

國立台中師範學院九十四學年度研究所碩士班考試

科學教育概論 科試題

自科 用

- 一、 奈米科技是當前新興科技產業，並逐漸滲透到吾人日常生活，請問是否有必要對中小學生進行奈米科技相關的教學？理由何在？如果有，教學的目標與方法當如何？（25分）
- 二、 請比較 Misconception, Alternative framework 及 Children's science 三項專有名詞間的異同，並說明其對教師從事科學教學的啟示。（15分）
- 三、 請問在科學教育中，要達成哪些情意的目標？科學教師應該如何設計科學學習活動，以協助這些目標的達成？（15分）
- 四、 （一）閱讀下面敘述，請用中文寫出主要的意思。（二）根據這些敘述，提出你個人的看法，說明你的理由。（25分）

Less is known about how questions drive the active inquiry, problem setting, data collections, and evidence analysis in the exploration phase. Martens proposed a new schema for teacher-initiated or student-initiated questions to scaffold students' inquiry and epistemic actions – focusing, data collection, comparison, action, problem posing, and reasoning during inquiry in small-group environments. She identified functional types of questions designed to promote inquiry procedures, task completion, data interpretation, reasoning, and other epistemic actions in a more collaborative manner.

Constructivist teachers want students to initiate and guide their own inquiries and knowledge construction. Students are able to generate their own basic information questions, but are less likely to generate wonderment questions that initiate discussion about hypotheses, predictions, experiments, and explanations. Students are likely to generate a wider range and greater number of wonderment questions in problem-solving activities.

- 五、 Please define the meaning of inquiry-based teaching and develop a science lesson including teaching objectives, inquiry-based approaches, and assessments.（20分）