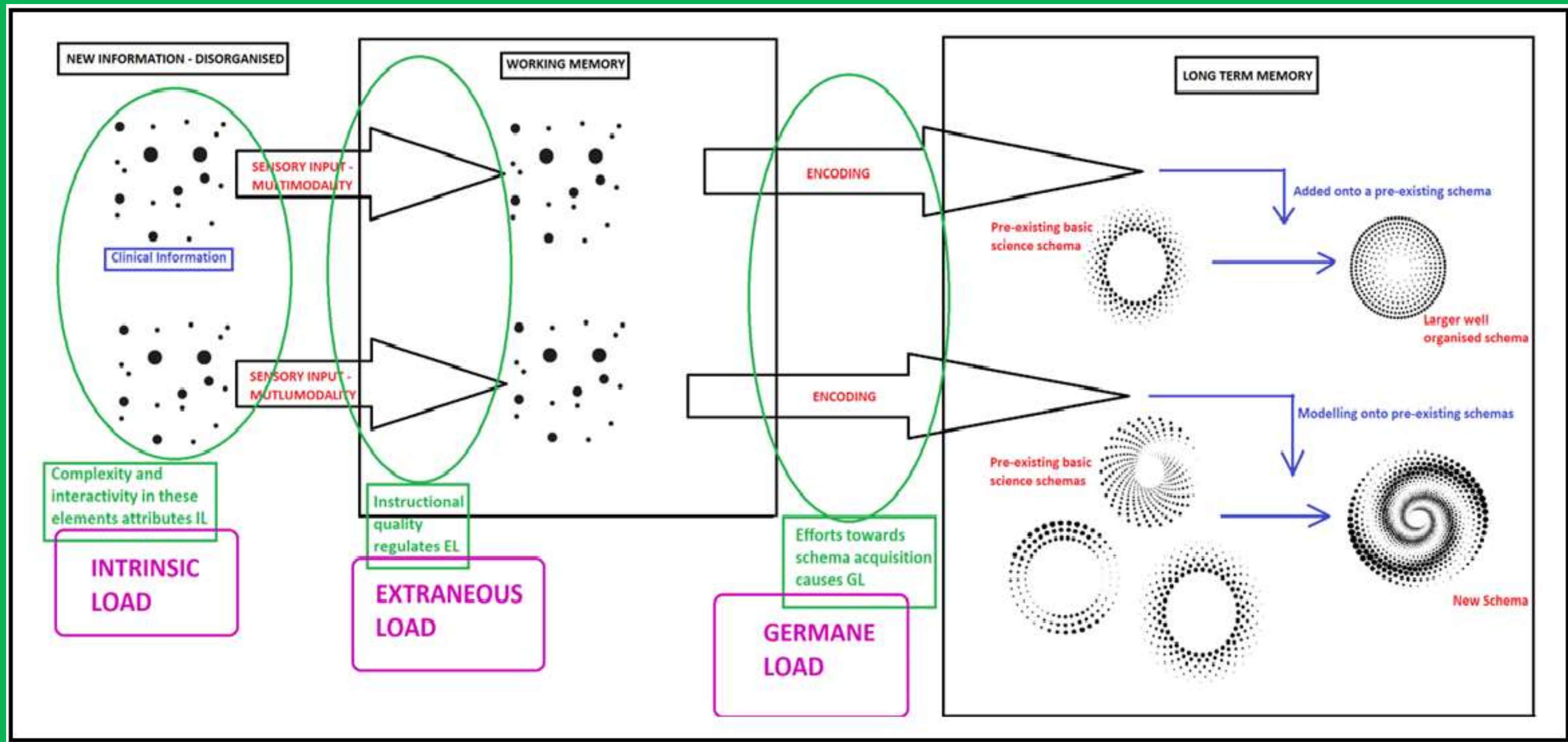


Optimising Cognitive Load in Classroom Teaching for Undergraduate Obstetrics and Gynaecology Curriculum

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Introduction

- John Sweller (1988) proposed the **Cognitive Load Theory (CLT)** based on Atkinson & Shiffrin (1968)



- Working Memory (WM)** is limited (Miller, 1956)
- Long term Memory (LTM)** is limitless - stores information - well organised structures called cognitive schemata (CS) (Van Merrienboer & Sweller, 2010)
- Intrinsic and extrinsic cognitive loads (ICL & ECL)** - additive effect - if they exceed WM - learning is impaired (Carlson, 2003)
- Germane cognitive load (GCL)** - facilitates learning by aiding the formation of CS in LTM (Van Merrienboer & Sweller, 2005)

Objective

- Primary** – Effect of integrating basic sciences on CL in clinical curriculum delivered by Case Based Discussions (CBDs)
- Secondary** – Differential CL perception in 3rd vs. 5th year students and those with a previous biomedical degree

Methodology

- Prospective Observational Study**
- Ontology:** Critical-realist | **Epistemology:** Subjective
- Philosophical Stance:** Post-positivist
- Ethical Clearance:** Newcastle School of Medical Education as a part of Practitioner Inquiry for PG Dip in MedEd – c0079449
- Consent:** Free consent to participate/ not participate/ withdraw
- Students:** 3rd and 5th year students - Obstetrics & Gynaecology hospital placement in 2021-2022
- Instrument for CL measurement** – Klepsch’s Instrument – Measures ICL, ECL, GCL on a scale of 1 (min) to 7(max)
- Perception** was specifically sought for **integration of basic sciences** to clinical curricular learning.
- Responses were analysed in different teaching sessions

Results

Overall Cognitive Load (CL)

CL	(N) Responses	M±SD
ICL	360	1.936±0.996
ECL	540	1.612±0.747
GCL	540	5.983±0.927
ECL vs. GCL (95%CI=4.2450 to 4.4970) p=0.0000		
ICL vs. GCL (95%CI=3.9061 to 4.1879) p=0.0000		
ICL vs. ECL (95%CI=-0.4649 to -0.1831) p=0.0000		

Anova

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CL in 3rd vs. 5th year Students

Type		Year 5		Year 3	P	95% CI
CL	(N) Resp	M±SD	(N) Resp	M±SD		
ICL	168	2.059±1.094	192	1.828±0.887	0.027	0.025 - 0.436
ECL	252	1.587±0.763	288	1.635±0.732	0.456	-0.174 – 0.078
GCL	252	6.015±0.934	288	5.954±0.921	0.445	-0.096 – 0.218

unpaired t-test

CL in students with Previous Bio-medical degree

Type		Previous Study		No Previous Study	P	95% CI
CL	(N) Resp	M±SD	(N) Resp	M±SD		
ICL	162	1.641±0.733	198	2.176±1.111	0.0001	-0.734 - -0.335
ECL	243	1.522±0.662	297	1.686±0.803	0.01	-0.290 - -0.037
GCL	243	6.283±0.689	297	5.737±1.020	0.0001	0.395 – 0.696

unpaired t-test

Discussion

- ‘Direct Initial Principle’** – inter-relating elements separated over time and distance - prevents **split-attention effect** (Ayres, 1990; Mayer, 2010)
- GCL - mental resources dedicated to acquiring CS (Sweller, 1998) which Ayres (2006) describes as essential to promote learning
- Integration of basic sciences reduces ICL and ECL and frees WM to allow optimum increase in GCL to allow formation of CS in LTM**