



Secondary Education

The Key Concepts

Jerry Wellington

SECONDARY EDUCATION

A comprehensive critical survey of the controversies, theories and practices central to secondary education today, this book provides teachers, researchers, parents and policy-makers alike with a vital new reference resource.

Secondary Education: The Key Concepts covers a wide range of important topics and debates, including:

- Assessment
- Citizenship
- Curriculum
- E-learning
- Exclusion
- Learning theories
- Work experience

Fully cross-referenced, with extensive suggestions for further reading and on-line resources, *Secondary Education: The Key Concepts* is the essential guide to theory and practice in the twenty-first-century classroom.

Jerry Wellington is Professor of Education at the University of Sheffield. His previous publications include *Teaching and Learning Secondary Science* (Routledge, 2000), *Getting Published* (Routledge, 2003) and *Educational Research: Contemporary Issues and Practical Approaches* (Continuum, 2000).

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LONDON AND NEW YORK

First published 2006
by Routledge
2 Park Square, Milton Park, Abingdon, Oxon, OX14 4RN
Simultaneously published in the USA and Canada
by Routledge
270 Madison Avenue, New York, NY 10016

Routledge is an imprint of the Taylor & Francis Group

This edition published in the Taylor & Francis e-Library, 2007.

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British Library Cataloguing in Publication Data

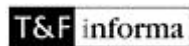
A catalogue record for this book is available from the British Library

Library of Congress Cataloging in Publication Data

A catalog record for this book has been requested

ISBN 0-203-48831-8 Master e-book ISBN

ISBN10: 0-415-34403-4 (Print Edition) ISBN13: 978-0-415-34403-6 (hbk)
ISBN10: 0-415-34404-2 ISBN13: 978-0-415-34404-3 (pbk)



Taylor & Francis Group is the Academic Division of T&F Informa plc.

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PREFACE

My aim in this book is to provide an introductory but critical summary of a range of ideas, trends, initiatives, theories, labels and concepts in education. I hope that it will be valuable to a variety of people: parents, new and more experienced teachers, governors, researchers not familiar with concepts from outside their own field, and readers with a general interest in education.

Each entry includes references and possible websites to explore. Please note that the selection of material from the World Wide Web is very much my own short-list of sites that I consider interesting and reasonably well written, in some cases from a trawl of potential hundreds of thousands. Many entries have suggestions for further reading. The use of bold in the text indicates that this is a cross-reference to another key concept.

I will certainly be criticised for including certain terms and omitting others but I had to stop somewhere. So what have I included, and why? I have tried to include concepts that I think are interesting and important, and that may be of lasting significance, but time may prove some of my choices wrong. In each case, I have tried to give a brief history of the idea or initiative, wherever possible, and to offer a short speculation on its future.

What have I left out? I have not included terms, trends and ideas that may be short-lived (though again my judgement might well be proved wrong on this) such as ‘City Academies’, and school ‘effectiveness’ (surely we won’t still be using the term ‘effectiveness’ in five years from now?). Ultimately, the choice of concepts to include has been a personal one and I fully expect to receive comments on this.

Each entry is built on the evidence and literature currently available. Several include (briefly) my own views and opinions in places. I have been involved in education for 32 years, in school and then in university life, so I feel I definitely have a view after all this time, and it often strikes me as slightly strange when authors keep their own views completely hidden.

If you have any comments or criticisms, praise or grumbles, please e-mail them to: j.wellington@sheffield.ac.uk

ACKNOWLEDGEMENTS

I would like to thank all my ‘critical friends’ for their valuable feedback on early drafts of many of the entries in this book, especially Wendy Wellington, Hannah Wellington, Jon Scaife and Jackie Marsh.

SECONDARY EDUCATION

The Key Concepts

ACCELERATED LEARNING

Accelerated learning is the notion that a child's (or an adult's) learning can be speeded up by certain means. The means vary but are by no means uncontroversial. For example, the suggestions for accelerating learning put forward by Smith (1996) are summarised by the acronym NO LIMIT. This represents seven principles. The first initial comes from the word *kNow*: the learner and teacher should know how the brain works in a learning situation—that the brain has different parts, that the right and left sides of the brain should be active and 'linked' and that visual, auditory and kinaesthetic (VAK) inputs can enhance this (see **multiple intelligences** and **metacognition**). The second principle refers to Open and relaxed learners: learning is said to be more enjoyable and longer lasting when the environment is enjoyable and the learner is confident and comfortable. For example, if music is played during a learning situation, this may help create the right environment for some learners. This assertion can be challenged, however; it can be the case that learning, especially outside the classroom, sometimes takes place under stressful or even traumatic conditions, e.g. at the scene of an accident.

The third initial L is for learning: by setting step-by-step targets, learners are given a challenging but supportive environment—experiencing success in achieving targets will motivate learners. *Input*, the fourth principle, is based on the idea that a variety of inputs is needed, e.g. VAK as above. Fifth, the idea of multiple intelligences leads to the principle that different learners have different intelligences that need to be nurtured and different styles in which they learn. Children may be smart in one area, e.g. 'number smart', and can excel in this, if not in other areas. The sixth principle is to invest in several strategies that can improve self-esteem and enhance learning—these are represented by another acronym, BASIS, with five elements: belonging, aspiration, safety, identity and success (Smith, 1996; Prashnig, 1998). The final initial in NO LIMIT refers to try it, test it and review it: the idea of constantly reviewing work within a target-setting system.

All the above principles are said to create a supportive learning environment, with a range of sensory inputs, which can motivate learners, enhance their understanding and improve retention of learning (Smith, 1996).

Some of the principles of accelerated learning are said to be based on theories of the brain and how it works. In brief, the brain is said to have three main parts, each with different functions. The 'reptilian brain', at the base of the skull, controls our basic and instinctive functions such as breathing or 'fight and flight'. The middle or 'limbic' brain is the seat of our emotions and long-term memory: it has been suggested that we remember best when our emotions are involved in learning. Finally, the 'neo-cortex' is the area where higher-order thinking skills and problem solving are said to take place. One of the benefits of this model of the brain is the realisation that all parts of the brain, including the emotions, are involved in learning. **Cognition** (i.e. skills, knowledge and understanding) is intimately connected with emotion. Positive emotions can encourage effective learning. Conversely, the implication is that fear and stress can cause activity in

the brain to move towards the 'reptilian' section, thus reducing activity in the neo-cortex area—consequently suppressing or even negating learning. Again, this hypothesis could be challenged because learning can occur in stressful or traumatic situations in everyday life.

Furthermore, the thinking part of the brain (the neo-cortex) is said to be in two hemispheres. The right side is responsible for creativity, images and visualisation, music, rhythm and rhyme, art and design, and gaining the holistic picture. The left-side processing involves words, language, logic, number, writing and reading and analytic activity. It has been said that artistic people are 'right-brained' while mathematicians are left-brained', though this has been challenged (OECD, 2002).

If we assume that there is some value in these models of the brain, the practical question arises: what is the classroom teacher to do about them, especially when faced with a class of 30 pupils, each with different learning styles and preferences? On the one hand, the teacher could focus on the learning strengths and preferences of individuals and try to build on or exploit them; on the other, they could try to develop the under-developed learning styles in the hope of increasing each learner's repertoire. This is a difficult choice for the classroom teacher to make. In reality, many teachers opt for a mixture of VAK ingredients in their lessons when planning and conducting them, in the hope of giving something to all learners and learning styles.

There are clearly dangers in relying on the two-sided model of the brain too closely as a basis for learning and teaching, especially if learners become labelled as 'right-sided' or 'left-sided' and this is deemed to be their learning style or learning preference, e.g. holistic imagers in contrast to analytic verbalisers.

Accelerated learning has become something of an industry in the twenty-first century, spawning a host of websites and consultancies. Certain activities and techniques have been developed, allegedly based on theories of the brain, and promoted at in-service and pre-service teacher training events, e.g., 'brain gym', target setting, VAK input and creating conducive environments using music. However sound or unsound the scientific basis for these activities may be, my own view is that the emphasis on improving or even accelerating learning has had certain beneficial effects, e.g. more varied input by teachers built into their lesson planning; increased self-awareness by learners of the way they learn; realisation by teachers that different learners learn in different ways; and the use of activities and environments that can enhance the learning process for many pupils.

See also: **cognitive acceleration**

References and further reading

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- OECD (2002) 'Understanding the Brain: Towards a New Learning Science', *OECD Social Issues/Migration/Health*, 11:1–10.
- Prashnig, B. (1998) *The Power of Diversity: New Ways of Learning and Teaching*, Stafford: Network Educational Press.
- Smith, A. (1996) *Accelerated Learning in the Classroom*, Stafford: Network Educational Press.
- (2000) *Accelerated Learning in Practice*, Stafford: Network Educational Press.

Useful websites

http://www.acceleratedlearning.com/method/what_is.html

<http://www.alcenter.com/alindex.html>

<http://www.ncrel.org/sdrs/areas/issues/students/atrisk/at41k59.htm>. This site includes the quote:

More has been discovered about how the human brain works in the last 15 years than in all history to date. The Accelerated Learning Method is based on that research. We each have a preferred learning style—a way of learning that suits us best. If you know and use the techniques that match your preferred way of learning, you learn more naturally. Because it is more natural for you, it becomes easier.

http://www.funderstanding.co.uk/accelerated_learning.cfm. The DfES National Key Stage 3 strategy contains a wide range of material on accelerated learning at:

http://www.standards.dfes.gov.uk/keystage3/search/?mode=basic_search&pagenumber=1&d=m-ks3&search_string=accelerated+learning

ACTION RESEARCH

This concept originated when Kurt Lewin (1935, 1936, and many subsequent publications) put the approach forward as a means of researching social issues and problems. He suggested a four-phase, continuous cycle of planning, acting, observing and reflecting, then re-planning and so on. This was later adapted by Kolb (1984) (see Figure 1).

In 1975, Lawrence Stenhouse applied the idea of action research to education with his concept of the ‘teacher as researcher’. It is still associated with the idea of teacher researchers or indeed any practitioner reflecting upon and researching their own practice in order to improve it. Elliott later expressed the idea in terms of enabling teachers to ‘act more intelligently and skilfully’ (1992, p.69) (see **reflective practice**).

Subsequently, various models of action research have been suggested, for example, several advocates have taken Lewin’s cycle and adapted it into an action research spiral, a model adapted by John Elliott in terms of a series of successive cycles. The spiral begins when those involved identify or ‘diagnose’ a particular problem, situation or issue that needs addressing. Discussion and planning follow and this leads to action or ‘intervention’, which is then monitored and evaluated. After the first cycle of diagnosing, planning, implementing and evaluating, the team will discuss the next stage of the spiral in the light of what has been learnt in the previous phase.

There is no one agreed definition of ‘action research’. Carr and Kemmis described it as follows:

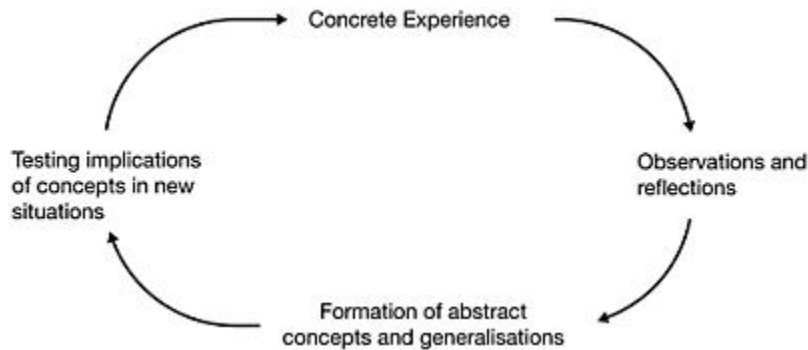


Figure 1 The experiential learning cycle

Source: Developed from the ideas of Kurt Lewin by Kolb (1984)

Action Research is a form of self-reflective enquiry undertaken by participants (teachers, students or principals) in social (including educational) situations in order to improve the rationality and justice of: (a) their own social or educational practices (b) their understanding of these practices and (c) the situations (and institutions) in which these practices are carried out.

(1986, p.2)

This has often been used as a working definition. Perhaps the key elements of action research are that it aims to do the following:

- to improve practice (as opposed to, say, simply studying it or describing it);
- to raise practitioners' awareness of their own practice;
- to bring about change as its primary aim, rather than just collecting research data and reporting on it;
- to monitor and evaluate any change and then to re-assess and modify the intervention or innovation;
- to be a collaborative effort among people working in the same setting—if 'outsiders' are involved they should work in partnership with insiders;
- to bridge the gap between theory and practice.

Action researchers are more than just external observers (though they may be 'participant observers', a term coined by ethnographers to show the importance in ethnography of observing one's own working environment and questioning its practices and taken-for-granted assumptions).

Action research has been used to focus on many different areas of education including the curriculum, pedagogy (teaching and learning), policy-making, management of educational institutions, and staff development. It is said to have several advantages as compared to 'traditional' approaches to research done by outsiders: the researcher may

often be an insider and will know and understand the situation and context of the situation being studied; action research may solve some of the traditional problems associated with the validity of research by allowing triangulation as a result of working collaboratively with others in the situation and reflecting on the process over time; and action research may solve certain ethical problems as it is likely to include those ‘being researched’ and will show sensitivity towards them. However, it could be argued that other approaches to research can be equally attentive to issues of triangulation and ethics; and also that action research faces as many problems as it solves, such as the possibility of the researcher being intimately involved in the research situation and therefore being biased or failing to question or ‘see’ things that an outsider might (‘going native’ as it is sometimes termed). There can also be ethical difficulties and power issues in researching one’s own colleagues or institution.

References and further reading

- Carr, W. and Kemmis, S. (1986) *Becoming Critical*, Lewes: Falmer Press.
Elliott, J. (1992) *Action Research for Educational Change*, Buckingham: Open University Press.
Kemmis, S. and McTaggart, R. (1988) *The Action Research Planner*, Geelong, Victoria: Deakin University Press.
Kolb, D. (1984) *Experiential Learning: Experience as the Source of Learning and Development*, Englewood Cliffs, NJ: Prentice-Hall.
Lewin, K. (1935) *A Dynamic Theory of Personality*, New York: McGraw-Hill.
——(1936) *Principles of Topological Psychology*, New York: McGraw-Hill.
McNiff, J. (1997) *Action Research: Principles and Practice*, London: Routledge.

Useful websites

<http://actionresearch.altec.org/>
http://carbon.cudenver.edu/~mryder/itc/act_res.html
<http://www.infed.org/research/b-actres.htm>
<http://www.infed.org/thinkers/et-lewin.htm>

AFFECTIVE DOMAIN

Humans are both thinking and feeling individuals; educators need to consider both, i.e. cognition and affect, as complementary. The affective domain is the component of **Bloom’s taxonomy** of educational objectives that involves the feeling and emotional side of learning and teaching, i.e. enjoyment, motivation, drive, passion, enthusiasm, inspiration. Educators have also employed the term ‘affect’ to describe attitudes, beliefs, tastes, appreciations and preferences.

The affective domain is an important domain for secondary and later phases of education, because it can be ignored by teachers in schools and lecturers in higher education who sometimes assume (wrongly) that all students past the primary phase provide their own motivation and inspiration. It may even explain why some teaching at university level can be so dull and uninspiring. Teachers and lecturers at all levels need to be reminded of this domain.

Why was it forgotten? As behaviourism became more dominant in educational psychology, affect was ruled out by some educators. Humans were viewed through a model of input-process-output with thinking processes which operate like a computer. Often in such a view, affect is seen as ‘a regrettable flaw in an otherwise perfect cognitive machine’ (Scherer, 1984, p.293). Now, most researchers who study human behaviour and human nature agree that the views of both extremes—emphasising only affect or only cognition—are undesirable. As Vygotsky put it, the separation of affect from cognition

is a major weakness of traditional psychology since it makes the thought process appear as an autonomous flow of ‘thoughts thinking themselves,’ segregated from the fullness of life, from the personal needs and interests, the inclinations and impulses, of the thinker. Such segregated thought must be viewed either as a meaningless epiphenomenon incapable of changing anything in the life or conduct of a person or else as some kind of primeval force exerting an influence on personal life in an inexplicable, mysterious way.

(1962, p.8)

According to Bloom *et al.* (1956; Kratwohl *et al.*, 1964), the affective domain includes ‘objectives’ that describe changes in interest, attitudes, emotions and values and the development of appreciation and adjustment. Bloom *et al.* set up a clear hierarchy for the *cognitive* domain, with factual recall at the bottom and understanding near the top. However, in the *affective* domain the hierarchy is less clear but is said to run from awareness and perception of value issues (‘receiving’ or ‘attending’) through responding, then valuing, to organising and conceptualising values. The authors clearly found this domain much harder to structure and organise into a neat order. Perhaps it is inappropriate to attempt a hierarchy.

Susan McLeod (see website) suggests that we view the affective domain using two dimensions: intensity and stability. In this view, emotions are intense but unstable (they do not last long); attitudes are less intense than emotions but more stable; and beliefs are less intense and more stable than attitudes. Thus attitudes can be changed, but beliefs are more difficult to change. Motivation would then, in this view, be seen as something involving both affect and cognition.

References and further reading

Bloom, B.S. (ed.) (1956) *Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook I: Cognitive Domain*, New York: McKay.

- Kratwohl, D.R., Bloom, B.S. and Masia, B. (1964) *Taxonomy of Educational Objectives: The Classification of Educational Goals, Handbook II: Affective Domain*, New York: McKay.
- Scherer, K.R. (1984) 'On the Nature and Function of Emotion: A Component Process Approach', in Scherer, K.R. and Ekman, P. (eds) *Approaches to Emotion*, Hillsdale, NJ: Erlbaum, pp.293–317.
- Vygotsky, L. (1962) *Thought and Language*, trans. Hanfmann, E. and Vakar, G., Cambridge, MA: MIT Press.

Useful website

<http://jac.gsu.edu/jac/11.1/Articles/6.htm> (Susan McLeod)

ALTERNATIVE FRAMEWORKS

Every student, of every age, comes into a classroom with some prior learning. This learning may involve skills or information they have acquired, either at home, outside, or in previous classroom experiences. But equally, students will have acquired prior concepts and ideas which have helped them make sense of their experiences. These prior concepts form 'frameworks' through which people understand what they see, read or hear. We all have frameworks by which we make sense of the world, whether we are aware of them or not. We have concepts about the physical/material world and concepts about the 'mental world' (concepts of how our mind and that of other people work). Without these concepts we could not operate successfully in a material or a social world; for example, people who are said to be 'autistic' are sometimes said to have a limited concept of mind, i.e. of how their mind and other human minds work—hence they are said to find it difficult to operate successfully in a social world and to interact with others (see **autism**).

In certain subject areas, such as science, there are accepted concepts and frameworks which are used in that discipline to conceptualise the physical world—or, in the case of psychology, the mental world; for example, physics uses scientifically accepted (at present) ideas of heat, work, energy and power. But many children (and adults) will operate, often successfully, with alternative concepts of, say, heat. For example, many children and adults view heat as a kind of fluid, which 'flows' from a hotter place to a cooler place (and 'cold' flows in the opposite direction). This can be a useful way of thinking about heat (e.g. you shut the window to stop the 'cold' from coming in) but it is not the accepted, established scientific view. Alternative notions or ideas such as these have been labelled 'alternative frameworks'.

In the past, they were sometimes called misconceptions. This is not always helpful for two reasons: first, it assumes that the 'textbook conception', e.g. the scientist's view of heat, is a true one and not subject to change; second, it implies that the alternative

conception is not helpful and that people cannot use it to live in the real world. This is patently untrue in the case of heat, where a concept that sees 'heat' and 'cold' as a kind of fluid, flowing from hot areas to cold ones (or vice versa), can be perfectly adequate for many purposes, e.g. stopping draughts in houses.

Why are 'alternative frameworks' important for education and for classroom teachers? First, because students' prior understandings and thoughts about a topic or concept before a lesson exert a tremendous influence on what they learn during teaching and learning. Alternative frameworks have proved remarkably resilient, and are stubborn and difficult to shift. This is true to the extent that students in science, for example, may operate in two 'domains' of thinking—one for the science classroom and the science examination and one for everyday life. Second, because for it to be **meaningful learning**, prior learning and prior conceptions need to be built upon. One of the teacher's primary goals is to bring about a change in the learner's cognitive structure or way of viewing the world. This can best be done by first gaining some knowledge about a student's prior conceptions (see **diagnostic assessment**).

Alternative frameworks are not confined to science learning. They may be present in other school subject areas such as mathematics, geography, history or technology. Equally, outside of school, students can also develop strong alternative frameworks or (mis) conceptions about a wide range of non-scientific areas such as how cars work, how the tax system operates, the process of government, money and money markets, how numbers work and many other areas. And alternative frameworks are not confined to school-age children. Even after several years of schooling, research has shown that people retain 'incorrect ideas' about scientific and other phenomena, e.g. the way that plants or trees grow; or how vision takes place.

Teaching for conceptual change

Learners' alternative frameworks and preconceptions are resistant to change. Learners rely on their own frameworks to understand and get by in their world; they may not wish to discard them and adopt a new way of thinking. Simply 'teaching' a new concept or telling the learners that their views are wrong will not result in conceptual change. One strategy suggested is to create 'cognitive conflict' (see **cognitive acceleration**). This involves creating situations where learners' existing conceptions about particular phenomena or topics are made explicit and then directly challenged in order to create a state of cognitive conflict or 'disequilibrium' (Piaget's term).

Cognitive conflict strategies can be part of Posner *et al.*'s (1982) suggested conditions for bringing about conceptual change. They can be summed up as:

- 1 There must be dissatisfaction with the currently held conception. If the learner's current understanding and ideas are satisfactory for making sense of a given phenomenon, the learner will be less likely to accept a new conception.
- 2 The new (to the learner) conception must make sense. Learners must be able to understand what the new conception means.

- 3 The new conception must appear plausible. Even if the learners understand the newly offered conception, they may not be able to see how it can be applied in a given situation or used to solve a particular problem.
- 4 The new conception must appear fruitful. It should do more than potentially solve current problems or answer questions. It must be useful in a variety of new situations.

To summarise, learners must become aware of their current conceptions, dissatisfied with them and accept a new notion as *intelligible*, plausible, and *fruitful*.

Teaching for conceptual change is not an easy process; it may often be more time-consuming than traditional, didactic ('tell them like it is') teaching methods. It requires a healthy and supportive classroom environment, where students feel confident talking about and sharing their ideas. Teaching for conceptual change also requires that the teacher should possess good facilitation skills and a thorough understanding of the topic or phenomenon in question.

References and further reading

There is a vast literature on alternative frameworks, but a few key references as starting points are:

- Nussbaum, J. and Novick, N. (1982) 'Alternative Frameworks, Conceptual Conflict, and Accommodation: Toward a Principled Teaching Strategy', *Instructional Science*, 11:183–200.
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- Scott, P., Asoko, H. and Driver, R. (1992) 'Teaching for Conceptual Change: A Review of Strategies', in Duit, R., Goldberg, F. and Niedderer, H. (eds) *Research in Physics Learning: Theoretical Issues and Empirical Studies*, Kiel: Institute for Science Education at the University of Kiel, pp.310–29.
- West, L. and Pines, A. (eds) (1985) *Cognitive Structure and Conceptual Change*, New York: Academic Press.

Useful websites

The following website, 'Constructing history: how historians see the light', illustrates the application of conceptual change to the domain of history (most of the other examples are limited to science topics).

http://www.coe.uga.edu/epltt/cc_example/history1.html

<http://www.coe.uga.edu/epltt/ConceptualChange.htm>