

Science in the Middle School: Challenges and Opportunities

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Engagement and Motivation



- **“From the day your child is born you must teach him to do things. Children today love luxury too much. They have detestable manners, flout authority, have no respect for their elders. They no longer rise when their parents and teachers enter the room. What kind of awful creatures will they be when they grow up? “**

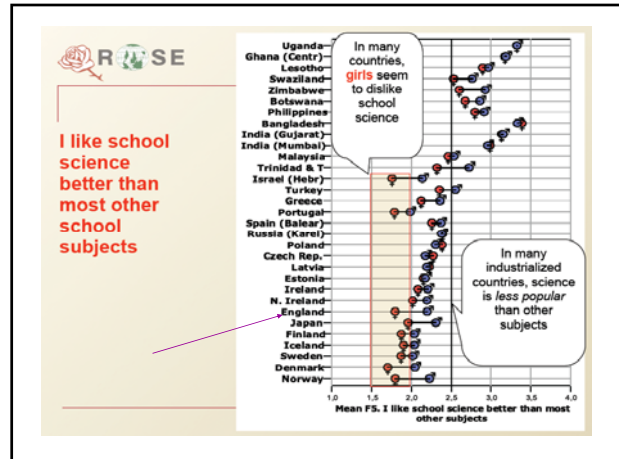
- **- Socrates, 399 B.C.**

	Disagree	Low Disagree	Low Agree	Agree
	%	%	%	%
I would like to become a scientist	58	21	13	8
I like school science better than other subjects	43	25	20	11
School science is interesting	16	23	38	23

Jenkins, E., & Nelson, N.W. (2005). Important but not for me: students' attitudes toward secondary school science in England. *Research in Science & Technological Education*, 23(1), 41-57.

ROSE project

- Relevance of Science Education project to shed light on factors of importance to the learning of science and technology – as perceived by the learners.
- 40 countries
- Not Australia!



What would you like to learn about?

- 108 Items
- No less than 80 generated statistically significant differences between girls and boys

Boys

1. Explosive Chemicals
2. How it feels to be weightless in space
3. How the atomic bomb functions
4. Biological and Chemical Weapons and what they do to the human body
5. Black holes, supernovae and other spectacular objects in space

Girls

1. Why we dream when we are sleeping and what the dreams may mean
2. Cancer, what we know and how we can treat it
3. How best to perform first-aid and use basic medical equipment
4. How to exercise to keep the body fit and strong
5. Sexually transmitted diseases and how to be protected against them.

How to engage your students?

- How can you tell?
- What works?



Start early - Year 7 students?

- Research by Nicole Spranger - CEO Paramatta, 2008

Defining Transition

The term transition covers

the broad period of time from preparing to move from primary school until successful settlement of the student in secondary school.

Transition may begin as early as Year 5

4 Phases of Transition

Four identifiable PHASES describe what happens and when.

- Preparation
- Transfer
- Induction
- Consolidation

Defining Transition _ How?

•Administrative

Formal liaison and **information exchange** occurs between primary schools and secondary schools. (procedural)

•Social and personal

Students' social and personal needs are addressed to **reduce their concerns** and possible anxiety about changing schools.

•Curriculum

Teachers in primary and secondary schools **share information** and plans about curriculum and content to be taught in the final stages of primary school and the beginning of secondary school.

•Pedagogy

Teachers in primary and secondary schools **develop a shared understanding** of how students learn and what constitutes effective teaching practice.

•Management of learning

All **students** are encouraged to manage their transition into secondary school and to **develop independent learning** and reflection skills.

Galton, Gray and Ruddock 1989

Situation Analysis

Research Evidence suggests :

- Most transition programs focus primarily on personal and social aspects of transition
- Students report a gap between their expectations of secondary schooling and the “reality”
- By end of Yr7 up to 40% of students experience
 - a significant “achievement dip”
 - a decline in motivation

Cooper et al (1996)
Barber, (1999)



What do students look forward to when they come to your science classroom in Year 7?

Student Issues/Disappointments

- Little or no recognition of prior learning
- Low challenge – an emphasis on “content” and assessment of knowledge vs application
- Learning is “passive” – teacher directed and group work limited
- Frustration at timetable constraints especially with practical work
- Low autonomy – limited choices in what and how they will learn.

Student Anecdote

*“I have been asked to draw around six leaves.
In my last school I’ve done photosynthesis and
I’m interested in what effect different light
may have on it’s growth.”*



Rudduck in Barber (1999)

Suggestions...

- Build student responsibility and intrinsic motivation
- Implement integrated, interdisciplinary thematic instruction
- Increase student understanding and retention of new learning
- Promote the latest ideas in critical thinking

- Help students process new information more effectively
- Learn classroom management techniques to organise differentiated instruction more efficiently
- Implement an interdisciplinary model to build academic and research skills
- Incorporate the latest ideas from brain research
- Make connections between the academic curriculum and the world of work

Some research and some ideas

- Dr T Roger Taylor – Differentiated learning styles
- Jamie McKenzie – Characteristics of engaged learners USA (2001)
- Refer to the articles in your workbook