, equally capable and intelligent, often need specialised support and accommodations tailored to their unique needs. This personalised approach helps them reach their full potential.

Dyslexia is the most common neurodivergent condition, affecting about 10% of the UK population. Other common neurodivergent conditions are dyspraxia, dyscalculia, ADHD and ASD. For those interested in a more in-depth exploration of these conditions, some further reading links will be provided.

2.2 Neurodivergent: overlaps and co-occurrence

Neurodivergent conditions often exhibit overlapping traits, known as **comorbidity** (discussed in Week 4). For instance, poor working memory, time management challenges and fine motor control difficulties are common among individuals with dyslexia, dyspraxia and ADHD. This means someone with dyslexia might show dyspraxia characteristics, though not necessarily enough to warrant a dyspraxia diagnosis. A notable example is the frequent co-occurrence of dyslexia and ADHD.

Let's move on now to cover some of the most common neurodivergent conditions.

2.2.1 Dyspraxia

Dyspraxia – also known as developmental coordination disorder (DCD) – affects movement and coordination. It can also impact other everyday activities which are non-motor in nature, resulting in social, emotional and organisational challenges. While motor challenges persist, with proper support, individuals with dyspraxia can lead successful lives.

Further resources

For a comprehensive definition of dyspraxia and more information, visit the NHS page on dyspraxia in adults and the British Dyslexia Association's outline of dyspraxia/DCD.

2.2.2 Dyscalculia

This learning difficulty primarily affects arithmetic and mathematical skills. Individuals with dyscalculia struggle with basics number concepts, understanding quantities and recalling mathematical procedures. While manifestations of dyscalculia vary, common indicators include difficulty with counting backwards, poor number estimation, slow work speed, and high anxiety levels concerning math.

Further resources

For a more detailed definition of dyscalculia and key indicators, visit the Dyscalculia Association.

2.2.3 Attention deficit hyperactivity disorder (ADHD)

ADHD is marked by inattention and hyperactive-impulsive behaviour. Symptoms may include difficulty focusing, forgetfulness, easily distracted, fidgeting, excessive talking and difficulty awaiting turns. ADHD symptoms hinder social, academic or occupational functioning. ADHD symptoms must be present before age 12 for a formal diagnosis. Interestingly, 25-40% of individuals with dyslexia are also diagnosed with ADHD and vice versa (Ciulkinyte et al., 2024).

Further resources

For a complete list of the criteria for an ADHD diagnosis in children and adults, visit ADHD UK. You may also want to study the 12-hour OpenLearn course *Understanding ADHD*.

2.2.4 Autism spectrum disorder (ASD)

ASD is a spectrum condition affecting individuals differently, with manifestations ranging from mild to severe. Core characteristics include repetitive behaviours and challenges in social communication. Autistic individuals may also experience sensory sensitivities, heightened anxiety, and develop an intense focus on specific interests. As with the other neurodivergent conditions, everyone with ASD has unique strengths and weaknesses,

and the degree and combination of all associated traits can vary widely. However, both repetitive behaviours and difficulties with social interaction are essential for a diagnosis.

Further resources

For a more detailed definition, visit the National Autistic Society. You may also want to study the 24-hour OpenLearn badged course *Understanding autism*.

Understanding these conditions ensures that support is holistic, addressing not just academic needs but also emotional and behavioural aspects. This comprehensive approach helps neurodivergent individuals thrive in various environments. Week 4 will look more closely at comorbidity and mental health as the association between learning difficulties and mental health 'is the rule, not the exception' (Chung, Patel and Nizami, 2020).

2.3 Diverging terminology

Different countries use various terms to describe neurodivergent conditions, reflecting cultural, historical and societal approaches. In the UK, primary and secondary education refer to these conditions as 'Special Educational Needs' (SEN), while further and higher education use 'Specific Learning Differences' (SpLD). In the USA and Australia, the term 'Specific Learning Disabilities' is common. The distinction between 'differences' and 'disabilities' highlights varying national perspectives and societal beliefs. The term 'Specific Learning Disorder' is also found in academic literature.

Activity 5 How these terms impact us

Allow about 15 minutes

Focusing on the terms 'Specific Learning Differences' as used in the UK, and 'Specific Learning Disabilities' as adopted in the USA, consider how language could be shaping our understanding and attitudes toward neurodivergent conditions. Reflect on the semantic and emotional weight each term carries, how they might influence an individual's self-perception, and what implications they might have on policy, educational approaches and support systems.

Provide your answer...

Recently, terms like 'neurodivergent' and 'neurotypical' have become popular. These terms promote inclusivity, reduce stigma, empower individuals, foster better communication, and encourage supportive practices. They help recognise and respect cognitive diversity. However, language is always evolving, and these terms might change in the future as political correctness continues to foster a more respectful and understanding society.

3 This week's quiz

Now that you've completed Week 3, you can take a short quiz to help you to reflect on what you've learned.

Week 3 practice quiz

Open the quiz in a new window or tab, then come back here when you've finished.

4 Summary of Week 3

This week, you've explored dyslexia from multiple angles: biological, cognitive, and behavioural perspectives, as well as environmental factors. The biological perspective examined genetic and neurological underpinnings, while the cognitive perspective focused on processing differences. Environmental factors, such as educational settings and family support, were also discussed.

You delved into neurodiversity, highlighting various neurodivergent conditions and their overlaps and co-occurrences, thereby underlining the complexity of these experiences. This week emphasised the importance of recognising neurodiversity, advocating for inclusive practices that respect individual differences. Additionally, this week clarified some diverging terminology within the context of neurodiversity, in order to promote better understanding and communication.

In summary, this week provided a holistic view of dyslexia and neurodiversity.

Next week will delve deeper into the personal experiences and comorbid conditions that often accompany dyslexia.

You can now move on to Week 4.

Week 4: Experiencing dyslexia

Introduction

Week 4 will go more into the persona of dyslexia. You'll start by evaluating comorbidity, that is, other conditions that may be simultaneously present with dyslexia. You will consider the individual experiences and constraints that arise from not being in an inclusive environment. Within this line of thought, you'll be provided with some specific considerations to look for and how to address them.

After this, you'll examine some positive connotations and feedback, provided directly by real people with dyslexia. Engaging with some personal experiences and real-life stories will allow you to start applying the knowledge you have obtained so far.

By the end of this week, you should be able to:

- understand comorbidity as the presence of one or more additional conditions co-occurring with dyslexia
- examine the challenges faced by individuals with dyslexia in educational and professional settings
- recognise the value of self-reflection in personal and professional growth within ourselves and others
- be more aware of effective strategies and tools to support individuals with dyslexia, such as assistive technology (AT) and tailored learning approaches
- cultivate a growth mindset to view challenges as opportunities for learning.

1 Comorbidity: dyslexia and emotions, self-esteem, and mental health

Sally Shaywitz in her book *Overcoming Dyslexia* (2020) acknowledges that 'for many affected children, dyslexia has extinguished the joys of childhood'. Dyslexia, despite being a learning difficulty, has a significant connection with emotions. Literacy skills, which are fundamental to teaching and learning today, are intertwined with society's perception of success in education and the workplace. There seems to be a general consensus that if you are not a strong reader you will never be successful, though of course this is not the case.

Activity 1 What is success?

Allow about 5 minutes

Write a few words considering the question: what does success mean to you?

Figure 1 One idea of success

Examples could include: walking 10km; eating something you have never tried before; earning money; getting a promotion; etc.

Provide your answer...

Low self-esteem may start in school, where rote learning (which is heavily based on memory and repetition) and procedural learning (which relies on rules and procedures) can be much harder for those with dyslexia to master, due to working memory and speed of processing weaknesses. Most academic skills rely on these styles of teaching and learning, so it can be easy for a dyslexic child to fall behind at an early stage. And while awareness of dyslexia has improved over the last decade, even the best interventions often fail to address the social and emotional challenges that make up the full picture of dyslexia.

Self-worth and identity are some of the most vulnerable aspects of a person. In the case of a child at school age, it is essential for teachers to nurture dyslexic students' sense of self. Family support also plays a key role, for instance reminding a child that dyslexia has nothing to do with intelligence, and exposing them to successful individuals who have also overcome these challenges. Moreover, a dyslexic person should be encouraged to talk about their dyslexia and analyse how it affects their day-to-day experiences. Helping a person to recognise their own experiences and advocate for themselves will help them to remember that they are more than their dyslexia – much more. Remind people of their strengths and give them opportunities to use them whenever possible. In education, if an assignment is especially challenging for a student with dyslexia, provide them with

alternative options if possible, or make sure that there is a broad variety of assessments, so they can demonstrate their talents in other topics (art, design, engineering, architecture, physics, sports and/or creative arts, to name a few possibilities). If an employee is struggling to read a full set of instructions, break this down into numbers/ bullet points and short sentences, or develop a graphic/chart. Most importantly, give a dyslexic person a multitude of opportunities to show what they are good at and to express themselves and explain how they are feeling. (Week 7, about dyslexia in the workplace, will explore this further.)

Watch this five-minute video called 'Things not to say to someone with dyslexia' produced by BBC Three:

Video 1: Things not to say to someone with dyslexia (open the link in a new tab/window so you can return here easily)

1.1 The school years: social barrier

Literacy skills are a key measurement of success today and yet, universal reading and writing are relatively new techniques in terms of human evolution. In 1870 the Elementary Education Act was passed, and education became compulsory for children aged from five to thirteen. Before this, many human beings learnt by speech and action, talking, and doing, telling stories, watching their elders, exploring, testing boundaries and learning from failures and setbacks.

Activity 2 Your views on intelligence and success

Allow about 5 minutes

Who's to say that our modern evaluation of intellectual ability and success is correct? Perhaps some of the strengths of dyslexia – such as creative thinking, problem solving, the ability to see the wider context and make connections, and strong visual/spatial skills – are stronger indications of innate intelligence.

What are your thoughts on this? Make a few brief notes.

Provide your answer...

How were you academically evaluated? Do you think this adequately demonstrated your proficiency in your strongest skills?

Provide your answer...

What makes a person intelligent?

Provide your answer...

Keep in mind

Low self-esteem can result from low awareness of a student's own strengths and capabilities and of the effectiveness of supportive study strategies.

Traditional forms of knowledge acquisition can soon lead to feelings of anxiety, shame, ridicule from peers, class exclusions and accusations of laziness and stupidity from parents and teachers, who do not understand the internal struggle going on. The child or individual may not understand themselves either, knowing that they are trying hard and are not stupid or lazy, but cannot understand why they are not finding literacy tasks as easy to master as their peer group. The feelings of inadequacy can start to filter into all aspects of life, producing shame, secrecy, masking, avoidance, and anxiety. If a child does not have a supportive family or school, and these feelings become overwhelming or embedded, misbehaviour can be used to form a screen to the world, leaving a child isolated and vulnerable to negative influences, which might temporarily boost their self-esteem but ultimately lead to a life that does not reflect their ability or achieve their potential. It is common for dyslexic learners to have a high sensitivity to how others perceive them, and research has found enhanced emotional reactivity to emotionally charged scenes in videos (Eide and Eide, 2023).

Empirical research data from the University of Buckingham shows that some students with support have converted low grades to firsts, sometimes within two or three months. This is not to make light of how difficult it can be, depending on the severity, to study with dyslexia – but to show how knowledge of the condition and its potential strengths and weaknesses, determination, motivation, self-belief, effective study strategies and strong positive support, can be highly effective. (Week 5 will explore this further.)

Recommendations

Positive relationships: It is important for dyslexic learners to establish a positive relationship with a teacher(s), parent(s), or wider family member(s). Somebody who will advocate for them, notice them, see something meaningful in them and establish an emotional connection which can provide the building blocks for self-confidence.

Assistive technology (AT): With the advent of a new era of learning centered around technology and reading and writing skills supported by AT (such as, speech-to to-text and text-to to-speech), dyslexic strengths will become more valued and important.

2 Succeeding with dyslexia

Did you know that there is evidence that suggests Albert Einstein (one of the most influencial scientists of all time) was dyslexic? He was a late talker, and failed at history and geography in school, excelling in maths and science, and used to love music. He said '...I was, on the whole, considerably discouraged by my school experience... I had the greatest difficulty in making myself understood.' It seems that he was also a visual thinker.

Dyslexia is still stigmatised and the misconception around dyslexia can still evoke words such as 'stupid', 'unteachable' or 'disadvantage'. Let's look at some other prominent people who have dyslexia and consider the use of such words.

Activity 3 Notable individuals with dyslexia

Allow about 5 minutes

Match the following well-known people to their successes.

Inventor of the telephone

Co-founder of the Virgin Group

Inventor of the first practical light bulb and the phonograph

Founder of a major automobile manufacturing company

Winner of all four major performing arts awards in the USA (Emmy, Grammy, Oscar and Tony Awards)

Nobel Prize-winning biologist

Co-founder of Apple

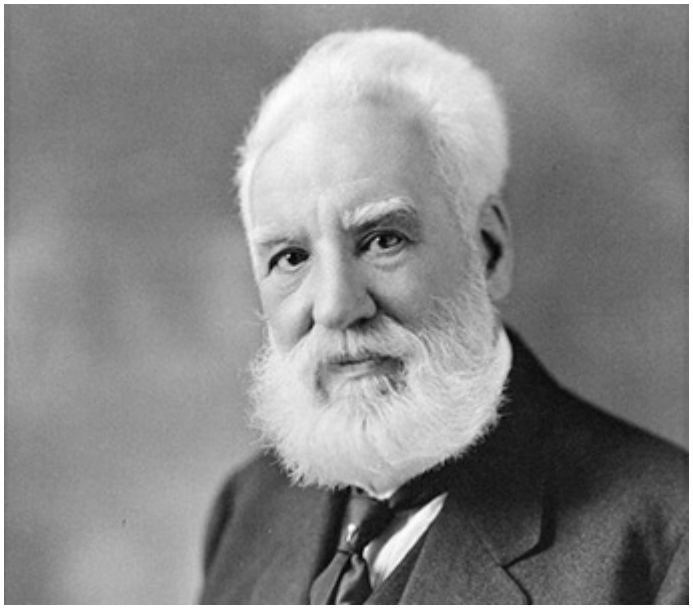
Award-nominated English actress

Spanish painter, sculptor, printmaker

Prime Minister of Norway (2013-2021)

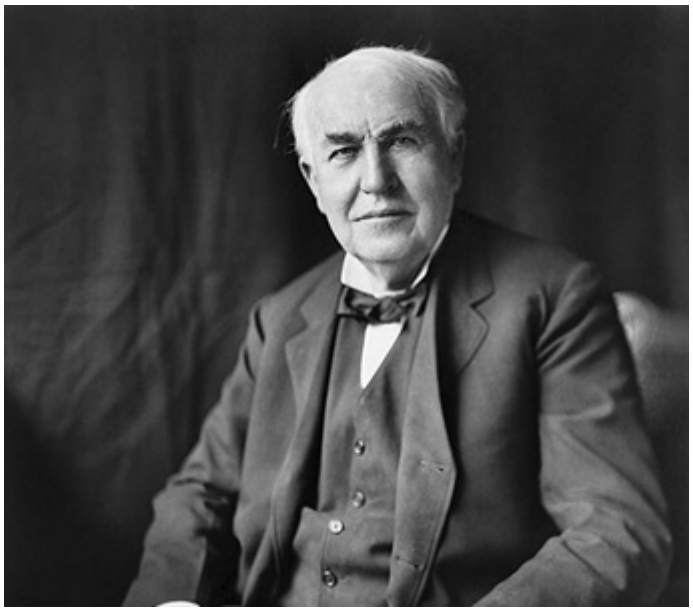
Love Island alumni

Match each of the items above to an item below.



Alexander Graham Bell

Richard Branson



Thomas Edison

Henry Ford

Whoopi Goldberg

Carol W. Greider

Steve Jobs

Keira Knightley

Pablo Picasso

Erna Solberg

Georgia Steel

By no means could these talented people be labelled as ‘stupid’. It’s important for us to change this way of thinking, and understand what dyslexia really is: a different way of thinking. It is neither a disability nor a disadvantage. The reality is that dyslexia is an advantage which sadly becomes a disadvantage in the current educational system, which does not accommodate diverse learning styles.

2.1 Testimonials

The following are reflections of what living with dyslexia and/or obtaining support means:

> ‘Reading has nothing to do with intelligence. It’s just one way of getting information. The important thing is how a person processes that information, the kind of person we are, the contributions we make, and the kind of utility we have society.’
>
> David Boies, Lawyer. Referred to by the New York Times as ‘the lawyer everyone wants’. Lawyer of the Year (National Law Journal); Anti-trust Lawyer of the Year (New York Bar Association); Commercial Litigator of the Year (Who’s Who).

> ‘Because of my dyslexia, my brain works differently, and I can see these patterns. I do have a gift that other people don’t have, and I will always stay ahead of the crowd and see more in an image than other people.’
>
> Dr Beryl Benacerraf, Radiologist and Expert in Ultrasound of Pregnancy.

> ‘My hope is that there will be greater understanding about dyslexia, so that the very many people who could be outstanding physicians and other professionals will have a chance to show what they can do.’
>
> Dr Stuart Yudofsky, Professor and Chairman of the Menninger Department of Psychiatry and Behavioural Sciences, Baylor College of Medicine; Chairman, Department of Psychiatry, The Methodist Hospital, Houston, Texas.

> ‘I think dyslexia and the consequences of dyslexia explain my own success. From my failures, I’ve learned where I need help, such as in reading and maths. But I’ve also learned from my accomplishments what I’m better at than the linear thinkers.’
>
> Jack Horner, Paleontologist. Jack turned his childhood passion for fossil-hunting into a career in paleontology.

> ‘… there are a large number of people out there like you. I see it in my children; they have faced up to their difficulties and have become successful as a result.’
>
> Richard Rogers, Architect. Richard likes to employ dyslexic architects because of their ability to think spatially and laterally.

> ‘Find other ways of doing things. It can be a more successful route. Even in business I have never taken the interstate. I take the winding rural road instead and see opportunities other people don’t.’
>
> Sir Jackie Stewart, Racing Car Driver.

‘I was dyslexic, I had no understanding of schoolwork whatsoever. I certainly would have failed IQ tests. And it was one of the reasons I left school when I was 15 years old. And if I – if I’m not interested in something, I don’t grasp it.’

Sir Richard Branson, who also says dyslexia is at least partially responsible for his success and people with the condition are likely to have ‘the skills of the future.’

‘Now I’m very open about my dyslexia. It’s part of who I am, and it’s made me who I am. If you want strategic thinking, come to me. If you want linear thinking, don’t come to me.’

Diane Swonk, Economist.

‘Any client of mine will tell you that if they have a complicated, difficult situation that they’re trying to work through, they’ll gladly take my occasional typos in my emails, for me as their lawyer to represent them and get them through that.’

Raphael Galvan, Lawyer.

Activity 4 Your role models for success

Allow about 10 minutes

Write the names of two successful people that inspire you. What makes them successful? Compare this with your previous notes about what it means to be successful.

Provide your answer...

Find out more about two famous people that have dyslexia (whether they were listed earlier in this section, or anybody else you know about), and see what you can find out about their journey.

Provide your answer...

2.2 Me, an ordinary person

This is a personal account from Patricia Covarrubia, one of the co-authors of this course, sharing her journey.

I’m from a small town in Venezuela, South America. Growing up, I faced the usual teasing at school for wearing glasses and having messy handwriting. I don’t remember much about reading, maybe because it was a tough experience. What I do remember is enjoying ballet, playing instruments, and making paper dolls. I did think I was ‘stupid’ in the classroom.

In secondary school, I discovered my love for graphic design and technical drawing. I struggled with other subjects but did okay in chemistry and physics, even though I

didn’t like them. Despite my poor handwriting, which often got me into trouble, I excelled in sports and ballet. I also started to enjoy being alone, maybe because of low self-esteem.

My parents didn’t go to university, but my mum was incredibly supportive and encouraged me to try everything we could afford. I never felt pressured to do well in school; it was my own drive to excel and be praised by teachers. I worked extremely hard and kept looking for what I could be when I grew up. I never knew exactly what I wanted to be – a dancer? A firefighter? A designer? In my last year of school, the pressure started about what to do next. It seemed my parents had already decided for me – I was going to university to study law! Even though I had no dreams of going to university, and if I did, I would have chosen architecture or engineering. Law wasn’t my choice, but I found my own methods to succeed. I used visual aids, charts, and colours to understand the material. Some of my peers were very helpful, explaining things to me. It was exhausting, and at times I felt like a failure and stupid, as my marks showed. But I discovered I wasn’t really that ‘stupid’ because I did well in oral exams. I persevered and graduated, even though I had to resit a few exams. There were many times when I called home and cried a lot. It wasn’t about being a quitter; it was about feeling exhausted, lost, and like a failure.

Next on the agenda was marriage. Yes, I was young, too young, but it was expected at the time. Thanks to my husband and his support, I could enhance the skills I thought I was good at. I went to university again and did a Masters in England. Crazy, right? I even got a scholarship to do a PhD. This time, I looked for things I liked, like business, technology, and creation. I found intellectual property law (IP) – it connected with my love for inventions, art, dancing, and architecture. I accepted that I wasn’t good at certain skills, but I didn’t need to be good at them to be successful. I am successful because I do what makes me comfortable and happy.

Today, I am Dr. Patricia Covarrubia, Abogado, LLM, PhD. I am the Programme Director of the LLB Full-time at the University of Buckingham. I work as an IP expert at the IPRs SMEs Helpdesk, European Commission. I have written over 400 posts on the IPTango blog, several journal articles in top UK and European journals, chapters in textbooks, a monograph, and an international edited book. I have given conferences around the globe, including in Indonesia, the USA, France, Spain, South Korea, and China.

By the way, I have dyslexia – although I never heard of it until my 40s (still a taboo in my country). My email reply reads ‘*This email is written with ‘creative expression and thinking’, do expect ‘creative spelling and grammar’ too. I have dyslexia. Please understand I do my best to reduce these errors.*’ Thanks to my colleague and co-author on this course, Sarah J. Myhill, I feel encouraged to tell you about my journey. I am not going to lie, there are still days, especially in meetings, where I feel uncomfortable, especially if they ask me to read something on the spot :(or to attend events where there are many papers to read, and I don’t manage to do it all. But life is a roller coaster, isn’t it?

Now, I want to encourage you to pursue what makes you happy and aim for what is your idea of success. It’s not always easy, and sometimes the path isn’t clear, but with determination and support, you can achieve it. Keep pushing forward and find what you are good at, rather than focusing on your weakness. Believe in yourself.

Watch this one-minute video naming Patricia as one of the Kindness & Leadership 50 Leading Lights, sponsored by University of Oxford and Financial Times.

View at: youtube:5N9_OZaSkKk

Video 3 Patricia Covarrubia

2.3 Living or working with someone that has dyslexia

Week 3 examined the biological aspect of dyslexia and its genetic heritability. Patricia's story doesn't end with her, as one of her daughters inherited the condition. But this is not specifically about her and her journey – it is about the many students Patricia shares her office and rooms with, and all of their journeys. Considering the bigger picture can be challenging, but is greatly rewarding.

Here are three key aspects to keep in mind, and suggested methods for addressing challenges, noted by the British Dyslexia Association. But keep in mind that dyslexia manifests differently in everyone, so behaviours and coping mechanisms can vary widely.

Table 1 Three key points

Skills	Other soft skills	Emotion
Dyslexia primarily affects reading and writing skills. They might read slowly, skip words, or have difficulty spelling. This means that a neurodivergent individual (a person with dyslexia) may struggle with tasks like reading instructions, writing, email formalities, or even simple participation in a session.	It's not all about the reading and writing. Dyslexia can impact short-term memory and organisational skills. This might mean forgetting appointments, poor time management, misplacing items frequently.	Dyslexia can affect self-esteem and lead to feelings of frustration, anxiety, or embarrassment.

Table 2 How to address challenges

Aspect	Suggestions
Communication	Use clear, simple language and provide instructions in multiple formats (e.g., written and verbal). Voice memos can be particularly helpful. Today, many tech tools like read-aloud and dictate can be used. Consider breaking information down into smaller chunks.
Distraction	We all are living in the smartphone era. Leave it behind! TV background noise is not helpful either.
Organisation tools	Utilise calendars, reminders, and organisational apps to help keep track of important dates and tasks. Use and encourage the use of colours to differentiate the tasks.

IT tools	Change the background colour of the screen (try different colours to see which works best). Use a dyslexia-friendly font like Arial or Calibri, avoiding Times New Roman. Larger print may also help. Try printing the page instead of reading directly from the screen, and use coloured paper for printing.
Patience and understanding	Be patient and understanding, especially when the person is tired. Exertion can exacerbate dyslexic symptoms.
Encouragement and support	Encourage your student to use alternative learning methods, like audiobooks or documentaries. Offer to help or at least to direct them to relevant resources and support teams when tasks involve heavy reading or writing.
Positive reinforcement	Focus on their strengths and achievements to boost their self-esteem. Reassure them that dyslexia does not define their worth.

Sharing your home, office or classroom with someone who has dyslexia requires empathy, patience, and a willingness to adapt. By understanding their challenges and providing support, you can help create a positive and supportive environment where everyone will excel.

3 Introducing three case studies

The last section for this week will introduce three neurodivergent individuals: Amaka, Ben and Chandru. They are modelled on people the course authors have worked with in the past. Their unique journeys and challenges with dyslexia will serve as case studies which will be revisited and expanded in the following weeks, and you can use them to reflect on how you feel or how you treat others.

3.1 Amaka

Amaka is a first-year university student studying archaeology. She has always been fascinated by this subject. For as long as she can remember, she loved watching documentaries and visiting museums and historical sites and developed a particular interest in ancient civilisations.

Figure 2 Meet Amaka (model used for illustration only)

As a child, Amaka loved to imagine herself in different historical eras, and at school, she used her vivid imagination and strong verbal skills to visualise historical events and enjoyed sharing her insights. Visits to castles with her family and school trips to museums with interactive activities were some of the highlights of her childhood. She was less enthusiastic about reading and writing, however, and struggled at school in these areas. She always read more slowly than her peers, she found spelling difficult, and her handwriting was very messy. She did well in subjects she had a passion for though, and this helped to boost her confidence, together with the support of her family. Her mother was an artist and did not read much herself, so although she encouraged Amaka, she was not worried about her daughter's slow progress with schoolwork. Even so, Amaka did feel quite low at times and was bullied sometimes. She couldn't understand why she found reading so difficult while her friends seemed to cope easily. She was also very clumsy and prone to falling over frequently, which was embarrassing, making her feel sad and different.

At university, Amaka has found it even more challenging to adapt, and although her coursework grades are good, she was disappointed with her results in her first end-of-term exams. She has also found organising her life and time very difficult without the support of her family and her previously structured life, so she often feels anxious and overwhelmed. A lot of the teaching is delivered via lectures which she sometimes finds boring, and she is expected to work through very long reading lists in many different areas. Amaka's personal tutor noticed that she was experiencing some difficulties with reading long texts and structuring her writing, and signposted her to the student support team for an assessment and helpful study strategies. They directed her to supportive assistive technology (AT) and now she often listens to audio versions of her textbooks or uses text-to-speech and speech-to-text features on her mobile or laptop that help her increase the amount of information she can absorb.

While Amaka struggles with note-taking due to her difficulty in multitasking, she has been encouraged to record lectures and later transcribes them at her own pace. This method

allows her to digest information in a way that suits her learning style, and she is also given access to PowerPoint presentations and slides prior to lectures and seminars. However, the process is time-consuming, and as a result, Amaka frequently finds herself sacrificing social events to keep up with her academic commitments. Given her innate shyness and lack of confidence, she believes this trade-off negatively impacts her social life and wellbeing and can make her feel isolated. This is made more acute given that many of her closest friends participate in various sports clubs, but she is not a natural at sports with her difficulties with co-ordination, so she always politely declines their invitations to join them.

3.2 Ben

Ben is studying for an apprenticeship in plumbing. His father runs a successful building business, and Ben has always enjoyed helping out at weekends. He has become especially good at seeing practical solutions to some of the problems on building sites, such as skilfully adding pipes that had been forgotten on the architect's plans. Ben has found he has a gift for reading these drawings and spotting errors. He is often called to the office on site to explain to one of the other workers how the two-dimensional image of a detail on the plan will need to be constructed.

Figure 3 Meet Ben (model used for illustration only)

Ben loved Lego and Meccano as a child and quickly built complicated constructions from the pictures on the box, rarely reading the step-by-step instructions. He would concentrate for long periods of time on these tasks, but he found it hard to focus on most other tasks. This was especially the case when it came to schoolwork. Ben found reading and writing challenging, so he tended to act as the class clown. While reading, he kept losing his place, and while writing, he often missed out words or phrases.

Even now, as a young adult, Ben avoids reading and prefers to learn by watching videos and taking things apart so he can see how they work. Knowing about his difficulties at school and recognising something of himself in them, Ben's father encouraged his son to explore the world through physical interactions and pursuits.

Sport is a source of great joy and relaxation for Ben. He enjoys watching and playing various sports, which he is naturally good at, and he also finds that the concentration his training requires curbs his distractibility. The family had always taken active holidays where Ben and his brothers could climb or swim, and Ben has continued climbing as a hobby.

Ben enjoys racing his cross-country motorbike and often spends time cleaning and repairing it. When faced with any written work or assignments associated with his apprenticeship course, he finds his inclination to put off tasks that he is not interested in so strong that he will leave them until the last minute. He is also very disorganised and well known among his friends for leaving his belongings everywhere.

3.3 Chandru

Chandru is classed as a ‘mature student’, although he is only 25 years old. He has just finished his Foundation Pathway year and started the first year of an engineering degree. He had not felt confident enough in his academic skills to go to university straight from school, so he took a job working with a firm that installed air-conditioning units. He discovered that he was good at sales. He enjoyed meeting new people, talking to clients and finding the right solutions for them. During the Foundation year, where academic reading and writing skills were core to the course, Chandru was surprised to see that his abilities in this area had really improved. This gave him the confidence and encouragement to apply to the engineering course.

Figure 4 Meet Chandru (model used for illustration only)

Chandru struggled with reading and writing at school and found spelling and learning the multiplication table difficult. This knocked his confidence in school, and it was made worse when some of his peer group made fun of him, and a teacher told him that he would not go far in life. However, Chandru excelled in technical drawing, where he had a very supportive teacher who noticed he was good at constructing 3D images and encouraged him to keep going.

In his engineering course, Chandru discovered the great value his work experience had, helping him understand many advanced concepts more quickly than his peers. He has started using mind mapping techniques which suit his multidimensional thinking. While in the past he struggled to develop his thoughts logically in writing, mind mapping allows him to brainstorm ideas and make new connections. Chandru uses assistive technology offered to him during his course, which has dramatically improved in the intervening years since he was at school. He especially values a speech-to-text application that lets him quickly get his thoughts onto paper and structure and refine them later.

3.4 Your initial impressions

Each person you’ve just read about has been diagnosed with one or more neurodivergent conditions. Do you think you can tell which?

Activity 5 Test your judgment

Allow about 5 minutes

While the details provided aren’t comprehensive enough to say with certainty which condition(s) each person might have, can you apply your current knowledge from the past four weeks to make an educated guess?

Amaka:

- ☐ ADHD
- ☐ ASD
- ☐ dyscalculia
- ☐ dyslexia
- ☐ dyspraxia

Ben:

- ☐ ADHD
- ☐ ASD
- ☐ dyscalculia
- ☐ dyslexia
- ☐ dyspraxia

Chandru:

- ☐ ADHD
- ☐ ASD
- ☐ dyscalculia
- ☐ dyslexia
- ☐ dyspraxia

4 This week's quiz

It's time to complete the Week 4 badged quiz. It is similar to the previous quizzes but this time, instead of answering 5 questions, there will be 15, covering Weeks 1 to 4.

Remember that the quiz counts towards your badge. If you're not successful the first time, you can attempt the quiz again in 24 hours.

Week 4 compulsory badge quiz

Open the quiz in a new window or tab, then come back here when you've finished.

5 Summary of Week 4

This week has explored the characteristics of neurodivergent individuals and the potential comorbidities they may face.

Having already covered the concept of dyslexia (Week 1), identifying dyslexia (Week 2), and explaining dyslexia (Week 3), you have now delved deeper into how dyslexia is experienced by neurodivergent individuals. As a society, we need to better understand and reflect on our perceptions of ourselves and others. To promote a human perspective on dyslexia, this week has provided examples of successful individuals with dyslexia, shared testimonials, and examined the lives of Amaka, Ben, and Chandru, which you will explore further in the coming weeks.

Next week will explore a range of dyslexia-friendly teaching strategies, focusing on multisensory methods, fostering curiosity and resilience, and utilising technology to enhance learning experiences.

You are now halfway through the course. The Open University would really appreciate your feedback and suggestions for future improvement in our optional end-of-course survey, which you will also have an opportunity to complete at the end of Week 8. Participation will be completely confidential and we will not pass on your details to others.

You can now move on to Week 5.

Week 5: Supporting dyslexia

Introduction

Understanding how to effectively teach and give directions to dyslexic and neurodivergent individuals can improve the overall learning and working environment for everyone. Integrating these principles into all forms of instruction will help dyslexic and neurodivergent learners succeed, while also enhancing the learning experience for all.

Universal literacy instruction and Universal Design for Learning (UDL) advocate for multiple means of representation to accommodate diverse ways of knowing and learning, supporting dyslexic and neurodivergent individuals across various environments and stages of their studies and careers. By integrating these principles, we can enhance the learning and working experiences for everyone. Dyslexia-friendly techniques in education and employment can support individuals with dyslexia to achieve their full potential. With technological changes like Artificial Intelligence (AI) challenging text-based methods, alternative approaches benefit everyone by providing diverse and effective ways of learning and working.

Educating individuals about dyslexia and other learning difficulties and providing effective support strategies can significantly enhance the experiences of those with dyslexia. Shifting from making judgments to gathering information about how people learn best and coaching to different strengths and weaknesses can support individuals at various stages of development. Building strong relationships with mentors can be life-changing, providing the foundation for self-confidence in learning and working.

Dyslexic learners often have heightened awareness of others' perceptions and enhanced emotional reactivity (Eide and Eide, 2023). Neurodivergent individuals can be more empathetic due to their own experiences. Learning grows from interactions with others, and a sense of belonging is essential for healthy learning and life (Eyler, 2018). Encouraging students to focus on short-term steps to long-term goals and showcasing success stories can empower neurodivergent learners.

> We can all have an effect on our students' educational journeys, provided we care about **who** they are, and we pay close attention to **how** they learn.
>
> Eyler, 2018, p. 15

> The dyslexia-friendly approach expects that what is good for dyslexic learners is good for all learners.'
>
> Pavey, Meehan and Waugh, 2010, p. 7

By the end of this week, you should be able to:

- understand dyslexia-friendly teaching techniques
- apply 'big picture thinking' and story-based learning
- utilise real-world experiences and exploration
- foster growth mindset and metacognitive skills

- demonstrate awareness of the use of assistive technologies and AI to enhance learning experiences.

1 Dyslexia-friendly teaching and learning

The following guidelines focus on creating an inclusive educational environment that accommodates the unique needs of dyslexic learners. By implementing tailored strategies and techniques, educators can enhance the learning experience and support the success of all learners.

Table 1 Strategies for inclusion

Create a welcoming learning environment	• This step starts with the educator/mentor, sharing some general personal anecdotes and experiences. This can foster a sense of trust and community in the room. • Can be particularly effective in reducing anxiety and encouraging curiosity among learners. • When it comes to supporting dyslexic learners, it's crucial to present information in a way that builds on their strengths, such as using visual aids and interactive examples. • Encouraging learners to engage with the material and considering it from different perspectives can also enhance their understanding and retention of the subject matter (Eyler, 2018).
Empower learners to take ownership of their learning	• Learners should understand that they are at the centre of their learning, and they are in control. This can be transformative. • Encourages active engagement, critical thinking, and personal accountability, thereby weakening the hold of dependency and passively receiving information. By fostering an environment where learners are motivated to explore, question, and apply their understanding, educators/mentors can cultivate a sense of independence and confidence in students. • This method not only enhances the learning experience but also prepares students for real-world challenges where self-directed learning and adaptability are key (Zull, 2011).
Reflection: the power of questions plays a crucial role in cognitive processes	• Taking time to reflect on sensory data and recall relevant memories can be more beneficial than rushing, as speed may hinder this reflective process. • Asking oneself introspective questions can highlight daily successes and align understanding with personal goals. • Sleep is not just downtime but an opportunity for the brain to process information and consolidate memories. • The process of creating, analysing, and discarding ideas is fundamental to cognitive growth, leading to the generation of new, potentially more refined ideas. This cycle is essential for making meaning out of ideas,

	continuous learning, and development (Zull, 2011).
Effective use of working memory in various environments	• Focusing on a limited number of key elements to enhance learning. This approach emphasises the importance of brevity and clarity, suggesting that learning experiences should be direct and simple. • For instructors, the challenge lies in empathising with the learner's perspective and distilling complex information into basic, accessible concepts which they can hang additional knowledge from, ensuring that the core message is quickly and clearly communicated. • Asking learners to make summaries at the end of a period of learning encourages reflection and develops a skill for identification of the main points (Zull, 2011).

The next page will offer some more recommendations about effective content delivery.

1.1 Delivering content

Consider how to deliver content in alternative formats, ensuring your documents and presentations comply with basic accessibility practice. You could do this by:

- using inbuilt heading styles to allow learners to rapidly navigate a document
- adapting assessments and tasks to play to the strengths of dyslexic (and SpLD) learners. For example, producing an image or poster, a podcast, audio or video materials instead of text.

The Home Office produced some 'dos and don'ts' guidance on designing for accessibility:

Table 2 Dos and don'ts (adapted from Pun, 2016)

Do:	Don't:
Use a dyslexia-friendly typeface, such as Arial, Comic Sans or Verdana. There are even some specifically designed fonts for dyslexic students such as Dyslexie and OpenDyslexic.	Use a font such as Times New Roman or Georgia.
Use images and diagrams to support text.	Use large blocks of heavy text.
Align text to the left and keep a consistent layout.	Justify the text.
Consider producing materials in other formats (e.g. audio or video).	Underline words, use italics or write in capitals.
Keep content short, clear and simple.	Force users to remember things from previous pages. Best practice is to give reminders and prompts.

Have notes available before the class/session/ meeting starts.	Rely on accurate spelling, use AutoCorrect or provide suggestions.
Let users change the contrast between background colour and text – it reduces glare.	Use PDF files.
	Put too much information in one place.

By leveraging dyslexic strengths, educators can enhance learning by providing context and previewing material to help dyslexic learners connect new information with what they already know. The key word there is ‘connect’. Now, let’s delve into how dyslexic strengths can be implemented most effectively in learning practices.

2 Learning through preview and context

The dyslexic brain has ‘the ability to perceive relationships like analogies, metaphors, paradoxes, similarities, differences, implications, gaps and imbalances’ (Eide and Eide, 2011, p. 5) and ‘unite all kinds of information about a particular object or thought into a single global or big picture view’ (ibid, p. 84). This means that dyslexic individuals excel at seeing the overall picture and understanding complex relationships.

Big picture thinking

Big picture thinking, having a preview or overview, and getting the gist or essence of a topic and the context, are important techniques for dyslexic learners. They’re generally less good at rote learning and often find it more difficult to hold information in the memory without links or associations. They need to see relevance and connections to other things, and will need to know the deeper underlying principles and context in order to understand fully. Many dyslexic learners find multiple choice exams very difficult for this reason – there is no context. Turning information into a story, or visualising an image with context, or embedding it into a scene or episode, can make memorisation much more achievable. When you get a preview or ‘big picture’ of a task, topic, text, lesson or lecture, the details will fit together much more easily.

Right brain thinking

Dyslexic people are generally good at ‘right brain’ thinking, using their creative, visual skills, and this can enable them to see relationships and interactions that neurotypical students may find more difficult. Some dyslexic learners have good spatial skills and an ability to visualise in 3-D, allowing them to create and manipulate images mentally.

Interconnected reasoning

Other dyslexic people are good at interconnected reasoning, identifying remote connections and unrelated meanings. They need to link learning to what they already know or experiences they’ve had, and form stories, thereby getting a preview, overview or big picture perspective. Before engaging with new learning, they may find it useful to receive key points, vocabulary and concepts, abstracts or summaries. This way, the boundaries of the task are more clear, and the details make sense and slot into the ‘big picture’ more quickly and easily. This builds on the natural ability of dyslexic learners for detecting similarities, analogies, paradoxes, homophones, rhymes, and seeing a problem from more than one perspective. Schools could shape the learning structure for all pupils along these lines based on a top-down approach – these methods would make learning easier for all pupils and students (not just the dyslexic ones) and create a truly inclusive learning environment, where no learner feels out of place (Eide and Eide, 2023).

3 Learning through episodes and events

Stories are a powerful tool for engaging dyslexic learners, as they naturally organise information into memorable episodes and events. By using narratives, educators can make complex concepts more relatable and easier to understand, fostering a deeper connection with the material. But why are stories so effective in enhancing learning and retention? Let's explore the cognitive processes at work here, and discover how storytelling can transform educational experiences.

Table 3 How the memory responds to events

1.	**Long-term memory** contains two categories. The first is implicit unconscious memory, for facts as abstract and impersonal data. This is linked with procedural memory, allowing for routine or common tasks to be performed automatically (e.g. tying shoelaces, riding a bike, or driving a car). The other main type of long-term memory is explicit conscious memory, for facts about the world, episodic experiences, concepts. This is linked with semantic memory (specific memories of, for example, individual words, objects, and people).
2.	**Episodic experiences are stored in episodic memory**. This is the memory of stories, events and episodes attached to a place with a sequence in time, enhanced by emotion, or the feeling attached to the memory. The difference between episodic memory and semantic memory is time. People with dyslexia tend to use episodic thinking more than neurotypical individuals, so thinking in stories, using descriptions and sensory imagery can greatly enhance their learning. Dyslexic people store the contents of their episodic memory (experiences, events, observations) in a multisensory way, using visual, auditory, and tactile cues. They make more individual memories which they keep separate, rather than the more usual trait of blending memories to form a general memory of similar events. This makes dyslexic people very good at seeing connections and similarities (Eide and Eide, 2023).
3.	**Dyslexic minds can also absorb the experiences of others**, and use this ability to blend with their own experiences. These integrated results can be used for future predictions, planning, and creating. This can contribute to making them very good problem-solvers. They can also show solutions to others through their creative and/or visual abilities (Eide and Eide, 2023).

In Week 4, you were introduced to three case studies: Amaka, Ben, and Chandru. Their stories hopefully gave you some insight into their individual challenges. But how well do you remember the details? Let's put your memory to a quick test (don't peek back!).

Activity 1 Memory test

Allow about 10 minutes

Amaka

1. What subject is Amaka studying at university?
- ○ History
- ○ Archaeology
- ○ Literature

- ○ Anthropology

2. What did Amaka enjoy doing as a child that sparked her interest in ancient civilisations?
- ○ Reading books
- ○ Watching documentaries and visiting museums
- ○ Playing sports
- ○ Writing stories

3. What challenges did Amaka face in school?
- ○ Difficulty with reading, spelling, and handwriting
- ○ Lack of interest in history
- ○ Struggles with mathematics
- ○ Poor social skills

4. What kind of assistive technology does Amaka use to help with her studies at university?
- ○ Audio versions of textbooks and text-to-speech features
- ○ Virtual reality headsets
- ○ Interactive whiteboards
- ○ Online tutoring services

5. Why does Amaka often feel isolated at university?
- ○ She has difficulty making friends
- ○ She sacrifices social events to keep up with academic commitments
- ○ She is not interested in extracurricular activities
- ○ She prefers to study alone

Ben

1. What is Ben studying for his apprenticeship?
- ○ Carpentry
- ○ Plumbing
- ○ Electrical work
- ○ Masonry

2. Which childhood activity did Ben enjoy that helped develop his practical skills?
- ○ Reading books
- ○ Playing video games
- ○ Building with Lego and Meccano
- ○ Drawing and painting

3. How does Ben prefer to learn new things as an adult?
- ○ Reading textbooks
- ○ Watching videos and taking things apart
- ○ Attending lectures

- ○ Listening to audiobooks

4. Which sport-related activity does Ben find helpful in curbing his distractibility?
- ○ Playing chess
- ○ Watching movies
- ○ Training for and playing various sports
- ○ Writing essays

5. What is one of Ben's main challenges with his apprenticeship coursework?
- ○ Lack of interest in the subject
- ○ Difficulty understanding the material
- ○ Procrastination and disorganisation
- ○ Poor relationships with his peers

Chandru

1. What degree is Chandru currently pursuing?
- ○ Business Administration
- ○ Engineering
- ○ Computer Science
- ○ Architecture

2. What job did Chandru take before starting his university studies?
- ○ Sales representative for an air-conditioning installation firm
- ○ Technical drawing instructor
- ○ Software developer
- ○ Construction worker

3. Which academic skills did Chandru improve during his Foundation Pathway year?
- ○ Mathematics and science
- ○ Reading and writing
- ○ Public speaking and presentation
- ○ Programming and coding

4. Which technique does Chandru use to help organise his thoughts and ideas in his engineering course?
- ○ Flashcards
- ○ Mind mapping
- ○ Group study sessions
- ○ Traditional note-taking

5. What kind of assistive technology does Chandru find particularly valuable for his studies?
- ○ Virtual reality simulations
- ○ Interactive whiteboards

- Speech-to-text applications
- Online tutoring services

Week 4 was just last week, right? You might still have found it hard to remember every answer. It's surprising how quickly we can forget details, even if we learned them very recently. But don't worry, it's completely normal! The fact is that **separated, episodic memories can create challenges** with procedural learning, or automaticity, on which much mainstream teaching and learning is based. Procedural learning needs more teaching, more repetition and takes longer to embed, the skills can be forgotten if not regularly practiced, and it relies heavily on rules and generalisations. This style of learning usually takes longer for people with dyslexia to absorb – they can have a fundamental difference in learning processes and need relevant strategies to adapt their learning. If their dyslexia has not been recognised at school (or as a child), this difference can lead to lifelong difficulties and engender low confidence in one's learning ability. For instance, **lists of facts, multiple choice tests and rote learning are not good for dyslexic learners**. Multiple choice tests are hard in general because they use generalisations and lack context. Many dyslexic learners use context to gain meaning from reading when they cannot recognise or understand the words.

Much academic study is based on 2D teaching and learning, whereas many dyslexic learners tend to use and excel at 3D visuo-spatial thinking. Building on their strength in 3D visuo-spatial thinking, learning can be enhanced by incorporating authentic, real objects and places into the educational experience. Let's look at this technique a bit more closely.

4 Learning through experience

> The scaffolding of the brain (nature) defines the arena in which change happens through experience (nurture)…[N]urturing is experience. Whatever happens, good or bad, is part of nurturing.
>
> Zull, 2011, p. 233

The human brain's survival instinct is a remarkable evolutionary adaptation that shapes our learning processes. By focusing on relevant and authentic information and dismissing what is irrelevant, the brain ensures that we acquire knowledge that is crucial for our wellbeing. This natural prioritisation can be leveraged in educational settings to enhance learning outcomes. By making learning relevant and authentic and avoiding unimportant information, engagement and retention are deepened and students can extract more meaning from their learning.

> We have cast our lot with learning, and learning will pull us through. But this learning process must be re-imbued with the texture and feeling of human experiences shared and interpreted through dialogue with one another.
>
> Kolb, 2014, p. 51

Constructivism

Students may know all the content, but not know how to use it, or see how it interacts with the real world. Constructivism – the idea that people cannot fully learn or understand unless they have been active participants in building knowledge and concepts for themselves – can be a solution, while also supporting the dyslexic mind. Learning through experience is strongly biased towards episodic memory and experiences which can be used as the foundations of learning. Practical experience and doing things firsthand using real life examples, objects, and situations, makes learning, authentic, interesting, memorable, and believable.

The dyslexic mind

Learners should be exposed to as many experiences as possible: doing things, getting involved and feeling curiosity. Dyslexic minds need case studies, examples, and concepts which they can relate to or transfer into other situations, gaining information from an exploratory process of learning rather than receiving information passively (Eide and Eide, 2023). Use this idea to connect learning to real world information, as these links will help to embed memory. Use diagrams, flowcharts, graphs, mind maps, visual images, posters and infographics, as translating ideas into words is hard. Consider these methods for alternative forms of assessment too. Nurture the ability for 3D thinking and interaction with visual/mental images, use past experiences and varied topics. In the case of dyslexic children, they can engage in special, more interactive projects which engage with their strengths. This can help to support their self-esteem when other areas of learning (such as reading and writing) may prove more challenging.

5 Learning through exploration

We have evolved as predictors. Our brains are designed to make predictions, which are often shaped by our experiences and beliefs. (Predicting can even be the more rewarding aspect in itself – the dopamine released in the brain is not dependent on receiving the anticipated outcome.) But what if a situation doesn't match with our prediction? That's an interesting result for our brains to encounter, and it's an opportunity for learning. These traits can be put to good use for encouraging our learners, and engaging more effectively with the exploratory dyslexic mind. But how exactly should educators do this?

Table 4 Engaging exploration

1.	**Foster curiosity in education, especially for dyslexic learners**. This can be a transformative approach that aligns with the natural human instinct to predict, explore and understand. By forming 'essential questions' at the beginning of lessons, educators can tap into the innate inquisitiveness of their students and help them to find the answers, guiding them to deeper engagement with the subject matter. Encourage students to create their own questions on the lecture topic. The brain has a natural inclination to answer a question when it is asked, by oneself or another person, so it can quickly engage an audience or encourage the mind to dig deep for answers. This method not only enriches the learning experience but also cultivates critical thinking and a lifelong passion for discovery.
2.	**Build bridges to learning** by using discussion and open-ended questions, 'why' questions – ask students to apply what they have learned. By teaching students to ask insightful questions, educators can guide them to think critically and apply their knowledge. This approach not only stimulates discussion but also empowers students to take ownership of their learning journey. Encouraging self-discovery and providing opportunities for hands-on experiences can lead to a more meaningful and lasting understanding of the concepts being taught (Eyler, 2018).
3.	In education, **a multifaceted learning approach can be beneficial**. Try incorporating a variety of exploratory methods, such as spatial and mechanical investigation, which stimulates curiosity and fosters a deeper understanding of complex concepts. By blending hands-on activities like building and deconstructing with interactive storytelling, debates, and re-enactments, learners are encouraged to think critically and creatively. Field trips and site visits, enriched with comprehensive background information, allow students to draw connections between their studies and the real world. Allowing time for reflection and experimentation further nurtures an environment where knowledge can flourish (Eide and Eide, 2023; Eyler, 2018).

6 Learning through setbacks, failure and metacognition

Embracing setbacks and failures as learning opportunities is crucial for developing resilience and a growth mindset. By fostering self-knowledge and recognising individual strengths, learners can transform challenges into valuable experiences that enhance their metacognitive skills and overall growth.

6.1 Failure

> Failure can only be valued as a mechanism for learning if it is valued by both the teacher and the students.
>
> It is the quality of failure that matters most. Quite simply, students must (not should, but must) fail in order to learn. As teachers, it is our job to help them to do so.
>
> (Eyler, 2018, p. 215)

Failure is not the tragedy that we are often led to believe it is, especially during our childhood. Failure is an opportunity for exploration and discovery; it is a human learning tool and a stepping stone to success. When someone has experienced a task or situation not working, and they've considered it and come up with a solution, they will remember that experience far more clearly than if they'd just been told what to do up front. Children need to learn to deal with failure early and often, as dealing with failure builds tenacity and creativity. Dyslexic students are typically more used to failure, more accustomed to getting back up and moving on, testing out new methods and devising their own strategies. Early difficult experiences in childhood can build resilience, resourcefulness, perseverance, and grit – characteristics that will help individuals to deal with later setbacks in adulthood.

6.2 Metacognition

> [Metacognitive knowledge is] knowledge about thought processes in general and about one's own cognitive strengths and weaknesses in particular. It includes knowledge about how to monitor, control, and evaluate one's performance on cognitively demanding tasks.
>
> (Nickerson, 1994, p. 419)

Metacognition – thinking about one's thinking – is relevant in every aspect of our lives (e.g. education, work, family, relationships, friendships, leisure, and community) and can be practised in any situation. It is a highly effective way of learning, doing things more efficiently and achieving successful outcomes. Good metacognitive skills make use of one's abilities intentionally rather than automatically, leading to independence in learning, allowing control of one's own learning and working methods, and thereby reducing stress and anxiety. An increase in self-esteem can be a positive outcome, encouraging self-belief and increasing expectations from oneself and others, leading to more confidence and more inclination to persevere, making academic and workplace success more likely.

Learning as much as possible about one's own thinking and learning processes can help dyslexic thinkers 'learn how to learn'. This is a process of building on their strengths and self-learned techniques, and developing further through available support and taught strategies. Encourage learning from experience, practice, feedback, and reflection,

learning from strengths and failures. By acting positively on feedback and setbacks, and feeding the new information back into behaviour, much deeper learning can be gained.

Encourage self-belief, self-advocacy, and positive self-talk. Our brains do not know what is in the future, only what we are telling it in the moment – so a positive mindset can make all the difference. Support students to think about their strengths – not only what they are good at, but what makes them feel good, what they enjoy. Try to view dyslexia from a strength-based perspective and encourage pupils and students to see their strengths as unique, positive features. Many dyslexic people can have low self-esteem around academic learning, so it's important to see the positives in different ways of learning, and support challenges with guidance and empathy (Eide and Eide, 2023).

Activity 2 Self-reflection

Allow about 15 minutes

Metacognitive journaling involves writing about your own thinking and learning processes. For this activity, you might find it useful to employ coloured pens or markers to highlight different aspects of your reflections. For example, use one colour for strategies that worked well, another colour for challenges faced, and perhaps a different colour for new insights or ideas.

Reflect on and write down your answers to the following questions:

What strategies do I use when I am learning something new?

Provide your answer...

How do I know when I understand something well?

Provide your answer...

What do I do when I encounter a difficult problem or concept?

Provide your answer...

How do I monitor my progress while studying or working on a task?

Provide your answer...

Metacognitive journaling is a great way to become more aware of our learning processes and to track their progress over time.

6.3 Growth mindset

> You are not handed a fixed pot of brilliance at birth. Instead you can grow and change your ability with practice, determination and effort.
>
> (Syed, 2018, p. 51)

Growth mindset is the belief that your ability is not fixed, but instead your brain has plasticity, growing and changing throughout the whole of your life. Consider Carol Dweck's (2007) 'growth mindset' approach, where the journey is praised rather than the end result.

Some examples of 'fixed mindset' thinking and the 'growth mindset' equivalents would be:

Table 5 Fixed mindset vs. growth mindset (Adapted from Syed, 2018, p.52)

Fixed mindset	Growth mindset
'I'm no good at that'	'I'm no good at that yet, but I can improve with effort'
'I'm so stupid'	'I just haven't done enough practice yet'
'She's a genius'	'I wonder what practice she's doing?'
'I've got no coordination'	'I need to find someone to study with me'
'I give up'	'What can I do differently?'
'It's too hard'	'This might take a while; I need to ask for help'

Activity 3 Reframing thoughts

Allow about 10 minutes

Consider the following thoughts, and how you can reframe them to focus on effort, learning, and growth. Note down your ideas in the boxes.

'I'll never understand this'

Provide your answer...

'I'm just not smart enough'

Provide your answer...

'I always fail at this'

Provide your answer...

‘I’m afraid of failing’

Provide your answer...

‘I always make mistakes’

Provide your answer...

Discussion

Consider sharing your growth mindset statements with your peers – that way you can inspire each other to embrace challenges and continue growing!

By embracing setbacks and leveraging metacognitive strategies, learners can develop a growth mindset that transforms challenges into opportunities for personal and academic growth.

7 Learning through multisensory methods

> In short, learning is dynamic, social, and context dependent because *emotions* are, and emotions form a critical piece of how, what, when, and why people think, remember, and learn.
>
> (Immordino-Yang, 2016, p. 1)

Multisensory learning – using the senses of sight, hearing, action (kinaesthetic) and touch – not only helps embed memory but enhances learning. Using two or more senses engages more of the brain, resulting in better learning outcomes. For example, students who use text-to-speech facilities while reading the text, thereby hearing the words while reading/seeing them (or even just saying the words aloud), can enhance the comprehension and memory of the text. If note-writing is added to this process, students remember more than students who don't write any notes, due to the kinaesthetic action between the hand and the brain. In addition, students who *write* notes typically remember more than students who *type* notes, due to increased sense engagement. Videos, audiobooks and podcasts are other methods of engaging the senses in learning. Multisensory learning is different from the learning styles approach, which divides people into audio, visual and kinaesthetic learners. This has now been discounted as a theory, as most people use all of these learning styles to a greater or lesser extent. Multisensory learning has been found to be particularly good for those with dyslexia and other learning difficulties, as using different senses simultaneously engages different areas of the brain and therefore enhances memory and learning.

Emotion and the senses are strongly linked, and factual memories are embedded by emotional memory. This makes emotion one of the most important factors for learning as it strengthens memory. Analysing the feelings related to emotions – looking at how we feel and why – can increase self-awareness in this area. Positive emotions such as happiness, joy, and humour aren't typically linked directly to learning, but are important in creating the caring environment necessary for dyslexic students (and indeed all students) to succeed. The images associated with emotion are the ones we remember most. This can be used by educators in many ways, such as recalling successes to strengthen memory and build motivation (Zull, 2011).

However, **negative emotions can impact learning detrimentally**. The small almond-shaped area of the brain known as the amygdala plays a central role in our emotional experiences, memory formation, and our fight-or-flight responses. The amygdala was once essential for survival, but fear can freeze learning and reduce memory. Many dyslexic students experience fear in the classroom, lecture hall or seminar room, so creating an empathetic environment, and putting the learner at the centre of teaching, will foster better understanding. Building on prior knowledge can induce feelings of familiarity and therefore reduce fear. New knowledge hooks onto existing knowledge more easily, helping to integrate new material with information that's already been mastered. So, five minutes spent jotting down anything known about a topic before studying will help to draw in and consolidate the new information. Guided feedback can help to scaffold this process.

Help learners find the joy in learning. New learning can be difficult, but overcoming the challenge can bring great rewards and great joy. Try to find an area of success for dyslexic students. Remembering associated feelings and visualising past successes are great incentives to tackling new tasks and challenges. It is important for students with dyslexia (or another learning difficulty) to see the challenge as valuable, to enjoy the journey, and to use the experience to learn more about themselves. With the right knowledge and attitude, something like a low grade can be seen as information rather than a failure.

Overcoming the challenges in learning can dampen fear and increase joy, and a sense of achievement can build motivation and self-confidence – attributes that are so important to the learning process.

8 Technology

> What determines success for dyslexics is high levels of actual and self-perceived control over their environment.
>
> (Fitzgibbon and O'Connor, 2002, p. 22)

Technology has become a powerful ally in supporting individuals with dyslexia, offering tools that enhance learning, communication and independence. From text-to-speech software to AI-driven personalised learning platforms, these innovations are reshaping how dyslexic learners engage with the world.

8.1 Assistive Technology (AT)

Assistive Technology (AT) can level the academic playing field for students with dyslexia or SpLDs. AT allows students with dyslexia or SpLDs to work unobtrusively alongside their peer group to reach their potential, and so encourages inclusivity.

AT can come in many forms. Here's a (non-exhaustive) list of methods to support learners with dyslexia and other learning difficulties:

- audiobooks
- text-to-speech
- speech-to-text facilities
- homophone spellcheckers
- creating MP3 recordings from documents
- isolating screen rulers with magnification
- screen light colour adjustments
- audio notetaking and lesson/lecture recording facilities can capture full recordings of lessons, allowing learners to focus on understanding rather than notetaking, to check details afterwards and re-cap lectures at the end
- mind mapping software can help to plan the content of an assignment, take notes, revise, or plan a project, and some mind mapping software can even transfer a mind map into a sequential word document
- changing computer fonts and colours, changing the background colour of text on the computer or using a transparent coloured overlay and a reading ruler or a guide, such as a ruler or pencil. This can reduce glare and consequently support faster reading speeds.

8.2 Artificial Intelligence (AI)

The emergence of generative AI tools, such as ChatGPT, has the potential to transform educational practices. These are large language models (LLMs) that recognise and generate text, among other functions. These tools can create text that resembles human-generated content, including images, and are increasingly being integrated into various educational tools and platforms. They can be great tools for students in general, for instance:

- Some students see the chat facilities as emotional support. You should remain aware, though, that this can lead to problems in itself.

For students with dyslexia, these tools can provide them with individualised support, serving as personal tutors, collaborative coaches, and study buddies.

They help with focus, productivity, time management, and prioritising of tasks. AI can empower dyslexic learners by providing personalised support and fostering inclusivity in education.

However, there are always two sides to any coin. The information held by LLMs is drawn from vast datasets on the internet, which can introduce biases, produce factual inaccuracies, and raise concerns about academic integrity (i.e. cheating and plagiarism). As AI is already here and rapidly progressing, we must learn to work with it. Both educators and learners are navigating this new landscape together. Consequently, teaching, learning, and assessment will be expected to adapt in response to these advancements.

9 This week's quiz

Now that you've completed Week 5, you can take a short quiz to help you to reflect on what you've learned.

Week 5 practice quiz

Open the quiz in a new window or tab, then come back here when you've finished.

10 Summary of Week 5

Understanding and implementing effective teaching strategies for dyslexic and neurodivergent individuals can transform the learning and working environment for everyone. By integrating principles of Universal Design for Learning (UDL) and universal literacy instruction, we can accommodate diverse ways of knowing and learning, ensuring that all learners are supported throughout their educational and professional journeys. Dyslexia-friendly techniques, coupled with the rapid advancements in technology such as Artificial Intelligence (AI), offer alternative approaches that benefit everyone by providing diverse and effective ways of learning and working.

Educating individuals about dyslexia and other learning difficulties, and providing them with effective support strategies, significantly enhances their experiences. By shifting from making judgments to understanding how people learn best, and coaching to different strengths and weaknesses, you can support individuals at various stages of development. Building strong relationships with mentors can be life-changing, fostering self-confidence in learning and working.

Dyslexic learners' heightened awareness of others' perceptions and enhanced emotional reactivity, along with the empathy often found in neurodivergent individuals, highlight the importance of social interactions and a sense of belonging in learning. Encouraging students to focus on short-term steps to long-term goals and showcasing success stories can empower neurodivergent learners, helping them to achieve their full potential.

Next week will develop your understanding of effective teaching strategies for dyslexic and neurodivergent learners, as you'll explore various methods designed to improve performance in learning. You will look at 'big picture' thinking, and practical techniques for supporting recall and concentration like 'review' and 'chunking time'. Additionally, you'll investigate other dyslexia-friendly strategies, such as mind mapping and memory techniques.

You can now move on to Week 6.

Week 6: Dyslexia strategies in practice

Introduction

This week will examine various supportive study strategies designed to enhance ‘big picture thinking’ and improve performance.

By the end of this week, you should be able to:

- describe a variety of supportive study strategies for enhancing study sessions
- set effective learning goals and objectives
- recognise and focus on essential concepts to improve comprehension and retention
- implement active reading strategies for more interactive and effective reading
- create hand-drawn and digital mind maps to organise information and visualise connections.

1 Supportive study strategies: big picture thinking

Supporting individuals with dyslexia involves implementing tailored strategies to enhance their learning experience. Students with dyslexia often have a slow reading rate, and will reread text multiple times in order to absorb the information. Reading strategies and techniques can be used to strengthen these skills. The key approaches in Figure 1 follow the ‘big picture thinking’ strategy – this section will explore each approach in turn.

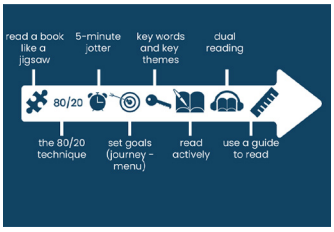


Figure 1 Supportive study strategies

1.1 The Jigsaw Technique

Read a book like a jigsaw puzzle! This technique aims to improve reading ability by enhancing reading comprehension. It can be used at all educational stages, from early years to university level (Mansur, 2019; Ayu, Rianti and Asilestari, 2021; Myhill, 2022). Here is how it works:

Step 1: Preview the picture

Just like with a jigsaw puzzle, you start by looking at the picture on the box lid to get an overview. Without this preview, completing the puzzle would be much harder. Flick through the book, article or lecture slides, and focus on getting the boundaries of the information.

Step 2: Skim through the book

Get a ‘preview’ of your book (or article, lecture slides, etc.) by skimming through from front to back. Your aim here is to get a feel for the boundaries of the contents.

This quick overview helps you read more efficiently and understand the material better.

Step 3: Find the corners and edges

When doing a puzzle, it’s best to look for the corner pieces and straight edges first, then fill in the rest. Similarly, when reading, identify the main ideas and key points before diving into the details. For instance, read the introduction and go straight to the conclusion or summary.

Look at diagrams, graphs, contents, chapter headings and the index. Highlight the headings and subheadings (it helps to break up the text) and read them aloud. This is like putting the **corner pieces** of your jigsaw in place.

Highlight the first sentence of every paragraph in another colour, and read them aloud. These sentences should tell you the topic/subject of that paragraph (don’t read any more than that for now). Now you’re putting the **straight edges** of your jigsaw in place.

Step 4: Piece it all together

Look for more detail if/when you need it – this is like filling in the jigsaw! Now, just like assembling a puzzle, you can start connecting the pieces of information. Use your brain to make connections and build a complete understanding of the text.

At this stage, you have gone through the material several times without reading it in detail. But you have a very good idea about the contents and the layout and where you'll need to focus your reading, so it will be easier to pick out the core messages and slot in the details.

1.2 The 80/20 technique

This technique (also known as the Pareto principle) is a powerful tool that can help streamline processes. The principle suggests that 80% of results come from 20% of efforts. When applied to reading, this means focusing on the most important 20% of the text to gain 80% of the comprehension and value.

Specifically, it helps people with dyslexia in the following ways.

1. Prioritising key information
    - **Focusing on main ideas** – for individuals with dyslexia, reading can be a strenuous task. By identifying and concentrating on the main ideas and key points, they can reduce the amount of text they need to process, making reading less overwhelming.
    - **Highlighting important sections** – using tools like highlighters or digital annotations to mark the crucial 20% of the text can help dyslexic readers quickly locate and revisit important information.
2. Reducing cognitive load
    - **Simplifying reading tasks** – by narrowing down the focus to the most critical parts of the text, the cognitive load is significantly reduced. This makes it easier for dyslexic readers to process and retain information.
    - **Using summaries and bullet points** – summarising key points and using bullet points can break down complex information into manageable chunks, aiding comprehension and memory.
3. Enhancing reading techniques
    - **Skimming and scanning** – encouraging dyslexic readers to skim and scan for the most relevant 20% of the content can improve their reading efficiency. This technique helps them quickly identify the main ideas without getting bogged down by every word.
    - **Visual aids and mind maps** – incorporating visual aids like mind maps can help dyslexic readers organise and visualise the key concepts, making it easier to understand and remember the material.
4. Building confidence
    - **Achieving quick wins** – by focusing on the most impactful parts of the text, dyslexic readers can achieve quick wins, boosting their confidence and motivation to continue reading.
    - **Setting realistic goals** – the 80/20 technique helps set realistic reading goals, making the task feel more achievable and less daunting.

By applying the 80/20 technique, individuals with dyslexia can enhance their reading skills, improve comprehension, and make the reading process more enjoyable and less

stressful. This approach not only helps in academic settings, but also in everyday reading tasks.

1.3 The 5-minute mind jotter

This technique is simple but effective, and it's designed to prepare your mind for new learning experiences. Before engaging with new material, spend just five minutes jotting down everything you know about the subject. By doing this, you can establish a mindset that makes tasks easier and helps you make connections to what you already know (Myhill, 2022).

This technique not only aids in understanding but also provides context, making the learning process more efficient and enjoyable.

How does it work?

Set a timer: allocate five minutes before reading, attending a lesson, or starting a new task.

Jot down your knowledge: write down everything you know about the subject, e.g., key concepts, related ideas or even questions you have. By doing so, you are recalling what you already know, and activating prior knowledge.

Good to know

It helps when you link 'new' to 'old'. New knowledge hooks onto old knowledge much more easily than starting from a blank space or page.

The added bonus with this technique is that it seems to reduce anxiety. Knowing that you have some background knowledge is encouraging, and helps to make the learning process less daunting.

1.4 Set goals and objectives

When you're embarking on a journey, you need to set a destination and use a route map. Well, you can do the same when reading a book or article to help identify what you need to read.

Ask questions like '**Why am I reading this?**' and '**What do I want to get out of this?**'.

These kinds of questions will help to maintain your focus. You may want to note your answers down somewhere so you can refer back to them – but keep them distinct from the rest of your materials, perhaps by using a different colour than the normal text or highlighter you have been using.

1.5 Key words and key themes

Think about the key words and key themes before reading. Your brain will then be primed to look for these words in the text. Determining the key words and key themes in a text can be a bit tricky, but here are some strategies to help you identify them:

Titles and headings – these often highlight the main topics and themes.

Introduction and conclusion – these sections usually summarise the key points.

Repeated words and phrases – words or phrases that appear frequently are often important.

Bold or italicised text – these are often used to emphasise key concepts.

Topic sentences – the first sentence of each paragraph often introduces the main idea.

Summaries and questions – end-of-chapter summaries or questions can point to key themes.

By focusing on these elements, you can more easily identify the key ideas in any text.

1.6 Read actively

Reading actively boosts your comprehension and retention (Roy et al., 2021; Myhill, 2022). Here's how:

1. Take notes
    - **In the margins of a notebook** – jot down summaries or thoughts that could be useful for essays or discussions later. Even if you never look at the notes again, the act of writing helps cement the information in your memory.
2. Engage your senses
    - **Kinaesthetic action** – the physical act of writing creates a connection between your hand and brain, enhancing your ability to remember the information.
3. Highlight and annotate
    - **Use highlighters** – highlight key points and important passages. This visual aid can help you quickly locate and recall important information.
    - **Annotate** – write questions, comments, or reflections in the margins. This active engagement with the text deepens your understanding.
4. Summarise and reflect
    - **Summarise sections** – after reading a section, write a brief summary in your own words. This reinforces what you've learned and helps identify any gaps in your understanding.
    - **Reflect on content** – think about how the information relates to what you already know or how it applies to real-life situations. This reflection can make the material more meaningful and memorable.

By incorporating these active reading strategies, you can make your reading sessions more effective and enjoyable.

1.7 Dual reading

The dual reading technique is a powerful educational strategy that involves presenting information in both visual and verbal formats simultaneously, thereby utilising multi-sensory learning. For instance, using some text-to-speech software so you're hearing the information out loud while reading can help you to retain it in your memory. If you make some notes at the same time, that can embed the memory even more effectively. By engaging both visual and verbal channels, dual coding reduces cognitive overload (Myhill, 2022).

1.8 Use a guide

You can use a guide to make reading smoother and more enjoyable (Watson and Wallace, 2021; Myhill, 2022). Here's how:

1. Anchor your eyes
    - **Pencil, chopstick, or finger** – use any kind of pointer to guide your eyes as you read. This simple tool helps anchor your eyes and keeps your place on the page, making reading smoother and more focused.
2. Specialised tools
    - **Reading rulers** – there are special reading rulers (including digital rulers) designed to help guide your eyes. These rulers can highlight one line at a time, reducing visual stress and making it easier to follow along.
    - **Coloured overlays** – some people find that using coloured overlays or filters can reduce visual discomfort and improve reading fluency.
3. Benefits
    - **Improved focus** – using a guide helps maintain focus and reduces the likelihood of losing your place, which is especially helpful for people with dyslexia.
    - **Smoother reading** – this technique can make reading feel less choppy and more fluid, enhancing overall comprehension and enjoyment.

By incorporating a guide into your reading practice, you can make the experience more manageable and enjoyable.

Good to know

You can change the background colour of your work.

Try reading through a coloured transparent layer placed over a physical text; or changing the background colour of digital work. This cuts the glare between the black words and the white background. This can make reading easier for everyone, not just dyslexic readers (Denton and Meindl, 2016; Myhill, 2022).

Many dyslexic students have great verbal skills but find writing information down in a linear, logical format much more difficult. Using a structure and visual approaches can help overcome this barrier.

Having examined a range of reading support strategies, let's move on to writing.

2 Using the ‘big picture’ in writing

Visual skills and ‘big picture’ planning are essential for academic writing. Think of it like the jigsaw technique you read about in the previous section. Getting the big picture can transform your writing process. Instead of starting at the beginning and working your way to the end in a linear fashion, this approach helps you build assignments and essays in a more holistic way.

By visualising the overall structure and planning your work globally, you can see more clearly how all the pieces fit together. This method not only makes writing more manageable, but also more enjoyable. So, embrace your inner puzzle master and let the big picture guide you to academic success! Use a mind map to brainstorm ideas and see connections. Let’s look closer at how to do this.

2.1 How to structure a 2000-word assignment

Start by bullet pointing your ideas, or creating a visual on how the structure will work. Here’s how to approach this:

- Use an essay planner to plan your assignment in a big picture, rather than a linear way where you start at the beginning and finish at the end.
- Write your assignment title in the middle of the page – this will help your writing stay relevant to the central idea.
- Make a 2000-word assignment less intimidating. A rule of thumb is that 10% of the word count should be reserved for the introduction and conclusion. With that in mind, by taking out 10% of the word count for the introduction and 10% for the conclusion (you don’t need to write them now – you can leave them to the end if you wish), you are left with 1600 words.
- Distribute 1600 words between four or five big paragraphs.

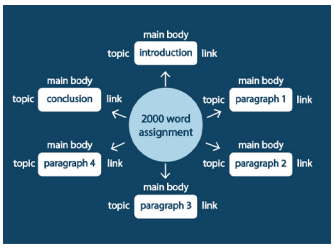


Figure 2 Planning your assignment visually

Here’s an outline document that you can download – you might find something like this helpful as you plan and write.

Essay structural planner

Unfortunately, this is not available in a word document format. Please refer to the openlearn course to access this activity.

But how do you brainstorm and organise? The following section will explore a popular technique that’s widely reported as successful.

3 Mind mapping

Mind mapping is a visual tool that helps organise ideas, enhance creativity, and improve memory by connecting related concepts. Many students have heard of mind mapping, but might not know just how useful this tool can be. This is a creative tool that works well with the dyslexic brain (Buzan, 2006).

Mind maps engage with our natural preference for thinking in pictures. They are a visual way of taking or making notes and planning. They show the big picture and how ideas are connected (Myhill, 2022). Mind mapping is a great tool that:

clarifies thinking and **simplifies complex ideas**

encourages **creative thinking** which produces more ideas

helps to **embed information** into your memory

makes links that **trigger recall of complete associated information**

results in an **increase in your performance**.

Students with dyslexia often prefer non-linear thought and think in multiple directions simultaneously, just like a mind map, starting from central trigger points in **key words** and **key images**. A key word is a memory trigger, and when linked to a key image, this stimulates both sides of the brain and involves your senses.

Figure 3 shows an example of a student's hand-drawn mind map (Myhill, 2022, p. 71):

Figure 3 A hand-drawn mind map

3.1 Hand-drawn or digital mind maps?

Mind maps can be hand-drawn or produced digitally. Which kind is more beneficial? Both mapping styles have a place in supporting academic studies. Let's think about some pros and cons for each.

Table 1 Features of hand-drawn and digital mind maps

Hand-drawn mind maps	Digital mind maps
• encourage a free flow of thoughts onto the paper • promote a kinaesthetic action between your hand and brain which helps with memorising • restricted by the size/edge of the paper • good for revision	• no size limit • usually have pre-set symbols, charts, etc. • easy to rethink and amend later • can incorporate references from online/ digital sources • the flow of ideas can be hindered when the branches are not related to words • there are many free/cheap software packages out there, as well as others that are quite pricey

Mind maps aren't exclusively used for brainstorming and organisation. They can also be used for:

Note-taking – create a map before a lecture and add to it during the lecture.

Note-making – make a map of the main themes in the book/article/lecture you are studying, add related branches. You will be able to form more connections.

Revision – create a hand-drawn map using the method above as a memory aid.

Planning assignments – get an overview of your assignment and plan your paragraphs with a hand-drawn or digital map.

4 Review

Review is an important step for retaining the ‘big picture’. 80% of detail is forgotten within 24 hours – so it’s important to review a book, study notes, lecture slides or other materials quickly to help you embed the information.

How to review

Skim over the information quickly – you don’t need to spend much time. Ten minutes on day 2; five minutes on day 7; two to four minutes on day 30. This will help the information to stay fresh in your mind, so you won’t have a huge mountain of revision to climb later.

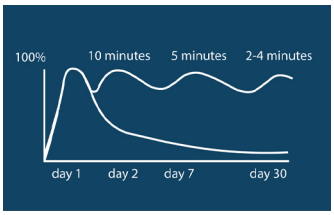


Figure 3 Reviewing will help the information stay embedded (Adapted from Knight, 2016)

Review is an excellent return on investment. A few minutes can potentially save you hours of time when you come to the exams (Knight, 2016).

4.1 Chunking time

This study technique keeps recall and concentration high, as you can see in Figure 5. Working for a lengthy period with no break will tend to cause recall and concentration to drop dramatically.

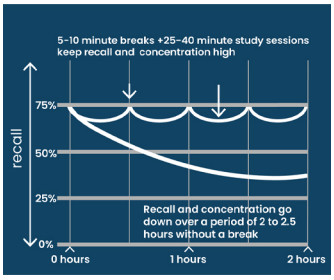


Figure 4 Loss of recall over time (Adapted from Myhill, 2022)

Here are some steps for avoiding this drop-off and maintaining recall and concentration.

Step 1

Before commencing any study, set a time window – for instance, two to three hours – and decide how much you would like to cover in this time period. Research suggests that the human brain has a very strong tendency to complete things when it knows the boundaries (Zull, 2011).

Step 2

Set a timer for somewhere around 25 to 40 minutes. When the timer goes off, stop and take a break. Set a 5-10 minute timer for your break, and go and do something different. No longer than 5-10 mins though!

Step 3

When you return to your study, quickly look back over what you've just read. This helps to embed the memory and reinforces what you've learned so far. Have a quick look over what you are about to study and then start another timer for 25 to 40 minutes.

Step 4

Have another 5-10 minute break, and when you come back, skim over the last two study sessions that you have completed. Repeat this process, and try to complete the time window that you decided on at the beginning.

4.2 Additional tips

Here a couple of other tips relating to effective learning.

Beginnings and ends

The first and last things you study in a session tend to be remembered more effectively than the information covered in the middle. You can use this to your benefit. The more beginnings and ends you build in, the better your chance of committing information to memory.

Breaks

The breaks themselves are just as important as the study periods. They give the brain a chance to absorb the information, and to integrate it with previous learning. The brain is a muscle, and just like going to the gym, you need to take rest breaks between workouts.

5 Memory techniques

Many dyslexic individuals say they do not have a good memory. If you feel this way, your memory may be better than you think, it just needs some training. Understanding how memory works and applying some strategies (and maintaining a positive approach) can make a significant difference.

Visual memory, our ability to recall what we have seen, plays a key role in learning – especially for dyslexic individuals who often benefit from visual cues, patterns, and imagery to support retention and understanding. **Verbal memory** is our ability to remember language-based information. We use both our visual and verbal memories to help us remember information.

For instance, if you were to see somebody dressed in purple walking down the street, you are far more likely to remember them than all the other people in ordinary clothes.

If you want to remember information, you need to use your imagination to make it more memorable.

Usually, when you link or associate information to other pieces of information – for instance, places, smells, people and sounds – you're using your senses to embed the memory.

Remember!

Imagination + Association = Memory

5.1 Different types of memory

There are different types of memory, and some knowledge of them is useful, because you can use the different characteristics of each type to help you remember more.

Table 2 introduces a number of types of memory. It's not an exhaustive list – there are others besides these.

Table 2 Types of memory

Type of memory	What it does	How it relates to learning
Episodic memory	Memory of recent experiences personal to you, e.g. what you had for lunch, what you wore to work.	These associations are good for learning if you can link learning to place (where you heard it) and circumstance (who told you? what were they wearing? what happened?). They incorporate senses too. These memories are especially strong for people with dyslexia.
Semantic memory	A category of long-term memory that involves the recollection of ideas, concepts and facts commonly regarded as 'general knowledge'.	This underpins learning. It has to do with the meaning of words and putting them into context based on what you already know.

Sequential memory	The ability to perceive and remember information in the right order, e.g. months of the year, the alphabet.	Can help with memorising, in terms of linking information. Sequential memory can be a problem for people with dyslexia.
Short-term memory	Involves repeating information over and over to help you remember. Short-term memory includes working memory.	You don't do anything with the information (e.g. phone numbers, lists, rote learning).
Working memory	Requires you to apply or do something with the information that is sitting in your short-term memory, before it slips away or is stored.	Holding and manipulating information to make meaning of it, e.g. mental maths.
Verbal working memory	Used to remember oral instructions.	Learning of new words, performing comprehension tasks, writing essays (when free writing), taking notes.
Visuo-spatial working memory	Used to remember sequences of events, patterns and images.	Linked to maths skills, visual tasks and designs, creative thinking, problem-solving. This type of memory can be strong in people with dyslexia.

It might sound obvious, but paying attention, concentrating and being interested are key to the learning process. Try to maintain concentration throughout tasks, however that works best for you.

We tend to remember:

- Information at the **beginnings and ends** of learning, more so than the middle.
- **Situations**, **names**, **people**, **places** and other bits of information that stand out to us. The more memorable something is, the more you will remember it. More extraordinary = more memorable.
- When we use our existing knowledge to **chunk familiar information together**: finger and nail, table and chair. New learning or new memories link onto old learning.
- When we make **associations and links to remember**. Where did you eat your lunch? What room was the lecture in? What was the tutor wearing?
- Words personal to us: **mother**, **cake**.
- Repeated words are more memorable: **the**, **and**.
- Words related to our senses: **love**, **soft**. A multisensory approach helps: **smell**, **sound** and **touch** can bring back a memory. Reading something yourself, hearing it read to you, repeating it out loud and writing notes helps to embed a memory.

5.2 Other memory techniques

Here are a few more techniques and tips for improving your memory.

Mnemonics

Stimulate your imagination to encourage your brain to make associations.

Sentence/rhyme – put new words/ideas into full sentences or short rhymes to help you remember them.

Acronyms – e.g. memorising the Great Lakes of North America with HOMES (Huron, Ontario, Michigan, Erie and Superior).

Memory palaces (aka the Roman Room technique) – linking something you know (your home) to new information through the use of imagination.

Making learning more fun

Teach others – teach your newly learned information to your colleagues, family members, a pet, or to yourself in the mirror!

Play academic Trivial Pursuit or Pairs – write key words, ideas or concepts on blank cards. Put the key word on one card, and the explanation on another – then play with a friend, a group, or on your own.

Use rhythm/melody – for those who are musical and can recall melodies or long lyrical sequences, matching this with revision can work. Try moving with the music or setting revision words to musical rhymes.

Good to know

It sounds like a cliché, but maintaining a healthy diet, good sleeping pattern and regular exercise can also have a positive impact on memory.

Sleep is extremely important for transferring short-term memories into long-term memory.

6 Confidence and self-belief in your ability to learn and study

Dyslexic people can often have low self-esteem around academic learning. They learn differently, but it's important to recognise the benefits of these differences, and view dyslexia from a strength-orientated perspective.

To encourage this mindset, you need to be aware of:

- your own thinking and way of learning
- the ability of the brain to change and grow throughout the duration of our lives
- your personal strengths and skills, and what a significant role they could play in your surroundings/environment
- the fact that dyslexic students often have a natural aptitude for sharp thinking.

There are many methods for fostering a positive impact on your studies: using metacognition; embracing failure; having a growth mindset; understanding counter-intuitive thinking; and realising the benefits of perseverance. Let's consider a few of these now, beginning with metacognition.

6.1 Metacognition

Metacognition is the 'confidence and the ability to think about our thinking while we think, changing it where it needs to be changed. It means conscious self-reflection and monitoring.' (Flavell, 1979, p. 80). Metacognition is relevant in every aspect of our lives.

Metacognition in practice

The following is a highly effective way of doing things more efficiently and achieving successful outcomes.

- When you complete a task and it doesn't go as planned, think about the reasons why.
- Dismiss negative thinking. Collect feedback, reflect, and input any new data from this process into future actions.

But how do you manage this? First, identify the problem, then substitute the negative thoughts for positive action. Table 3 shows a few examples of this process.

Table 3 Positive actions

Problem	Negative thought	Positive potential actions
I got very low marks for my essay – tutor feedback: poor structure	'I'm terrible at essays'	• Look at some essay-planning tips regarding structure • Plan essay in a 'big picture' way using mind maps or an essay planner • Seek advice from tutor • Look at good models

My mind goes blank in exams	'I've got a bad memory and I'm going to fail'	• Use positive self-talk • Consider how you can revise more effectively next time • Understand the material so you don't learn by rote for exams • Build up your mindfulness practice
I'm always late with work submissions and appointments	'I can't do anything about it – there is something wrong with me'	• Get a large planner on your wall, and use post-it notes to move information around • Input deadlines and appointments • Sync with your online calendars and diaries • Use reminders • Tackle procrastination

Activity 1 Using metacognition

Allow about 10 minutes

Think about some situations where you could use metacognition to improve an outcome. Note your thoughts down in the table.

Table 4 Using metacognition

Problem	Response	Positive potential actions
Provide your answer...	*Provide your answer...*	*Provide your answer...*
Provide your answer...	*Provide your answer...*	*Provide your answer...*

It's important to be aware of your strengths, because focusing on areas in which you do well could effectively be the difference between grades, or other outcomes.

6.2 Failure

Failure is **not a tragedy**, as we are often led to believe as children. Failure is a human learning tool and a **stepping stone to success**.

Joshua R. Eyler in his 2018 book *How Humans Learn* states that 'the brains of human beings are designed to detect and to learn from failure' (p. 174). Not only do we learn valuable lessons from failure, but **our brains grow and change from these**

experiences, new neurons are created, and their pathways reinforced. Changes and setbacks are excellent opportunities to learn. It's just a shift in how information is presented.

Dyslexic people are designed to thrive in adulthood – try not to let the past and negative childhood experiences influence you, and instead concentrate on your long-term goals. Earlier setbacks and failures can build resilience and grit, which ultimately helps you to deal with setbacks going forward. Learn to do things in your own way, and foster flexibility.

6.3 Growth mindset

Carol Dweck found in her research that those who believed in the plasticity of the brain or 'growth mindset' achieved more success in many different areas of life than those with a more 'fixed mindset' (Dweck, 2006). A growth mindset is based on the belief that you can change your brain through your own efforts. Further research by Dweck has shown that adopting a growth mindset results in an increase in students' academic performance.

Ultimately, the application of metacognition, embracing failure and adopting a growth mindset can lead to:

- independence in learning
- the ability to stand out from the crowd
- enhanced creative thinking and problem-solving skills
- greater academic and workplace success
- improved employability prospects
- increased self-esteem and confidence
- reduced stress and anxiety.

Impact on academic studies

According to Eide and Eide (2011), the dyslexic brain has 'the ability to perceive relationships like analogies, metaphors, paradoxes, similarities, differences, implications, gaps and imbalances' (p. 5) and 'unite all kinds of information about a particular object or thought into a single global or big picture view' (p. 84).

Therefore, students with dyslexia can:

- excel at being **curious and creative, and seeing connections** where others don't
- **make new connections** between old ideas, which is very useful in assignments
- create and deliver **more interesting and convincing** presentations
- produce writing that's **more perceptive and unique**, because they have made the ideas their own
- learn **'how' to think**, not just 'what' to think
- see problems and solutions from a **different perspective**.

See setbacks as learning opportunities – and if at first you don't succeed, keep trying.

7 Organisation

The slower processing of information and reduced working memory difficulties associated with dyslexia can lead to overwhelm, and result in problems with organisation, time management and procrastination. But there are many tools out there that can help, which this section will explore.

7.1 Time management

Why is time management important? It's a core skill, which a lot of your life will revolve around. You need to manage your time efficiently for study and work, thereby increasing your chances of success in a highly competitive world. Effective time managers are often high achievers in life.

Let's revisit our Week 4 case studies, with a particular lens on time management skills.

Amaka

Here's what Amaka's doing to manage her time.

Amaka (model used for illustration only)

- Getting the 'big picture' of her life by analysing available time, tasks and deadlines.
- Using calendars (physical and digital), diaries, reminders, lists, post-it notes and colour highlighting different subjects and tasks.
- Being aware how she uses her time, and prioritising certain activities where necessary.
- When she feels overwhelmed by the volume of work and tasks she needs to achieve, amid the general fast pace of life, she minimises her stress and maximises success by being **proactive not reactive**. This helps her to stay in control.

Chandru

Let's see what Chandru is doing to plan his time effectively.

Chandru (model used for illustration only)

Time management – determining his available time, and planning out what he can realistically achieve with it; identifying and using ‘unproductive time’ for other things; sticking to his plan, but allowing for adjustments and building in flexibility.

Task/workload management – prioritising tasks, defining his goals, making lists of everything he needs to do; reviewing and, where appropriate, reducing the number of tasks assigned for any given day; acknowledging that tasks often take longer than expected, and that work tends to expand to fill any available time; ticking off tasks when work is completed.

Planning – getting the big picture of time frames by using a large wall planner, which helps him look ahead and stay on track; using highlighters and sticky notes on the planner to keep it up to date about progress and developments.

Use of deadlines – establishing the deadlines for urgent tasks and marking them into the plan; building in contingency, and using false/early deadlines to help him get ahead.

Productivity – considering his most productive times of day; planning in breaks alongside periods of work; tracking his progress, removing completed tasks, carrying over unfinished tasks and reprioritising as needed; establishing a routine for himself.

Ben

Ben is taking the following actions to manage his time during his apprenticeship.

Ben (model used for illustration only)

Reminders – setting alarms ahead of deadlines and appointments, and connecting them to his phone calendar.

Tasks – using ‘to-do’ list facilities, like Todoist (Linear) or Trello (Visual).

Timers – useful for practicing exam papers, using timed study methods, oral presentations.

Productivity apps – Pomodoro, Flora and Focus. He particularly likes the ‘Forest’ app which grows trees while you are engaging in a task, which helps him stay focused and in the present.

7.2 Procrastination

Procrastination is the thief of time. We all procrastinate, but when you have dyslexia (or other learning difficulties that reduce attention span), reading and writing can take longer and require more effort. This makes getting started even harder. Understanding these feelings and developing some strategies can help.

Remember!

Procrastination is an emotion management problem – not merely a time management problem.

If we have negative emotions about a task, we want to avoid it. But that's a short-term solution – the task doesn't go away. Guilt and shame are some of the most common emotions associated with procrastination. Awareness, understanding, acceptance/tolerance, coping ability, and the ability to modify emotional experience can all help to regulate emotions.

Keep these points in mind:

- Everything doesn't need to be done in one sitting, or even ten. Making a start can look like writing 30 words – but this could give you the motivation you need.
- Getting started and successfully completing one task can build motivation for more, raising self-confidence.

Here are some strategies to help beat procrastination.

Table 5 Beating procrastination

Self-efficacy	Motivation	Perfectionism	Performance
Positive self-talk: prevents ego depletion and promotes self-belief	**Don't wait for motivation** or to be in the right mood – just act!	**Lower standards a little**: perfectionism and fear of failure can paralyse you	**Inhibit multi-tasking**, and reduce your number of tasks
Success encourages feelings of accomplishment and the motivation to do more	**Activity often inspires more activity** – action comes first, motivation comes second	**Be more relaxed** to be more creative and more productive	**Break up tasks into small, manageable units** and link study to small rewards, and studying will become a more positive experience
Mindset: imagine yourself doing the task and finishing the task, remember/visualise a past success.	**Completing a project** builds more confidence and motivation to do it again	**Identify** your fear	**Consider your working environment**, how and where do you work best… declutter.
Give yourself credit – procrastinators tend to do just the opposite	**List everything you've achieved in a day**	**Failure is a stepping stone to success** and a necessary human leaning tool	**Work in short spurts with breaks** – use a timer
	Find something interesting in your work		**Make a plan**, and include timings.

Very specific intentions in the form of **'when… then' can make a big difference to success**

Accountability – tell someone what you will be doing and when you will be starting

Apps

Here are a few apps that might be helpful:

- **Focusmate** – helps you with productivity by connecting you with a partner.
- **StickK**, **Habit Tracker** and **HabitShare** – free apps that help with tracking habits.
- **The Noise App** – this could be useful if you feel your study or workplace are noisy, and would benefit from recording audio or video evidence.

One more suggestion

Try asking 'how' instead of 'why'. Think about *how* to reach your desired outcome and ask yourself questions like:

'How can I move forward?'

'How can I stop procrastinating?'

'How can I do this?'

'Why' questions **stop you seeing the solutions**. They can lead to overthinking or sole focus on the problems themselves.

'How' questions make your brain **search for solutions** and try to achieve those outcomes. These are more action-oriented and solution-focused, as you're thinking about the strategies involved.

So: try asking 'how' questions more often, and see what changes over time.

8 This week’s quiz

Now that you’ve completed Week 6, you can take a short quiz to help you to reflect on what you’ve learned. –

Week 6 practice quiz

Open the quiz in a new window or tab, then come back here when you’ve finished.

10 Summary of Week 6

This week evaluated various supportive study strategies for improving academic performance. These techniques were aimed at enhancing ‘big picture’ thinking:

- The Jigsaw technique, which enhances reading comprehension by breaking text into manageable sections.
- The 80/20 technique, which helps students focus on the most impactful aspects of their studies.
- The 5-minute mind jotter, which encourages quick, reflective note-taking to consolidate learning.
- Setting goals and objectives provides direction and motivation, while identifying key words and themes aids in comprehension and retention.
- Active reading and dual reading strategies enhance engagement with texts.

‘Review’ and ‘chunking time’ were discussed as practical methods to maintain recall and concentration, and retain the ‘big picture’ after studying. Ultimately, being able to remember is an important part of the learning process, and with that in mind, this week introduced some of the different types of memory, a few fundamentals about how memory works, and some theory-driven techniques to help your learning journey.

This week also evaluated the benefits of mind mapping, considering and comparing hand-drawn and digital formats. Lastly, some tips on effective time management and overcoming procrastination were discussed. By adopting these strategies, learners can build confidence, foster a growth mindset, and work their way to academic success.

Next week will look at dyslexia in the workplace. There’ll be a focus on dyslexic strengths, workplace assessments and reasonable adjustments, assistive technology and the legal support for dyslexia and neurodiversity at work.

You can now move on to Week 7.

Week 7: Dyslexia in the workplace

Introduction

This week will examine the unique contributions of dyslexic individuals in the workplace, emphasising their potential to drive innovation. Research on dyslexia often focuses on academic performance, with less attention given to the workplace. Despite increased awareness in the UK and the US, dyslexic talents remain underutilised. Dyslexia, a neurodevelopmental condition persisting into adulthood, presents unique workplace challenges and strengths. This week explores these aspects, highlighting the need for greater focus on dyslexia's impact on cognition and workplace dynamics, and the potential benefits of supporting dyslexic employees.

This week will provide guidance on the disclosure dilemma, offering advice on whether and how to disclose dyslexia at work. It will also cover workplace assessments to understand specific challenges and necessary adjustments. Additionally, it will explore assistive technologies that can support dyslexic employees, and discuss legal cases and protections related to disability discrimination.

By the end of this week, you should be able to:

- provide a comprehensive understanding of how dyslexia can be an asset in professional environments
- understand and appreciate the unique creative and problem-solving skills that dyslexic individuals bring to the workplace
- gain insights into the disclosure process for dyslexia, learn how to conduct workplace assessments, and identify necessary adjustments to support dyslexic employees
- explore various assistive technologies that aid dyslexic employees, and understand the legal protections against disability discrimination.

1 Dyslexia: the secret ingredient for workplace innovation

Most research focuses on children or students, based on academic performance, with little on the workplace (Leather, 2023). According to the Adult Dyslexia Centre, one in ten employees is likely dyslexic. While awareness of dyslexia has greatly improved in the UK and the US, this talent remains underutilised. Dyslexia can be a barrier not only in education but also in the workplace, preventing individuals from progressing and succeeding in their careers.

Dyslexia is a neurodevelopmental condition that persists into adulthood, where cognitive demands and emotional experiences differ significantly from childhood (Smith-Spark, Gordon and Jansari, 2022). While there is some literature on dyslexia in the workplace, the impact on cognition and related aspects remains underexplored. As Smith-Spark et al. rightly say, these areas need more attention. Therefore, this section aims to explore the unique strengths and challenges faced by individuals with dyslexia in the workplace.

Engaging dyslexic strengths

A few notes about recognising and engaging the strengths of dyslexic individuals in the workplace:

- **Unlock hidden talents** – don't overlook talented dyslexic individuals just because they don't fit traditional criteria. They might not have perfect grades or spelling, but they bring unique strengths to the table. They thrive on novelty, change, and challenges, rather than routine tasks and strict rules. Employers who support a diverse workforce can reap huge benefits from these talents.
- **Think outside the box** – dyslexic and neurodiverse employees might seem hard to fit into a traditional system because they can often struggle with boundaries. They excel in lively, interactive environments, typically more so than with abstract, theoretical work. They need to see the meaning or importance of a task in order to truly engage with it. Recognise and utilise their talents, and your business will run more smoothly. They learn best from hands-on experience rather than meetings and long emails.
- **Embrace the difference** – dyslexic employees can sometimes be seen as a threat by others in the workplace for not following traditional systems and routines. Look for win-win situations, as they need to be able to work well with others.
- **Resilience and grit** – growing up with dyslexia can build the ability to withstand setbacks and failure, fostering resilience and grit. This can be a huge advantage when navigating the adult world.
- **Performance matters** – assess their performance through observation and oral evaluations.
- **Tech to the rescue** – provide assistive technology to support dyslexic employees in tasks they find challenging, allowing their creativity to shine. Starting from entry-level positions and providing support can nurture their talents.

Viewing dyslexia from a strength-based perspective and focusing on results rather than methods can lead to a workplace revolution, harnessing diverse strengths to create amazing teams.

Figure 1 Strength in the workplace

1.1 Dyslexic strengths in the workplace

#dyslexicthinking

'Dyslexic thinking' is a term that you can find defined in online dictionaries, and it was recently added as a skill on LinkedIn. This is recognition of the power of dyslexic thinking, in the workplace and more broadly; dyslexic thinking is crucial to society. As discussed earlier in this course, many prominent entrepreneurs and inventors are dyslexic (35% in the US and 20% in the UK), and their unique methods have led to key innovations and societal contributions.

Research from London's Cass Business School describes a range of skills among dyslexic people, e.g. vision and determination, oral communication, problem-solving, delegation, and spatial awareness (Logan, 2009). Dyslexic strengths can often revolve around the ability to 'think outside the box' with enhanced creative thinking and problem-solving skills (Eide and Eide, 2023). But of course, these traits will vary and manifest differently between individuals.

For instance, people with dyslexia can be skilled at any of the following (not an exhaustive list!):

- problem-solving (e.g., dyslexic entrepreneurs are good at the early problem-solving stage in business)
- spatial reasoning, seeing spatial objects and spatial awareness (e.g., good for mechanical/building trades or orthodontists/doctors/surgeons)
- creative tasks (e.g., useful in the planning and troubleshooting phases, can break blockages, good at facilitating teamwork)
- systems-based reasoning, meaning the ability to understand systems (e.g., useful in the planning and troubleshooting phases)
- helping people function together, as another form of systems thinking
- connecting people
- reframing familiar/existing events, and reassembling them
- creating plans and reviewing plans (e.g., seeing strong mental patterns)
- picking up information (e.g., seeing obscure details and how they fit together)
- sales jobs and customer service (e.g., engaging clients and creating a personal touch)

- prediction, simulating mental models and possible results (e.g., useful for forecasting, spotting trends and setting goals)
- balancing (e.g., seeing effective approaches to situations with competing demands)
- visits, inspections, negotiations
- storytelling and presentations
- using experience to build resilience, determination, motivation, and resourcefulness, ultimately producing a high capacity for hard work

It is imperative that everyone is allowed to reach their full potential, so we should embrace our differences wholeheartedly. For students, school is their main occupation and main area of competition; for adults, work is essentially the same in practice; and we need to learn to understand our role in life in a well-informed and healthy way (Eide and Eide, 2023). Dyslexic people need self-advocacy, self-belief, and to recognise their own strengths, as well as having others recognise and support them in achieving this.

#creativethinking

The Confederation of British Industry's 'Education and Skills Survey' in 2011 highlighted skills shortages, with companies struggling to find suitable employees. Despite an influx of applications from graduates with good degrees, these candidates often lacked the essential thinking skills that employers need. The Chartered Institute of Personal and Development (CIPD) identified the same issue. Both organisations emphasise the importance of creative skills. The CIPD survey underscored that these higher-level skills are crucial for maintaining a competitive edge in the future (Greetham, 2016).

The top ten skills

Various other studies have shown that creative thinkers have notable cognitive skills and capabilities (Greetham, 2016). They are:

- Communication skills (verbal and written) – the ability to express your ideas clearly and convincingly.
- Numerical reasoning – the ability to carry out simple arithmetical operations, and interpret and use data.
- Logical reasoning – the ability to reason consistently.
- Conceptual thinking – the ability to analyse concepts and arguments, to synthesise ideas into concepts and create new concepts.
- Teamwork – working effectively and confidently with others.
- Planning and organising – the ability to analyse the task, put together an effective plan and carry it out effectively.
- Creative thinking and problem-solving – analysing problems, gathering information and using it creatively.
- Leadership – the ability to form an effective team and motivate others.
- Flexibility – the ability to adapt your thinking or ways of working to changing circumstances, rather than remain rigid.
- Initiative, self-motivation, and self-awareness – the confidence to act on your own initiative, to motivate yourself to come up with new ideas and solutions, and to be self-reflective (able to identify your own weaknesses and areas for improvement).

#cognitiveskills

Neurodivergent individuals, including those with dyslexia, often synthesise disparate ideas in new and original ways, allowing them to see problems from unique perspectives. For example, Zolfagharian, Tafti and Jarrahi (2024) highlighted how distinctive cognitive profiles can be advantageous in fields like astronomy, with the British Government Communications Headquarters (GCHQ) also recognising the value of dyslexia in top-secret activities.

Figure 2 Applicability in secretive fields

But how often is this ‘power’ disclosed in the workplace? Let’s consider the matter of disclosing a special learning difficulty (SpLD).

2 To declare or not to declare?

Many individuals remain unaware that the challenges they face are linked to a learning difficulty like dyslexia, or they may be fearful of disclosing it. This lack of awareness or fear of disclosure often results in people not accessing the appropriate support they need, and not reaching their full potential as a result (Beetham and Okhai, 2017). However, there is no legal obligation to disclose dyslexia if an individual believes it does not affect their ability to perform their job.

Dyslexia is not always viewed positively – some cultures do not recognise it at all, and accordingly provide little or no support. Educational institutions (including universities) and employers have a duty to implement reasonable adjustments; in the UK, this falls under the Equality Act 2010. This Act can be incredibly helpful in supporting a dyslexic person to engage their potential and achieve success. It can also foster a more understanding environment among peers and colleagues. Despite the strengths associated with dyslexia, many people do not want to be labelled due to the stigma, potential victimisation by employers, or bullying by colleagues (Beetham and Okhai, 2017).

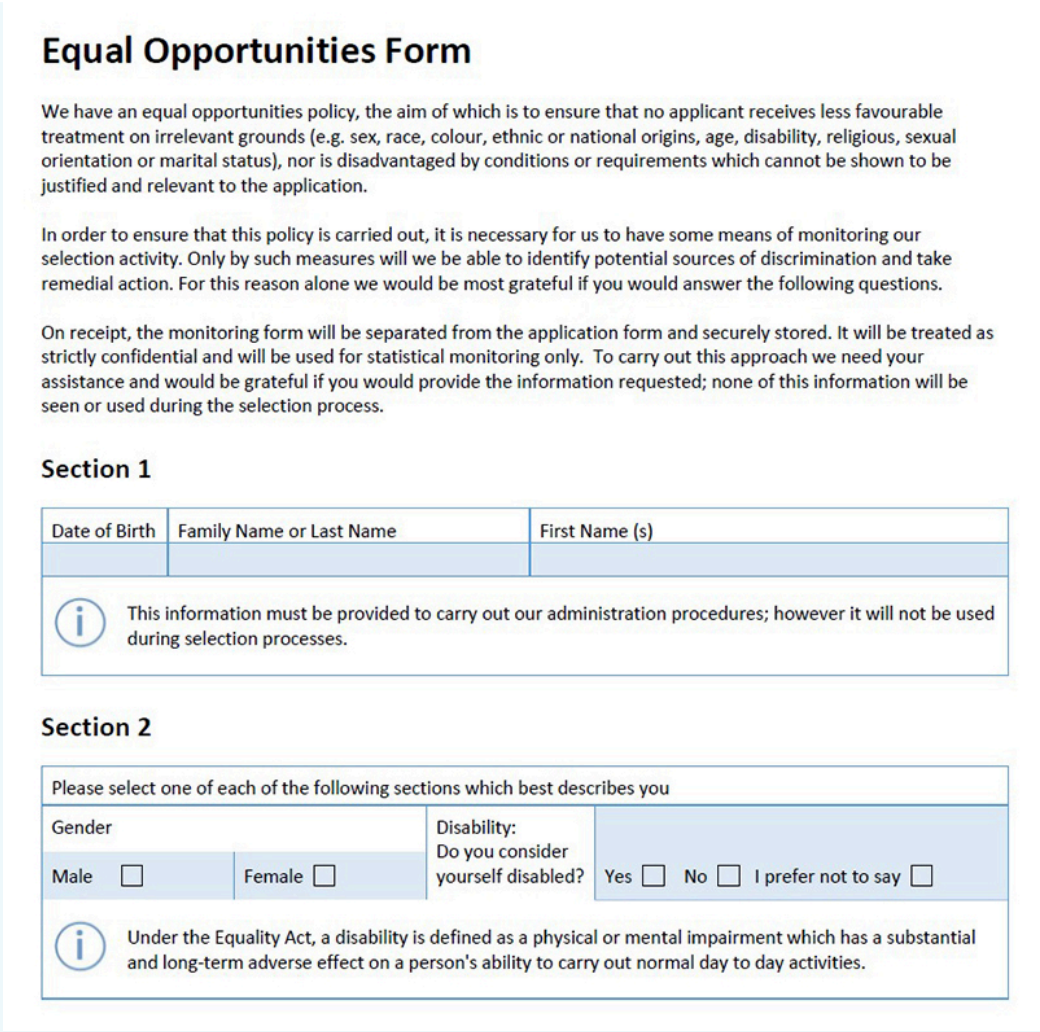
Where or how to disclose?

There are several ways to disclose dyslexia. One option is to mention it in the ‘equal opportunities’ section of a job application form, or during the interview process. If this was not done initially, individuals can update their employer via human resources, or have a candid conversation with their line manager.

Figure 3 Disclosing at work

Example form

Here’s an excerpt from an ‘equal opportunities’ form to give a general idea about how they look – the exact format and layout will vary.



Equal Opportunities Form

We have an equal opportunities policy, the aim of which is to ensure that no applicant receives less favourable treatment on irrelevant grounds (e.g. sex, race, colour, ethnic or national origins, age, disability, religious, sexual orientation or marital status), nor is disadvantaged by conditions or requirements which cannot be shown to be justified and relevant to the application.

In order to ensure that this policy is carried out, it is necessary for us to have some means of monitoring our selection activity. Only by such measures will we be able to identify potential sources of discrimination and take remedial action. For this reason alone we would be most grateful if you would answer the following questions.

On receipt, the monitoring form will be separated from the application form and securely stored. It will be treated as strictly confidential and will be used for statistical monitoring only. To carry out this approach we need your assistance and would be grateful if you would provide the information requested; none of this information will be seen or used during the selection process.

Section 1

Date of Birth	Family Name or Last Name	First Name (s)

This information must be provided to carry out our administration procedures; however it will not be used during selection processes.

Section 2

Please select one of each of the following sections which best describes you

Gender		Disability: Do you consider yourself disabled?	
Male ☐	Female ☐		Yes ☐ No ☐ I prefer not to say ☐

Under the Equality Act, a disability is defined as a physical or mental impairment which has a substantial and long-term adverse effect on a person's ability to carry out normal day to day activities.

Figure 4 Equal opportunities form

Activity 1 Self-reflection

Allow about 5 minutes

How would you feel about having a diagnosis of a learning difficulty like dyslexia? Would you want to disclose it, or prefer to keep silent? Why? Note down some thoughts.

Provide your answer...

Deciding whether to disclose learning difficulties or any ‘hidden disability’ in the workplace is a complex decision with pros and cons, and a range of possible outcomes. Sharing this information can lead to understanding and tailored support. Remaining silent might avoid immediate discomfort, but can result in long-term performance issues. Research by Beetham and Okhai (2017) highlights that without appropriate support, employees may

struggle to meet their potential, ultimately affecting their work performance and overall wellbeing. When applying for a job, sharing information about your condition can lead to adjustments being made to accommodate you at the recruitment stage, such as bypassing certain types of assessment, having extra time provided if needed, and ensuring accessibility.

Good to know

An employer only has the duty to make adjustments where they are aware (or could reasonably be expected to know) that a worker has a disability (Equality and Human Rights Commission, 2019).

Privacy and confidentiality are key factors in this process. Employers should be careful not to ask intrusive questions or ones that violate someone's dignity. Privacy is a human right protected by law. After some challenges have been identified, rather than asking 'do you have a disability like dyslexia?' it may be more appropriate to ask a question like 'what can we do to help you thrive?'

2.1 Workplace assessment

Following the disclosure of dyslexia, an employer should offer a **workplace needs assessment**. This is a summary report that identifies reasonable adjustments that can be implemented to support an employee in the workplace (British Dyslexia Association, n.d.). Reasonable adjustments may include assistive technology, strategy coaching, and providing cues.

(For instance: in this course author's workplace, there is a bundle of light yellow A4 paper next to the printer for me to use, and I have two computer screens.)

The next section will give more information on reasonable adjustments.

What to know in advance

1. The employer and/or line manager would pay for the report.
2. Written proof of permission from the person being assessed may be required to comply with data protection laws.
3. The assessment should be conducted by a qualified professional who understands the specific needs of dyslexic individuals.
4. The report should be in line with the SpLD Assessment Standards Committee (SASC) guidelines.
5. The report is sent to both the employer and the employee.
6. The outcome of the report is to present recommendations for reasonable adjustments.
7. The report DOES NOT give a diagnosis. The employee should have been assessed for dyslexia previously.

Good to know

Workplace needs assessments can't be used for exam access arrangements in professional exams. Each professional body has its own rules and criteria, which are often available on their websites.

On a more positive note, though, online screening tests are accepted by the DVLA (in the UK) for reasonable adjustments in the driving theory test. Since many jobs in the UK will require a car, the stakes can feel high, leading to pressure and anxiety. But support (like extra time) is available to facilitate your success.

Example assessment

Here is an example of a workplace needs assessment, in downloadable Word format.

(Note that the form has been stripped of any specific identifying information for all parties involved.)

Workplace needs assessment

Unfortunately, this is not available in a word document format. Please refer to the openlearn course to access this activity.

Employers often find the idea of providing reasonable adjustments daunting, partly because it's a legal obligation, and it seems complicated and costly. However, the reality is that the most common requests are usually cost-free. These include: flexible working hours to avoid busy and noisy periods; the option to work remotely sometimes to minimise distractions; exemption from hot-desking; clear and straightforward instructions; sending messages via audio instead of in writing; and using more accessible fonts (e.g. Arial) instead of Times New Roman.

Find out more

If you are interested in learning more about career potential and workplace inclusivity, you might find these websites useful: EmployAbility and MyPlus Students' Club.

If you are concerned about the costs, there is a UK government scheme called Access to Work which may pay some or all expenses.

3 Specific workplace challenges and adjustments

In recent years, levels of recognition and support for neurodiversity in the workplace have become much more significant (Smith-Spark, Gordon and Jansari, 2022). The term ‘inclusive’ is becoming more common as we understand that dyslexia is about more than literacy challenges (ibid). Many dyslexic individuals in the workforce are ’literate dyslexics’, meaning literacy isn’t their main issue. However, if they aren’t ‘dyslexia aware’ they might face other difficulties (like missing deadlines) that they find hard to explain.

Dyslexic individuals have unique cognitive profiles, and their workplace challenges can vary greatly depending on their strengths, the specific role they have, and the work environment (Beetham and Okhai, 2017). For instance, someone in a detail-oriented job might struggle with precise spelling or data entry. The levels of support and understanding available from colleagues and management will also play a crucial role in shaping their experience.

Some of the cognitive challenges are (but not limited to):

- organisation
- planning
- structuring written communication
- presenting information
- mental health issues, such as depression and anxiety
- working memory
- attentional focus.

These challenges can sometimes be misinterpreted by employers or managers as poor performance or an inability to meet targets. This misunderstanding has led to numerous legal cases where employers were found lacking in their duty to support dyslexic employees (Beetham and Ohkai, 2017). To address this, it’s recommended that employers seek a workplace needs assessment to understand what reasonable adjustments can be made. Beetham and Ohkai’s research emphasises that while support and guidance are essential, the key is having the right resources tailored to individual needs. It’s not about the quantity of support, but its quality and relevance. Additionally, there’s still a lack of awareness about dyslexia, which needs to be addressed as the work environment significantly influences an individual’s experience.

3.1 Reasonable adjustments for workers with disabilities

In the UK, employers must make reasonable adjustments to help workers with disabilities or health conditions do their jobs without disadvantage.

Who does this apply to?

This applies to all workers, including trainees, apprentices, contract workers, and business partners.

What are adjustments?

Adjustments are changes that make it easier for a dyslexic person to do their job – see below for an array of examples. These changes might not solve every problem, but they help reduce barriers at work.

How do you get an adjustment?

To get an adjustment, you might need a workplace needs assessment (as discussed in Section 2).

What is ‘reasonable’?

Employers must do what is reasonable, which depends on various factors like practicality, resources, finances, size of the company, among others. The goal is to remove or reduce any disadvantage faced by a disabled worker (Equality and Human Rights Commission, 2019). Additionally, there are charities that can help cover the costs of adjustments.

Activity 2 Ben’s reasonable adjustments

Allow about 5 minutes

Ben (who you met earlier in Week 4) would like some adjustments to be made in his workplace. Which of the following should be considered reasonable?

- ☐ Having any hard copies of documents printed on coloured paper
- ☐ Being provided with a smartphone to take pictures and record his mentor
- ☐ Having verbal instructions provided separately from written ones
- ☐ Being provided with a curved 34” monitor screen
- ☐ Having tasks broken down into smaller, manageable steps
- ☐ Receiving regular feedback

Before continuing on with this next bit of information, you might find it helpful to look back over the three case studies in Week 4 and refresh the details in your mind.

There are three requirements formed by the duty of reasonable adjustments:

1. The first requirement is **changing how things are done**. In general, the Equality and Human Rights Commission monitors the need for policy updates, and changes to the way things are usually done. The culture of ‘we’ve always done it that way’ is fundamentally flawed. The Equality Act 2010 includes guidance on changing the way things are done. Look at whether there is a need to change some (written or unwritten) policies, established processes and ways of working, and consider how you could remove or reduce barriers that place a disabled person at a substantial disadvantage. For example, in the firm where Chandru used to work, the report containing unit type and size, location, electrical requirements, safety precautions, among other information was given the day before the installation. The employer agreed that the report should instead be provided 72 hours ahead, providing enough time to read and digest the information.
2. The second requirement is **changing the built environment** to avoid substantial disadvantage. For example, Ben is struggling to find the right balance between the theoretical and practical work during his apprenticeship. The theoretical part is imparted by videos, printed materials, and some talks in the middle of the office where there are many people coming in and out. As this is quite distracting, the secretary has moved the talks to the back of the building in a closed office.
3. The final requirement is **providing auxiliary aids and services**. The details will depend on the individual and the job they need to perform. For example, when Ben

helps other workers to understand the 2D images, they have a 24” screen or printouts on white A4 paper. The master plumber requested a larger screen and for the 2D images to be printed in A3 and in colour.

Good to know

Providing reasonable adjustments is an anticipatory duty. This means employers need to be proactive and they shouldn’t wait for problems to show up; they must try to prevent them before they happen (Public Health England, 2017).

3.2 Assistive technology for people with dyslexia – auxiliary aids

Assistive technology can be a game-changer for people with dyslexia, helping for example with literacy and simple memory tasks. Consider tools that remind you to attach documents to emails, speech recognition software that types out your speech, and writing assistance software that helps with spelling and grammar. Tools can also be used to send reminders to attend meetings (or even to take breaks or have lunch). But the benefits of assistive technology can take many other shapes. Dyslexic people might need help with working memory, organisation, metacognitive skills and task analysis. For instance, dealing with interruptions, working in open plan offices, dealing with busy and demanding situations, receiving written messages that need to be read during an ongoing meeting, etc. (Smith-Spark, Gordon and Jansari, 2022).

Here are some common adjustments that can make a significant difference.

Table 1 Common adjustments

Technology	No technology involved
text-to-speech software, speech-to-text software and screen readers, e.g. Immersive Reader, dictate functions in Microsoft Office 365; speech recognition or dictation software, e.g. Dragon NaturallySpeaking	allowing extra time to read documents or to complete work, e.g. by reducing time constraints
specialised fonts that can make reading and writing easier, e.g. Arial, Calibri	giving written instructions in accessible formats, and/or allowing employees to write down instructions
using advanced grammar and spell checkers	focusing on the result rather than how the task was completed
use of multiple computer screens, and adjusting changing monitor settings, e.g. background colour to reduce visual stress, font text size	coaching on skills such as time management, task management, prioritisation and procrastination

organising reference material in one place, e.g. Google Keep or Microsoft OneNote	compartmentalising information, e.g. allowing diagrams and infographics; producing bullet point planning and mock-ups
online calendars, e.g. Microsoft Outlook, ToDoist (Linear Task List) and Trello (Visual Task List)	physical diaries, calendars and wall charts
noise-reducing headphones to help focus, reducing the distraction of background noise	flexible work arrangements, e.g. adjusted work hours (avoiding the distraction of the busiest office hours) or remote work options
switching off certain lights in an office	flexible workspaces: fixed desks with a wall behind and/or to the side to help focus; quiet workspaces/areas; allowing people to opt out of hot-desking
recording instructions in audio format for later playback	mapping of work tasks to time allocation, to ensure deadlines are met
scan pens, as a support for reading printed text	allowing for employees' own solutions and initiative

For more information, you can visit the British Dyslexia Association's page on Reasonable adjustments in the workplace.

Remember that everyone is unique, so it's important to have a workplace needs assessment.

3.2.1 Technology

While assistive technology and the advent of AI can help reduce some barriers faced by dyslexic people, they are not a complete solution. For instance, using grammar check tools doesn't help if you don't know the correct word to use.

Author's experience

I once wrote 'pubic' instead of 'public' in an important document. Both are grammatically correct words, but 'pubic' was definitely *not* what I intended in a paper about Indigenous peoples' rights to preserve their culture.

Having a colleague or family member proofread your work is always a good practice.

The 'dictate' function in Microsoft 365, like many other software options, is a convenient way to quickly capture your thoughts, create drafts, and author content using your voice.

Author's experience

Pronunciation is not my strong suit, so this wasn't for me. I get frustrated and end up shouting at the screen. How am I supposed to know that something ends with a 't' and should be pronounced accordingly? I honestly gave up. But give it a try, as it might work for you!

When using any type of technology, it's important to have someone who can mentor you on how to use it effectively.

Author's experience

It's important for me that it's not a five minute whistle-stop tour. I always ask them to go slowly and take notes so I can refer to them later. Step-by-step guides, infographics and mind maps are great for this. Alternatively, ask for the session to be recorded.

The range of mobile technological support devices available to adults with dyslexia has been highlighted by many scholars (Reid, Strnadová and Cumming, 2013). However, adults with dyslexia still report frequent everyday problems with prospective memory, even when using tools and techniques to assist memory (Smith-Spark, Zięcik and Sterling, 2017; Smith-Spark, Gordon and Jansari, 2022). Keep in mind that, while technology can help, it takes time to get comfortable with it and truly see its benefits.

Activity 3 Duties and reasonable adjustments

Allow about 5 minutes

Match the job and duties performed by a person with dyslexia to some potential reasonable adjustments.

The employer agrees to incorporate visual barriers like low partitions, and acoustic panels that absorb sound; and to divide the office into zones based on noise levels

The employer agrees to purchase a printer for the employee's use

The employer agrees to install screen-reading software, and provide templates with clear instructions

The employer agrees to modify instructions or reference manuals, for example, providing them in audio format and infographics

Match each of the items above to an item below.

Junior School Administrator – working in an open plan office

University Registrar – in charge of data entry

Quality Assurance Officer – works with online materials and information

Nightclub doorman – needs to read a bundle of policies (health and safety, emergency action plan, etc.)

4 Disability discrimination regarding dyslexia

The Equality Act 2010 in the United Kingdom requires employers to make reasonable adjustments for employees with disabilities, including dyslexia. This duty starts from the recruitment process and continues through promotions, transfers, training, development and even dismissal. Simply put, employers MUST NOT discriminate against disabled individuals. Although the term ‘disability’ isn’t commonly used in the UK to describe dyslexia, it is a lifelong condition that significantly impacts on a person’s day-to-day life, thus meeting the criteria of a disability under the Equality Act 2010.

The Equality Act defines a disability as:

> a physical or mental impairment which has a substantial and long-term adverse effect on their ability to carry out normal day-to-day activities.

‘Substantial’ means ‘more than trivial’ as established in the case of ‘Mr P Aderemi v London and South Eastern Railway Ltd’ (2012). Additionally, the Public Sector Equality Duty applies to public bodies and those performing public functions, ensuring they also make reasonable adjustments. Despite this legal protection, many employees still face discrimination. Deacon, Macdonald and Donaghue (2022) have discussed the mental impact of experiencing exclusion in the workplace due to dyslexia. However, the empirical research is limited in this area.

The law firm Springhouse notes that while there may be situations where duties are withheld from dyslexic employees, this must be handled sensitively to avoid allegations of discrimination or harassment. Blanket rules preventing dyslexic employees from certain roles are highly unadvisable. Each case should be considered individually, considering the role, duties, circumstances, and the employee’s needs.

Employment tribunals have emphasised the importance of understanding and accommodating dyslexia in the workplace to prevent discrimination and support employees effectively. By fostering an inclusive enviroment and making reasonable adjustments, employers can help dyslexic employees thrive.

Cases decided in tribunals

‘Mr D Paterson v Commissioner of the Metropolitan Police’ (2007)

> Case Summary: Chief Inspector Paterson claimed that the Metropolitan Police didn’t make reasonable adjustments for his dyslexia during promotion exams. Initially, a tribunal ruled that his dyslexia had only minor effects, but this was overturned on appeal. Expert evidence showed that Paterson had significant difficulties with phonological processing, short-term auditory working memory, and processing information quickly under pressure.
>
> Outcome: The appeal tribunal recognised that dyslexia had a substantial impact of making reasonable adjustments in such cases.

‘Miss M Kumulchew v Starbucks Coffee Company UK Ltd’ (2014)

> Case Summary: Meseret Kumulchew, a Starbucks employee, was accused of falsifying documents (wrongly recording the temperature of fridges and water at specific times) after making mistakes due to her dyslexia. She was given lesser duties and told to retrain, which left her feeling suicidal.
>
> Outcome: The tribunal ruled in favour of Meseret Kumulchew, finding that Starbucks had failed to make reasonable adjustments for her disability and had discriminated against her.

Watch this four-minute video by Clive Coleman (Legal correspondent for BBC News) on how Meseret felt during her work placement, and the little steps (i.e. reasonable adjustments) they could have taken but didn't.

Video 1: Starbucks employee wins dyslexia discrimination case (open the link in a new tab/window so you can return here easily)

It's important to note here, that employers must make sure that people with dyslexia are not bullied because of their learning difficulty (British Dyslexia Association, n.d.).

Case study

Martin Searle Solicitors shared a case study (2014) about Wendy, a Specialist Nurse at an NHS Trust who faced bullying and disability discrimination at work. The bullying included being given tasks that were especially challenging for someone with dyslexia and being publicly criticised for mistakes. Wendy's legal team pointed out that the employer failed to follow the Equality Act 2010 and the ACAS Code of Practice. The case was resolved with the employer making the necessary adjustments and addressing the bullying behaviour.

If someone believes they have been discriminated against, they can take their case to an employment tribunal within three months of the incident. Disability discrimination is based on 'discrimination arising from disability', meaning there's no need to prove they were treated worse than others.

Other relevant information: workplace health needs assessment

In the UK, the government offers practical advice for employers on workplace health, and provides tools for conducting workplace health needs assessments (Public Health England, 2017). These assessments gather anonymous information about the health of a company's workforce and help employers decide where to invest in staff health and wellbeing, beyond just the basic requirements.

5 This week’s quiz

Now that you’ve completed Week 7, you can take a short quiz to help you to reflect on what you’ve learned.

Week 7 practice quiz

Open the quiz in a new window or tab, then come back here when you’ve finished.

6 Summary of Week 7

This week has examined the significant impact of dyslexia in the workplace, showcasing its potential as a catalyst for innovation. You began by examining the reality of dyslexia and highlighting its strengths, such as creative thinking and problem-solving skills. There are numerous skills associated with dyslexic thinking, which can be valuable assets in various professional settings.

You then turned to the dilemma of whether to disclose one's dyslexia at work, looking at the guidance about how and where disclosures should be made. Practical examples and activities were given to help individuals navigate this decision. Workplace assessments and specific challenges faced by dyslexic individuals were covered, along with reasonable adjustments and assistive technologies that can support them.

Finally, this week addressed disability discrimination, presenting several cases decided in tribunals and providing a case study to illustrate the key points involved. It concluded with a summary of workplace health needs assessments. Overall, this week aimed to provide a comprehensive understanding of how dyslexia can be a valuable asset in professional environments.

In the final week of this course, you will recap some key concepts, review practical strategies, complete some activities, and reflect on the impact of mindfulness, culminating in drafting an action plan to take you forward beyond this course.

You can now move on to Week 8.

Week 8: Drawing the threads together

Introduction

Welcome to the final week of *Understanding dyslexia*! This week will draw together all the threads from your journey, reinforcing the key concepts and strategies you've explored. This week will cover the following:

- a recap of some key concepts that have been introduced in this course
- a review of the practical strategies and tools discussed throughout
- an opportunity to reflect on the impact of mindfulness
- some closing remarks, and an action plan for you to draft.

By the end of this week, you should feel like you have a thorough understanding of dyslexia, and that you're equipped with practical and effective strategies for supporting individuals with dyslexia.

1 Key concepts – the threads

Let's begin this week by reviewing the key terms that have been covered throughout this course, and highlighting the most important points to take away. The aim here is to reinforce your understanding of dyslexia, its characteristics, and its impact on individuals.

Activity 1 The terms you've learned about

Allow about 20 minutes

Table 2 is arranged so you can test your understanding of a range of terms covered in this course. You don't need to explain anything in great detail here, and shouldn't expect to match the answers word-for-word. The aim is to encapsulate the information you've learned, rather than present rote definitions. Give it a try!

Table 1 Defining key terms

Term	Your understanding
Attention deficit hyperactivity disorder (ADHD)	*Provide your answer...*
Autism spectrum disorder (ASD)	*Provide your answer...*
Comorbidity	*Provide your answer...*
Diagnosis (of dyslexia)	*Provide your answer...*
Disability	*Provide your answer...*
Dyslexia	*Provide your answer...*
Dyscalculia	*Provide your answer...*
Dyspraxia	*Provide your answer...*
Intersectionality	*Provide your answer...*
Medical model of disability	*Provide your answer...*

Metacognition	*Provide your answer...*
Neurodiversity	*Provide your answer...*
Reasonable adjustments	*Provide your answer...*
Screening (of dyslexia)	*Provide your answer...*
Social model of disability	*Provide your answer...*

Discussion

Table 1 Defining key terms (completed)

Term	Definition
Attention deficit hyperactivity disorder (ADHD)	A chronic condition characterised by a combination of inattention, hyperactivity and impulsive behaviour.
Autism spectrum disorder (ASD)	A neurodevelopmental disorder characterised by differences in communication and social interaction. Usually, challenges are noted with speech and nonverbal communication including social skills, and repetitive behaviour.
Comorbidity	Medical conditions that occur independently, but coexist at the same time.
Diagnosis (of dyslexia)	Involves assessing an individual's reading, writing, and cognitive skills through tests that evaluate phonological awareness, decoding skills, reading fluency, and spelling. The diagnosis is run by accredited professionals.
Disability	A physical or mental impairment that significantly (and long-term) affects the ability to perform everyday activities.
Dyslexia	A learning difficulty that affects reading and spelling skills. It often involves challenges with phonological awareness, verbal memory, and processing.
Dyscalculia	A learning difficulty that affects a person's ability to understand and work with numbers.
Dyspraxia	A neurological condition that affects motor skills and coordination. Sometimes may present challenges with memory and cognitive functions.

Intersectionality	This describes how different aspects of a person's identity, such as race, gender, class, and sexuality, overlap. It highlights social categorisation.
Medical model of disability	The model that focuses on disability as a problem that exists within an individual's body (physical or mental).
Metacognition	Refers to thinking about one's thinking, understanding one's own thought processes.
Neurodiversity	Variation in how a people's brain function and process information.
Reasonable adjustments	Reasonable depends on each situation. Adjustments are required to the environment a disabled person allowing the person no to be disadvantaged and discriminated.
Screening (of dyslexia)	Tests that identify an individual's strengths and weaknesses in cognitive skills such as reading, writing, spelling, and memory, and can indicate the likelihood of having a specific learning difficulty like dyslexia. It does not provide a diagnosis.
Social model of disability	The model that considers the societal barriers that create a problem, not as something that exists within an individual's body (physical or mental).

2 Practical strategies – linking the threads

Having consolidated the foundational terms, let's proceed now to review the practical strategies and tools that have been discussed throughout the course. The aim was to emphasise how these strategies can be applied in real-life scenarios, both in educational and professional settings, as well as daily life. Throughout the course, success stories have been included to illustrate the positive impact of understanding and supporting individuals with dyslexia. These kinds of stories help to promote better understanding of Specific Learning Difficulties (SpLD) in society.

Table 2 Practical strategies

Strategy	Description
Preview / big picture thinking	Providing an overview or summary before diving into the detail, to help individuals with dyslexia understand the context and main ideas.
Review	Regularly revisiting previously covered material to reinforce learning and retention.
Chunking time	Breaking down tasks into smaller, manageable segments to avoid overwhelm and improve focus.
Assistive technology	Utilising tools such as text-to-speech software, audiobooks, and specialised apps to support learning and daily activities.

The strategies outlined in Table 2 are designed to support individuals with dyslexia. However, it's important to note that these strategies can be beneficial for all – not just those who are neurodivergent. By incorporating these approaches into educational, professional, and daily settings, we can create more inclusive and effective environments for everyone.

Having explored various support strategies, it's clear that concentration plays a crucial role in their successful application. The next section, then, will delve into techniques and practices that enhance concentration – which is, again, something that's essential both for neurodivergent individuals and the broader population. By improving concentration, we can further optimise the effectiveness of the strategies discussed and foster a more productive and inclusive learning environment.

3 Concentration

Concentration is key to academic success, and it is equally vital in a work environment. Let’s consider some barriers to effective concentration and how they might be overcome.

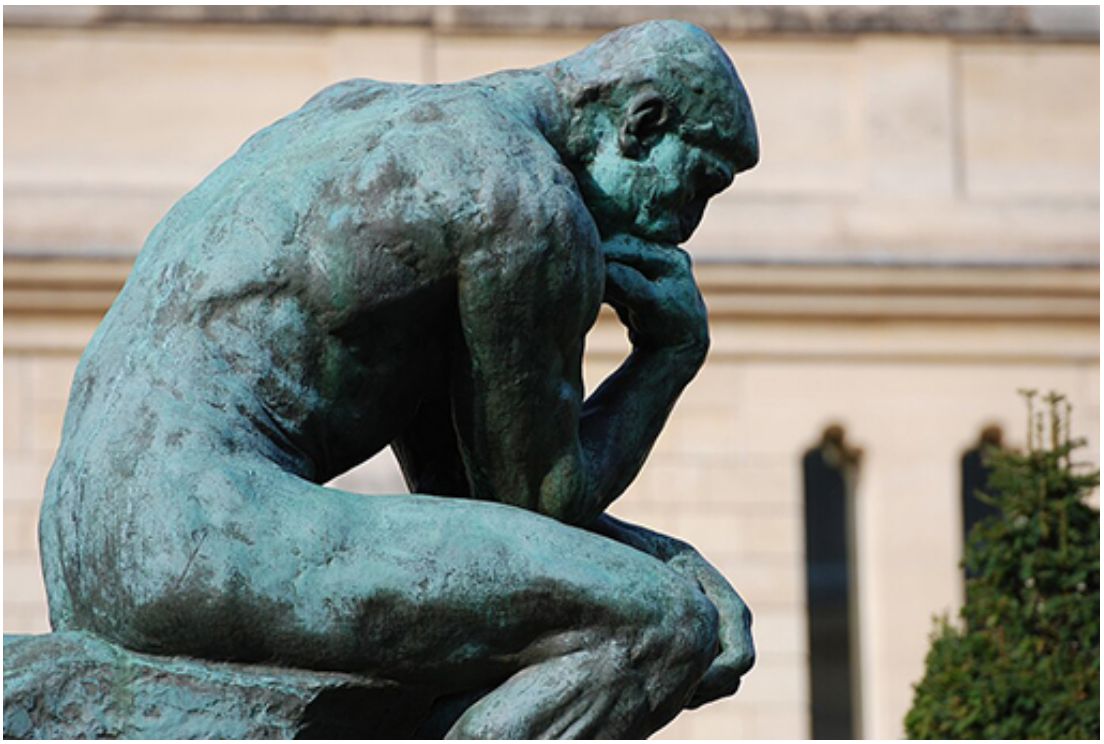


Figure 1 Effective concentration

3.1 Why is it so difficult to concentrate?

We can find it hard to concentrate because there are so many thoughts occupying our minds. Distractions are rife nowadays. We have become so used to attending immediately to these distractions – such as text messages, social media and app notifications – that we’ve worn down our attention spans. In this digital age, there are so many competing demands for our attention that it’s become increasingly difficult to focus our thoughts.

3.2 How can we improve our concentration?

Awareness of the issue is the key first step towards addressing it. From there, our ‘will’ to concentrate can be built back up again. You can being this work by acknowledging the impact of thoughts and emotions on our concentration, and using techniques like positive self-talk, visualisation, concentration exercises, and mindfulness exercises. Consistent work to promote concentration will have a noticeable impact.

At the same time, it must be kept in mind how significant our lifestyle choices are. They have a huge impact on our concentration, and subsequently will impact academic/ professional achievement. So try to make consistently healthy choices for peak performance.

Improve your focus to improve your performance

- Concentration is the ability to focus your attention on a single thought, idea, or action. As critical as this skill is, it is one of the most difficult to develop (Knight, 2019, p. 1).
- Concentration is a critical skill for any individual. Without it, you are not able to start, stick with, or finish a task or an assignment (Knight, 2019).
- Mindfulness can strengthen the focus area of your brain and therefore raise your performance.
- Individuals with dyslexia often suffer from lack of concentration, but they can often work more intensely than others between distracted periods.
- Short rests/naps can help to balance and reset concentration.
- Don’t compare yourself with others, because you have a unique learning strategy.
- Check your lifestyle: plenty of water to drink, green foods and protein included in a daily diet. Sleeping for 7-8 hours a night (as often as possible), and getting fresh air and doing regular exercise can be crucial for concentration and focus.

Work ethic and healthy lifestyle choices

Sleep:
- improves energy levels, focus, motivation and mood
- sleep deprivation negatively affects short-term memory (used while studying)

Exercise/play/activity:
- enhances working memory
- lowers stress and anxiety
- improves your mood as well as your self-esteem

Nutrition:
- ‘you are what you eat’
- you need to eat right to work hard

To do:
- manage your time
- create a routine
- prioritise your tasks
- manage interruptions
- stop procrastinating
- make use of schedules and plans

A wandering mind can be an unhappy mind

- Attention finds a focus point, and it **absorbs what it rests on**.
- What it repeatedly rests on can **influence our intuitions, thoughts, and actions**.
- Our minds do tend to **wander towards negative content** and negative experiences.
- Thoughts can **overwhelm us and trigger emotions** and further thoughts – for instance, remembering an argument or a difficult meeting can stir up emotions that distract us still further.

- We **do not acknowledge the positive aspects of life** as much, which leads us to more negative thoughts.

We can train our minds to recognise this trait, halt the process, and direct our thoughts in a more positive direction with self-talk.

Self-talk

- Self-talk is a form of concentration training – you have to focus on the words.
- Self-talk changes your mindset and identity – if you repeat certain words they will sink in further, and influence your brain to act out what the words describe.
- To do: make a statement in the present tense, as though it's happening now or already true, e.g. 'I am excellent at concentrating', 'I have a very good memory'. Your brain will start to find it easier to believe and work towards that outcome (Knight, 2019).

3.3 How to manage distractions

Here are a few tips for managing distractions that you might try.

- **Stay away from your phone** (and social media, emails, etc.) when you need to concentrate. Put the device in another room for a while, or switch it to airplane mode.
- Your concentration will improve if you can **train your brain to refrain** from attending to distractions for longer and longer periods.
- Keep your **workspace tidy**.
- **Link study to small rewards** (e.g. a piece of chocolate, an outing, or anything else) to build positive associations.
- **Break up tasks** into small, manageable units.
- Consider when your **most productive time of day** is (when you feel most energetic and focused). Remember to work in **blocks of time**.
- If all else fails, try a **distraction-free zone**! Take yourself away from your usual environment and go the library (or even a coffee shop if the noise levels are manageable for you) and take what you need to complete your work. Work for an hour, and take stock of your progress. Don't be surprised if you find that you've completed several hours' work compared to what you'd typically manage in your own space, just because you are free from the usual distractions.

4 Mindfulness

> Mindfulness is awareness that arises through paying attention, on purpose, in the present moment, non-judgmentally.
>
> Dr Jon Kabat-Zinn (2017)

Try using the ‘five senses’ exercise to bring you into the present moment. This exercise involves noticing and naming the following sensory stimuli:

FIVE things you can see
FOUR things you can feel
THREE things you can hear
TWO things you can smell
ONE thing you can taste

Figure 2 Engaging your senses

Activity 2 Test your five senses

Allow about 5 minutes

Try out this exercise now, and make some notes on your observations below.

Things you can see

1.
2.
3.
4.
5.

Things you can feel

1.
2.
3.
4.

Things you can hear

1.
2.
3.

Things you can smell

1.
2.

Things you can taste

1.

Mindfulness is really attention training

- Mindfulness strengthens the focus area of your brain and can therefore lead to high performance.
- There are many benefits associated with mindfulness for both physical and mental health, especially when undertaken with an attitude of kindness, patience, and gentleness.
- It can slow down thoughts and smooth emotions.
- You can use the activity above to calm yourself, reduce anxiety, and increase concentration on your work.
- Regulating attention leads to becoming more self-aware, building new neurons, and reinforcing the pathways in the brain.
- This leads to putting life and events into perspective.
- A sense of wholeness develops over time with mindfulness.

Documented benefits of mindfulness

stress reduction • clarity and focus • greater resilience • enhanced creativity • improved relationships • improved concentration • rapport and communication • improved health and wellbeing • greater confidence and self-esteem • reduced anxiety and depression • improved work-life balance • greater work satisfaction • memory enhancement • intuitive ability • pain reduction • happiness

(UK College of Mindfulness Meditation, 2022)

4.1 Formal and informal mindfulness

Formal mindfulness is the practice of using guided meditations or dedicated periods of quiet time spent focusing on the breath (or some other method of cultivating focus). This activity can be used to strengthen the focal abilities of the mind. In fact, research by Basso et al. (2019) has shown that non-experienced meditators practising for 13 minutes a day over eight weeks brought about beneficial brain changes – enhancing attention, memory, mood, and emotional regulation – which could be identified by neuroimaging.

Informal mindfulness brings the mind into the present moment during everyday activities, like washing the dishes, brushing your teeth, or going for a walk outside. We tend to live in the past or the future in our minds, living on autopilot much of the time, distracted by our thoughts, with little time for peace. Just bringing our minds to the sensations around us – the feeling of water on our hands, or the sound and weight of a footstep – a few times a day can help to enhance the brain's ability to focus.

Activity 3 A technique for focus

Allow about 15 minutes

Try out this mind training technique:

1. Sit or lie down quietly, and let yourself feel still.
2. Concentrate on your breathing, and the rise and fall of your chest.
3. Every time a thought enters your head, bring your attention back to your breathing.
4. Do not get angry or frustrated by your thoughts trying to intrude – acknowledge them and let them float by.
5. Visualising an image – such as a shape, a number, or a symbol – or saying a mantra such as 'I am calm in mind and body' can be an alternative to concentrating on breathing. Keep bringing your mind back from your thoughts via whichever method works best for you.
6. With time and practice, you'l find that there will be longer and longer periods of peace in your head. Even one minute is a very good start!
7. This peace will become more readily accessible to you, and you can incorporate this effect into other areas of your life. For example, it can help you to concentrate on your academic work for longer and longer periods of time.

Examine the effects you're feeling from this technique – asking yourself questions like the ones below – and consider how you might be able to apply it elsewhere. If you aren't seeing any results just yet, revisit the steps above (either now or later) to build on your practice.

Does it help to improve your focus, and manage distractions?
Are you more aware of the impact of your thoughts and emotions?
What impact does it have on your self-talk?
Does it help you to consider the impact of your lifestyle on your studies?

5 Revisiting the case studies

It's time to apply the knowledge and skills that you've acquired throughout this course.

Activity 4 Revisiting Amaka, Ben, and Chandru

Allow about 20 minutes

Let's revisit the case studies introduced in Week 4 one more time. Consider everything you've read about Amaka, Ben, and Chandru's profiles, and fill in the following boxes as much as you feel possible with the information available:

Table 3 Revisiting Amaka, Ben, and Chandru

	Amaka	Ben	Chandru
Condition(s)	*Provide your answer...*	*Provide your answer...*	*Provide your answer...*
Statement(s) or information that suggest this condition	*Provide your answer...*	*Provide your answer...*	*Provide your answer...*
Challenges (existing, or that you foresee)	*Provide your answer...*	*Provide your answer...*	*Provide your answer...*
Strengths (existing, or that you'd recommend)	*Provide your answer...*	*Provide your answer...*	*Provide your answer...*
Strategies (existing, or that you'd recommend)	*Provide your answer...*	*Provide your answer...*	*Provide your answer...*
Reasonable adjustments (existing, or that you'd recommend)	*Provide your answer...*	*Provide your answer...*	*Provide your answer...*

Discussion

Table 3 Revisiting Amaka, Ben, and Chandru (completed)

	Amaka	Ben	Chandru
Condition(s)	dyslexia dyspraxia	dyslexia ADHD	dyslexia potential dyscalculia
Statement(s) or information that suggest this condition	• 'read more slowly than her peers, she found spelling difficult, and her handwritng was very messy' • 'clumsy and prone to falling over frequently' • 'difficulty in multitasking' • 'sacrificing social events to keep up with her academic commitment' • 'difficulties with coordination'	• 'seeing practical solutions' • 'reading these drawings and spotting errors' • 'hard to focus' • 'reading and writing challenging' • 'put off tasks'	• 'enjoyed meeting new people' • 'finding the right solutions' • 'struggled with reading and writing' • 'multiplication table difficult'
Challenges (existing, or that you foresee)	• lack of concentration • difficulties with sequencing • slow processing • taking notes • writing logically • slow reading rate • time management • poor listening skills • low self-esteem • organisation • writing logically • slow reading rate	• distractibility • lack of concentration • organisation • writing logically • slow reading rate • organisation	
Strengths (existing, or that you'd recommend)	• motivation • determination	• problem-solver • ability to visualise in 3D • mentally rearranging designs and information • ability to manipulate and	• problem-solver • ability to visualise in 3D • rearranging designs and information

		match images	
Strategies (existing, or that you'd recommend)	Already in place: • family support • student support team • assistive technology (AT) • record lectures • presentations and slides available prior to lectures and seminars • positive teacher attitudes		• supportive teacher • mind-mapping • assistive technology
Reasonable adjustments (existing, or that you'd recommend)	• speech-to-text software • extended time and deadlines for assessments • leniency towards spelling errors		

6 Action plan

Now that you're approaching the end of this course, it's time to create your own personal action plan to implement what you've learned.

Activity 5 Make an action plan

Allow about 15 minutes

Take some time to reflect on how society responds to individuals who are exactly that – unique individuals with their own circumstances.

Set specific goals and identify steps you can take to support individuals with dyslexia in your community. To do so, follow these steps:

1. **Identify one area** where you can make a difference – this could be in your workplace, school, community, or personal life.
2. **Set specific goals** related to supporting individuals with dyslexia (e.g. raising awareness, improving accessibility, advocating for inclusive practices).
3. **List practical actions** you can take to achieve each goal. For example:
   - Share resources or articles about dyslexia with colleagues or peers.
   - Suggest or implement assistive technology in your setting.
   - Organise a dyslexia-friendly event or workshop.
4. **Consider potential challenges** and how you might overcome them.
5. **Set a timeline** for reviewing your progress and adjusting your plan if needed.

If you believe that you may have dyslexia yourself, a good next step is contacting a national charity. They will be able to offer some assistance and guidance in the first instance. If you are based in the UK, you may wish to contact the British Dyslexia Association (BDA), or charities such as Helen Arkell Dyslexia Charity.

Resources for concentration and meditation

Here are some helpful apps and resources for concentration and meditation:

Calm
Edraw
Flora
Focus Plant: Pomodoro Forest
Focusmate
Forest
HabitShare
Headspace
iMindMap
Insight Timer
Inspiration
Jon Kabat-Zinn (JKZ) Meditations
MindMeister
MindMup

MindTools – Time management
MindTools – How to stop procrastinating
MindTools – Prioritisation
MindView
myNoise
Pomodoro Technique
Todoist – Linear Task List
Trello – Visual Task List

7 This week's quiz

It's time to complete the Week 8 badged quiz. It is similar to the previous quizzes but this time, instead of answering 5 questions, there will be 15, covering Weeks 5 to 8.

Remember that the quiz counts towards your badge. If you're not successful the first time, you can attempt the quiz again in 24 hours.

Week 8 compulsory badge quiz

Open the quiz in a new window or tab, then come back here when you've finished.

8 Summary of Week 8

As you wrap up the final week of *Understanding dyslexia*, take time to reflect on the journey you've taken. This week, you've revisited the key concepts that shape our understanding of dyslexia, explored practical strategies and tools to support individuals effectively, and engaged with activities designed to deepen your learning through participation. This week also encouraged you to consider the role of mindfulness – how being present, empathetic and reflective can enhance your approach to supporting dyslexic individuals. Now, with all these insights in hand, it's time to look forward.

Throughout this course, dyslexia has been evaluated as a learning difficulty, and seen as a disability in accordance with the Equality Act 2010. We support the need for intervention as a social model of disability, and we aim to acknowledge the increased levels of creative reasoning. The challenges presented for neurodivergent individuals are clear; but so too are the advantages on offer from engaging with their strengths. In an era of developing artificial intelligence (AI), we may experience a wider re-examination of the skills necessary for society to flourish. This may well highlight a need for the creative thinking skills that computers are unable to do, but which are available to many dyslexic people.

We're delighted that you've chosen to study *Understanding dyslexia* as a first step, and we hope you'll continue to develop and spread awareness and support for dyslexia. Thank you for your engagement and commitment throughout the course.

Tell us what you think

Now you've come to the end of the course, we would appreciate a few minutes of your time to complete this short end-of-course survey (you may have already completed this survey at the end of Week 4).

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Whoopi Goldberg: Whoopi Goldberg speaks about her book, “Bits and Pieces,” with Librarian of Congress Carla Hayden during a special presentation, May 10, 2024. Photo by Shawn Miller/Library of Congress. https://commons.wikimedia.org/wiki/File:Whoo-pi_Goldberg_in_2024_(cropped).jpg

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Videos

Video 2: Patricia Covarrubia (course author) interviewed as a recipient of Kindness & Leadership’s ‘50 Leading Lights’ listees in 2022 https://www.youtube.com/watch?-v=5N9_OZaSkKk https://www.kindnessrules.co.uk

Week 6

Images

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Week 7

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Week 8

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