

Australian Council for Educational Research (ACER)

ACEReSearch

[ACER eNews Archive](#)

[ACER Archives](#)

4-2006

ACER eNews 04 April 2006

ACER

Follow this and additional works at: https://research.acer.edu.au/enews_archive



Part of the [Education Commons](#)

Recommended Citation

ACER, "ACER eNews 04 April 2006" (2006).
https://research.acer.edu.au/enews_archive/86

This Article is brought to you by the ACER Archives at ACEReSearch. It has been accepted for inclusion in ACER eNews Archive by an authorized administrator of ACEReSearch. For more information, please contact repository@acer.edu.au.

Published April 2006

In this issue:

- [Teaching science in Australia](#)
- [ACER UPDATE](#)

Teaching science in Australia

This article is based on an article by Jan Lokan to appear in a forthcoming edition of [Research Developments](#). It is due to be published in June.

The quality of Year 8 science teaching in Australia has been endorsed by the latest findings from the Third International Mathematics and Science (TIMSS) 1999 Video Study. The study investigated and described Year 8 Science teaching in Australia, Japan, The Czech Republic and The Netherlands, all of which achieved relatively highly in the TIMSS 1995 and 1999 written assessments, and The United States, which achieved at average level only. A sample of Year 8 science lessons in each country was videotaped and later analysed to identify common features as well as distinctive characteristics in teaching styles across the five countries.

Internationally, the science component of the TIMSS Video study comprised a total of 439 Year 8 lessons collected from the five participating countries. In Australia the study involved 87 Australian teachers and around 2000 students from all regions and school sectors. Lessons were videotaped between June 1999 and May 2000.

The international study was conducted by Lesson Lab Inc based in the United States. ACER conducted the Australian component of the study on behalf of the Commonwealth, state and territory governments. The Australian report, *Teaching Science in Australia*, by Jan Lokan, Hillary Hollingsworth and Mark Hackling was published by ACER in April.

The reports on science teaching in five countries follow the mathematics component of the TIMSS Video Study which, were released in 2003. The mathematics study involved seven countries, including Australia, and identified no single best method of teaching eighth-grade mathematics in high achieving countries.

Published April 2006

International findings

Researchers observed that there is more than one way to teach science successfully, supporting the proposition that teaching is culturally based. Teachers in the participating countries used a variety of teaching methods and combined them in different ways.

Of particular interest to researchers was whether it was possible to identify characteristics of science teaching shared by the high achieving countries that were different to those of the United States. The four higher achieving countries shared two features. Firstly, lessons in each of the countries had high content standards and high expectations for student learning. Secondly, rather than exposing students to a variety of teaching methods and content, the science lessons in each higher-achieving country reflected a common core instructional approach that was content-focused. The main difference in Year 8 science teaching between the four higher-achieving countries and the United States was that, although United States students were exposed to a variety of organisational structures, content and activities, these features were not typically used in ways that would offer students a clear and coherent picture of conceptual links that can be made between content ideas.

Australian findings

Australian lessons typically involved gathering and analysing data through independent practical activity to develop ideas. Real-life experiences and issues were often used to help students connect ideas. In addition, Australian teachers were well trained and mostly well resourced. Compared to the other participating countries, Australian lessons most closely resembled those in Japan.

The style of science teaching in both countries tended to focus on developing a limited number of ideas by making connections between ideas and evidence. Students were usually engaged in practical activities that were followed by discussions of results and conclusions. In contrast with Japan, Australian science lessons supported the development of science ideas more often with real-life examples but less often with visual representations.

Published April 2006

Despite the largely positive findings for Australia, concerns have been raised regarding the low emphasis placed on student-directed investigations and the generally basic level of content covered in the Australian lessons. Fifty-seven per cent of Australian lessons focused on content that was generally at only a basic level for Year 8 and would have offered limited challenge for students, particularly more able students. Thirty-three per cent of lessons provided a mix of basic and challenging content and a further 9 per cent focused on predominantly challenging content. Only 9 per cent of the Australian lessons involved content that was judged to be highly challenging.

Conclusions

What did we learn about science teaching in Australia from observing the sample of Australian Year 8 lessons? In many respects Australian Year 8 science teaching was found to resemble a model of ideal science teaching derived from research and Australian curriculum documents. Students were provided with good opportunities to achieve the stated goals of the science curriculum and to develop aspects of their scientific literacy. Overall the Australian lessons can be characterised as providing many opportunities for students to practise several of the important scientific inquiry skills such as collection and interpretation of scientific data. Lessons were coherently-structured, generally providing connected, richly supported material as the content was developed.

The content of lessons was typically only at a basic level for Year 8. Students did not have much opportunity to formulate their own research questions, devise their own experimental procedures and analyse their own data because the independent practical work was largely teacher-directed. Opportunities to discuss conclusions arising from the practical activities were also rare. Australian Year 8 students would benefit from more opportunities to learn and practise higher-order inquiry skills such as designing their own investigations and taking part in more class discussions about the results of their practical activities.

Published April 2006

Given the centrality of inquiry-based learning in Australian science teaching, the commitment to scientific literacy and the emphasis on independent practical work, there appears to be a need to allow more student directed investigations and more public discussion of the results and conclusions arising from the practical work to ensure that scientific concepts underlying investigations can be developed and consolidated.

More information about the study and additional findings are contained in the full report, [Teaching Science in Australia](#), by Jan Lokan, Hillary Hollingsworth and Mark Hackling. More info on [TIMSS Video](#)

The international report, [Teaching Science in Five Countries. Results from the TIMSS 1999 Video Study of Eighth-Grade Science Teaching: Statistical Analysis Report](#), by K.J Roth, S.L Druker, H. Garnier, M. Lemmens, M Chen, T Kwanake, D Rasmussen, S Trubacova, D Warvi, Y Okamoto, P Conzales, J Stigler and R Gallimore was released in April by the US Department of Education, National Center for Education Statistics.

Published April 2006

ACER UPDATE

STRIVE

ACER is contributing to the assessment component the Strengthening Implementation of Basic Education in Selected Provinces in Visayas (STRIVE) project. This is an AusAID funded project targeting two of the poorest regions in the central Philippines. This is a five-year project focused on strengthening the systems that are already in place to support students who have dropped out of school as well as school students. The first phase of the work involves setting up a feasible project plan that operates, as far as possible, within existing education department structures. ACER's role is to find ways to best use the project's resources to increase the effectiveness of current assessment systems.

Academic Leadership Capabilities for Australian Higher Education

The Carrick Institute for Learning and Teaching in Higher Education has announced that the University of Western Sydney and ACER were successful in their joint proposal to conduct a project on *Academic Leadership Capabilities for Australian Higher Education*. The project will run from May 2006 to October 2007. The project is a welcome development for ACER's research in both the higher education and leadership areas.

Civics and Citizenship Assessment 2007

ACER has received official notification that it has secured the contract for the National Assessment Program- Civics and Citizenship Assessment 2007.

Published April 2006

Research Conference 2006

Bookings are now open for ACER's Research Conference 2006 – *Boosting science learning – what will it take?* The conference will examine recent research and practice directions in the area of science education both locally and internationally. For further information visit the [conference website](#)

Copyright © Australian Council for Educational Research 2015

All rights reserved. Except under the conditions described in the Copyright Act 1968 of Australia and subsequent amendments, no part of this electronic publication may be reproduced, stored in retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without written permission. Please address any requests to reproduce information to communications@acer.edu.au

[Subscribe](#)

Australian Council for Educational Research
Private Bag 55, Camberwell, Victoria Australia 3124
Tel: + 61 3 9277 5555
Fax: + 61 3 9277 5500
Web: www.acer.edu.au

