

Writing Strategies for the Education Dissertation

Donald Schon (Schön): learning, reflection and change. Donald Schon made a remarkable contribution to our understanding of the theory and practice of learning. His innovative thinking around notions such as "the learning society", "double-loop learning" and "reflection-in-action" has become part of the language of education. We explore his work and some of the key themes that emerge. What assessment can we make now?

Contents: introduction · donald schon · public and private learning and the learning society · double-loop learning · the reflective practitioner · reflection-in- and "on-action" · conclusion · further reading and references · links · how to cite this article

Note: I have used Donald Schon rather than Donald Schön (which is the correct spelling) as English language web search engines (and those using them!) often have difficulties with umlauts).

Donald Alan Schon (1930-1997) trained as a philosopher, but it was his concern with the development of reflective practice and learning systems within organizations and communities for which he is remembered. Significantly, he was also an accomplished pianist and clarinetist " playing in both jazz and chamber groups. This interest in improvisation and structure was mirrored in his academic writing, most notably in his exploration of professional's ability to "think on their feet". On this page we review his achievements and focus on three elements of his thinking: learning systems (and learning societies and institutions); double-loop and organizational learning (arising out of his collaboration with Chris Argyris); and the relationship of reflection-in-action to professional activity.

Donald Schon

Donald Schon was born in Boston in 1930 and raised in Brookline and Worcester. He graduated from Yale in 1951 (Phi Beta Kappa), where he studied philosophy. He was also a student at the Sorbonne, Paris and Conservatoire Nationale de Music, where he studied clarinet and was awarded the Premier Prix. After graduating, he received the Woodrow Wilson Fellowship and continued at Harvard, where he earned master's and doctoral degrees in philosophy. The focus for his doctoral dissertation (1955) was John Dewey's theory of inquiry " and this provided him with the pragmatist framework that runs through his later work. In 1953 he began to teach Philosophy at the University of California, Los Angeles. This was followed by two years of service in the U.S. Army. Concurrently, he lectured at University of Kansas City as an Assistant Professor of Philosophy.

Working from 1957-63 as senior staff member in the industrial research firm Arthur D. Little, Inc., Donald Schon formed the New Product Group in the Research and Development Division. Under the Kennedy administration, he was appointed director of the Institute for Applied Technology in the National Bureau of Standards at the US Department of Commerce (he continued there until 1966). He then co-founded and directed OSTI (Organization for Social and Technological Innovation), a non-profit social research and development firm in

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the Boston area (he left the directorship in 1973).

His first book, *Displacement of Concepts* (1963) (republished in 1967 as *Invention and the Evolution of Ideas*) dealt with "the ways in which categories are used to examine "things" but are not themselves examined as ways of thinking" (Parlett 1991, quoted in Pakman 2000). Pakman (2000:3) goes on to comment:

The interest in metaphor expressed in that book, would grow years later toward his elaborations on "generative metaphor," and its role in allowing us to see things anew. Thus, he was already showing some of what would be epistemological enduring interests for his inquiry, namely: learning and its cognitive tools, and the role of reflection (or lack of it) in learning processes in general, and conceptual and perceptual change in particular.

Donald Schon's next book *Technology and Change, The new Heraclitus* (1967) developed out of his experience as an organizational consultant and received considerable critical acclaim. He was invited to give the 1970 Reith Lectures in London. His focus, "Change and industrial society," became the basis for his path-breaking book: *Beyond the Stable State*. Schon's central argument was that "change" was a fundamental feature of modern life and that it is necessary to develop social systems that could learn and adapt. Both books show the influence of the work of his great friend and colleague, Raymond Hainer. (Donald Schon had been able to work through his ideas with Hainer, and to draw upon, for example, his exploration of pragmatism, rationalism and existentialism [Hainer 1968]).

Donald Schon became a visiting professor at MIT (Massachusetts Institute of Technology) in 1968. In 1972, he was appointed Ford Professor of Urban Studies and Education there. From 1990-92, he served as chair of the Department of Urban Studies and Planning. He later became Ford Professor Emeritus and senior lecturer in the School of Architecture and Planning. The time at MIT was very productive " and he was later to describe the climate of MIT's Division for Study and Research in Education as especially conducive to thinking and research. While he was there he began a very fruitful collaboration with Chris Argyris. This collaboration involved teaching, researching and consulting and resulted in three key publications: *Theory in Practice: Increasing Professional Effectiveness* (1974), *Organizational Learning: A Theory of Action Perspective* (1978), and *Organizational Learning II: Theory, Method, and Practice* (1996). Here we can see Donald Schon's attention moving toward some of the themes that emerged in *The Stable State*. There is a concern with professional learning, learning processes in organizations, and with developing critical, self-reflecting practice.

It was the last of these areas that then provided the focus for the deeply influential series of books around the processes and development of reflective practitioners (1983; 1987; 1991). He sought to offer an approach to an epistemology of practice based on a close examination of what a (small) number of different practitioners actually do. The heart of this study was, he wrote, "an analysis of the distinctive structure of reflection-in-action" (1983: ix). He argued that it was "susceptible to a kind of rigor that is both like and unlike the rigor of scholarly work and controlled experimentation" (op. cit.). His work was quickly, and enthusiastically, taken up by a large number of people involved in the professional development of educators, and a number of other professional groupings.

His last major new literary project arose out of a long-term collaboration, dating back to the early 1970s, with Martin Rein (a colleague at MIT). *Frame Reflection* (Schon and Rein 1994) is concerned with the ways in which intractable policy controversies can be reconciled. During his later years Donald Schon also developed an interest in software design and, in particular, the role of computers in designing, and the uses of design games to expand designing capabilities.

Donald Schon died September 13, 1997 at Brigham and Women's Hospital after a seven-month illness.

Public and private learning, and the learning society

While it is Donald Schon's work on organizational learning and reflective practice that tends to receive the most attention in the literature, his exploration of the nature of learning systems and the significance of learning in changing societies has helped to define debates around the so called "learning society". Indeed, Stewart Ranson (1998: 2) describes Donald Schon as "the great theorist of the learning society". He was part of the first wave of thinkers around the notion (other key contributors include Robert M. Hutchins 1970; Amitai Etzioni 1968; and Torsten Husen 1974). Hutchins, in a book first published in 1968, had argued that a "learning society" had become necessary. "The two essential facts are| the increasing proportion of free time and the rapidity of change. The latter requires continuous education; the former makes it possible (1970: 130). He looked to ancient Athens for a model. There:

education was not a segregated activity, conducted for certain hours, in certain places, at a certain time of life. It was the aim of the society. The city educated the man. The Athenian was educated by culture, by *paideia*. (Hutchins 1970: 133)

Slavery made this possible â€" releasing citizens to participate in the life of the city. Hutchinsâ€™ argument is that â€"machines can do for modern man what slavery did for the fortunate few in Athensâ€™ (op. cit.)

Donald Schon (1973, first published 1971) takes as his starting point the loss of the stable state. Belief in the stable state, he suggests, is belief in â€"the unchangeability, the constancy of central aspects of our lives, or belief that we can attain such a constancyâ€™ (Schon 1973: 9). Such a belief is strong and deep, and provides a bulwark against uncertainty. Institutions are characterized by â€"dynamic conservatismâ€™ â€" â€"a tendency to fight to remain the sameâ€™ (ibid.: 30). However, with technical change continuing exponentially its pervasiveness and frequency was â€"uniquely threatening to the stable stateâ€™ (ibid.: 26). He then proceeds to build the case for a concern with learning (see inset).

Exhibit 1: Donald Schon on learning and the loss of the stable state

The loss of the stable state means that our society and all of its institutions are in continuous processes of transformation. We cannot expect new stable states that will endure for our own lifetimes.

We must learn to understand, guide, influence and manage these transformations. We must make the capacity for undertaking them integral to ourselves and to our institutions.

We must, in other words, become adept at learning. We must become able not only to transform our institutions, in response to changing situations and requirements; we must invent and develop institutions which are â€"learning systemsâ€™, that is to say, systems capable of bringing about their own continuing transformation.

The task which the loss of the stable state makes imperative, for the person, for our institutions, for our society as a whole, is to learn about learning.

What is the nature of the process by which organizations, institutions and societies transform themselves? What are the characteristics of effective learning systems? What are the forms and limits of knowledge that can operate within processes of social learning? What demands are made on a person who engages in this kind of learning? (Schon 1973: 28-9)

Donald Schon argues that social systems must learn to become capable of transforming themselves without intolerable disruption. In this "dynamic conservatism" has an important place.

A learning system must be one in which dynamic conservatism operates at such a level and in such a way as to permit change of state without intolerable threat to the essential functions the system fulfils for the self. Our systems need to maintain their identity, and their ability to support the self-identity of those who belong to them, but they must at the same time be capable of transforming themselves. (Schon 1973: 57)

Schon's great innovation at this point was to explore the extent to which companies, social movements and governments were learning systems and how those systems could be enhanced. He suggests that the movement toward learning systems is, of necessity, "a groping and inductive process for which there is no adequate theoretical basis" (op. cit). The business firm, Donald Schon argues, is a striking example of a learning system. He charts how firms moved from being organized around products toward integration around "business systems" (ibid.: 64). In an argument that has found many echoes in the literature of the "learning organization" some twenty years later, Donald Schon makes the case that many companies no longer have a stable base in the technologies of particular products or the systems build around them. A firm is:

"an internal learning system in which the system's interactions must now become a matter of directed transformation of the whole system. These directed transformations are in part the justification for the business systems firm. But they oblige it to internalise processes of information flow and sequential innovation which have traditionally been left to the "market" and to the chain reactions within and across industry lines " reactions in which each firm had only to worry about its own response as one component. The business firm, representing the whole functional system, must now learn to effect the transformation and diffusion of the system as a whole. (Schon 1973: 75)

In many respects, we could not ask for a better rationale for Peter Senge's later championship of the Fifth Discipline (systemic thinking) in the generation of learning organizations.

Two key themes arise out of Donald Schon's discussion of learning systems: the emergence of functional systems as the units around which institutions define themselves; and the decline of centre-periphery models of institutional activity (ibid.: 168). He contrasts classical models of diffusing innovation with a learning system model.

Classical models for the diffusion of innovations Learning systems™ models around the diffusion of innovation The unit of innovation is a product or technique. The unit of innovation is a functional system. The pattern of diffusion is centre-periphery. The pattern of diffusion is systems transformation. Relatively fixed centre and leadership. Shifting centre, ad hoc leadership. Relatively stable message; pattern of replication of a central message. Evolving message; family resemblance of messages. Scope limited by resource and energy at the centre and by capacity of ~spokes™. Scope limited by infrastructure technology. ~Feedback™ loop moves from secondary to primary centre and back to all secondary centres. ~Feedback™ loops operate local and universally throughout the systems network.

In this we can see the significance of networks, flexibility, feedback and organizational transformation. At the same time we have to recognize that the ~ways of knowing™ offered by the dominant rational/experimental model are severely limited in situations of social change. Donald Schon looks to a more ~existentially™-oriented approach. He argues for formulating projective models that can be carried forward into further instances (a key aspect of his later work on reflective practice).

Moreover, learning isn™t simply something that is individual. Learning can also be social:

A social system learns whenever it acquires new capacity for behaviour, and learning may take the form of undirected interaction between systems. [G]overnment as a learning system carries with it the idea of public learning, a special way of acquiring new capacity for behaviour in which government learns for the society as a whole. In public learning, government undertakes a continuing, directed inquiry into the nature, causes and resolution of our problems.

The need for public learning carries with it the need for a second kind of learning. If government is to learn to solve new public problems, it must also learn to create the systems for doing so and discard the structure and mechanisms grown up around old problems. (Schon 1973: 109)

The opportunity for learning, Donald Schon suggests, is primarily in discovered systems at the periphery, ~not in the nexus of official policies at the centre™ (ibid.: 165). He continues, ~the movement of learning is as much from periphery to periphery, or from periphery to centre, as from centre to periphery™. Very much after Carl Rogers, Donald Schon asserts that, ~Central comes to function as facilitator of society™s learning, rather than as society™s trainer™ (ibid.: 166).

Taken together, the themes that emerged in *Beyond the Stable State* provided a rich and highly suggestive basis for theorizing about both "the learning society" and "the learning organization". Yet for all his talk of networks and the significance of the "periphery", Donald Schon's analysis falters when it comes to the wider picture.

While his critical analysis of systems theory substitutes responsive networks for traditional hierarchies, his theory of governance remains locked in top-down paternalism. Only an understanding of the role of democratic politics can provide answers to the purposes and conditions for the learning society he desires. The way societies learn about themselves, and the processes by which they transform themselves, is through politics, and the essence of politics is learning through public deliberation, which is the characteristic of effective learning systems. (Ranson (1998: 9)

Donald Schon's later work with Martin Rein around frame reflection does attend to some matters of public deliberation " but the broad line of argument made by Stuart Ranson here would seem to stand. It was the contribution of two of Schon's contemporaries " Ivan Illich and Paulo Freire " that takes us forward. The former focus on learning webs, the debilitating impact of professionalization, and the need for an ecological appreciation; and the latter's championship of dialogue and concern to combat oppression allow for a more committed and informed engagement with the "learning society" and "learning organization".

Double-loop learning and theories in use

Donald Schon's work on learning systems fed nicely into a very significant collaboration with Chris Argyris around professional effectiveness and organizational learning. Their (1974) starting point was that people have mental maps with regard to how to act in situations. This involves the way they plan, implement and review their actions. Furthermore, they asserted that it is these maps that guide people's actions rather than the theories they explicitly espouse. One way of making sense of this is to say that there is split between theory and action. Chris Argyris and Donald Schon suggested that two theories of action are involved. They are those theories that are implicit in what we do as practitioners and managers, and those on which we call to speak of our actions to others. The former can be described as theories-in-use. The words we use to convey what we, do or what we would like others to think we do, can then be called espoused theory. This was an important distinction and is very helpful when exploring questions around professional and organizational practice (see Chris Argyris and theories of action for a full treatment of this area).

To fully appreciate theory-in-use we require a model of the processes involved. To this end Argyris and Schon (1974) initially looked to three elements:

Governing variables: those dimensions that people are trying to keep within acceptable limits. Any action is likely to impact upon a number of such variables – thus any situation can trigger a trade-off among governing variables.

Action strategies: the moves and plans used by people to keep their governing values within the acceptable range.

Consequences: what happens as a result of an action. These can be both intended – those actor believe will result – and unintended. In addition those consequences can be for the self, and/or for others. (Anderson 1997)

For Argyris and Schön (1978: 2) learning involves the detection and correction of error. Where something goes wrong, they suggested, a starting point for many people is to look for another strategy that will address and work within the governing variables. In other words, given or chosen goals, values, plans and rules are operationalized rather than questioned. According to Argyris and Schön (1974), this is single-loop learning. An alternative response is to question to governing variables themselves, to subject them to critical scrutiny. This they describe as double-loop learning. Such learning may then lead to an alteration in the governing variables and, thus, a shift in the way in which strategies and consequences are framed. (See Chris Argyris and double-loop learning).

When they came to explore the nature of organizational learning Chris Argyris and Donald Schon (1978: 2-3) described the process as follows:

When the error detected and corrected permits the organization to carry on its present policies or achieve its presents objectives, then that error-and-correction process is single-loop learning. Single-loop learning is like a thermostat that learns when it is too hot or too cold and turns the heat on or off. The thermostat can perform this task because it can receive information (the temperature of the room) and take corrective action. Double-loop learning occurs when error is detected and corrected in ways that involve the modification of an organization's underlying norms, policies and objectives.

Single-loop learning seems to be present when goals, values, frameworks and, to a significant extent, strategies are taken for granted. The emphasis is on – techniques and making techniques more efficient – (Usher and Bryant: 1989: 87) Any reflection is directed toward making the strategy more effective. Double-loop learning, in contrast, – involves questioning the role of the framing and learning systems which underlie actual goals and strategies –

(op. cit.).

Finger and Asã°n (2000) argue that this constitutes a two-fold contribution to pragmatic learning theory. First, their introduction of the notion of "theory in action" gives greater coherence and structure to the function of "abstract conceptualization" in Kolb's very influential presentation of experiential learning. "Abstract conceptualisation now becomes something one can analyse and work from" (Finger and Asã°n 2000: 45). Second, they give a new twist to pragmatic learning theory:

Unlike Dewey's, Lewin's or Kolb's learning cycle, where one had, so to speak, to make a mistake and reflect upon it| it is now possible| to learn by simply reflecting critically upon the theory-in-action. In other words, it is not longer necessary to go through the entire learning circle in order to develop the theory further. It is sufficient to readjust the theory through double-loop learning (ibid.: 45-6)

To be fair to John Dewey, he did not believe it was necessary to go through a series of set stages in order to learn (although he is often represented as doing so). However, Finger and Asã°n's main point stands. The notion of double-loop learning adds considerably to our appreciation of experiential learning.

The reflective practitioner " reflection-in- and "on-action

Donald Schon's third great contribution was to bring "reflection" into the centre of an understanding of what professionals do. The opening salvo of *The Reflective Practitioner* (1983) is directed against "technical-rationality" as the grounding of professional knowledge. Usher et. al. (1997: 143) sum up well the crisis he identifies. Technical-rationality is a positivist epistemology of practice. It is "the dominant paradigm which has failed to resolve the dilemma of rigour versus relevance confronting professionals". Donald Schon, they claim, looks to an alternative epistemology of practice "in which the knowledge inherent in practice is be understood as artful doing" (op. cit.). Here we can make a direct link between Donald Schon and Elliot Eisner's (1985; 1998) interest in practitioners as connoisseurs and critics (see Eisner on evaluation).

The notions of reflection-in-action, and reflection-on-action were central to Donald Schon's efforts in this area. The former is sometimes described as "thinking on our feet". It involves looking to our experiences, connecting with our feelings, and attending to our theories in use. It entails building new understandings to inform our actions

in the situation that is unfolding.

The practitioner allows himself to experience surprise, puzzlement, or confusion in a situation which he finds uncertain or unique. He reflects on the phenomenon before him, and on the prior understandings which have been implicit in his behaviour. He carries out an experiment which serves to generate both a new understanding of the phenomenon and a change in the situation. (Schön 1983: 68)

We test out our "theories" or, as John Dewey might have put it, "leading ideas" and this allows to develop further responses and moves. Significantly, to do this we do not closely follow established ideas and techniques "textbook schemes. We have to think things through, for every case is unique. However, we can draw on what has gone before. In many respects, Donald Schon is using a distinction here that would have been familiar to Aristotle " between the technical (productive) and the practical.

We can link this process of thinking on our feet with reflection-on-action. This is done later " after the encounter. Workers may write up recordings, talk things through with a supervisor and so on. The act of reflecting-on-action enables us to spend time exploring why we acted as we did, what was happening in a group and so on. In so doing we develop sets of questions and ideas about our activities and practice.

The notion of repertoire is a key aspect of this approach. Practitioners build up a collection of images, ideas, examples and actions that they can draw upon. Donald Schon, like John Dewey (1933: 123), saw this as central to reflective thought.

When a practitioner makes sense of a situation he perceives to be unique, he sees it as something already present in his repertoire. To see this site as that one is not to subsume the first under a familiar category or rule. It is, rather, to see the unfamiliar, unique situation as both similar to and different from the familiar one, without at first being able to say similar or different with respect to what. The familiar situation functions as a precedent, or a metaphor, or an exemplar for the unfamiliar one. (Schön 1983: 138)

In this way we engage with a situation. We do not have a full understanding of things before we act, but, hopefully, we can avoid major problems while "testing the water". When looking at a situation we are influenced by, and use, what has gone before, what might come, our repertoire, and our frame of reference. We are able to draw upon certain

routines. As we work we can bring fragments of memories into play and begin to build theories and responses that fit the new situation.

There have been three important areas of criticism with regard to this model (beyond those wanting to hang onto "technical rationality"). First, the distinction between reflection in and on action has been the subject of some debate (see Eraut 1994 and Usher et al 1997). Indeed Donald Schon may well have failed to clarify what is involved in the reflective process " and there is a problem, according to Eraut, around time " "when time is extremely short, decisions have to be rapid and the scope for reflection is extremely limited" (1994: 145). There have also been no psychological elaborations of the psychological realities of reflection in action (Russell and Munby 1989). However, when we take reflection in and on action together it does appear that Schon has hit upon something significant. Practitioners are able to describe how they "think on their feet", and how they make use of a repertoire of images, metaphors and theories. However, such processes cannot be repeated in full for everything we do. There is a clear relationship between reflection in and on action. People draw upon the processes, experiences and understandings generated through reflection on action. In turn, things can be left and returned to.

We have to take certain things as read. We have to fall back on routines in which previous thought and sentiment has been sedimented. It is here that the full importance of reflection-on-action becomes revealed. As we think and act, questions arise that cannot be answered in the present. The space afforded by recording, supervision and conversation with our peers allows us to approach these. Reflection requires space in the present and the promise of space in the future. (Smith 1994: 150)

Second, there is some question as to the extent to which his conceptualisation of reflective practice entails praxis. While there is a clear emphasis on action being informed, there is less focus on the commitments entailed. Donald Schon creates, arguably, "a descriptive concept, quite empty of content" (Richardson 1990: 14). While he does look at values and interpretative systems, it is the idea of repertoire that comes to the fore. In other words what he tends to look at is the process of framing and the impact of frame-making on situations:

As [inquirers] frame the problem of the situation, they determine the features to which they will attend, the order they will attempt to impose on the situation, the directions in which they will try to change it. In this process, they identify both the ends to be sought and the means to be employed. (Schon 1983: 165)

The ability to draw upon a repertoire of metaphors and images that allow for different ways of framing a situation is clearly important to creative practice and is a crucial insight. We can easily respond in inappropriate ways in situations through the use of an ill-suited frame. However, what we also must hold in view is some sense of what might make for the good (see Smith 1994: 142-145).

Third, it could be argued that while Donald Schon is engaged here in the generation of formal theory " what we do not find in Schon is a reflection by him on his own textual practice in giving some kind of account of that he does of reflection-in-action and the reflective practicum. He does not interrogate his own method". (Usher et. al 1997: 149). A more sustained exploration of his methodology may well have revealed some significant questions, for example, the extent to which he "neglects the situatedness of practitioner experience" (ibid.: 168). This is a dimension that we have become rather more aware of following Lave and Wenger's (1991) exploration of situated learning. It may well be that this failure to attend to method and to problematize the production of his models and ideas has also meant that his contribution in this area has been often used in a rather unreflective way by trainers.

Conclusion

The impact of Donald Schon's work on reflective practice has been significant " with many training and education programmes for teachers and informal educators adopting his core notions both in organizing experiences and in the teaching content. Indeed, there is a very real sense in which his work on reflective practice has become "canonical" " frequently appealed to by trainers in a variety of professional fields (Usher et . al. 1997: 143). As such they have suffered from being approached in ways that would have troubled Donald Schon. Rather too often, practitioners are exhorted to "apply" his theories and exemplars to their own situations and experiences. For him reflective practice was to be enacted. It may be that his theory of reflective practice is far less "critical" than it appears to be, "since it is not directed to its own situated practice of doing theory" (Usher et. al. 1997: 147). However, it remains very suggestive " and for has some very real echoes in people's accounts of their processes as "professionals".

In a similar fashion, his work with Chris Argyris still features very strongly in debates around organizational learning and the possibilities, or otherwise, of learning organizations. And while there is good deal of rhetoric around the notion of the learning society, as Stuart Ranson has convincingly argued, it is Donald Schon's work on learning systems that still provides the most thorough theoretical treatment.

Taken together with his work on design and upon the "resolution of intractable policy controversies" via "frame reflection" this is a remarkable catalogue of achievements. Interestingly, though, it is difficult to find a sustained exploration of his contribution as a whole. While there are discussions of different aspects of his thinking (e.g. Newman 1999 analysis of Schon's "epistemology of reflective practice"), as far as I know, his work has not been approached in its totality. This is a great pity. Going back to books like *Beyond the Stable State* pays great dividends.

Further reading and references

Argyris, M. and Schön, D. (1974) *Theory in Practice. Increasing professional effectiveness*, San Francisco: Jossey-Bass. Landmark statement of "double-loop" learning and distinction between espoused theory and theory-in-action.

Schön, D. A. (1973) *Beyond the Stable State. Public and private learning in a changing society*, Harmondsworth: Penguin. 236 pages. A very influential book (following Schön's 1970 Reith Lectures) arguing that "change" is a fundamental feature of modern life and that it is necessary to develop social systems that can learn and adapt. Schön develops many of the themes that were to be such a significant part of his collaboration with Chris Argyris and his exploration of reflective practice.

Schön, D. (1983) *The Reflective Practitioner. How professionals think in action*, London: Temple Smith. 374 + x. Influential book that examines professional knowledge, professional contexts and reflection-in-action. Examines the move from technical rationality to reflection-in-action and examines the process involved in various instances of professional judgement.

Schön, D. (1987) *Educating the Reflective Practitioner*, San Francisco: Jossey-Bass. 355 + xvii pages. Development of the thinking in the 1983 book with sections on understanding the need for artistry in professional education; the architectural studio as educational model for reflection-in-action; how the reflective practicum works; and implications for improving professional education.

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Reference

[Educating Doctors: Crisis in Medical Education, Research and Practice](#)

[Behavior Theory in Public Health Practice and Research](#)