Physics Education Laboratory Lecture 24

Learning Disorder in Physics Learning

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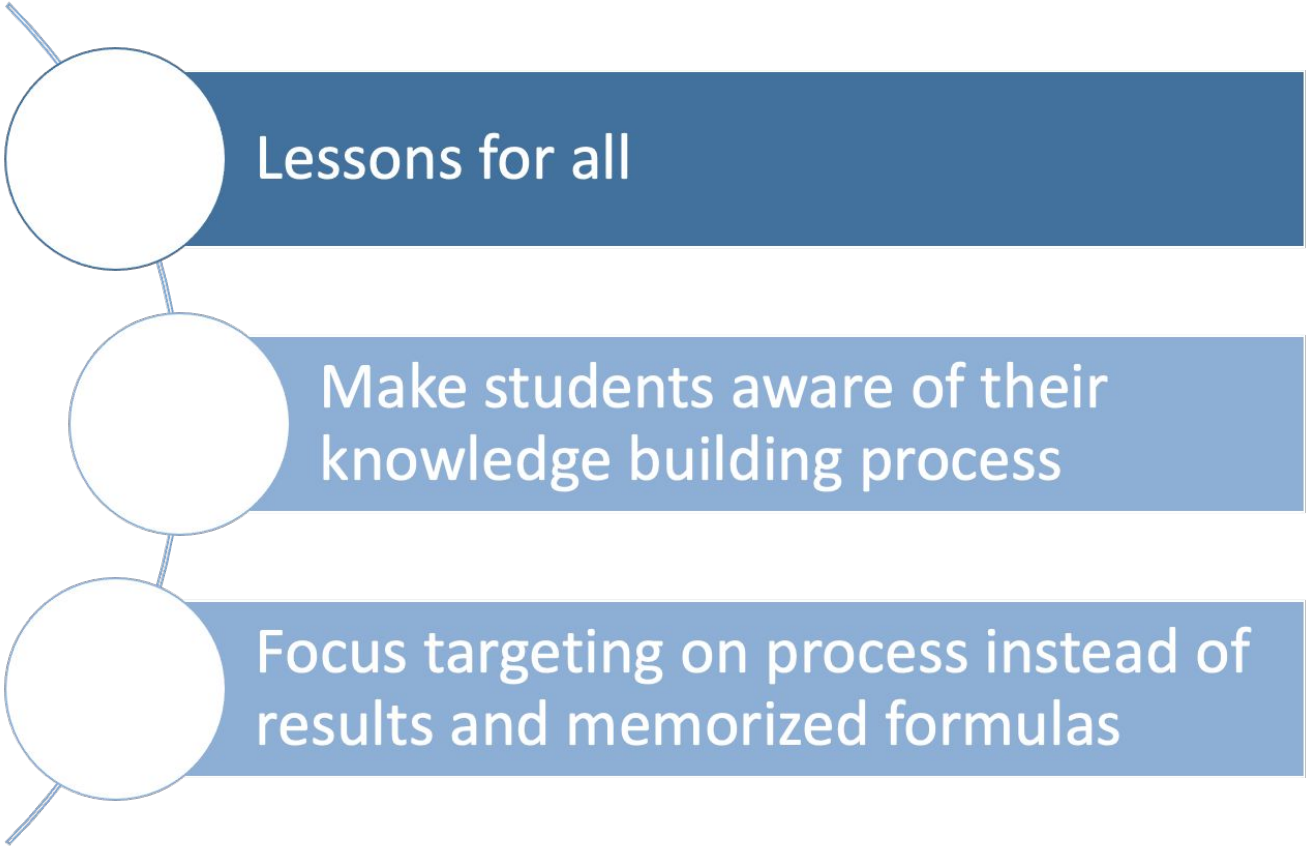
Checklist of key questions for inclusive practice - teaching and learning

Supporting STEM students with Dyslexia, 2013

- Do you provide clearly structured notes, covering the content in advance?
- Are these notes in sans-serif font with good line spacing and clear headings, avoiding small text and cramped layouts?
- Do the notes include clear definitions of all notation and terms used?
- Are these notes available in non-PDF format for screen-reader accessibility?
- Are all diagrams in notes, hand-outs, presentations, etc, clearly labelled and positioned so that there is a logical order with the related text?
- Are new technical words given visually, where possible, and a glossary provided?
- Is symbolic notation clearly written to avoid confusion with other characters?
- Are screenshots visible long enough to allow students to assimilate information?
- Do you avoid the need to copy complicated mathematics from the screen or board?
- Do data tables and spreadsheets have shaded or coloured columns to aid clarity?
- Are generic templates available to help structure written work, particularly for laboratory or field work?
- How have you assessed your competence standards in laboratory or field situations?

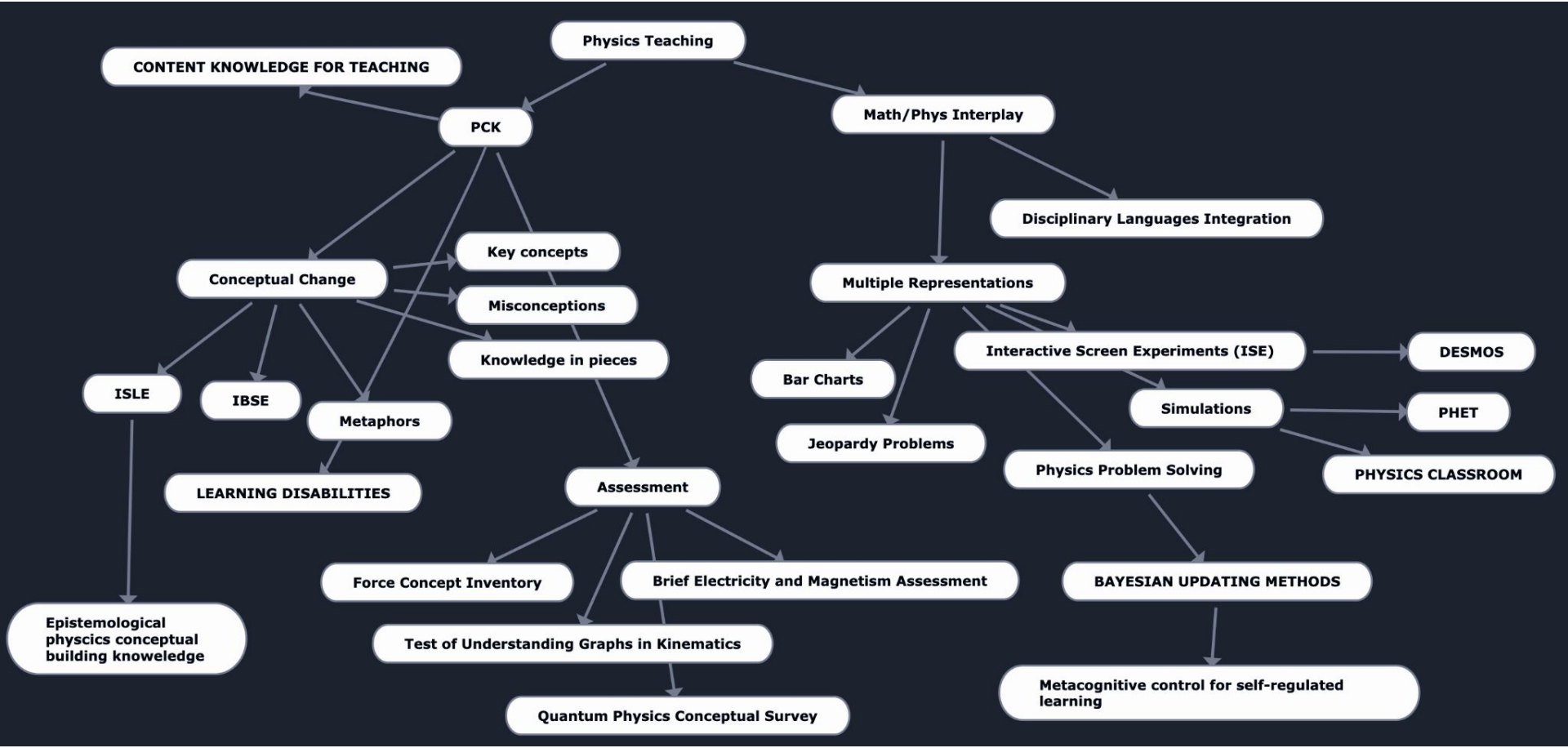
Checklist of key questions for inclusive practice - assessments

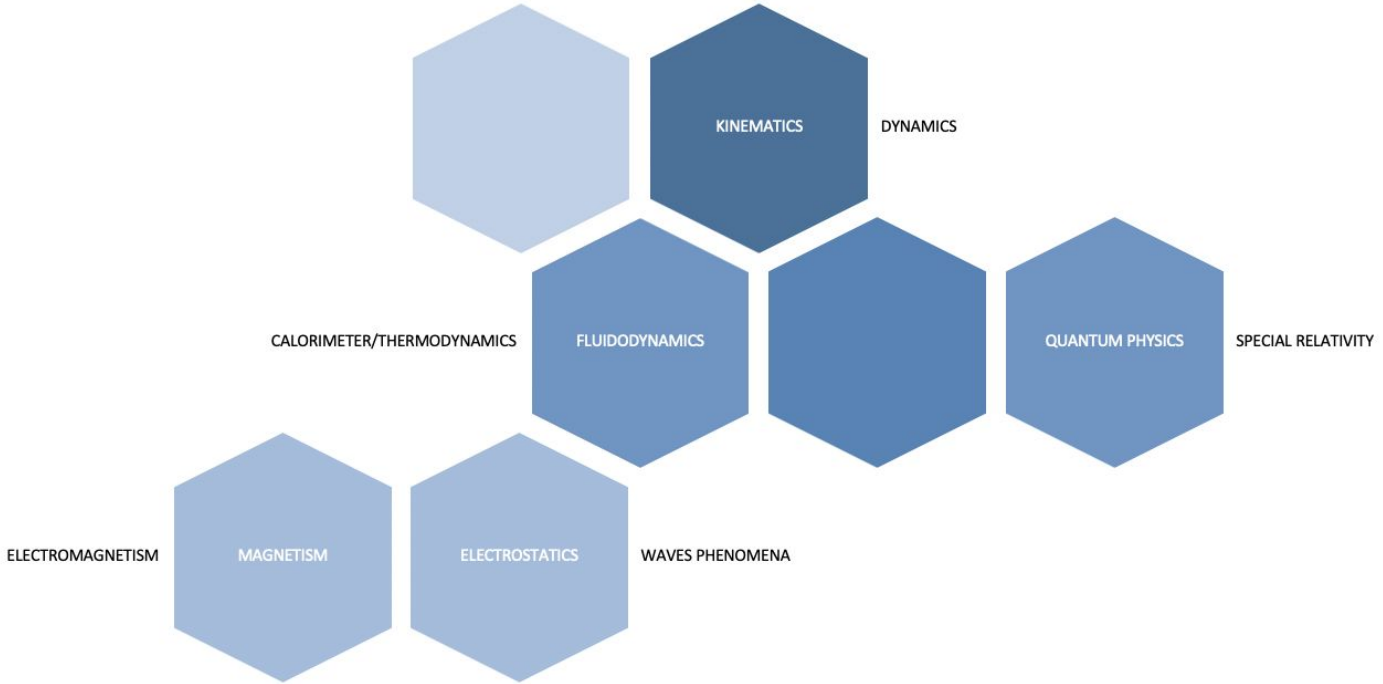
- Are the assessment tasks clearly set out so that students understand the requirements of the question and solution?
- Are formula booklets and/or a glossary of terms available in exams and tests, where competence standards allow?
- Is coloured graph paper or squared paper available in exams?
- Do questions avoid rote learning and recall by focusing on understanding?
- Do you have a marking scheme that avoids penalising messy work?
- Do you provide alternative assessments (e.g. presentations/posters/portfolio of work/annotated diagrams instead of written work)?
- Is detailed and clear feedback, available in alternative formats, given to enable students to see how to move forward?
- Have you reviewed all of your tests for accessibility?


Lessons for all
Make students aware of their knowledge building process
Focus targeting on process instead of results and memorized formulas

Course overview

https://www.mindomo.com/mindmap/physics-teaching-07f5851b73d046408d73891102a86dac


Physics Teaching
CONTENT KNOWLEDGE FOR TEACHING
PCK
Math/Phys Interplay
Disciplinary Languages Integration
Key concepts
Conceptual Change
Misconceptions
Multiple Representations
Knowledge in pieces
ISLE
IBSE
Metaphors
Bar Charts
Interactive Screen Experiments (ISE)
DESMOS
Simulations
PHET
Jeopardy Problems
Physics Problem Solving
PHYSICS CLASSROOM
LEARNING DISABILITIES
Assessment
Force Concept Inventory
Brief Electricity and Magnetism Assessment
BAYESIAN UPDATING METHODS
Epistemological physcics conceptual building knoweledge
Test of Understanding Graphs in Kinematics
Metacognitive control for self-regulated learning
Quantum Physics Conceptual Survey



COURSE MAIN TOPICS

FINAL EXAMINATION

- Decide which topic …
- Decide which classroom (DSA…)
- Decide how many hours …
- Plan the activities …
  - How?

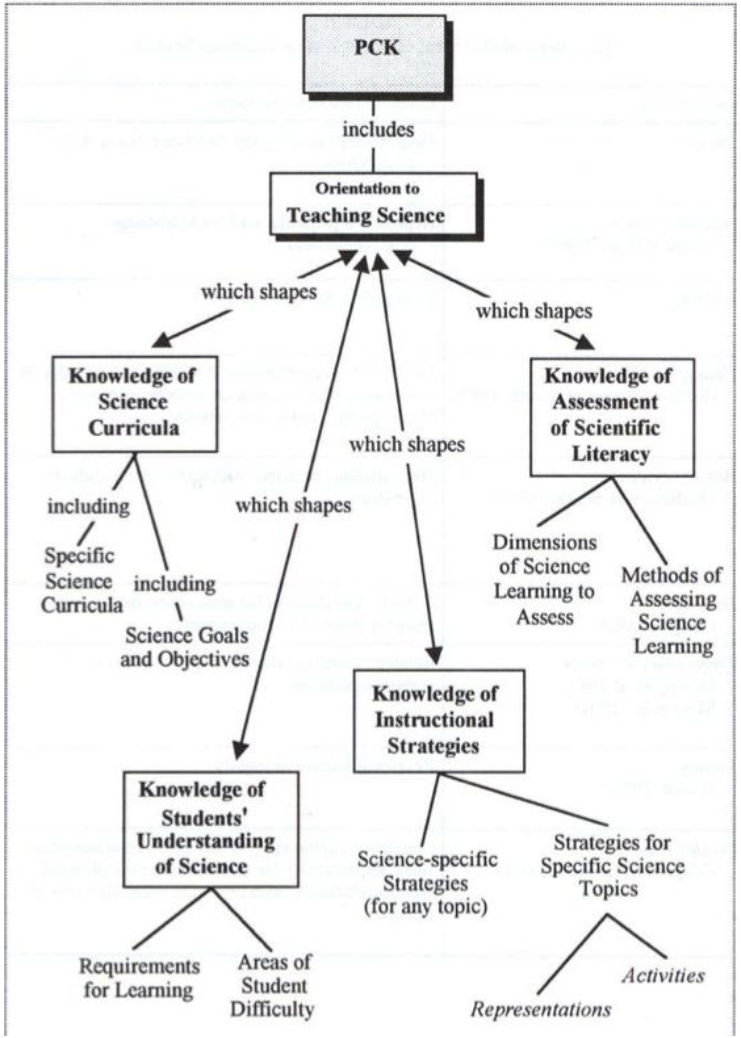
FINAL EXAMINATION

WRITTEN REPORT WHICH INCLUDES:

- HOW TO BUILD CONTENT KNOWLEDGE
- STUDENTS' DIFFICULTIES
- TEACHING STRATEGIES IMPROVED AND USED
- MOTIVATING YOUR CHOICES

- Brief introduction to the topic
- Prerequisites
- Survey of methods to be used
- Highlight of possible misconceptions
- Assessment method

FINAL EXAMINATION



NEW

1. ISLE
2. Multiple representations
3. Electromagnetism and Quantum Mechanics
4. Simulations
5. DSA
6. IBSE
7. DESMOS teacher board

TO BE DONE

1. Indicazioni nazionali per i diversi tipi di scuole
2. Verifiche
3. Problem Solving approaches
4. Laboratorio IBSE
5. Aspetto metacognitivo e interazione con il docente
6. Studenti con disabilità sensoriali