

國立臺灣師範大學 101 學年度碩士班招生考試試題

科目：科學學習心理學基礎

用系所：科學教育研究所

注意：1.本試題共 1 頁，請依序在答案卷上作答，並標明題號，不必抄題。2.答案必須寫在指定作答區內，否則依規定扣分。

一、名詞解釋 (9 分)

- 1.資訊處理理論(Information processing theory)
- 2.知識表徵(knowledge representation)
- 3.近側發展區(Zone of Proximal Development, ZPD)

二、為促進有意義的科學學習，請提出三種有效的教學法，並說明理由和舉例。(18 分)

三、請以皮亞傑(Piaget)的認知發展階段來評析九年一貫自然與生活科技課程設計的優缺點，並佐以你所熟悉的課程內容分階段來說明。(18 分)

四、請閱讀下文，並寫下摘要(8分)和心得(7分)。

Some researchers portray students' learning in science as reflecting similar patterns of change as have occurred in science itself, through progressive restructuring of students' underlying theories (Carey, 1985; Chinn & Brewer, 1993; McCloskey, 1983; Vosniadou & Brewer, 1987). Although we recognize that learning science does involve some restructuring of ideas, we argue that viewing learning as theory change puts too great an emphasis on the theory-like nature of students' informal ideas. We argue that their tacit and situated nature distinguishes them from scientific theories. Furthermore, learning science in school means more than changing from one set of theories to another; it means being consciously articulate about what constitutes theories in the first place (Driver, Asoko, Leach, Mortimer, & Scott, *Educational Researcher*, 1994, p. 9)

五、關於學生對科學的另有概念(alternative conception) (共 40 分)

1.定義

- (1) 請定義科學教育中的另有概念 (4 分)
- (2) 請說明另有概念和科學理論/概念的異同 (6 分)

2.來源

- (1) 請說明另有概念的兩個可能來源，並各自舉自然科學的實例說明 (8 分)
- (2) 科學教師的授課是否可能造成迷思概念，原因為何？應如何避免？ (8 分)
- (3) 評量：標準化測驗是否能測出學生的另有概念，請論述原因 (8 分)
- (4) 學習：另有概念會如何影響科學概念的學習 (6 分)