Y10 HT3 Development Knowledge Organiser

Early Brain Development

Brain stem – highly developed at birth, connects brain to spinal cord, autonomic functions

Cerebellum – matures late, near top of spinal cord, co-ordinates sensory and motor

Thalamus – deep inside the brain in each hemisphere, info hub receives info and then sends signals around the brain

Cortex – very thin and folded cover, thinking and processing, frontal, visual, auditory, motor areas in each hemisphere

The roles of nature and nurture

Nature is inherited
Nurture is environmental influences

Smoking during pregnancy can lead to smaller brain

Infection – German measles in the womb can lead to hearing loss

Voices – babies learn to recognise mother's voice

Interaction between nature and nurture – brain forms due to nature but the environment has a major influence, even in the womb

Piaget's Theory *(logical thinking occurs in stages)*

Theory – changes in thinking over time. Children think differently from adults
Logical thinking develops in stages.
Schemas – mental structures containing knowledge, schemas become more complex through assimilation and accommodation
Assimilation – adding new info to an existing schema
Accommodation – receiving new info which changes our understanding so a new schema is formed

Evaluation:
Research evidence - many studies have been conducted to test Piaget's theory, which has helped improve our understanding of how children's thinking develops

Real-world application – theory has helped change classroom teaching so it is now more activity based

Stretch evaluation:
The sample – Middle-class Swiss children were used so the theory may not be universal

Conservation

Although appearance changes, quantity stays the same.
Piaget showed that younger children cannot conserve using the naughty teddy study

McGarrigle and Donaldson (Key Study)
Aim – the 'naughty teddy' study aimed to see if a deliberate change in the row of counters would help younger children conserve
Method – children age 4-6year, two rows of counters, teddy messed up one row, then asked if the rows were the same
Results – deliberate change – 41% conserved, accidental change – 68% conserved. Older children did better than younger ones
Conclusion – Piaget's method doesn't show what children can do, this study does show there are still age-related changes

Evaluation:
The sample – primary school sample from one school so comparison between groups may not be valid

The change was not noticed – children may appear to conserve because they simply didn't notice the change as they were distracted by the teddy

Stretch evaluation:
Challenges Piaget – study shows that Piaget confused young children with his style of questioning

Egocentrism

Seeing the world from one's own point of view
Three mountains task tested this and showed egocentrism up until the age of 7

Hughes' Study (Key Study)
Aim: policeman doll study aimed to create a test that would make more sense than Piaget's
Method – 3 ½ yr olds – 5yr olds were asked to hide a boy doll from two policemen
Results - 90% could hide the boy doll away from the two policemen
Conclusion – children age 4years are mostly not egocentric. Piaget underestimated abilities but was right that thinking changes with age

Evaluation
More realistic – task made better sense to the children and they were given practice so they understood, more realistic test of abilities

Effects of expectations – unconscious cues from the researcher may have influenced the children's behaviour

Stretch evaluation:
Challenges Piaget – shows Piaget's task confused the children

Stages of cognitive development

Sensorimotor 0-2yrs – learn to coordinate sensory and motor info, object permanence develops

Pre-operational 2-7yrs – can't think in a consistently logical way, egocentric and lack conservation

Concrete operational 7-11yrs – at age 7 most children can conserve and show less egocentrism, logical thinking applied to physical objects only

Formal operational – 11+yrs children can draw conclusions about abstract concepts and form arguments

Application in education

Readiness – only teach something when child is biologically ready

Learning by discovery and the teacher's role – children must play active role, not rote learn, teachers should challenge schemas

Individual learning – children go through same stages in same order but at different rates

Application to stages
Sensorimotor – stimulating sensory environment
Pre-operational – discovery learning rather than written work
Concrete operational – physical materials to manipulate
Formal operational stage – scientific experiments to develop logical thinking

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Key terms

Key Term	Definition
Autonomic functions	Automatic, refers to functions in the body which we do not consciously control e.g. heartbeat, digestion and fear
Brain stem	Develops early because it controls vital autonomic functions, passes info from the brain to and from the body
Cerebellum	The 'little brain' at the base of the brain above the spinal cord the coordinates movement with sensory input (sensorimotor) and also has a role in cognition
Cognition	Refers to thinking and mental processes
Cortex	It is the outer covering of the brain where mental processing takes place
Nature	Refers to genetic influences
Nurture	Refers to other influences, how you were raised, your experiences and the environment
Thalamus	Key hub of info in the brain, relaying sensory and motor signals to the cortex
Womb	Part of the woman's body where the baby develops
Accommodation	Learning that takes place when we acquire new info that changes our understanding of a topic to the extent that we need to form one or more new schemas
Assimilation	Learning that takes place when we acquire new info which does not radically change our understanding of the topic
Schema	Mental framework of beliefs and expectations that influence cognitive processing, we are born with some schemas but the develop in complexity with experience of the world
Conservation	The ability to realise that quantity remains the same even when the appearance changes
Egocentricity (egocentrism)	The child's tendency to only be able to see the world from their own point of view
Concrete operational stage	7-11years, beginning to use adult logic but only when working with physical objects, logical thinking
Formal operational	11+, Child now fully able to think logically and with abstract ideas,
Pre-operational stage	2-7years, Child's thinking lacks internal consistency, they are not using adult logic, lack of conservation and egocentrism
Sensorimotor	0-2 years, Child focused on learning coordination, object permanence
Fixed mindset	Achievements are due to innate abilities
Growth mindset	Basic abilities can be developed through effort, regard failure as a challenge
Praise	To express approval of someone else and or what they have done
Self-efficacy	A person's understanding of their own capabilities, high self-efficacy influences motivation
Learning style	A person's relatively consistent method of processing and remembering info
Verbaliser	A person who prefers to process info through words and sounds
Visualiser	A person who prefers to process info in terms of pictures or diagrams

Effects of learning on development

Dweck's mindset theory

The set of assumptions we have (mindset) affects success
Success is due to effort not talent

Fixed mindset – effort won't help because talent is fixed in the genes, focused on performance

Growth mindset – can improve with effort, enjoy challenge, focused on learning goals

Dealing with failure –
Fixed mindset – give up
As failure indicates lack of talent
Growth mindset – opportunity to learn more and put in more effort
A Continuum – not simply one or the other, depends on the situation

Evaluation:
Research support – Dweck found that children taught growth mindset had better grades and motivation
Both mindsets involve praise – praising effort still leads to doing things for approval so can discourage independent behaviour
Real-world application – in business, sport, relationships, seeing failure as a lack of effort rather than talent motivates future effort

The role of praise and self-efficacy

Positive effect of praise – it's a reward, makes people feel good so the behaviour is repeated

Praise effort rather than performance – praising effort enables control, praising performance is demotivating

Self-efficacy – understanding your own abilities, increases of decreases future success

Effect of self-efficacy on motivation – greater effort, persist longer, greater task performance and more resilience if high self-efficacy

Learning styles

How people differ in the way that they learn. Matching teaching to learning should improve learning

Verbaliser – focus on words, processing by hearing info and talking about it

Visualiser – processing info by seeing spatial relationships using diagrams, mind maps, graphs

Kinaesthetic learners – learning by active exploration, making things, physical activities

Willingham's learning theory

Educational ideas should be evidenced based
Cognitive psychology and neuroscience can be used to improve learning

Praise – praising effort should be unexpected, praise before a task let to less motivation

Memory and forgetting – forgetting occurs due to a lack of cues, practise retrieving information from memory

Self-regulation – self-control (delay gratification marshmallow test) linked to high academic performance

Neuroscience – brain waves in dyslexics are different, this could benefit progress by receiving help earlier

Evaluation:
Evidence-based theory – based on scientific evidence giving the theory greater validity

Real-world application – positive impact on education as an alternative to learning styles

Application of neuroscience – dyslexia cannot be diagnosed by brain waves as it is not just linked to one thing