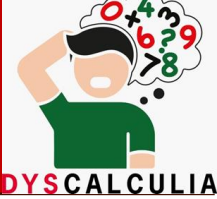


Dyscalculia

WP2: Plan de estudios y material del curso sobre discalculia

Prof. Dr. Marc Beutner
Helene Lindenthal





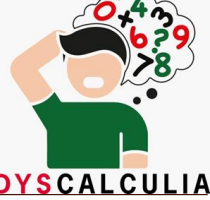
Dyscalculia

Módulo 1: Desarrollo de competencias clave

Prof. Dr. Marc Beutner
Helene Lindenthal



Módulo 1: Desarrollo de competencias clave

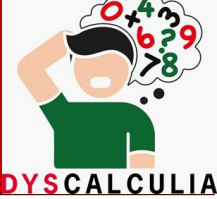


1. Introducción del módulo
2. Contenido del módulo
3. Enlace a texto adicional
4. Enlace a vídeos adicionales
5. Prueba
6. Resumen del módulo
7. Recursos

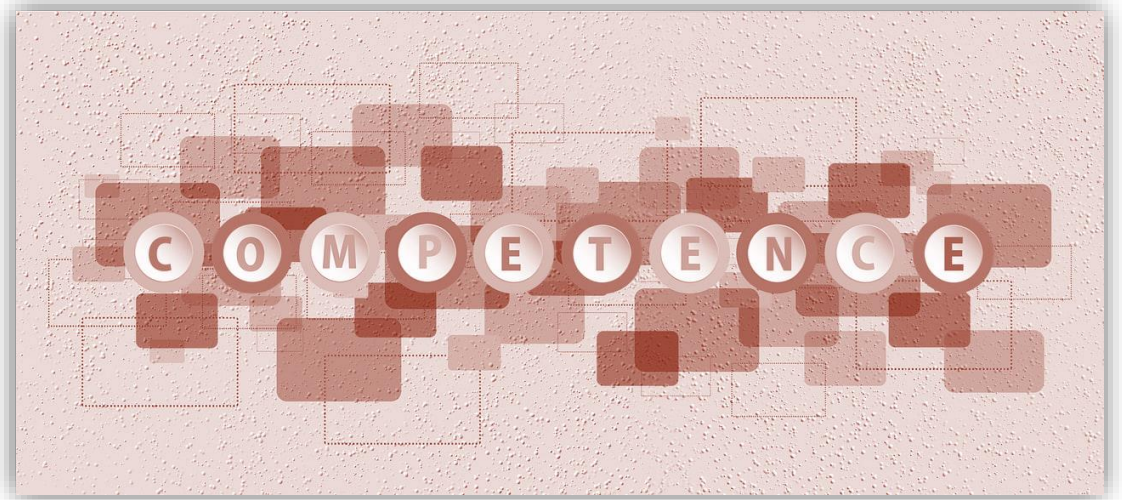


Módulo 1: Desarrollo de competencias clave

1. Introducción del Módulo



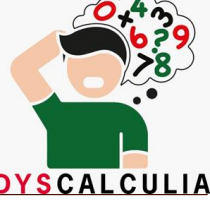
El "Módulo 1: Desarrollo de las competencias clave" trata de las competencias clave necesarias como profesor de alumnos discalcúlicos. Se ofrecerá una visión general de las competencias docentes y profesionales necesarias y de cómo mejorarlas. Se presentan las competencias metodológicas para utilizar diferentes enfoques y prácticas, ejemplos de actividades, métodos y técnicas de enseñanza para la educación de alumnos con diferentes niveles de aprendizaje. Por último, se describirá cómo los educadores pueden desarrollar su capacidad a largo plazo.



Source: https://cdn.pixabay.com/photo/2021/06/05/04/52/competence-6311491_1280.jpg

Módulo 1: Desarrollo de competencias clave

2. Contenido del módulo



Los profesores deben adaptar sus lecciones no sólo al contenido de aprendizaje sino, sobre todo, a las necesidades individuales de los alumnos.

Las necesidades de los alumnos son muy individuales y diferentes, ya que cada alumno aporta al aula diferentes conocimientos previos, requisitos de aprendizaje, motivación, forma diaria, etc.

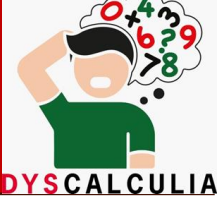
Los estudiantes también traen consigo trastornos del aprendizaje, como la discalculia.

Los profesores necesitan conocimientos, conciencia adecuada y habilidades esenciales para tratar eficazmente a los niños con discalculia en la escuela y brindarles una enseñanza de alta calidad.

Las competencias clave de un profesor para estudiantes discalculicos son cruciales para el éxito del aprendizaje en las lecciones de matemáticas.

Módulo 1: Desarrollo de competencias clave

2. Contenido del módulo

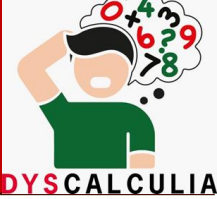


Las competencias clave de un profesor para estudiantes discalculicos son:

facilitación	responsabilidad	reflexión	soporte	comentarios
<ul style="list-style-type: none">• El profesor debe facilitar el proceso de aprendizaje• Los alumnos discalculicos necesitan apoyo en su proceso de aprendizaje.	<ul style="list-style-type: none">• El profesor debe saber cuándo transferir la responsabilidad del proceso de aprendizaje a los alumnos.• El profesor debe crear un espacio para que los alumnos asuman responsabilidades.• Los alumnos con dificultades de cálculo pueden fortalecerse si se les permite asumir responsabilidades por sí mismos.	<ul style="list-style-type: none">• El profesor y el alumno deben reflexionar periódicamente sobre los procesos de enseñanza y aprendizaje• La reflexión es importante para que los alumnos discapacitados tomen conciencia de sus progresos.	<ul style="list-style-type: none">• El profesor debe establecer un sistema de apoyo para el desarrollo de conocimientos, habilidades, actitudes y valores.• Los alumnos discapacitados deben tener la sensación de que el profesor les apoya.	<ul style="list-style-type: none">• El profesor debe establecer un sistema de retroalimentación en el que tanto el profesor como el alumno puedan recibirla de forma respetuosa y regular.• El feedback debe ser apropiado, específico y oportuno• Tanto el feedback positivo como el negativo pueden ayudar a los alumnos discalculicos en sus procesos de aprendizaje a adaptar su conducta de aprendizaje

Módulo 1: Desarrollo de competencias clave

2. Contenido del módulo

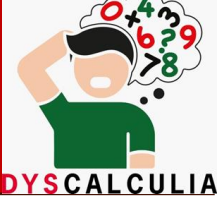


The **teaching skills** of a teacher for dyscalculic students are:

individualidad	recursos adicionales	experiencias para la mente	experiencias prácticas	Proyectos	social form
<ul style="list-style-type: none">• El profesor debe ser capaz de apoyar a los alumnos mediante experiencias de aprendizaje individuales• Los alumnos con dificultades de cálculo necesitan apoyo individual.	<ul style="list-style-type: none">• El profesor debe proporcionar recursos educativos abiertos (REA) adicionales para que los alumnos aprendan individualmente por su cuenta.• Los REA adicionales son útiles para los alumnos discalculicos porque pueden aprender por su cuenta fuera del aula, lo que podría ayudar a reducir la posible presión.	<ul style="list-style-type: none">• El profesor debe proporcionar experiencias que estimulen la mente• A los alumnos con dificultades de cálculo se les debe retar a que utilicen y amplíen su mente.	<ul style="list-style-type: none">• El profesor debe proporcionar experiencias prácticas• Para los alumnos discalculicos es útil aprender con casos prácticos, de modo que el contenido matemático pueda transferirse a la vida real	<ul style="list-style-type: none">• Teacher needs to offer project-based learning• Through different kinds of learning scenarios, dyscalculic learners can transfer their knowledge• Projects are closed cases, and these can help to transfer the theoretical knowledge	<ul style="list-style-type: none">• Teacher needs to offer different kinds of social form within the learning processes• Cooperative learning can help dyscalculic learners to engage and learn with and from others

Módulo 1: Desarrollo de competencias clave

2. Contenido del módulo



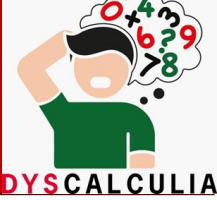
Teaching skills: different teaching approaches (1)

In most cases, the learners in a school class are heterogeneous in many respects. Different teaching approaches are required to meet the different needs. Here is a small selection of teaching approaches:

teaching approach	definition	advantage	disadvantage
Lecture-based teaching	Teacher conveys theoretical content to the whole class, learners only participate passively in the lesson	A lot of content can be conveyed in a short time	Learners are only passive and cannot learn actively
Interactive teaching	Teacher wants participation of learners throughout the lesson	Learners can actively think and contribute to the lesson	Learners don't have to be active
Problem-Based Learning (PBL)	Groupwork for solving real-life problems	Fosters collaboration, problem-solving skills, critical thinking	Learners can be overwhelmed with solving the problem on their own

Módulo 1: Desarrollo de competencias clave

2. Contenido del módulo

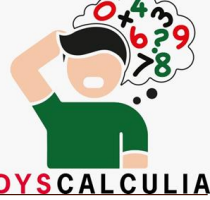


Teaching skills: different teaching approaches (2)

teaching approach	definition	advantage	disadvantage
Project-Based Learning	Group- or single work for solving problems within a project with what they have learned in class	Promotes action-orientation, collaboration, creativity	Learners can be overwhelmed with the creative task
Flipped Classroom	Gain of knowledge is happening outside of class so hands-on activities are happening in class	Learners can learn the theoretical part on their own and participate actively during the lesson	Learners can have difficulties with learning outside of class

Módulo 1: Desarrollo de competencias clave

2. Contenido del módulo



Teaching skills: practices for students with different levels of learning

The heterogeneous learning requirements of the learners in a class also require different practices.

Provide different tasks with different levels of difficulty

Use different learning material

Let students of different learning levels work together

Prepare extra tasks for fast learners

Provide different learning methods with changing social forms, group work

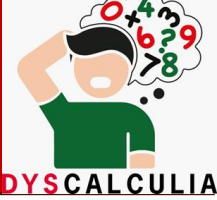
Address all sensory perceptions (listening, reading, writing, watching, etc.)

Learning counters, station learning (various stations, with different materials and

Individual learning assessments (depending on personal development)

Módulo 1: Desarrollo de competencias clave

2. Contenido del módulo



Teaching skills: Proficiency in planning and delivering effective lessons.

In order to deliver high-quality lessons to a diverse group of learners, teachers need proficiency in planning and delivering effective lessons.

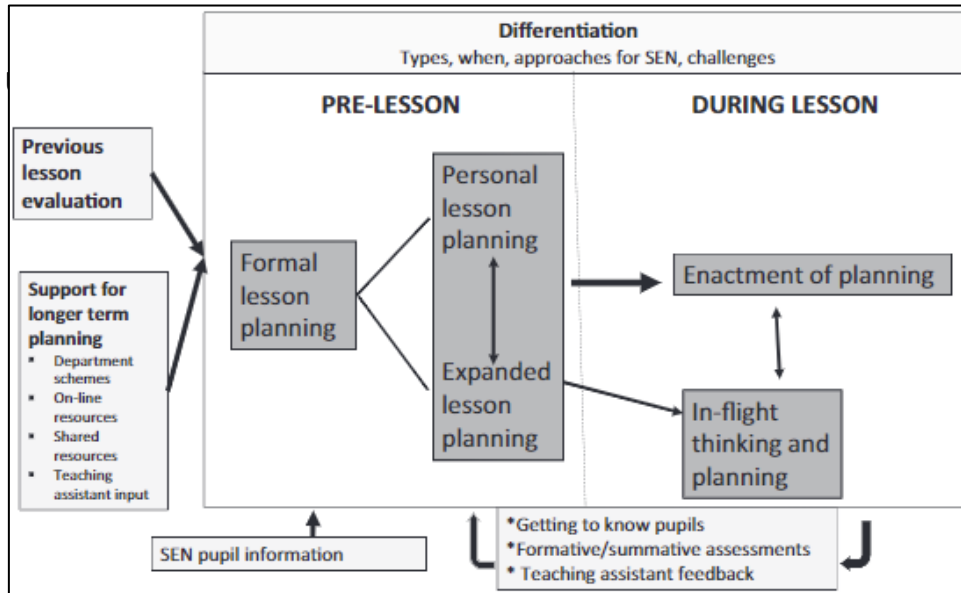


Fig. 1: Concept of lesson planning for inclusive lessons (Black, Lawson & Norwich, 2019, p. 123)

- for performance management and appraisal purposes
- not required for all lessons
- formal process
- evaluating purposes
- planning is written down

Formal planning

- individually
- lesson specific
- some elements of formal planning
- informal, interactive, ongoing process
- formative and practical purposes
- planning is written down, in-mind planning for the lesson

Personal planning

- formative and practical purposes
- planning is written down or takes place in the mind
- for unexpected situations, gives some kind of flexibility, adaptability

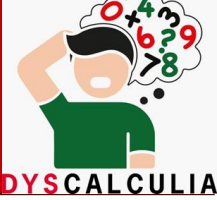
Extended planning

- planning takes place in the mind
- during the lesson in response to the unexpected

Planning on the fly

Module 1: Development of key competences

2. Content of the Module

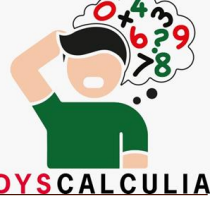


The **professional skills** of a teacher for dyscalculic students are:

knowledge	closeness	pedagogue	further education and training	network
<ul style="list-style-type: none">• In order to effectively teach dyscalculic learners, teachers need to know about dyscalculia and its effects on the learning processes, the learners, the family, friends and other learners in class	<ul style="list-style-type: none">• Teacher needs to know each learner in the class, so s/he can help them individually• Only when the teacher knows what each of the learner needs, s/he can help them effectively	<ul style="list-style-type: none">• Teacher should not look at dyscalculic learners as ill children• Teacher should treat them as children with a speciality	<ul style="list-style-type: none">• Teacher needs to actively take part in further education and training concerning teaching, learning and dyscalculia, because the knowledge about dyscalculia is not final, it is still being researched and new insights are being gained	<ul style="list-style-type: none">• Teacher needs to build a network with other teachers, so they can advise each other on the learning processes of the dyscalculic learners• Teacher should also stay in contact with the family of the dyscalculic learners

Module 1: Development of key competences

2. Content of the Module



Awareness of the importance of **continuous professional development** for educators is crucial. The professionalisation of teachers plays a central role in supporting learners with dyscalculia. Here are some essential professional skills that teachers should develop in this context:

Teachers should have the ability to continuously learn and improve their teaching skills. Recognising the ever-changing educational landscape and a willingness to learn new methods and approaches are crucial. Especially when it comes to research into learning disabilities such as dyscalculia, teachers must constantly expand their knowledge and adapt their teaching accordingly.

Professional development skills

Pedagogical competence

The ability to develop and implement teaching strategies that meet educational objectives and cater for the needs of different learners is essential. When dealing with learners with dyscalculia, it is particularly important to know and apply alternative teaching methods in order to take individual learning needs into account.

Teachers should be able to collaborate effectively with colleagues, parents and other stakeholders to improve the educational experience for learners. Collaboration enables a holistic approach to support learners with dyscalculia as different perspectives and expertise can be brought together.

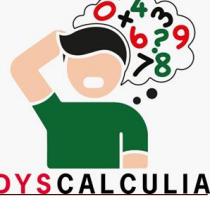
Collaboration skills

Communication skills

The ability to effectively convey information and interact with learners, other teachers and families is essential. Communicating clearly and comprehensibly fosters a supportive learning environment and facilitates collaboration among all stakeholders.

Module 1: Development of key competences

2. Content of the Module



The **methodological competences** of a teacher for dyscalculic students are:

Developing and maintaining these methodological skills enables teachers to organise lessons to meet the needs of learners with dyscalculia. Adaptability and a constant willingness to evolve are key elements in creating an effective and supportive learning environment that meets the diverse needs of learners.

methodological competence

- Teachers should have the ability to choose and apply appropriate teaching methods and techniques for different levels of learning
- For students with dyscalculia, it is particularly important to master a variety of methodological approaches to meet individual learning needs

adaptability

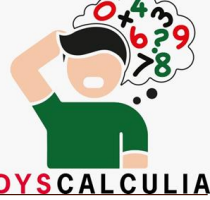
- The ability to adapt teaching methods to meet the needs of students with different learning levels is crucial
- This requires flexibility and a willingness to organise lessons dynamically to meet the different needs of learners with dyscalculia

continuous development of methodological competences

- In order to successfully use different approaches and practices, examples of activities, teaching methods and techniques in education for students with different levels of learning, the continuous development of methodological competencies is essential
- Teachers should put effort into the improvement of their skills through further training and the exchange of good practice

Module 1: Development of key competences

3. Link to additional text



"Meeting the Needs of Students with Dyslexia and Dyscalculia"

Authors: B. Witzel & M. Mize (Withrop University)

Published in: SRATE Journal 27(1)

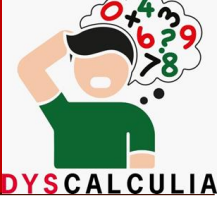
Year: 2018

Link: <https://files.eric.ed.gov/fulltext/EJ1166703.pdf>



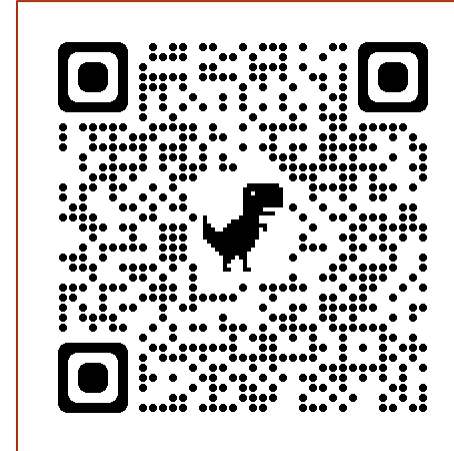
Module 1: Development of key competences

4. Link to additional videos



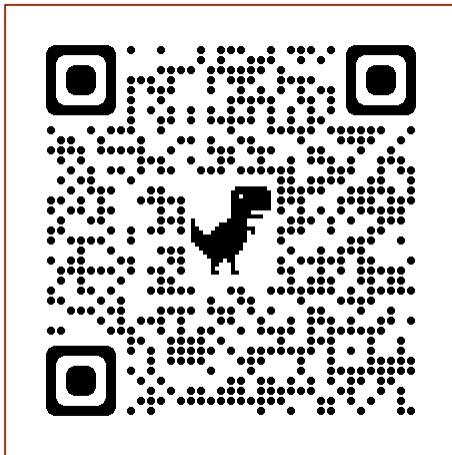
Link Video English: “Dyscalculia: Teaching Strategies & Modifications”

<https://www.youtube.com/watch?v=BWaam8s9wSs>



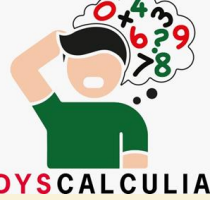
Link Video German: “Rechenschwäche - Was tun bei Dyskalkulie? | Schule im Gespräch #190”

https://www.youtube.com/watch?v=N_ur5UD2iv4



Module 1: Development of key competences

5. Quiz



1. Multiple Choice Question: What are the key competences for teachers of dyscalculic learners?

1. Reflection
2. Facilitation
3. Inability to communicate
4. Responsibility
5. Intolerance
6. Support

3. Why is it particularly important for teachers who teach learners with dyscalculia to go through continuous professional development?

1. To learn alternative teaching methods for individual learning needs.
2. To better meet the difficulties of pupils.
3. To take into account current research findings in the field of dyscalculia.
4. All of the above.

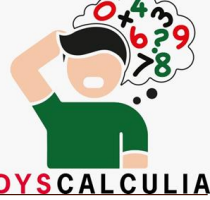
2. Single Choice Question: Which teaching approach promotes action-orientation, collaboration and creativity?

1. Lecture-based teaching
2. Interactive teaching
3. Problem-Based Learning (PBL) Project-Based Learning
4. Flipped Classroom
5. Project-based learning (PBL)
6. Lecture-based teaching

Why is it important for teachers of learners with dyscalculia to plan lessons but still maintain a degree of adaptability?

1. Because the lesson plan provides a clear structure and teachers can set their objectives in advance.
2. Because flexible customisation of lessons allows individual needs and progress of learners to be addressed.
3. Because learners with dyscalculia benefit from clear and predictable structures.
4. Because a predetermined plan enables teachers to teach more efficiently.

Ressources



- Black, A., Lawson, H. & Norwich, B. (2019). Lesson planning for diversity. *Journal of Research in Special Educational Needs* 19(2), p. 115-125.
- Sankar, S. (2022). Primary Teachers' Competencies For Dealing Students With Dyscalculia. *Journal of Pharmaceutical Negative Results* 13(7), p. 8247-8270.
- Ufer, S., Heinze, A. & Lipowsky, F. (2023). Unterrichtsqualität und Instruktionsstrategien [Teaching quality and instructional strategies]. In R. Bruder, A. Büchter, H. Gasteiger, B. Schmidt-Thieme & H.-G. Weigand (Ed.) *Handbuch der Mathematikdidaktik* (2. ed.), S. 465-492. Berlin: Springer Spektrum.
- Williams, A. (2012). A teacher's perspective of dyscalculia: Who counts? An interdisciplinary overview. *Australian Journal of Learning Difficulties*, 18(1), p. 1-16.



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