

## 1. Facts & figures

- Dyscalculia is a learning disability characterized by a persistent problem in the fluent and accurate **recalling of number facts** and/or the fluent and accurate **application of math procedures**.
- Within the **Belgian population** the presence of dyscalculia is estimated at about **5%**. There is no data available on the numbers of students in higher education. A study in England estimates that about 0.4% within the student population has dyscalculia.
- There are **different expressions or subtypes** of dyscalculia. Procedural dyscalculia and memory dyscalculia are scientifically funded. Students with dyscalculia in higher education can experience problems with:
  - Executing **mental and written math procedures and operations**.
  - Understanding, knowing, interpreting, and applying **number structure, math symbols, and concepts, spatial concepts and numerical information**.
  - Recalling **number facts** from long term memory
  - Understanding, remembering, and reproducing **mathematical and scientific information**.
  - Reading **analogue and digital clocks**
- There can be **associated problems** such as the retrieval of verbal information, visual short term memory and working memory, a slower processing speed, and difficulties with study skills such as discriminating main issues from side issues, planning and time management.
- There is a large chance on the development of **emotional problems** such as fear of failure, stress and low self-esteem.

## 2. Focus points, tips & tricks

### Attending classes

#### Focus points

- o Reading and interpreting charts and figures can be difficult.
- o There can be difficulties performing **mental operations** in a fluent and accurate manner and understanding **mathematical assignments**
- o Due to spatial difficulties, **orientation on campus** can be difficult which can complicate finding the lecture rooms.
- o Due to weak time management and difficulties reading the time **being on time for classes** is not easy.

#### Tips and tricks

- o PowerPoint presentations with adequate **structure**, synoptic lay-out, **fonts sans serif**, (= without thin horizontal lines at the end of the letters, such as Arial or Calibri) in **font size 24** facilitate reading and taking notes. **Tables and figures** are best provided with a **clear title and lay-out**.
- o Presentations **delivered before classes** facilitates following classes and taking structured notes on the hand-outs.
- o **Lecture recordings** that are made available **online after classes**, offer the opportunity to review difficult passages and complete notes.
- o It is advised to indicate the **time span of the class**.
- o When mental operations need to be done on the whiteboard, give sufficient time for **preparation** and allow the use of a simple calculator.
- o Providing a campus plan and a **prospection** of the campus facilitate finding the class rooms on campus.

## Planning and organizing study-related activities

### Focus points

- Planning skills are weak and time management is not always realistic. Often more time is needed to process the information which increases the chance on study delay.

### Tips and tricks

- Providing an overview of all assignments and tasks helps to create an overview and make an efficient study plan.
- Study coaching can be useful to help improve planning skills and teach time management skills.

## Processing and rehearsing study materials

### Focus points

- Math related courses such as economy and statistics are substantial barriers. There can be difficulties understanding, remembering and displaying mathematical and scientific knowledge and reading and interpreting charts and figures.
- There can be difficulties selecting the appropriate study skills to discriminate main issues from side issues and process the course content efficiently.

### Tips and tricks

- Course materials with adequate structure and a synoptic lay-out promote the information processing. Learning goals, sample questions, and model answers incorporated in the course materials can be of assistance when processing the course content and can promote self-testing strategies. They give direction to the way the course content needs to be processed.

- Offering **study coaching** where the focus lies on learning techniques that help discriminate key issues from side issues, making connections, generalizing the course content, interpreting charts and graphics can enhance learning outcomes.

## Assignments

### Focus points

- **Math related assignments** are not always correctly understood. There can be difficulties understanding, remembering and displaying **mathematical and scientific knowledge** and reading and interpreting **charts and figures**.
- Assignments are not always free of **math errors**.
- Due to weaker planning skills and time management, **deadlines are sometimes missed** or the **estimating of the duration** of a task is inaccurate.

### Tips and tricks

- Assignment should consist of **clear and uniform formulations** and are best **offered well in time and in writing**.
- Checking whether the **assignment was understood** is supportive.
- For math assignments **sufficient time** should be foreseen.
- The use of a **formula list** and a **calculator** can be supportive.
- A distinction should be made between **immediate and delayed recall**. In case of delayed recall the correction level can be elevated because assistive tools can be applied. When recall is immediate this is not an option. Math errors should then be ignored or adjusted provided this is not in contradiction with the learning goals.
- By providing **more time**, the student can compensate for the slow information processing.

## Exams

### Focus points

- Questions including **complex mathematical assignments** are not always understood correctly. There can be difficulties understanding, remembering and displaying **mathematical and scientific knowledge** and reading and interpreting **charts and figures**.
- Exams are not always free of **math errors**.
- Due to weaker planning skills and difficulties with time management, **estimating the duration** of an exam is often inaccurate.

### Tips and tricks

- The use of a **formula list and a calculator** can be supportive, provided that this is not in contradiction with the learning goals.
- Offering **sample questions and model answers** can enhance better preparations for exams.
- **Extra preparation time** at an oral or written exam allows to compensate for the slower processing skills.
- An additional **oral presentation** at a written exam can help clarify the responses and eliminate ambiguities.
- An **optimal spread of exams** within an exam period can help accommodate for the cognitive overload and the slower processing time.

## Internships

### Focus points

- Problems with the comprehension of **math assignments** are common.
- Difficulties with **time management** can lead to difficulties making deadlines.

## Tips and tricks

- For assignments that require mental operations, **more time** or the use of **assistive tools** such as a calculator or formula list are appropriate provided this is not in contradiction with the learning goals.

## Student life

### Focus points

- **Additional problems** such as fatigue, stress, anxiety and low self-esteem are possible.

### Tips and tricks

- A **fixed contact person** in the study program can help monitor the load limit and help look for solutions in case of difficulties.
- Staff members of student facilities provide **coaching** in case of **psycho-social problems**.