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ABSTRACT

This paper approaches the concept of curriculum design from a philosophical perspective, arguing that the concept of "design" in curriculum is fundamentally misleading. The paper begins with a series of comments questioning the assumption that curriculum design involves a set of discrete skills or procedures in which one may attain expertise like skating, welding, or filling out a tax return. The concept of curriculum design is equivocal on the distinction between the intrinsic value and the practical success of a curriculum, with the result that questions of evaluation and implementation are often allowed to determine content, without adequate consideration of what is educationally worthwhile. Curriculum design is an open and flexible domain due to uncertainty and disagreement over ends, definitions, and cause and effect. Counterarguments are offered to four of the most commonly accepted assumptions behind the curriculum design concept: (1) that the ultimate aims of education are not the direct responsibility of the curriculum designer; (2) that curriculum design is an applied science; (3) that designing curriculum is a skill or set of skills; and (4) that there is a determinate list of things that a curriculum design should include. The most important omission from all curriculum textbooks is a rigorous examination of the aims and nature of schooling and education. (TE)

The Concept of Curriculum Design

ROBIN BARROW.

1. Introduction

Reference to "design", rather than, say, "planning", already hints at the sort of precision and inflexibility that is required when producing specifications for an aeroplane, rather than the openness and unavoidable equivocation to be found in the stage directions for a play. Talk of "curriculum design" suggests that there must be designers who have a special kind of expertise other than that of simply understanding curriculum, just as architects are commonly thought to be something more than people who merely understand building techniques and have an aesthetic perspective. Yet, while precision, a "proper" way, and an expertise are implied, the accredited experts actually produce such distinct types of proposal as to make it difficult to think of them as alternative accounts of the same thing, i.e. as alternative designs. Compare for example Popham's behavioral objectives approach with Stenhouse's process model; or consider the approaches of Skilbeck or Sockett, the very openness and flexibility of which almost negate the idea of a design in the sense of an outline of the way in which a curriculum should be planned and set out.[1]

I shall argue that rather than thinking in terms of curriculum designers in some way analogous to dress designers or automobile designers, we should think in terms of coming to understand what the key curriculum questions are and the appropriate manner for trying to answer them. If we do that, we shall see that a number of key curriculum questions are philosophical, and yet philosophy is the discipline least in evidence in conceptions of curriculum design.

In order to maintain the flow of what is conceived of as a general argument about the nature of curriculum design I have placed almost all references and examples in support of my claims in the notes.[2]

II. Some comments on the idea of curriculum design

i) The notion of a curriculum design obviously makes sense, as does that of designing a particular curriculum, although both imply a degree of precision and inflexibility that might in the event be either lacking or inappropriate, or both. The "design" of some British "A" level courses, for example, has more in common with the agenda for a meeting than the specifications for constructing a house. There are some people who truly design their courses; there are others whose "design" might more accurately be described as "a general idea" of what they are going to do.

ii) Considerably more important than these possibly misleading connotations of the word "design" is the implication that to describe someone as a curriculum designer is to attribute some skill or set of skills to him, rather than merely to draw attention to the field in which he moves about. Most curriculum designers and most curriculum textbooks implicitly or explicitly suggest that one may learn how to design curricula as one may learn how to skate, how to weld or how to fill in tax returns.[3] That is to say they suggest a set of movements or procedures that once mastered allow one to set out any curriculum competently, as one may learn to skate on any ice, weld any metal and fill in the tax form any year.

But compare learning how to skate with learning how to use a library or with learning how to be a historian or a good husband. It is clear that these examples become progressively divorced from any particular skills or procedures. I can teach you how to use one library and that will probably enable you to use others. But it will not necessarily do so and I might have taught you how to use that library in a different way. I can teach you certain aspects of historical procedure, but it is implausible to call this teaching you "the procedures of the historian". When we come to the husband it seems plain silly to imagine a set of procedures that one could set down as necessary for all marriages to follow. (I say this notwithstanding the antics of some marriage counsellors).

I have no doubt that curriculum has more in common with marriage than with skating and not much in common with either. But that is not the immediate point, which is that the notion of curriculum design unwarrantably implies that there is an expertise to be acquired which may then be exercised on any subject matter in any context, just as there is an expertise in riding horses to be acquired. It is implausible to suggest that the typical package of procedures advocated in textbooks on curriculum design (e.g. formulate pre-requisites, specify objectives, produce evaluation criteria) is either necessary or sufficient for any particular curriculum, but in any case it is unfortunate that the question of whether it is or not should be bypassed by dint of presenting the elements in the package as features of the business of curriculum design by definition.

iii) The concept of curriculum design is equivocal on the question of whether being a curriculum designer involves claiming proficiency at setting out curricula or at expounding on the theory of setting out curricula. There is a distinction, as there is between being good at handling people and having a Ph.D. in management. Every educationalist ought to be a good curriculum designer if that means being good at organizing one's teaching. It is not so obvious that everybody ought to be a good curriculum design student if that means learned in the wisdom of Sockett, Tanner, Taba or Pratt.[3] Nor is the relationship between the wisdom of Tanner and the practice of good organisation as clear as one might wish. This is partly because the practice of curriculum books is to obscure the distinction. They review and give critical consideration to many features of curriculum design so that they could be seen as concerned only with expounding on the theory of setting out curricula. But in the event most of them clearly present a view of the way to set out curricula: they propose a path to practical proficiency.[4]

iv) Another area of equivocation is over different kinds of question. I am not referring here to different logical kinds of question, such as confusing evaluative questions with descriptive questions, although some of that does still go on. I am referring to the tendency of curriculum designers tc amalgamate questions that might profitably be distinguished such as what should we do if we want to produce a rationally defensible curriculum and what should we do if we wish to ensure successful implementation of our curriculum. To be sure, students of curriculum are painstakingly taught to distinguish between summative and formative evaluation and between evaluating the curriculum (i.e. seeing that it

works on its own terms) and estimating its worth. But curriculum design, as it is currently conceived, quite clearly ignores the last named activity. Curriculum designers simply do not address themselves or their textbooks to the question of what is educationally worthwhile. The result is a gradual blurring of the distinction between value and pay-off -- worth and appeal, idealism and immediate practicability. One result is that questions of evaluation and implementation are often allowed to determine content.

v) It may be said that whatever the truth about curriculum design it is certainly no simple matter, since there are many different perspectives, paradigms of research, or competing metaphors. I have argued elsewhere that I think the appearance of openness and variety is deceptive.[5] The so-called different conceptions of the process model, the product model or the reconceptualist model are really no more than shifts of focus to different particular aspects of curriculum. They do not necessarily compete with one another. And the question of different paradigms of curriculum research seems to me to boil down to the question of how much that is of concern to curriculum can be successfully researched in the experimental fashion of the natural sciences.

But whatever metaphor for curriculum we are tempted to adopt, from engineering, through cake-making, to drama, it is surely clear that, though it may be fun to argue that it is more like one than another, it is not actually very like anything other than itself.

It is <u>more</u> like some branch of the arts, landscaping or interior decorating than it is like engineering or cake-making, in as much as it is an open flexible domain due to uncertainty and disagreement over ends,

crucial concepts being contested or unclear, our relative ignorance about cause and effect, and the likelihood that in this case there are many good ways to kill a fox. But nonetheless it does not seem appropriate to adopt a metaphor from the arts. For there are a great many further respects in which curriculum is quite different from any particular variant of any particular branch of the arts. Teaching is thoroughly distinct from conducting, for instance, and it is no more to be equated with a dramatic encounter than playing Hamlet is itself to be equated with being a doctor.

The obvious argument in favour of metaphors is that they may illuminate or stimulate our perception. The more real danger may be that they inhibit our powers of thought. Curriculum is a relatively large and open area giving rise to many different kinds of question and encompassing many different kinds of activity. We would surely be well advised to start understanding curriculum itself before we restrict our vision by looking at it in the light of particular metaphors. Metaphors can only be other than restrictive when we understand both the terms being compared relatively well.

The above points -- that although a curriculum needs to be planned it is not clear that there is a proper way of planning, still less of designing with all that that word implies; that it is not established that there is a set of necessary and sufficient procedures for curriculum; that any attempt to plan has to face the fact that what there is good reason to do may be distinct from what one can easily do or easily monitor; and that all metaphors, different as they may be, have in common the tendency to offer a restrictive view of the way things should be -- strongly incline me to the conclusion that the very idea of there

being an art, skill, expertise, or science of curriculum design i at best highly misleading.

I shall now turn to consideration of some specific claims that many curriculum designers would seem to accept.

III. Claim 1: 'The ultimate aims of education/schooling are important, but they are not the direct responsibility of the curriculum designer". That is to say it is not part of the function of the designer to formulate or contribute to the formulation of aims. This is Pratt's position. It is true that he makes the odd reference, as do most curriculum designers, to the need for philosophers to consider aims, but that is evidently to set them aside as somebody else's business; his own procedure is to give a cursory examination to the suggestions that the curriculum should be designed to promote knowledge for its own sake, to train the mind, or to enhance employability, and then to propose that it should be based on needs. Which needs are to be met is determined by a procedure of needs assessment the detailed methods of which are conceded to be grossly fallible;[6] but in any case this approach clearly leaves the curriculum designer in the position of one who seeks to deliver the goods as required rather than to examine the good. Thus when it comes to discussing "curriculum rationale", which is defined as "an argument that seeks to justify the pursuit of an aim",[7] Pratt in fact offers no advice pertaining to a rationale in that sense, but instead counsels us to be "eloquent and persuasive... the rationale should be written with a view to convincing... especially those who have the power..."[8] His approach would seem to endorse the view of the 26th NSSE Yearbook that "the people... may properly formulate a general statement of aims... of education... (while) the task of discovering appropriate materials through which to achieve those aims... is a technical

one... demanding special professional preparation."[9]

Claim 2: "Curriculum design is an applied science." While it is true that this view has been challenged it is, I think, the dominant view in North America.[10] This is scarcely surprising when we consider that curriculum is heavily grounded in research into teacher effectiveness and educational psychology, both of which have been dominated by the model of the natural sciences. Of course, if one cuts off inquiry into worthwhile aims and fails to detect the conceptual inadequacy and the lack of control of variables throughout more than fifty years of empirical educational research, one can hardly fail to see curriculum design in this light.

Claim 3: "Designing curriculum is a skill or set of skills." Implicit in much curriculum writing is the idea that the curriculum designer is a professional with expertise, comparable in many respects to the mechanic or the dentist. The mechanic may not be the best of drivers himself and he may have no ideas about the role of the car in society, but take any vehicle along to him and he'll get it going. The dentist's own teeth may be poor and he may have contentious ideas about whether teeth should be objects of beauty or merely functional, but at any rate he can keep them in good shape. In the same sort of way a curriculum designer, though he may not be an educationalist on a par with Socrates or Dewey, can at any rate fix you up with a decent curriculum, if you need it. This conception of the curriculum designer arises in part, I think, out of a more general North American phenomenon: the idea that the most profitable way to look at the civilized human being is in terms of various large-scale monolithic skills, be they physical, cognitive (critical thinking; values clarification), affective (loving, getting on with people), or whatever (creativity, management). It is therefore only par for the course that curriculum designers should be conceived of as people who are

specially competent at e.g. breaking down aims into objectives, formulating prerequisites concisely, and presenting objectives to meet various criteria.[11]

Claim 4: "There is a determinate list of things that a curriculum design should include." Here of course there is some divergence of opinion amongst designers as to what things should be on the list. But it is generally true that design textbooks proceed as if there were a right answer to the question "what steps should design incorporate?" There is, besides, fairly widespread agreement that it should involve most of the following: specification of objectives, required entry characteristics, instructional strategies and schedule, evaluation procedures and implementation steps.[12]

IV. Each of the above four claims is fairly certainly false.

1. What the aims of education should be cannot be scientifically demonstrated. But they can be reasoned about and it is not the case that they are simply a matter of arbitrary preference. Quality in any sphere is to a considerable extent governed by the nature of the enterprise.[13] It is no more open for me to say that enabling people to operate computers is amongst the aims of education than it is open for me to say that knocking people over is one of the aims of soccer. Therefore Pratt's starting point for curriculum design is seriously deficient. On his own admission he is directing his efforts towards attempting to meet an imperfect compromise between imperfectly canvassed opinions (that are themselves in various ways imperfect) about what children ought to gain from school.[14]

Without a clearly articulated set of aims a coherent curriculum plan is a logical impossibility, for coherence partially pertains to the curriculum's relationship to its aims. To be more specific a coherent

curriculum has to be grounded in a clear and acceptable conception of schooling and education, for that is where the aims are derived from. Yet we know from any standard curriculum textbook, be it Pratt's, Tanner's, Zais' or Taba's, that aims are either not stated at all, or, if stated, neither explicated nor justified. I should add without dwelling on it that it is important here to maintain the distinction between clarity and specificity.[15] A common line has it that aims are general, objectives specific; that may be made so by definition, but the important thing is that what we are aiming at, whether near or far, specific or general, should be clear. Most curriculum work starts with goals that are not adequately justified and not clear. It will continue to do so so long as it thinks that consideration of aims can be hived off in some way.

2. If curriculum design is to be an applied science it must have uncontentious ends, which, as we have just seen, though it might have in principle, it doesn't have in fact. Engineering would cease to be an applied science if certain objectives such as that a bridge should stay in position and bear weights were set aside.

Engineering would also cease to be an applied science if the body of attested laws about e.g. the functioning of metal in different conditions were to cease to obtain. This is a large topic in itself, but it seems to me not unreasonable to claim that, though we have some plausible generalisations about education, we do not have anything worthy of the name of a body of general laws about child psychology or classroom interaction that are also of practical value.[16] (There are certain truths, but they turn out to be true by definition and/or to have no

practical importance. And there are certain significant claims but they are not empirically established.)[17] Ironically this is actually conceded by most of those who have reviewed research into teacher effectiveness, if not not by educational psychologists.[18] (Perhaps that is because the latter tend unconsciously to make their true observations significant by equating the aims of education with the aims of the measuring instrument. Thus the I.Q. test is given importance by presuming that success at it betokens educated intelligence.)

But whatever such researchers are up to it is obvious from a cursory inspection of the writing in the field that curriculum specialists simply make selective reference to research conclusions, thereby giving a quite spurious air of scientific rigour to their recommendations. We are told that research shows this or that, but with rare exceptions it does not do so. The reason that it does not do so is partly that that same absence of clearly defined ends for the whole educational enterprise makes any research into educational effectiveness meaningless, as does that same conceptual confusion render most of it worthless.[19] In addition it is inconceivable that anyone should derive true general laws or clear cause and effect relationships from field studies such as make up the vast bulk of educational empirical research. Any metaphorical link with architecture or engineering is in these circumstances simply irrelevant.

3. It should already be clear that a crippling weakness in curriculum design is disregard for conceptual points. That same weakness probably explains the third claim. For if people would pause to consider what a skill might be, they would surely not be so foolish as to use the same word of the business of tying one's shoe-laces, the business of riding a

horse, the business of being managing director of Prentice Hall and the business of being a trenchant political commentator.

McPeck in his Critical Thinking has argued convincingly that it makes little sense to talk of a skill of critical thinking.[20] And for the same sorts of reason I cannot make sense of the idea that there might be a skill of curriculum designing, or such subskills as that of breaking down objectives or assessing needs. A person may be described as skilfull at these things, meaning that he generally does them well, but the fact remains that they are not well-seen on an analogy with the mechanical operations that provide our touchstone for skills, and they are essentially context bound. My ability to break down aims into objectives in the context of teaching ancient history tells you nothing about my ability to do it in the context of photography or physics. A "skill" of breaking down objectives in general would have to rest upon skill at manipulating key concepts in all educationally significant areas. Such a "skill" is feasible, but not possessed by those who adhere to the current conception of curriculum design.

What competent designing of curricula requires rather than some alleged skill is obviously good understanding of the nature of curriculum and that broad range of questions and claims that touch upon it.

4. Many of the popular tenets of curriculum design are sensible enough as suggestions but absurd as prescriptions. What is silly about Popham is not his idea of the advantages of behavioural objectives, but his idea that everything has got to be done this way.[21] (Incidentally in this connection Pratt makes a bad mistake in observing that we could probably find ways of measuring 99% of our objectives if we set our mind to it.

For of course we could define everything from love to beauty in such terms, but the question would be whether our clear and measurable definitions did justice to what people actually conceive of as love and beauty.)[22] Similarly the basis of Stenhouse's approach to curriculum research is the entirely accurate observation that teachers take little notice of research and the quite sensible suggestion that they should be more involved by basing research in the schools.[23] But this position becomes untenable when it is pushed to the ideological limit so that only school-based research is regarded as bona fide curriculum research.

The questions of what requires to be specified for any given curriculum in the way of resources, prerequisites, modes of organisation and techniques of instruction and how any specifications should be formulated must surely be open ones. The only likely consequence of treating various such steps as necessary parts of good curriculum design is that the tail may come to wag the dog: the presumption that a curriculum must include objectives stated in a certain kind of way, procedures for evaluation, strategies for implementation etc., necessarily leads on occasion to manipulation or distortion of the content to meet these demands. But nobody who is seriously concerned about education as opposed to keeping children occupied at tasks that can be monitored, or a school curriculum as opposed to a series of activities to keep people occupied and accountable, could accept that the way to decide whether and how to do something with Wordsworth, pop music, classical Greece, Indian culture, or chemistry, in the curriculum is to be determined by whether and how we can obtain ready acceptance for it (implementation) and quantify children's progress and our success at it (evaluation).[24]

Certainly we must wish that a proposed curriculum should be accepted in fact and implemented with understanding. But a serious minded educator will, if necessary, seek to spread understanding and gain acceptance after producing a worthwhile curriculum. He will not allow considerations of implementation to become criteria for designing curricula. Evaluation, which is also being insidiously and, I dare say, unconsciously promoted as a criterion of quality in design, should be of even less concern to the curriculum designer qua designer. For, notwithstanding all the excellent reasons for wanting to evaluate where we can, not a single argument has ever been produced that establishes that a curriculum that cannot be evaluated other than impressionistically is ipso facto to be deplored. Only the slowly grinding wheels of the curriculum industry have continued to suggest that "without some kind of evaluation any curriculum innovation becomes meaningless and probably also impossible" (Kelly).[25] (In passing I should add that although informal techniques of evaluation are to be welcomed where appropriate it is perhaps unfortunate that those who perceived the debilitating and constraining implications of too much emphasis on formal evaluation have nonetheless tended to reinforce such constraint. By taking up grand names such as "illuminative" or "holistic" evaluation, instead of simply observing that sometimes one can and should do no more than look and judge impressionistically, the myth that evaluation is a science that must play its part in curriculum design has been furthered even while being challenged.)

V. I imagine that some might wish to say that I misrepresent the intentions of the lady. Curriculum design is not concerned to lay down the law or demand

a set of specific steps on all occasions; it merely seeks to explore and uncover the dimensions to the question of what form our curricula should take.

I hope I have said enough to show that that is not the case. The fact of there being a number of widely believed but extremely dubious claims in curriculum design, the fact of it being thought of as a matter of design, and the way in which the textbooks are actually presented all conspire to suggest unequivocally that one who would propose something for the school curriculum can and should learn to present it in a particular kind of way.

The most important ommission from all curriculum textbooks is a rigorous examination of the question of the aims and nature of schooling and education. That is not only what is needed to make sense of curriculum design prescriptions, but it would also be sufficient of itself to yield useful curriculum prescription when combined with thorough understanding of potential content. Of course it matters how one organises and teaches one's material, but what matters is to organise and teach it in a way that makes sense of the material in terms of the aims of education and schooling. Of course there is also the question of presenting material in a way that is suited to the students in question. But as to that it is doubtful whether all the empirical research of this century has thrown up any previously unknown general laws that have practical significance. The teacher always has to make particular judgements about individuals before him: to make such judgements what he requires is knowledge of them as individuals, (not generalisations, which are altogether different from general laws), combined with a thorough understanding of what he is about and where he is trying to go.

Footnotes

[1]See Popham, W. J., "Probing the validity of arguments against behavioral goals," in R. J. Kibler et. al. (eds.), Behavioral Objectives and Instruction, (Boston: Allyn and Bacon 1968); Skilbeck, M., "School-based curriculum development." (90-102 in Open University Course 203, Unit 26, Milton Keynes: The Open University Press 1976); Sockett, H., Designing the Curriculum, (London: Open Books 1976); Stenhouse, L., An Introduction to Curriculum Research and Development, (London: Heinemann 1975). For a critical summary of these and other approaches see Barrow, R., Giving Teaching Back to Teachers, (Brighton: Wheatsheaf 1984).

[2]It is worth noting here that I shall refer on several occasions to David Pratt's Curriculum: Design and Development, (New York: Harcourt Brace Jovanovich, 1980). I do this because I think it may be helpful to illustrate points by reference to a case study, and Pratt's book, though representative of a kind I am arguing against, seems to me good of its kind.

[3]For the purposes of this paper I shall assume the following to be reasonably representative of curriculum textbooks: Taba, H., Curriculum Development: Theory and Practice, (New York: Harcourt Brace Jovanovich, 1962); Tanner, D., and Tanner, L. N., Curriculum Development: Theory into Practice, (New York: Macmillan, 1980); Tyler, R., Basic principles of Curriculum and Instruction, (Chicago: University of Chicago Press, 1949); Zais, R. S., Curriculum: Principles and Foundations, (New York: Harper and Row, 1976); Sockett, H., op. cit; Stenhouse, L., op. cit.; Pratt, D., op. cit.

[4]Pratt, for example, provides a specimen curriculum at the end of his book.

[5]"The Paradigm to end Paradigms" in R. Enns and G. Milburn (eds.), Curriculum Canada, 1984.

[6]See especially Pratt, op. cit., pp. 84-90.

[7]Ibid., p. 152.

[8]Ibid., p. 152.

[9]Ibid., p. 32.

[10]It is explicitly Pratt's view (see p. 4), although he is in fact rather moderate in what he takes to be empirically established. Nonetheless his approach is based upon the idea that our empirically tested means-ends knowledge provides curriculum prescription.

[11]Pratt, for instance, lists seven main criteria that "objectives should meet", p. 183.

[12]All of the features noted are emphasised by Pratt.

[13]See Barrow, R., The Philosophy of schooling, (Brighton: Wheatsheaf, 1981).

[14]See Pratt chs. 3 and 4. The problem is well illustrated by his example of a curriculum concerned with nutrition, for it is arguable that whether people consulted perceive a need for this or not it is of no obvious concern to the school and still less of any obvious educational significance.

[15]Barrow, R., The Philosophy of Schooling, op. cit.

[16]For the argument to support such a claim, see Smedslund, J., "Between the analytic and the arbitrary," Scandinavian Journal of Psychology, 20, 1979; Egan, K., Education and Psychology, (New York: Teachers' College Press, 1983); Barrow, R., Giving Teaching Back to Teachers, (Brighton: Wheatsheaf, 1984).

[17]For example "Time spent on reading and numbers is associated with growth in those areas, whereas time spent in other areas appears to detract

from growth in reading and mathematics". (Barak Rosenshine, Classroom Instruction in N. L. Gage (ed.), The Psychology of Teaching Methods, University of Chicago Press, 1976). "Brighter people can learn things less bright ones cannot learn." (E. R. Hilgard, Theories of Learning. Appleton-Century-Crofts, 1956). "A motivated learner acquires what he learns more readily than one who is not motivated." (ibid.). "Three stages are necessary for successful discussions: orientation, development, concluding." (The stages identified by C. S. Tann, "A study of groupwork in Primary and Lower Secondary Schools," unpublished Ph.D. thesis, University of Leicester. Cited and the "identification" of the stages described as "pretty meaningless" by A. Yeomans "Group Work in Schools: Britain and U. S. A." The Durham and Newcastle Research Review 10.51, 1983). I will leave the reader to consider which of these examples are true by definition and/or of no practical importance. All of them purport to be significant empirical discoveries. For a list of significant claims that cannot be said to be actually empirically established one needs only to look at any comprehensive review of research and note those studies that appear to produce contrary finding.

[18]See, for example, Dunkin M. and Biddle B., The Study of Teaching (New York: Holt Rinehart and Winston, 1974); Heath, R. W. and Nielson, M. A., "The Research basis for performance-based teacher education," (Review of Educational Research, 44, 1974); Gage, N. L., Teacher Effectivenes and Teacher Education, (Palo Alto, Calif.: Pacific Books, 1972).

[19]The simplest way to illustrate what would otherwise require a paper in itself is to cite, for example, Bennett's claims about the relative merits of formal, informal and mixed teaching styles for various purposes and Barrow's critique of that research. N. Bennett, Teaching Styles and Pupil Progress, (London: Open Books, 1976); R. Barrow, The Philosopy of Schooling, op. cit.,

ch. 6. A very full treatment of the topic with copious examples is to be found in Barrow Giving Teaching Back to Teachers, op, cit., chs. 5 and 6. A less adequate but brief and immediate illustration is afforded by the assumption that "practice at de Bono's lateral thinking exercises is shown to be educationally profitable." (Pratt would probably accept my wording of the claim here, but it is not his wording, see p. 313). This assumption is entertained by many teachers and educationalists, but as stated is certainly false. Nothing has been "shown" because the experimentation necessary to establish that such practice is the cause of the development of certain abilities is beyond our power, because it is inconceivable that the "cognitive skill" involved in wondering "how you would weigh an elephant" should lead you to solve the problem of how to get rid of your wife or split the atom, and because the question of importance is one that no researcher has asked: "is whatever happens to those who play de Bono's games educationally valuable?"

[20]McPeck, J., Critical Thinking, (Oxford: Martin Robertson, 1981).

[21]Popham, W. J., op. cit.

[22]Pratt, D., op. cit., p. 199

[23]Stenhouse, L., op. cit.

[24]Of course I am aware that these are only two possible and somewhat extreme characterisations of implementation and evaluation.

[25]Kelly, A. V., The Curriculum: Theory and Practice, (New York: Harper and Row, 1977).