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MMTS104 Addressing Maths Learning Difficulties

ECTS Value: 3 ECTS
Contact Hours: 15
Self-Study Hours: 28
Assessment Hours: 32

Overall Objectives and Outcomes

This module will explore the complexity and heterogeneity of Maths Learning Difficulties, the ongoing search for underlying cognitive causes, means by which they can be identified and intervention strategies that link the field of research with practices at classroom level.

By the end of this module, the learner will be able to:

Competences:

a. identify cognitive impairments by recognition of their manifestations at different stages of an individual's life
b. analyse a mathematical profile and extract from it the student's areas of strengths and weaknesses and the particular phenotype associated with it.
c. develop and evaluate intervention strategies correlated to a specific phenotype of MLD
d. devisemultisensory lesson plans that take into consideration the student's impairments, emotional and motivational aspects and issues of comorbidity with other learning difficulties.

Knowledge:

a. Outline various cognitive theories of MLD, their development and their convergence into the Multi-Deficit Theory
b. recognise comorbidity of MLD with other learning difficulties
c. Associate how these theories and comorbid issues impact on the identification and intervention strategies to be used.ai
d. Develop knowledge for flexibility in lesson preparation and presentation to target specific cognitive deficits and cater for the individual learning difficulties of students.

Skills:

a. Evaluate the importance of addressing MLD at an early age and how this effects positively the individual's future development at the emotional, social and economic levels.
b. recognise and differentiate between domain specific and domain general impairments that impinge on the acquisition of Maths skills.
c. identify cognitive impairments by recognition of their manifestations at different stages of an individual's life
d. Apply different teaching strategies and methods when presenting the same topic to meet the requirements of students with different mathematical profiles.

Assessment Methods

This module will be assessed through: Assignment, Presentation and Resources

Suggested Readings

Core Reading List:

1. Träff, U., Olsson, L., Östergren, R., & Skagerlund, K. (2017). Heterogeneity of Developmental Dyscalculia: Cases with Different Deficit Profiles. *Frontiers In Psychology*, *7*. doi: 10.3389/fpsyg.2016.02000
2. Geary, D. (2011). Consequences, Characteristics, and Causes of Mathematical Learning Disabilities and Persistent Low Achievement in Mathematics. *Journal of Developmental & Behavioral Pediatrics*, *32*(3), 250-263. doi: 10.1097/dbp.0b013e318209edef
3. Chinn, S. (2012). *More trouble with maths*. London: Routledge.
4. Vukovic, R. K. (2012). Mathematics Difficulty with and without Reading Difficulty: Findings and Implications from a Four-Year Longitudinal Study. Exceptional Children, 78(3), 280–300. https://doi.org/10.1177/001440291207800302
5. Farrell, R. (2018). The MathPro Battery: A tool for assessment of mathematical skills and identification of Mathematics learning difficulties. A Pilot Project
6. Emerson, Jane, and Patricia Babtie. Dyscalculia Assessment. Bloomsbury Publishing, 2014.
7. Price, G. R., & Ansari, D. (2013). Dyscalculia: Characteristics, Causes and Treatments. *Numeracy,* 6(1/2), 1-13. https://scholarcommons.usf.edu/numeracy/vol6/iss1/art2/
8. Karagiannakis, G., Baccaglini-Frank, A., & Roussos, P. (2017). Detecting Strengths and Weaknesses in learning Mathematics through a model classifying mathematical skills. *Australian Journal of Learning Difficulties, 21(2),* 115-141. Doi:10.1080/19404158.2017.1289963
9. Mou, Y., Berteletti, I., & Hyde, D. (2018). What counts in preschool number knowledge? A Bayes factor analytic approach toward theoretical model development. *Journal of Experimental Child Psychology*, *166*, 116-133. doi: 10.1016/j.jecp.2017.07.016
10. Wilson, A., Andrewes, S., Struthers, H., Rowe, V., Bogdanovic, R., & Waldie, K. (2015). Dyscalculia and dyslexia in adults: Cognitive bases of comorbidity. *Learning and Individual Differences*, *37*, 118-132. doi: 10.1016/j.lindif.2014.11.017

Supplementary Reading List:

1. Butterworth, B. (2010). Foundational numerical capacities and the origins of dyscalculia. *Trends in Cognitive Sciences, 14(12),* 534-541.
2. Kaufmann L, von Aster M. (2010) The diagnosis and management of dyscalculia. Dtsch Arztebl Int. 2012;109(45):767–778. doi:10.3238/arztebl.2012.0767
3. Landerl, Karin et al. (2009). Dyslexia and Dyscalculia: Two Learning Disorders With Different Cognitive Profiles". *Journal of Experimental Child Psychology*, vol 103, no. 3, 2009, pp. 309-324. *Elsevier BV*, doi:10.1016/j.jecp.2009.03.006.

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