

ITL-820: Cognitive Development

Credit Hours:

3+0

Prerequisites:

None

Course Objectives:

How do humans think, learn, and communicate across the lifespan? What makes young children such remarkable learners, and how does cognition continue to evolve through adolescence and adulthood? This course explores the processes of cognitive development from infancy to adulthood through theoretical, empirical, and applied perspectives. Students will examine major theories (Piaget, Vygotsky, Information Processing, Core Knowledge, Dynamic Systems) and engage with cutting-edge research on perception, language, memory, reasoning, executive function, and social cognition.

The course emphasizes scientific methods used to study cognition, contemporary debates (e.g., nature vs. nurture, universal vs. culture-specific development), and the impact of cultural and technological contexts on cognitive growth. Applications for educational practice, policy, and technology-driven learning environments will be a key focus. By the end of the course, the students will be able to:

1. Explain major theories and models of cognitive development across the lifespan.
2. Critically evaluate empirical research and scientific methods in cognitive development.
3. Identify developmental changes in memory, language, reasoning, and executive function.
4. Analyze biological, cultural, social, and technological influences on cognition.
5. Apply cognitive development principles to educational design, policy, and technology-based learning solutions.

Course Contents:

- Introduction to Cognitive Development
 - Defining cognition and development
 - Big questions: How do humans think, learn, and communicate?
 - Historical overview and importance for education and technology
- Theoretical Foundations
 - Piaget's stages of development and criticisms
 - Vygotsky's socio-cultural theory and scaffolding
 - Information Processing and Core Knowledge perspectives
- Research Methods in Cognitive Development

- Experimental, observational, and longitudinal methods
- Neuroscientific techniques and digital tools in research
- Ethical issues in developmental studies
- Infancy and Early Cognitive Abilities
 - Perception and object permanence
 - Core knowledge systems and early reasoning
 - Why infants are powerful learners
- Language Development and Communication
 - Theories of language acquisition (nativist, interactionist)
 - Bilingualism and multilingual learning
 - Language and cognitive technology tools
- Social Cognition and Theory of Mind
 - Understanding intentions and beliefs
 - Early social learning and imitation
 - Implications for collaborative digital learning environments
- Memory, Attention, and Executive Function
 - Development of working memory and self-regulation
 - Links to academic achievement and digital learning platforms
 - Interventions to improve executive function
- Middle Childhood and Cognitive Advances
 - Logical reasoning, metacognition, and problem-solving
 - Role of schooling and educational technology
 - Assessment of cognitive growth in digital classrooms
- Adolescence and Higher-Order Thinking
 - Formal operational thought and abstract reasoning
 - Risk-taking, identity, and decision-making in a tech-saturated world
- Emotion, Motivation, and Cognition
 - How emotions influence learning and attention
 - Motivation in digital and gamified learning environments
- Neuroscience and Cognitive Development
 - Brain development and plasticity
 - Developmental disorders (ADHD, dyslexia, autism)
 - Brain-based learning technologies
- Socio-Cultural and Contextual Influences

- Cross-cultural perspectives on cognition
- Impact of digital divide on cognitive development
- Contemporary Debates and Digital Age Issues
 - Nature vs. nurture, universal vs. culture-specific pathways
 - Screen time, AI, and cognitive development
 - Cognitive implications of virtual reality and adaptive learning
- Future Directions in Cognitive Development Research
 - Emerging trends in neuroscience, AI, and educational technology
 - Designing technology-enhanced interventions based on cognitive principles

Course Learning Outcomes:

At the end of the course, the students will be able to:

1. Demonstrate a deep understanding of cognitive developmental processes from infancy through adolescence.
2. Critically interpret and synthesize primary research studies.
3. Apply developmental theory to design technology-enhanced learning interventions.
4. Debate key issues such as digital media impact on cognitive growth and cultural variability in development.
5. Integrate neuroscience and AI trends into cognitive development perspectives.

Reference Materials/ Books:

1. Siegler, R. S., DeLoache, J., & Eisenberg, N. (2017). How Children Develop.
2. Gopnik, A., Meltzoff, A., & Kuhl, P. (1999). The Scientist in the Crib.
3. Tomasello, M. (2019). Becoming Human: A Theory of Ontogeny.
4. Bjorklund, D. F., & Causey, K. B. (2017). Children's Thinking: Cognitive Development and Individual Differences.
5. Selected peer-reviewed articles on digital learning, neuroscience, and educational technology.