Dyslexia in higher education

Summary contribution

This summary contribution is based on the webinars 'Studying with dyslexia anno 2020: a state of affairs' and 'Succeeding with dyslexia in higher education', given by Prof. Dr. Wim Tops (UHasselt) hosted by SIHO. The summary starts with a short introduction to dyslexia in general, followed by its implications for study support in higher education.

Prof. Dr. Wim Tops is a linguist, neurolinguist and psychologist and is currently working as a lecturer at the School of Educational Studies (faculty of Rehabilitation Sciences). His experience as a teacher in secondary education, lecturer and care coordinator, but also as a therapist and researcher in psychology resulted in an impressive expertise on dyslexia. He combines this professional experience with his experiences as a father of a son with dyslexia.

Dyslexia: a complex condition

When one thinks of dyslexia, the first thing that usually comes to mind is the reading and writing problems associated with it. Because it seems such a specific problem, it is quickly assumed that a specific cause can be found. In reality, dyslexia is a much more complex issue with risk factors on different levels: genetics, neurobiology, cognition and behavior, will interact with environmental factors and parents (genes and environment) to determine its probability.

Clinically, the focus is on behavior and the reading and writing problems will be the trigger to reach a diagnosis. Three prerequisites need to be met:

- Lag in reading and/or writing skills compared to a relevant reference group (belonging to bottom 10 percentile compared to peers with similar level of education),
- Persistence of problems after a minimum of two measurements and individual remediation for at least 6 months,

- Exclusion of alternative explanations for the learning problem such as e.g., long-term education in another language, a home language that is not the dominant language, illness, poor education, etc.

Thus, the Dyslexia Netherlands Foundation (2016, p.29) comes to the following definition: "dyslexia is a disorder characterized by a persistent problem with the learning and/or fluent application of reading and/or spelling at word level."

It is important to point out that, due to its complex nature, people with dyslexia also often experience difficulties with executive functions such as attention and concentration, orientation in time and space, order and structure, memory, or assessing themselves correctly.

A state of affairs anno 2020

An increasing number of students with dyslexia are entering higher education. Nowadays, they represent about 2 to 3% of the total student population. Those who start in higher education have a similar chance of succeeding as other students, although a dyslexic student is more likely to experience study delay and will change studies more quickly. Extra guidance during a student's orientation can thus be of great value to a student with dyslexia, in part because it is often more difficult for them to get a clear insight into their own talents and limitations (see below).

Students who experience other learning disabilities in addition to dyslexia and have thus received a dual diagnosis, drop out without qualification more often.

Challenges in higher education

Calllens, Tops, & Brysbaert (2012) did a research on how these difficulties translate to students' experiences in higher education and, came to the following conclusion:

Differ from other students in...	Do not differ from other students in...
☐ Reading, especially in reading pace ☐ More spelling errors ☐ Phonological processing ☐ Less extensive and less profound vocabulary ☐ Slower processing speed ☐ (Verbal) memory ☐ (Fast) mental arithmetic	☐ Fluent intelligence ☐ Visual information processing ☐ Auditory comprehension

It is striking again that the difficulties are not only located in the field of vocabulary, reading comprehension or writing skills and that students can also experience problems with processing speed, memory, test strategies and studying skills. A double focus with on the one hand reasonable adjustments tailored to the student's need and on the other hand the strengthening of the student's competencies and study strategies is therefore recommended.

Succeeding in higher education

To put this dual focus into practice, Tops identifies four pillars on which study support for students with dyslexia in higher education can focus in addition to the range of accommodations:

- ☐ Pyscho-education,
- ☐ Remediation of reading and writing skills,
- ☐ General study guidance,
- ☐ Supporting software.

☐ Psycho-education

There is no difference in intelligence between students with or without dyslexia. It can be empowering and motivating to explicitly point this out to students. However, the seriousness of the reading and writing problems and the associated difficulties should not be underestimated. Explaining how short- and long-term memory works and how

it might be disturbed can help students with dyslexia to gain more self-insight and select the right study approach.

The difficulties with the phonological processing of new information amongst students with dyslexia, usually lead to a smaller short-term memory ('the notepad' - see figure). When we study, we first keep repeating information to ourselves by means of a kind of 'inner voice' or 'phonological loop' until that information is recorded in our long-term memory ('the drawer - see figure). When students have dyslexia, this 'phonological loop' will likely decay more quickly, which will not only make the transfer from short-term to long-term memory more difficult, but can also cause difficulties when the same loop needs to be recalled. Prof. Wim Tops explains this mechanism using the figure below.

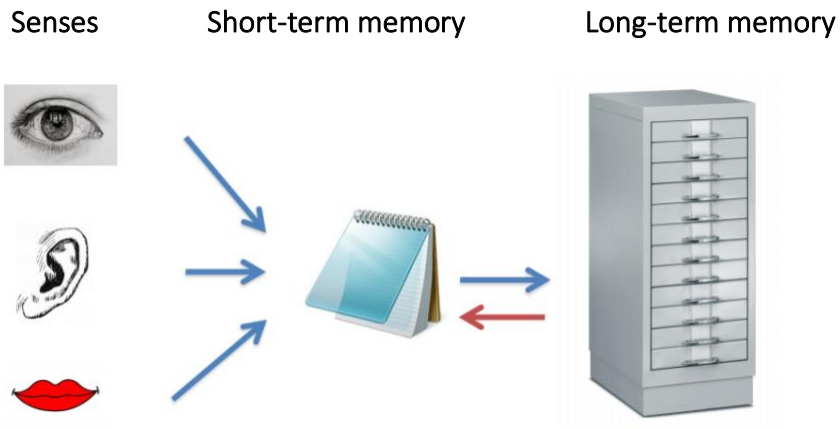

Figure 1: workings of short-term and long-term memory

☐ Remediation of reading and writing skills

Even in higher education, tutoring focused on reading and writing skills can be useful. The main slogan here is ‘by doing, one learns’. By reading more, students can anticipate more quickly, become familiar with content words, and learn to broaden their reading horizons. Working on linking words is also recommended to boost reading comprehension skills.

Support in reading comprehension is also essential. The publication '*Wijzer op Weg*' distinguishes the following steps:

- Step 1: Learning objective(s) and table of contents
- Step 2: Titles and prominent words
- Step 3: Global reading
- Step 4: Understanding
- Step 5: Summarize/Making a schedule
- Step 6: Memorize and Check
- Step 7: Repeating and checking

Study guidance focused on writing skills is best designed broadly. Research shows that students with dyslexia are up to three times more likely to make spelling errors, experience more difficulty with sentence structure and punctuation, and also struggle more frequently with capitalization. They have the tendency to avoid difficult words in favor of their shorter, less correct alternatives. Nowadays writing courses in higher education often focus exclusively on academic language use; for students with dyslexia, courses that reiterate the basics may also be of interest. For the writing process, the seven steps of the writing guide from *'Wijzer op Weg'* can provide a guide (see below).

- Step 1: Find information about the text type, guidelines and grading criteria
- Step 2: Brainstorm: write out prior knowledge and ideas (in a mind map)
- Step 3: Find information and complete the mindmap
- Step 4: Organize information and look for connections
- Step 5: Write the text
- Step 6: Reread, delete and rewrite
- Step 7: Take care of the layout

General study guidance

Overall, the study skills of students with dyslexia do not differ that much from their peers and this group shows large differences among themselves. In addition to the

classic themes, extra attention can be paid to study skills related to the executive functions.

In the overview below you can find a number of study tips around three themes that students with dyslexia often struggle with, namely time management, working memory and self-activation.

Time management

- ☐ Supplement your internal clock with real clocks and mnemonics
    - ☐ Learn to look at the clock regularly
    - ☐ Wear a watch
- ☐ Use an alarm or warning devices
    - ☐ Set your phone's alarm
    - ☐ Use programs that limit your time on social media (Leechblock or Stayfocsd)
    - ☐ Avoid activities that take up all of your time
- ☐ Use a schedule to allocate time
    - ☐ Write out your plans for each day
    - ☐ Adjust your schedule as circumstances change
    - ☐ Provide time to wrap up
    - ☐ Extend the estimated time by 50%
    - ☐ Follow someone else's schedule

Working memory

- ☐ Make sure important things stand out
    - ☐ Do it immediately
    - ☐ Use or ask for reminders
    - ☐ Use post-its, alarms, ...
- ☐ The fewer distractions, the better you can stay focused
    - ☐ Take yourself off mailing lists
    - ☐ Throw things away
    - ☐ Limit the number of activities

- ☐ Write things down and don't try to remember them all
    - ☐ Write out complex directions or problems in partial steps
    - ☐ Make to-do lists and check them off

Self-activation

- ☐ Make sure the first step is small and manageable
    - ☐ Prepare yourself
    - ☐ Set a timer
    - ☐ Start with a subtask
    - ☐ Divide large projects into small parts
    - ☐ Work on similar tasks simultaneously
- ☐ Visualize rewards for starting or completing a task
    - ☐ Try to picture rewards or punishments vividly
    - ☐ Focus on the rewards, not the punishments
    - ☐ Make it more fun
    - ☐ Provide a reward yourself if there is none
    - ☐ Don't wait too long with rewards
- ☐ Work on a task, even without motivation
    - ☐ Make good use of your energy
    - ☐ Do not take the concerns of others personally
    - ☐ Investigate whether you do a better job if you start earlier

☐ Supporting software

There are different types of supported software: reading software, speech-to-text software, translation software, Book-a-Book, as well as study support such as mind map software or rehearsal software. Below we briefly discuss some points of interest for using these. For more information, also see ‘Supporting software' at the bottom.

Reading software can be a useful tool, but it can also cause additional confusion for students. The sooner students become familiar with its use in their school career, the more it can help them in their higher studies. Popular reading software in Flanders are Sprint, Kurzweil, Clearoread. A lot of new laptops have a built-in voice-over. Reading

aloud software can also be of added value in writing tasks. When students hear their text, they will sometimes detect errors faster than when they reread the text themselves. For a lot of students, a spelling check can be sufficient, or word predictors like Wody and Skippy can provide support.

The speech-to-text software is still developing, although there is clear growth in this market. Currently the offer still consists mainly of quite expensive programs, well-known software are Dragon Naturally Speaken or MacSpeech Scribe (Mac application).

Because students with dyslexia often experience greater difficulties with foreign languages, the introduction to qualitative translation software can be a big help. Currently, the translation website DeepL is the most reliable option in the category 'free software'

Through Book-a-Book, the digital web application of the SIHO, higher education students with a registered disability in Flanders can request free digital versions of their textbooks.

Conclusion

Dyslexia is complex and manifests itself in more than just writing and reading problems. In addition, people with dyslexia often experience difficulties with executive functions such as attention and concentration, orientation in time and space, order and structure, memory or assessing themselves correctly. If higher education wants to effectively support students with dyslexia, it must also include psycho-education, general study guidance and the use of supportive software in the support offered. Within existing trainings focused on writing skills, more room needs to be reserved for the repetition of basic skills such as capitalization, punctuation, and sentence structure. Below the reader will find an overview of relevant software. Here you can consult the SIHO chart on dyslexia.

During the sessions, related topics such as dyslexia and choice of study or questions about the relevance of typical "dyslexia facilities" within Universal Design came up in the discussions. The SIHO commits itself to continue working on these themes.

Supporting software

Overview text and speech-software
General: https://www.siho.be/en/publications/database-assistive-technologies **Text-to-speech:** Sprint, Kurzweil, Claroread, built-in-voice-over, AppWriter, TextAid **Word prediction:** Wody, Skippy **Speech-to-text:** Dragon Naturally Speaken, MacSpeech Scribe **Book-a-book:** https://book-a-book.be/ **Translation software:** www.deepl.com
Software study support
Mindmap software: E-mindmaps, Freemind **Interrogating programs:** Teach2000 **Other:** Scanlio