

The Macrotheme Review

A multidisciplinary journal of global macro trends

Misconception or Alternative Framework: Which One?

Davy Seligin* and Jominin Goropos**

*Universiti of Malaysia Sabah, School Of Education & Social Development, Malaysia**
*Sandakan Community College, Sandakan Sabah East Malaysia***

Abstract

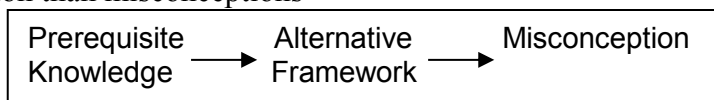
This research strive to explore students alternative framework (AF) and misconception in Body Coordination among 54 students, in form four science subject. Research was conduct in one school in Sandakan, Sabah Malaysia. Qualitative design were administered in this research. The concept test named Body Coordination Two Tier Concept Test (BCTTCT). This research proposed misconception as behalf of the AF.

Keywords: Misconception and Alternative Framework, Body Coordination

1. INTRODUCTION

Researchers in the discipline of science education have identified a large diversity of misconceptions and Alternative Framework (AF) to be potential conflict among students. In fact, many studies show that students possess a number of pre-existence of the conception (alternative) about potential scientific phenomena interfere with the learning of students (Driver and Easley, 1978; Driver and Erickson, 1983; Fler, 1999; Palmer, 1999, Posner et al., 1982; Taber, 2001). This is because Helm, Hugh and Novak (1983) asserts that students come to school already has a trust how things happen and have different interpretations based on past experience that enables them to predict future events. They also have a clear meaning of the word they use, among which only understood by their own, (Gilbert et al., 1982; Osborne et al., 1983; Ozmen, 2004) which are unparallel with scientific concepts, one being used in schools and the other is used in the 'real world' students (Trowbridge and Mintzes, 1985). AF use is synonymous with the word misconception but we proposed these term have slightly different even though its use is often whether construed by most researchers. Previously research in Figure 1 showed that a huge collection of AF causes the misconception even mostly researcher from over the world look's these is no different about them.

Figure 1: AF position than misconceptions



Source: Davy Seligin (2012)

Malaysia Science Secondary School Curriculum

In Malaysian education system, science subjects are taught in upper secondary level (Form 4 and 5) consists of 16 chapters. The earlier eight chapter will learned in Form 4 and eight chapter again will be learned in Form 5. Curriculum Development Centre (CDC, 2002) are solely responsible to formulate of the content in all subjects. CDC divided the Body Coordination into ten subtopic that are Body Coordination, Human Nervous System, Nervous Coordination, Proprioceptors, The Human Brain, Hormonal Coordination, Coordination Between the Nervous System and the Endocrine System, Effect of Drug Abuse On Body Coordination and Health, Effects of Excessive Consumption of Alcohol on Body Coordination and Health and The Importance of a Sound and Healthy Mind.

Purpose of the study

The purpose of this study are: (a) To examine the AF and misconception among students in Body Coordination.

Research questions

The following research questions were addressed in this study: 1. What are the AF and misconception among students in Body Coordination?

2. METHOD

BCTTCT consist 20 questions 2 level (two-tier) pioneered by Haslam and Treagust (1987) to detect misconception among students and analysed based on types of understanding level by Mustafa (2007). According to Mustafa (2007), the level of understanding of students categorized into three categories as in Table 1.

Table 1: Category of Students understanding.

Category	Description	Example
Category 1	responses showed no evidence of student understanding	'I do not know ..'
Category 2	students' responses showed AF / misconceptions	'glands located at the foot'
Category 3	students have a full understanding	'the example of drug is cocaine'

Firstly, 54 students answer the BCTTCT. Second, on next day, 8 selected students will continue with interview session. We conduct focus group interviews to explore the AF and misconceptions among the students. There are advantages and disadvantages of individual interviews and focus groups, but it depends on the aims and objectives of the study. This interview method provides interaction between the respondents interviewed, and intensive data collection and participation of all individuals in the group (Krueger, 1994; Creswell, 2008). We must be

wise to address the situation before, during and after the interview so that the participation of students at the maximum.

To analyze the question, two criteria used to classify and identify the students' response to the answer. Analysis of question two tier the student (multiple choice and true / false) as specified in the tables 2 and marking system referred in Table 3 (Costu et al, 2007).

Table 2: Criteria for Analysis of two-tier (Type Multiple Choice and True False)

Category		Symbol	Marks
Stage One	Stage Two		
True Respond	- True Justification	T-T	3
Wrong Respond	- True Justification	W-T	2
True Respond	- Wrong Justification	T-W	2
True Respond	- No Justification	T-N	1
No Respond	- True Justification	N-T	1
Wrong Respond	- Wrong Justification	W-W	0
No Respond	- Wrong Justification	N-W	0
Wrong Respond	- No Justification	W-N	0
No Respond	- No Justification	N-N	0

Table 3: Criteria for Analysis of Two-Stage Question (two-tier)

Response	Marks	Types of Response	Marks
True	1	Full Understanding (FU)	3
		Partially Understanding (P/U)	2
Wrong	0	Specific AF/Specific Misconception (SAF/SM)	1
		No Understand (NU)	0
		No Response (NR)	0

Resource and modified: Costu *et al.* (2007)

3. RESULTS AND DISCUSSION

List of Alternative Frameworks (AF) in Body Coordination:

Table 4 shows the suggestion diversity of AF and Misconceptions in Body Coordination.

Table 4: AF and Misconceptions in Body Coordination

Students ID	Question numbers	Classification: AF or Misconception
1	6	PU: <i>'reacting too quickly'</i> Misconception
3	19	SM: <i>'occurred in the brain that much memory'</i> AF
4	6	PU: <i>'chemical system'</i> Misconception
8	19	NU: <i>'one for his own wrong'</i> Misconception
9	19	SM: <i>'disturbed area of the brain store memories'</i> AF
16	15	SAF/SM: <i>'drug is a hallucinogenic pills'</i> Misconception
18	19	SAF/SM: <i>'true medulla oblongata injury'</i> Misconception
19	8	SAF/SM: <i>'nerve fibers as the muscle stimulating uncontrolled'</i> Misconception
	10	SAF/SM: <i>'such as cycling'</i> Misconception
	19	SAF/SM: <i>'true as can be fatal'</i> Misconception
	20	SAF/SM: <i>'true because they take pills or drugs can bring diseases'</i> AF
22	6	SAF/SM: <i>'reflex action as the neurons directly into the spinal cord'</i> AF
	15	SAF/SM: <i>'destroy the body. For example ganjan (morphine), herven (heroin)'</i> AF
23	10	SAF/SM: <i>'cerebral for example to read'</i> Misconception
	12	
	17	PU: <i>'true because it is located above the kidneys'</i> Misconception
		NU: <i>'none of the above'</i> Misconception
		NU: <i>'do not know they do not know'</i> Misconception
24	18	SAF/SM: <i>'processing of alcohol'</i> Misconception
25	10	PU: <i>'pierced nails, cerebellum'</i> AF
27	6	SAF/SM: <i>'shows the path of reflex action as impulses in the nervous system'</i> AF
28	20	SAF/SM: <i>'true because the law'</i> Misconception
29	5	SAF/SM: <i>'voluntary action does not involve muscle control as'</i> AF
	8	SAF/SM: <i>'muscle fiber muscle fiber as it is'</i> Misconception
30	6	SAF/SM: <i>'action as for giving the response'</i> Misconception
	8	SAF/SM: <i>'muscle fibers as function as a sensory organ'</i> AF
	15	PU: <i>'a drug developed by scientists'</i> Misconception

35	10	SAF/SM: 'such as walking slowly' Misconception
38	6	SAF/SM: 'action for carrying impulses from receptors to effectors' AF
	10	SAF/SM: 'singing' Misconception
	18	SAF/SM: 'the increase in energy because of the glucose' AF
39	17	NA: 'none of the above' Misconception
42	15	SAF/SM: 'Drugs is a powder that contains strong chemicals' Misconception
	20	SAF/SM: 'true as cause of death' Misconception
46	20	SAF/SM: 'because the drug is lethal to a person' Misconception
53	19	SAF/SM: 'because the affected parts of the brain that stores memory or a memory' AF

4. CONCLUSION

We strive to explore what the students thinking about Body Coordination topic. Finally here we suggest the misconception (single issue) a part of alternative framework (more than one issue) to clarify students answer.

References

- Costu B., Alipasa A., Niaz M., Unal S., & Calik M. (2007). *Facilitating Conceptual Change in Students' Understanding of Boling Concept*. Springer Science+Business Media, LLC.
- Curriculum Development Centre. (2002). *Secondary School Intergrated Curriculum*. Malaysia of Education.
- Creswell, J.W. (2008). *Educational Research: Planning, Conducting, and Evaluating, Quantitative and Qualitative Research*. Pearson Educational International.
- Davy Seligin. 2012. Alternative Framework, Attitudes Towards Science and Problem Learning: A Pilot Study. *International Organization of Scientific Research*. Vol.2 Issue 2, 28-41.
- Haslam F. Treagust D.F. (1987). *Diagnosing secondary students' misconceptions of photosynthesis and respiration in plants using a two-tier multiple choice instrument*. *J Biol Educ* 21 (3: 203-211).
- Helm, Hugh, and Joseph D. Novak. (1983). *PROCEEDINGS OF THE INTERNATIOAL SEMINAR ON MISCONCEPTIONS IN SCIENCE AND MATHEMATICS*. Ithaca, NY: Cornell University, July,. ED 242 553.
- Mustafa Cin. (2007). *Alternative Views Of The Solar System Among Turkish Students*. *Review of Education*. 53: 39-53.
- Ozmen, H., (2004). Some student misconceptions in chemistry: A literature review of chemical bonding. *J. Sci. Educ. Technol.*, 13: 147-159.
- Taber K. S. (2001). *Building The Structural Concepts of Chemistry: Some Considerations From Educational Research*. Invited Theme Issue: Structural concepts Contribution from science education. *Chemistry Education: Research And Practice In Europe*. Vol. 2, No. 2, pp.123-158.
- Trowbridge, J. E. & Mintzes, J. J. (1985). Students' alternative conceptions of animals and animal classification. *School Science and Mathematics*, 85(4), 304-316.