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A Diverse, If Not Exhaustive, Look at What Psychology Can Offer to Education: An Essay Review of the *International Handbook of Psychology in Education*

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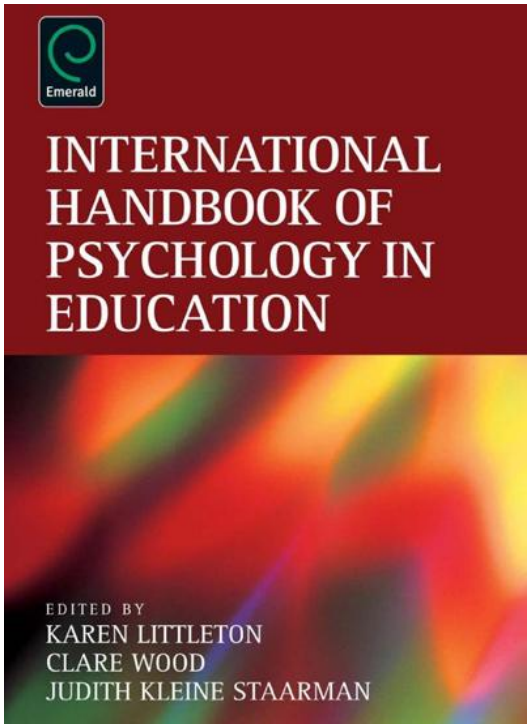
The *International Handbook of Psychology in Education* (or *Handbook* from this point) comprises 20 chapters organized into five sections on:

1. Early biological and cultural influences on young children's development, learning and educational attainment
2. Interaction, relationships and learning
3. Cultures, creativity and technologies
4. Individual differences and children's experiences of education
5. Knowledge, assessment and achievement

Here, then, are some key themes from the breadth of topics considered in psychology, all of which are clearly of direct relevance to the core concern of education, classroom teaching and learning (Pring, 2000). The *Handbook* has been well put together, with contributions from prominent scholars in the field. The contributors are internationally based, although the UK seems especially well represented. The contributions offer insight across a wide range of themes, and are well written, providing a significant book, exploring many aspects of how psychology does and can inform education. There is little doubt that such a book will be a useful source of information and perspectives.

The term "handbook" seems to be much liked by publishers, perhaps for the obvious reason that the latest handbook in a field should be expected to offer the most definitive guide to that field for the practitioner and researcher. Therefore, handbooks are likely to become important (and well selling) reference works. One immediate issue with the present *Handbook* is identifying the field it is intended to inform. The book is not a handbook of *Educational Psychology*, or even a handbook *for Psychologists* working in Education, but, it seemed to this reader, largely a handbook for those working in education looking to be informed by what psychology has to offer. That brings both strength and weakness. As education is such a wide and well-populated field, and as so much of educational practice can usefully be informed by psychology, the potential readership of the book could be vast. There is material here of potential value to undergraduate and graduate students, to teachers working at whatever level, and to researchers who are drawing on psychological perspectives to inform studies of education. Of course, much of this potential readership will have a selective interest, but that is the



nature of books meant largely for reference. The converse side of this type of book is that it is difficult to be comprehensive, and authors may be uncertain at what level to pitch their treatments of topics. The editors acknowledge the problem of covering everything a reader might expect in a handbook of this kind: "it is, of course, impossible to be exhaustive...our aim has been to incorporate...a diverse range of chapters" (p. xi).

Reviewing a Handbook

I decided that the most sensible way to approach reviewing such a book was to consider how I would wish to use it as a

reader. I would have a book like this on the shelves ready to refer to when I need information about some specific topic. So I decided to sample a few topics that I have a personal interest in, as a scholar in education whose work is often linked to psychological themes. I therefore selected some of the topics I have worked on, and approached the book's index to see how these topics were treated.

Psychological Perspectives on Constructivism

The first topic I decided to investigate through the *Handbook* was constructivism. Constructivism has been widely discussed in education (Larochelle, Bednarz, & Garrison, 1998; Phillips, 2000), and has been heavily critiqued as a perspective informing instruction (Tobias & Duffy, 2009). There are many "flavours" of constructivism (Bickhard, 1998), but the aspect which has arguably been most influential and important in education is what has been variously labeled as pedagogic, cognitive, or psychological constructivism: that is, a theory of learning which emphasises how personal knowledge is constructed piecemeal, using existing knowledge as the foundations for further learning. I use the term "personal knowledge" here to mean something other a philosopher's notion of true, justified belief (Goldman, 1995), but rather the ideas that a person either considers to be true, or at least to have some feasibility or utility in making sense of the world.

It is this "psychological" form of constructivism, drawing on findings from research into such areas as perception, concept formation, memory functioning, metacognition, and so forth, that has a very strong claim to be an important theoretical perspective for informing teachers in their work of planning, teaching, and functioning in classrooms (Taber, 2011). So constructivism is a major theme in the education literature, is often seen as a key idea in teaching and learning, and draws on several areas of psychology.

My initial inspection of the *Handbook* index was disappointing. There was no entry for "constructivism" *per se*, nor for "social constructivism," nor "constructionism," terms associated with the shift from a focus on personal construction of knowledge to a focus on the social aspects of human learning. However, I found entries for both "constructivist approach to learning" and "constructivist era."

The first of these references, to a "constructivist approach to learning," related to the first two pages (pp. 177-178) of a chapter (Chapter 6) by Kai Hakkarainen on *Learning communities in the classroom* (pp. 177-225), as part of the section on "Interaction, relationships and learning." Here the reader is told that,

> "so-called constructivist approaches to learning, in contrast [to 'traditional,' behaviourist-informed approaches], emphasise the fact that learning always takes place on the basis of a student's current understanding, involves his or her active 'constructive' efforts and cannot be externally controlled. The cognitive revolution of educational thinking, pioneered by the research of Jean Piaget and Jerome Bruner, involved

putting a student and his or her active efforts of knowledge construction and meaning making into the centre of educational discourse." (pp. 177-178)

Hakkarainen's treatment moved on to consider some of the work on cognitive learning which informed constructivist thinking, including Bruner's shift from a focus on the individual's learning, to learning as sharing of a culture, and then to the nature of classroom learning communities. Hakkarainen discusses a "trialogical," "object-centred" view of learning as "a collaborative process of advancing shared objects of activity" (p. 179) (cf., Engeström, Miettinen, & Punamäki, 1999). This is a relatively condensed treatment of constructivist approaches, as a background to different ways of thinking about classroom learning communities; however it does offer the reader a clear overview of some key aspects of constructivist thinking about learning.

The reference in the index to the "constructivist era" related to a chapter (Chapter 12) on *Technologies for formal and informal learning* by Charles Crook and Sarah Lewthwaite (pp. 435-461) in the section on Cultures, Creativity and Technologies. Here Crook and Lewthwaite describe "a period of technology enthusiasm around the decade of the-1980s [that] was notable for the extent to which it foregrounded constructivist thinking—making this framework distinctly central to learning designs" (pp. 444-445). They explain that the pioneer of technology in education, Seymour Papert, had studied with "the great constructivist, Jean Piaget" (p. 445).

Interestingly, although the term "constructionism" was not indexed, Crook and Lewthwaite do use the term in their chapter, when they describe how

"...computers were machines that, through various forms of programming language, could be made to do interesting things or create interesting products. In fact this emphasis on 'making things' encouraged use of the alternative term 'constructionism' as a distinctive realisation of the constructivist ideal - casting the learner in an engineering role." (p. 445)

I found this especially interesting as it suggests a rather different understanding of the term "constructionism" in this context of technology application, to common usage in other discourse on education. More often the term is used when describing how "processes by which language is used and meaning is constructed are social processes, which reside within groups or societies, and that these processes constitute knowledge" (Bodner, Klobuchar, & Geelan, 2001), as opposed to the personal constructivist perspective where knowledge is considered to reside in individual learners' (and teachers') minds (Pope, 1982).

Crook and Lewthwaite report how studies of students working in computer generated "microworlds" found that "unstructured constructionist activity" did not lead to significant impacts, and that "a significant degree of teacher guidance or scaffolding" was an important feature of effective learning (p. 446). Interestingly, this is a message that reflects a "social constructivist" perspective, even though the term "unstructured

constructionist activity"' would seem to be an oxymoron from *that* perspective. The contemporary perspective on "psychological" constructivism is very much about how teachers can offer scaffolding and guidance to support (and in particular, channel or direct) the construction of knowledge, and learning through "unstructured" activity would not be considered a suitable component of constructivist teaching (Taber, 2011).

Although there were few obvious entries in the *Handbook* index to constructivism *per se*, there was a reference to "Piagetian constructivism." This related to an interesting chapter (Chapter 9) by Seanna Moran (pp. 319-359) on *Creativity in School* (also in the section on Cultures, Creativity and Technologies). Piaget was only mentioned in passing here, but this chapter did set out a perspective based on another key investigator of constructivist thinking, Vygotsky. Piaget and Vygotsky are both referred to liberally thoughout the *Handbook*, usually without any explicit link to the constructivist nature of their thinking. In addition, relying on the index could lead a reader to completely miss the whole chapter by editor Staarman and Neil Mercer on *The guided construction of knowledge: talk between teachers and students* (Chapter 3, in the section on Interaction, Relationships and Learning). I will consider this chapter below, in relation to dialogic teaching.

Overall, I felt constructivist themes were strongly reflected in the *Handbook*, although a novice searching out information on the topic through the index might well have found much of what was relevant was not clearly signposted; it is obviously easier to seek out material when you already know about some of the related terms and associated ideas to support a search. This suggests that despite what seems at first sight an extensive index, a book such as this might actually benefit from on-line representation where readers can more readily search keywords.

Psychological Perspectives on Giftedness

Another area of my own work with strong links to psychology relates to the idea of giftedness. Having run several projects related to challenging the most able students in science classes, I had found limited research on giftedness in the science education journals, but much relevant material to inform this area of work in the psychological literature (Taber, 2007b). I found that the *Handbook* had no index entry for "giftedness," so I looked instead for "high ability" and "ability," but neither of these alternatives was listed. The term "talent" (in the UK, the government guidance documents often conflate "gifted and talented") did not feature either in the index. "Creativity," however, was well represented (as might be expected in a book with a section on Cultures, Creativity and Technologies').

I looked for index entries for "intelligence" and found references to "intelligence quotient" (IQ) and "intelligence tests." The entries on IQ were in the chapter (Chapter 16) by Robert Savage and Louise Deault on *Understanding and supporting children experiencing dyslexia and ADHD* (pp. 567-606), in the section on Individual Differences and Children's Experiences of Education. The

reference related to historical approaches to diagnosing learning difficulties. The entry on intelligence tests related to a reference to the use of such tests to provide "baseline" information in a chapter (Chapter 17) by Elaine Funnel and Sylvia Steel on *Single case studies of cognitive development and their educational relevance* (pp. 609-640) in the section on Knowledge, Assessment and Achievement.

Neither of these references offered much on my theme of giftedness, but arguably much in Seana Moran's chapter on *Creativity in school*, referred to above, could be seen as relevant. This chapter made some explicit references to programmes for gifted learners, and there was also a reference to such programmes in Chapter 14 (by Herbert W. Marsh and Karolina Retali) on *Academic self concept* (pp. 499-533), but not significant enough to be included in the index.

In my own work on gifted education with science students, I adopted student metacognition as one key target for challenging learners (Taber, 2007a), so the chapter (Chapter 19) on *Metacogntion, self-regulation and meta-knowing* by David Whitebread and Deborah Pino Pasternak (pp. 673-711), as part of the section on Knowledge, Assessment and Achievement would certainly have been helpful to me in that regard, even though Whitebread and Pasternak's focus on younger learners than those my projects were designed for. I felt (although I should acknowledge that I am here commenting on the work of Faculty colleagues) this chapter would certainly make a good general introduction to this topic for someone new to the concept of metacognition.

Psychological Insight on Dialogic Teaching

One of the projects I am currently working on is concerned with improving science and math teaching at lower secondary level, and one key feature of this is the use of "dialogic" teaching. In this context, the chapter on *The guided construction of knowledge* by Judith Klein Staarman and Neil Mercer is highly relevant. As Mercer is a colleague of the reviewer, I could be considered to show some bias here, but I remember being strongly influenced by Edwards and Mercer's (1987) *Common Knowledge* long before I ever met Mercer; and his work on classroom dialogue would seem to be one of the mooted psychological perspectives discussed in the book with the most promise for developing teachers' classroom behaviour in ways which can significantly improve teaching by bringing about student learning, and especially conceptual change. As these authors suggest "dialogic talk in education aims to cultivate knowledge and transform understanding through interaction and reflection, in particular through the participation of multiple voices and discourses in the dialogue" (p. 87). Staarman and Mercer's chapter is an important contribution to a book such as this.

As noted above, this topic does link strong with the theme of constructivism, for as Staarman and Mercer suggest this teaching approach is "characterised by substantial and significant contributions from both teachers and students which help to move forward

children's thinking on a given idea or theme" (p. 88). That is, the approach is constructivist in drawing upon students' ideas, and recognising that their existing understanding and experiences provide the resources for their further learning; yet this does not mean (as some critics sometimes imply) simply celebrating students' own ideas rather than looking to teach the canonical ideas of the subject. Rather, the teacher works with both the learners' inputs *and* the authoritative voice of the curriculum. Staarman and Mercer discuss a range of relevant ideas, including the scholarly work of Robin Alexander, which has explored dialogic teaching drawing on a range of cultural contexts. Perhaps of most direct relevance to classroom practitioners, however, is what Mortimer and Scott (2003) termed the "communicative approach," which offers a simple model that can be readily explained to, and applied by, teachers to analyse and so monitor the balance and sequencing of different types of classroom talk, and in particular the shift between periods of exploring students' ideas and then (informed by, and responding to, their current state of understanding) setting out the canonical account that acts as target knowledge in the curriculum. The model is presented and explained (pp. 95-96), before Staarman and Mercer discuss empirical classroom work informed by this framework.

Cognitive Accounts of Learning

I also sought to find index references to a number of key terms relating to aspects of learning that feature in my own area of research, and which draw on various cognitive science perspectives. I could find no entries for "phenomenological primitives" (a.k.a. p-prims) or to "implicit knowledge," although there was an entry for implicit processes and metacognition, relating to the Whitebread and Pasternak chapter mentioned above. I could not find an entry for "natural kinds," although I would consider this an important idea for understanding student concept learning (Keil, 1992). Nor could I find any reference to "modularity of mind" in the index, or in the book, although again this would seem a very relevant idea to education (Fodor, 1983). Perhaps even more surprisingly for a psychology handbook, and perhaps reflecting trends in the discourses of the subject, there was not even an index entry for the term "mind," or the related term "memory" (although there is an entry for "working memory")! There were some references in the book to "domains," although "domain specificity" in relation to student cognitive structure (Hirschfeld & Gelman, 1994) was not a specific theme discussed.

There were no entries relating to "alternative conceptions," "conceptual frameworks," "misconceptions" or "intuitive theories"—common terms used in my field to describe aspects of student knowledge and thinking (Taber, 2009). "Mental models," another term commonly used (if not always in a very technical sense) in my own area of research was indexed, in relation to its use in Chapter 5 on *Argumentation and reasoning*, by Baruch S. Schwarz and Christa S. C. Asterhan (pp. 137-176) in the section on Interaction, Relationships and Learning. These authors referred to students' different mental models of evolutionary processes, but did not explain the term in any detail.

This reflects a key issue in research in my own area, where researchers have adopted a wide range of pseudo-technical terms, such as mental models, conceptual frameworks, alternative conceptions, but often but tend to use them without clear definition, and sometimes almost interchangeably more in "the natural attitude" (Schutz & Luckman, 1973) than in a scientific (i.e., scholarly) manner. This is clearly problematic in an academic field, as knowledge claims based on fuzzy constructs become ambiguous and indeed often vague, both fueling apparent discrepancies between findings and undermining the ability of research to effectively inform educational practice and to build cumulatively in a programmatic manner (Taber, forthcoming).

Karmiloff-Smith's (1996) ideas about representational redescription did not feature in the book, despite their relevance to conceptual development, and in particular offering insight into Vygotsky's (1934/1986) ideas on the topic. Nor did Thagard's (1992) ideas about the significance of explanatory coherence in conceptual change. There were no explicit reference to cognitive dissonance, or Gestalt theory, and nothing about using bridging analogies in teaching: indeed the word analogy appeared to be used only to be used once in the book, and was not indexed, despite being the basis of core ideas about learning (Goswami, 2008).

Overview

The *Handbook* is a substantive volume, and the editors have done a good job of eliciting well-written contributions on a wide range of important themes where psychology offers approaches and insights to inform education. I have examined the book as a potential reader might approach a reference work with the question of how useful I would find it as a resource. That is a highly subjective thing to do; another reader, with different research interests, would seek a completely different set of topics. However, it seems a suitable way to approach reviewing a handbook. This approach revealed that I readily found a lot of information on some topics of interest, and nothing on others, despite selecting terms I considered to relate to psychological perspectives on learning. I found the book very informative, but the treatment of some topics I was interested in did not greatly extend my own knowledge in these areas. This highlights the two problems raised early in the review inherent in such a book.

Firstly, psychology is a broad discipline, and so much of it has direct relevance to education, that a book on how psychology can inform education that is not selective will be impractically large and expensive. Secondly, it is difficult to pitch such a handbook in terms of level of treatment of topics. Within a specialist field, chapter authors will know they are writing for others working in the field. They will also know they are being asked to offer something definitive as an account of the current state of their topic. Yet this *Handbook*, although written by

experts in areas of psychology in education, is clearly intended to be useful to a wide readership, including many working in education with limited backgrounds in psychology. The authors have done a good job in this regard, offering scholarly accounts of topics that are accessible to those without specialist knowledge. Despite my personal disappointment with finding little here on many topics I might have hoped to find in a book on psychology in education, I can see myself, over time, referring to many of the accounts here as I need an introduction to some of the wide range of topics covered in the *Handbook*. I certainly understand, then, why the editors sensibly declined and sought to deflect any expectation that they should offer an "exhaustive" account of psychology in education. Given that rather serious proviso, I consider they have done a good job in selecting and editing together a "diverse" range of well-informed and interesting commentaries on some fascinating and important topics.

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