

國立彰化師範大學 101 學年度博士班招生考試試題

系所：科學教育研究所

組別：乙、丙、丁、戊

科目：科學教育

☆☆請在答案卷上作答☆☆

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名詞解釋 (25%)

1. Scientific literacy
2. Self-efficacy
3. Authentic assessment
4. Cognitive load theory
5. Multiple representations

論述題：

1. 在科學師資培育的研究中很強調，一個專業的教師必須擁有豐富的學科教學知識。請用具體例子說明一個好的科學教師（學科領域你可自訂）在一個你所訂的單元中（請寫出特定的單元），其具體的學科教學知識應包含哪一些內容？(20%)
2. 探究教學在當前的科學教育領域中是很重要的議題。請比較探究教學與傳統的實驗教學有何差異？教師的角色與學生的角色在探究教學中的特徵？在探究教學中要如何評量學生的學習成效？(30%)

翻譯及問答題：

1. 請翻譯以下有關科學論證 (argumentation) 的一段文字 (15%)：

Many teachers are uncomfortable with argument given that many teach in contexts in which much of their time is spent mediating conflict and persuading students of the value of civil exchange. Skill and persistence are required to help students grasp the difference between scientific argument, which rests on plausibility and evidence and has the goal of shared understanding, and everyday argument, which relies on power and persuasiveness and assumes that the goal is winning. It is not straightforward to get a middle schooler to see a distinction between disagreeing with an idea and disagreeing with a person. (節錄並改自 National Science Council (2007). *Taking Science to School*. The National Academies Press: Washington DC.)

2. 近年來為何科學論證受到重視？科學教育希望藉由科學論證培養學生何種能力？(10%)