



**UNIVERSITY OF JOHANNESBURG**  
**FACULTY OF EDUCATION**  
**NOVEMBER EXAMINATION 2015**

**PROGRAMME:** BEd (HONS) SCIENCE EDUCATION (BED047)  
**MODULE:** SCIENCE EDUCATION (PEDAGOGICAL CONTENT KNOWLEDGE)  
**CODE:** SED0017  
**TIME:** 3 hours  
**MARKS:** 100  
**EXAMINER:** Prof U. Ramnarain and Dr L. Mnguni  
**MODERATOR:** Prof J.J.J. de Beer (NWU-Potchefstroom)

(This paper consists of 3 pages)

**INSTRUCTIONS**

This paper consists of three(3) questions. Answer all questions. Read each question carefully before answering it. The following rubric will be used assessing your answers:

**Rubric**

Criteria	Level 1 (0-25%)	Level 2 (26-49%)	Level 3 (50-74%)	Level 4 (75-100%)
Introduction	-weak introduction of topic -thesis is weak and lacks an arguable position	-adequate introduction that states topic , thesis and some of the subtopics - thesis is somewhat clear and arguable	-proficient introduction that states background information, controversial question, topic, thesis, and all subtopics in proper order - thesis is a clear and arguable statement of position	-exceptional introduction that grabs interest of reader and states background information, controversial question, topic, thesis, and all subtopics in proper order - thesis is exceptionally clear, arguable, well developed, and a definitive statement
Quality of Information / Evidence	-limited information on topic or inaccurate information	Some accurate evidence but still inadequate	Detailed information with accurate & critical evidence	extremely detailed and accurate with critical evidence from a variety of sources
Support of Ideas / Analysis	-limited connections made between evidence, arguments and	-some connections made between evidence, arguments and	-consistent connections made between evidence, arguments and	-exceptionally critical, relevant and consistent connections made between evidence,

	counter-arguments -lack of analysis	counter-arguments -showing analysis	counter-arguments -showing good analysis	arguments and counter-arguments -showing excellent analysis
Organization / Development of Ideas	-paper lacks clear and logical development of ideas with weak transition b/w ideas and paragraphs	-somewhat clear and logical development of subtopics with adequate transitions b/w paragraphs	-clear and logical subtopic order that supports thesis with good transitions b/w paragraphs	-exceptionally clear, logical, mature, and thorough development of subtopics that support thesis with excellent transition b/w paragraphs
Conclusion	-lack of summary of topic, with weak concluding ideas	-adequate summary of topic, with some final concluding ideas	-good summary of topic, with clear concluding ideas	-excellent summary of topic (with no new information), in proper order with concluding ideas that leave an impact on reader
Language Conventions	- inconsistent grammar, spelling and paragraphing throughout paper	-paper has some errors in grammar, spelling and paragraphing	-paper is clear, with mostly proper grammar, spelling and paragraphing	-paper is very concise, clear, with consistently proper grammar, spelling and paragraphing

### QUESTION 1

The inclusion of Pedagogical Content Knowledge (PCK) is an essential tenet in the current thinking about science teacher education. TPACK (Technological Pedagogical Content Knowledge) builds on the core ideas of PCK through the inclusion of technology. Explain the importance of PCK and TPACK in science teaching. Use the following sub-headings in your answer:

- 1.1 Shulman's (1986) notion of Pedagogical Content Knowledge (PCK) (5)
  - 1.2 Pedagogical Professional-experience Repertoire (PaPeR) (5)
  - 1.3 Content Representations (CoRes) (10)
  - 1.4 TPACK (10)
- (30)**

### QUESTION 2

By drawing up the work of Treagust (2010) critically reflection upon the use of pedagogical representations in science teaching.

**(30)**

### QUESTION 3

According to Kemmis (1985) “reflection is a dialectical process: it looks inward at our thought and thought processes, and outward at the situation we find ourselves” (p.141).

3.1 Differentiate between the three types of reflection that have been discussed in this module. (10)

3.2 Write a two to three page essay where you discuss the role of reflection in the development of a science teacher’s PCK and TPACK. (30)

(40)

**TOTAL: 100**

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