

NE - Award in Educational Neuroscience

MQF Level: 6

ECTS Value: 10 ECTS

Programme Description

Through this programme, participants will be given the opportunity to develop their understanding of ways in which cognitive neuroscience can inform their decisions to further improve the educational and learning experience. The programme will introduce participants to concepts of genetics and brain science. Participants will explore various processes in the brain including executive functioning, attention, working memory, and the retrieval and transfer of knowledge. In doing so, they will analyse and interpret several studies related to cognition and learning to infer changes to better support learners. Following this, participants will observe cognitive and language development from the early stages of life up to adolescence and adulthood including typical and atypical development. In turn, this will lead to further research on the application of neuroscience to classroom practice and how various studies have shown how to harness this development and direct it to improve learning.

Entry Requirements

Applicants interested in following this programme are to satisfy one of the minimum eligibility criteria:

1. An awarded MATSEC Certificate at MQF Level 4, or equivalent;
2. A full MQF Level 4 qualification preferably in the area of Education with a minimum of 120 ECTS, or equivalent;
3. An MQF Level 5 Certificate in Facilitating Inclusive Education with a minimum of 30 ECTS.

Overall Objectives

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

- a) Broaden their understanding on current research in educational neuroscience;
- b) Demonstrate a link between genetics and brain development;
- c) Understand ways in which knowledge of cognitive neuroscience can be used to inform decisions about education and learning Better support typical and atypical development and identify implications for the classroom from developmental cognition research.

Programme Structure and Mode of Delivery

This programme adopts a blended approach to teaching and learning. It is composed of the three modules:

- The Brain and Genetics: An Introduction to Educational Neuroscience (3 ECTS);
- Cognitive Neuroscience and Learning (4 ECTS);
- Developmental Neuroscience (3 ECTS).

For further details regarding delivery and assessment kindly refer to the individual module descriptors below and the IfE Portal.

Certification

Upon successful completion of this module, course participants will be conferred an accredited certification.

Further Learning Opportunities and Career Progression

Upon successful completion of this module, course participants may use certification conferred to apply for Recognition of Prior Learning for accredited programme. Teachers may also use this certification in their application for accelerated progression.

NE01 The Brain and Genetics: An Introduction to Educational Neuroscience

MQF Level: 6

ECTS Value: 3 ECTS

Module Description

The aim of this module is to introduce participants to concepts of genetics and brain science which forms a part of the fundamental knowledge in the field of educational neuroscience. Through this module, participants will develop the ability to critically engage with and discuss present issues in neuroscience and their application to educational settings, including the shortfall of this field in creating a direct bridge with educational practice.

Overall Objectives and Outcomes

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

Competences

- a) Extend current research on cognitive development to professional practice and scrutinise the link between science and classroom practice;
- b) Develop an introductory understanding of human central nervous system and genetics;
- c) Establish an independent appreciation of cognitive research and links to pedagogy;

Knowledge

- a) Outline the different functions of nervous system and brain regions;
- b) Determine the role molecular genetics plays in cognitive development;
- c) Identify different neuroimaging techniques;
- d) Determine the role of working memory and executive functioning.

Skills

- a) Evaluate the functions of the brain / CNS and their role in learning and development;
- b) Critically review how nature / nurture interplays with brain development;
- c) Use research in cognitive neuroscience to evaluate and make judgements about classroom practice;
- d) Expand the understanding of quantitative research and descriptive statistics to access and critically research literature on educational neuroscience.

Mode of Delivery

This module adopts a blended approach to teaching and learning. Information related to the structure and delivery of the module may be accessed through the IfE Portal. For further details, kindly refer to the Teaching, Learning and Assessment Policy and Procedures found on the Institute for Education's website.

Assessment Methods

This module will be assessed through: Research Assignment and Online Tasks/Reflections.

Suggested Readings

Core Reading List

1. Patten, K. E. & Campbell, S. R. (2011) *Educational Neuroscience : Initiatives and Emerging Issues*. John Wiley & Sons.
2. Mayer, R. E. (2016) *How can brain research inform academic learning and instruction?* Springer Science.
3. Pera, A. (2014) *The integration of cognitive neuroscience in educational practice*. Woodside.
4. Patten, K. E. & Campbell, S. R. (2011) *Educational Neuroscience : An Introduction*. John Wiley & Sons.
5. *Self-Control on Perceived Maternal and Paternal Socialization: Results from a Longitudinal Sample of Twins*. Springer Science
6. Mareschal, D., Butterworth, B., & Tolmie, A. (Eds.). (2013). *Educational Neuroscience*. John Wiley & Sons.
7. Howard-Jones, P. (2009). *Introducing neuroeducational research: Neuroscience, education and the brain from contexts to practice*. Routledge.
8. Beaver, M. V. (2010) *The Effects of Genetics, the Environment, and Low*

Supplementary Reading List

1. Moberg, T., Lichtinsein, P., Forsman, M. & Larrison, H. (2011) *Internalizing Behavior in Adolescent Girls Affects Parental Emotional Overinvolvement: A Cross-lagged Twin Study*. Springer Science
2. Ferrari, M. (2011) *What can Neuroscience bring to Education?* John Wiley & Sons.

NE02 Cognitive Neuroscience and Learning

MQF Level: 6

ECTS Value: 4 ECTS

Module Description

This module provides learners with the opportunity to analyse and interpret various studies relating to cognition and learning and infer changes to classroom practice to further improve learning. In this module, learners will explore various processes in the brain and apply current research to education. Topics covered will include: executive functioning, attention, working memory, early and adolescent brain, retrieval and transfer of knowledge.

Overall Objectives and Outcomes

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

Competences

- a) Link the role of executive functioning to attention and its effect on academic achievement;
- b) Develop an understanding of the importance of sleep on learning;
- c) Demonstrate an understanding on sensitive periods in brain development;
- d) Devise a link between retrieval and transfer of knowledge and how this can be tackled in the classroom.

Knowledge

- a) Broaden their understanding of visual perception and attention;
- b) Expand their knowledge on different kinds of development and sensitive periods (emotional, social);
- c) Identify techniques that promote transfer of learning.

Skills

- a) Apply cognitive research to the classroom to support learning;
- b) Evaluate how working memory, executive functioning and visual perception relate to effective learning;
- c) Associate research-based evidence on how content retrieval and application of knowledge can be improved.

Mode of Delivery

This module adopts a blended approach to teaching and learning. Information related to the structure and delivery of the module may be accessed through the IfE Portal. For further details, kindly refer to the Teaching, Learning and Assessment Policy and Procedures found on the Institute for Education's website.

Assessment Methods

This module will be assessed through: Presentation, Online and Practical Tasks/Reflections.

Suggested Readings

Core Reading List

1. Beruenger, C., Miranda, A., Colomer, C., Baixauli, I. & Rosello B. (2017) *Contribution of Theory of Mind, Executive Functioning, and Pragmatics to Socialization Behaviors of Children with High Functioning Autism*. Springer Science.
2. Karmiloff Smith, A. (2010) *Neuroimaging of the Developing Brain: Taking developing seriously*. Wiley-Liss, Inc.
3. Kelly, A. E. (2011) *Can Cognitive Neuroscience Ground a Science for Learning?* John Wiley & Sons.
4. Kirk, H., Gray, K., Ellis, K., Taffe, J. & Cornish, K. (2017) *Impact of Attention Training on Academic Achievement, Executive Functioning, and Behavior: A Randomized Controlled Trial*. Washington.
5. Thomas, M. & Victoria, K. (2009) *Sensitive periods in brain development – implications for education policy*. European Psychiatric Review

Supplementary Reading List

1. Diamond, A. (2010) *The Evidence Base for Improving School Outcomes by Addressing the Whole Child and by Addressing Skills and Attitudes, Not Just Content*. Taylor & Francis.
2. Dundar, S., Ayvaz, U. (2016) *From Cognitive to Educational Neuroscience*. Canadian Centre of Science and Education.
3. Whitted, K. (2011) *Understanding how social and emotion skills deficit contribute to school failure*. Taylor & Francis.

NE03 Developmental Neuroscience

MQF Level: 6

ECTS Value: 3 ECTS

Module Description

Through this module, participants will be given the opportunity to observe cognitive and language development from the early stages of life up to adolescence and adulthood including typical and atypical development. In turn, this will lead to further research on the application of neuroscience to classroom practice and how various studies have shown how to harness this development and direct it to improve learning.

Overall Objectives and Outcomes

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

Competences

- a) Support learners with developmental disorders and create adequate learning experiences;
- b) Develop knowledge on the different areas involved in brain development and how each can inform research-based education;
- c) Formulate interventions based on language development.

Knowledge

- a) Describe the different rates of brain plasticity during the early years of an individual and in adolescence;
- b) Determine brain differences in atypical development and subsequent impact to the classroom;
- c) Identify key stages in language development.

Skills

- a) Link knowledge of the biological processes involved in early development and other critical stages to the educational process;
- b) Critically Analyse several developmental disorders and how these interplay with academic achievements;
- c) Critically evaluate the development of the social side of the brain.

Mode of Delivery

This module adopts a blended approach to teaching and learning. Information related to the structure and delivery of the module may be accessed through the IfE Portal. For further details, kindly refer to the Teaching, Learning and Assessment Policy and Procedures found on the Institute for Education's website.

Assessment Methods

This module will be assessed through: Reflective Journal and Online Tasks/Reflections.

Suggested Readings

Core Reading List

1. Taylor, S. J., Barker, L. A., Heavey, S. & McHale, S. (2012) *The Typical Developmental Trajectory of Social and Executive Functions in Late Adolescence and Early Adulthood*. Developmental Psychology.
2. Kuhl, P. K. (2007) *Is speech learning 'gated' by the social brain?* Blackwell Publishing.
3. Pfeifer, H. J. & Blakemore, S. J. (2012) *Adolescent social cognitive and affective neuroscience: past, present, and future*. Oxford University Press.
4. Blakemore, S. J. (2008) *The social brain in Adolescence*. Nature Reviews Publishing Group.
5. Crone, E. A. (2009) *Executive Functions in Adolescence: inferences from brain and behavior*. Blackwell Publishing.

Supplementary Reading List

1. Viding, E., Larrson, H. & Jones, A. P. (2008) *Quantitative Genetic Studies of antisocial behaviour*. Royal Society
2. Kirk, H., Gray, K., Ellis, K., Taffe, J. & Cornish, K. (2017) *Impact of Attention training on Academic Achievement, Executive Functioning and Behaviour: A Randomized Controlled Trial*. American Journal on intellectual and developmental disabilities.
3. Casey, B. J., Jones, R. M., Todd, A. H. (2008) *The Adolescent Brain*. Annals of the New York Academy of Sciences.