

## **DEFSA-Conf 2006 Research Paper**

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# **Learners as Agents: design as a learning vehicle.**

## **Introduction**

This paper proposes design as the guiding pedagogical metaphor for education in the 21<sup>st</sup> century. Educational reform literature is preoccupied with notions of indeterminacy in relation to learning (Doll, 1986, Kress, 1998, Castells, 1999, Giroux, 1999, Gardner, 2006, Capra, 2006, Kellner, 2004,) because of major social changes that have occurred over the last two decades- globalization, pluriculturalism, informalisation, consumerism, the rise of the network or information/knowledge based society increasingly become defining markers of these changes. The paper draws together a set of pedagogical movements (Constructivism, Critical Pedagogy, Reflective Learning and Multiliteracies) in putting forward a case that a pedagogy **modeled on design** is capable of responding to transforming social conditions. In doing this, outcomes- based education is critiqued in terms of its appropriateness in addressing new demands made on the educational system.

## **Learning as design.**

Donald Schön's (1987, 1992) reflective practitioner is pivotal in terms of understanding the contingent and complex nature of learning. For him (1987:6), real learning can only take place within "zones of indeterminacy". He describes the set of competences required to operate here using the general concept of "artistry" (1987:12,19), making astonishing claims for it as a set of sensibilities that cut across and define learning in all professional domains. He asserts that design "is the prototype of the kind of artistry other professionals need most to acquire" (Schön 1987:19).

Schön (1987:12) contends that the world of practice is inherently "complex, unstable, uncertain and conflictual" and that the design process embodies this. Designers "convert indeterminate situations into determinate ones" (Dewey cited by Schön, 1987: 42), "beginning with situations that are at least in part uncertain, ill defined, complex and incoherent... construct and impose a coherence of their own" (Schön, 1987:43). Artistry is defined as quality of conversation conducted between any practitioner and materials of a situation- the materials being, in professional terms the "stuff" that practitioners face in their day-to-day work.

Schön (1987:39) attacks normative notions of technical rationality within professional education by asserting that practitioners rarely follow the rules and procedures stipulated by their training. They "invent rules on the spot", experimenting constantly "worldmaking", actively "constructing the situation of their practice" (Schön 1987:63-75). Designers, like artful practitioners, "understand a situation by trying to change it". Learning in the world of practice demands a constructionist rather than positivist conception of knowing. The former views knowledge as a provisional social construct, the latter assumes that knowledge is static, fixed and universal. Given the indeterminate and situated nature of design, (Schön 1987:80-99) designerly thinking or artistry cannot be taught, only learnt.

Schön posits the design studio as a prototype for the conditions required in order for a professional to acquire artistry in the form of a "reflective practicum" (Schön, 1987:19). Students who enter reflective practicum cannot know from the start what it is they need to know or do because knowledge and artistry can only be gained in doing. They are locked into a learning predicament or paradox where he/she:

"knows that she has to look for something but does not know what that something is. She seeks to learn it, moreover, in the sense of coming to know it in action... the instructor is caught up in the same paradox: he cannot tell the student what she

needs to know, even if he has words for it, because the student would not at that point understand him" (Schön, 1987:83).

The educator operates as a coach, or facilitator, designing learning problems in which the student may learn artistry through an active and reflective conversation with the design situation. Conversation is unpacked as a dynamic sequence of knowing-in-action, reflection-in-action, reflection-on theories-in-use which is facilitated by a dialogical triad consisting of the design, design student and coach (Schön, 1987: 22-44). The reflective practicum is critical in differentiating education from training. Design competence is the difference between a practitioner who can merely follow technical procedures, in terms of Bloom's (1956) cognitive domains, can only know, apply and analyse and those who can think within their discipline, analyzing, applying, synthesizing and evaluating within the context of their practice.

Schön's work on designerly reflective practice resonates with the basic tenets of constructivist theories of learning. Constructivism draws on biological metaphors in constructing a theory of learning. Things are living because they are able to transform into more and more complex systems. Transformations are internal, not determined by external stimuli, but manifest in interactions with the environment. Perturbations result in states of disequilibrium that are best resolved through "accommodation", a process that results in a transformation of the whole living system, increasing its structural complexity (Proulx, 2006:7-8). In accommodation, the organism changes and in doing so changes its environment- "intelligence organizes the world by organizing itself" (Piaget cited by Proulx, 2006:2). It is compelling is how Piagetian theory describes life as a form of artistry or design, where the organism or learner enters into a "reflective conversation with its situation", transforming both itself and the situation of design.

Constructivism maps out a radical episteme for learning. Knowledge is not discovered so much as invented and constructed socially and transactionally, within specific contexts of interaction and meaning-making. Learning is an active process of individual construing and modifying "knowing", rather than the linear process of acquiring and accumulating knowledge (Davis cited by Proulx, 2006:6). Deleuze (as cited by Semetsky, 2003:17) suggests that learning is "rhizomatic"- that concepts can only be understood as concepts within a living economy of signs. Designers tacitly understand that knowledge is constructed. In design, hypotheses are viewed as provisional constructs, only valuable to the extent to which they inform the search for a solution (Cross, 2001: 81). Knowledge is a manifestation of coherence or "fit", the designer producing solutions dialectically, through praxis, formulating knowledge in the act of design rather than applying apriori knowledge from the outside.

Knowledge is only perceived as knowledge, by designers, when it is instrumentalised in specific "appreciative contexts" (Schön, 1987: 118). It is for this reason that constructivism does not prescribe methods of teaching and learning. Artistry cannot be taught because definitions of artistry are contingent. Further, knowledge constructs are unique to individuals and cannot exist in a pure form outside of their own experience. This however does not preclude the mediation of individual learning. In Schön's terms, the designed object makes manifest the individual's production of knowledge or meaning-making process. It provides the occasion for social mediations. The reflective practicum becomes the dialogical space in which knowledge is collaboratively and socially constructed.

The creative act of design is synthetic, relational or "superpropositional" (Dewey as cited by Semetsky, 2003:25). Designing as an art brings together the cognitive domains outlined by Bloom's scaffolding of the cognitive domains- knowledge-analysis-application-synthesis-evaluation. The very nature of design demands this. Studies in the work of designers confirm that design may only takes place within ill-structured domains (Goel, 2001:221, Cross, 2001:81, Zimring and Latch Craig, 2001:134). If the design problem can be decomposed, then it suggests a solution and was not a problem to begin with. Research into the cognitive operations of designers suggests that the core competence of design resides in the preliminary phase of design which is a "classical case of creative, ill-structured problem solving" (Goel, 2001:234), a zone that foregrounds artistry or thinking rather than knowledge accumulation, requiring a form of transactional thinking. A competent designer is able to

“produce overlapping cognitive states” (synthesis) facilitated by a problem space which is necessarily ill-structured and ambiguous (Goel, 2001: 233).

For new knowledge to be perceived as knowledge at all it needs to cohere within a multimodal context of existing knowings. In other words, reflection is critical for learning. Design objects by their very nature produce the need for reflection. Design provides the object in which reflection can take place by socializing the learners meaning-making. By synthesizing cognitive activity concretely, knowledge becomes relational within the visual (product) and sensible field (process) producing the effect of reflection-in-action and reflection-on-theories-in-use.

## **Outcomes and artistry**

Outcomes prioritise students achieving and teachers measuring specifiable and observable outcomes. Generic competences within learning areas are broken into skills bits, and these bits broken down further into criterion in an attempt to deliver a curriculum that is objective, fair and transparent. There are a number of practical problems with basing the design of a curriculum on outcomes. Firstly, outcomes statements are able only to describe accurately the most technical and low order of competences. Attempts to encapsulate higher order competence in language statements (those that require artistry) result in vagueness. The most significant outcomes and criteria, those that attempt to describe high order activity, are heavily reliant upon human judgment and contexts of practice in order to have any authentic meaning, subverting the intention of outcomes to be objective and transparent. Qualification writers and curriculum designers attempt to unpack complex and key competences into minutiae of criteria, range statements and so forth to make assessment “objective”, producing cumbersome, impractical, inappropriate and bureaucratic procedures. Outcomes lack precision in terms of differentiating developmental levels of learning. Often a learning outcome is worded ambiguously so as to be appropriate at any level of expertise. This points to a general problem of describing indeterminate and complex practices through curricular language.

Gerard Lum (1999:413-415) calls the competence approach to curriculum bankrupt in its empiricism because it assumes “that it is possible for a statement to unequivocally; accurately and sufficiently describe ontologically subjective epistemologically objective features of the world.” In his final analysis competence based education “is a strategy most notable for its artlessness, its profoundly naïve assumptions about language, and its apparent disregard for the metaphysical complexity of human action” (Lum: 416).

Language cannot correspond point-by-point with practice, because, as Schön (1987: 21-27) notes, artful practitioners demonstrate their ability in integrated performances, tacitly, in-action, rather in discreet competence packages. The general non-utility of outcomes is further exacerbated by the fact that they fail to operate in the learning areas that most foreground artistry- the arts and humanities. The dangers are severe when they translate into teaching practices that artificially package skills into neatly bordered learning units.

Doug Boughton (1996:2000) problematises the assumption that specification of standards will lead to improvements in learning. He argues for communally designed “objectives” rather than outcomes (Boughton, 1996:203). “Objectives” point to the constructedness of the language that is used to assess human performance. The term allows negotiation and agency in assessment, foregrounding the situatedness of human judgments. Boughton (1996:207-209) proposes that the quality of and process of judgments made by a carefully constituted “community of arbiters” is at the heart of curriculum reform. He suggests that objectives are designed from the world of learner and professional practice rather than imposed in a top-down fashion.

Schön's model of professional artistry indicts outcomes as a form of technical rationality. If it is true that "a design like practice is not teachable by classroom methods", that is "not fully describable in advance", that design is a "holistic skill...that cannot be learnt in a molecular way, by first learning first to carry out smaller units of activity and then string those units together in a whole design process.." (Schön 1987:159-161) then outcomes appear as an inappropriate way of producing artistry.

Doll's (1986) curriculum of complexity is useful in explaining why outcomes don't work. He suggests that skills are developed "epigenetically"- not by "pushing an individual to skills beyond his structural limit, not by artificially expanding his structure, but by developing fully the skills appropriate to each structure. This progress toward is really made via from...epigenetic progress is from bottom up, not top down" (Doll, 1979: 334). Outcomes, in their goal- centeredness, deemphasize the role relationality plays in cognitive development. Doll's curriculum of complexity implicitly points to the capacity of design to produce learners who can learn-to-learn. He posits three qualities for an effective curriculum: learning through action, structures of the field encountering the structures of the learner in action, perturbation through diversity, reflection on experience. Doll (1979:14-16) argues against a "measured curriculum", favouring a "transformatory curriculum" that resonates powerfully with Schön's reflective practicum and definition of artistry. The measured curriculum is defined as a one-size-fits-all educational system that only measures that which it can predict and observe, reducing the complexity and unpredictability of the learning process. His transformatory curriculum points toward a designerly conception of pedagogy where the curriculum is an emergent property of construction, deconstruction, reconstruction (Doll, 1979: 346).

This challenges the very notion of a "curriculum". A curriculum naturalises relations and places knowledge and skill outside the consciousness of the learner. For Deleuze (as cited by Semetsky, 2003:25) knowledge is not built up against an aim, but rather develops organically within a system of relations, rhizomatically so to speak, with learners "drawing lines of connections within the act of making". Designerly learning does two things in disrupting conventional notions of curricula. First, each design solution or product provides the "problem frame" for the next set of design activities mirroring the "rhizome's renewal of itself...which proceeds autopoietically: the new relations generated via rhizomatic connections are not copies, but each and every time a new map, a cartography" providing "an open-ended, smooth pedagogical space" (Semetsky, 2003:27). Further, design concretizes rhizomatic cognitive activity, beyond action, prompting opportunities for reflection-on-theories-in-use, where students can evaluate their own learning or "strategies of drawing lines of connections" (Semetsky, 2003:27).

The outcomes-based curriculum in contrast to this reduces active participation to a set of logical propositions. It attempts to define disciplinary artistry in terms of fragmented sets of competence offering little insight into how learning actually takes place.

## **Design as a disruptive discourse**

There are problems inherent in outcomes-based education that fall outside the ambit of cognition and developmental learning. Outcomes raise serious questions about the ethical and political nature of education. In this section I draw on critical pedagogy to argue for learning- as-design as a "disruptive discourse" that holds the potential to produce a powerful sense of agency within the social context of indeterminacy and complexity.

Critical pedagogy is a practice of teaching that foregrounds the relation between education and power, promoting education as a dialogical practice for social justice. Schools are conceptualised as sites for the construction of democratic values for the negotiation of cultural difference and areas of political resistance against neo-liberalist attempts to privatize education (Giroux, 1999: 2006). It focuses educational practice on the purposes and ends of education and in doing so, I argue, implicates design as a central metaphor for its mission:

The strength of critical pedagogy lies in its capacity to foster the principle of social justice and to propel this principle into the realm of hope, so that it might arch toward the future in a continuing orbit of possibility" (Mclaren, 1999:32-33).

It defines human agency as a "language of possibility", corresponding with Schön and Doll's learning within "zones of indeterminacy". Agency is the capacity to act on the world in a responsible and ethical way.

The ends and purposes of education are not neutral but political (Giroux, 2006:18). In this way their "design" should be seen as a participatory and inclusive. Outcomes by describing the products of education index a social future. In technical education or the "measured curriculum", one that assesses only that which can be measured and predicted, the outcome becomes invisible- unproblematic, prescriptive and rarely subject to moral and ethical scrutiny.

Outcomes incentivises learners into converting their parcels of skills into commodities on the labour market. They call for educators to operate as line managers objectifying knowledge in the service of producing the skills necessary to produce "flexible" informational workers within a post-industrial context. Knowledge is "embedded" in competence, suggesting that knowledge is but an inert substance (information) used in the service of something other than itself. This diverts attention away from artistry and reflection- critical components in producing knowledge through practice.

Hargreaves and Moore (2000: 29) contend that outcomes free teachers and students to find their own creative ways of achieving prescribed curricular outcomes. The point is that despite this, the ends are asserted as primary, the means instrumentalised in the service of ends. The design of means may be negotiable, but as every teacher in an outcomes-based system knows - outcomes are non-negotiable. The political heart of the curriculum becomes naturalized and in this way suggests that they are carriers of ideology, severing education from political agency.

Bernstein (1996) demonstrates how curricular decisions are ethical and political in nature. He contrasts what he terms the "collection-type" curriculum with the "integrated curriculum". The former is composed of hierarchized contents that "stand in closed relations to each other", the latter characterized by the contents standing in "open relation to each other". Each curriculum type produces different social effects. The collection type sacralises knowledge, ritualizing and hierarchizing the educational relationship, making knowledge appear to be "very similar to private property with various kinds of symbolic fences, and the people who own the knowledge look rather like monopolies". It emphasizes "states of knowledge". The integrated type stresses horizontal social relations, emphasizes processes of knowing and generates consensus because order is emergent- it "is something that has to be developed and planned", or put differently- **designed** in communities of practice. The problem with outcomes within a collection type curriculum is that ends are not co-jointly designed by communities of learning and agreed upon by those it effects but prescribed from above.

As I have argued earlier, the processes of design can be mapped out as a meta-language of artistry. This is precisely what the critical cross-field outcomes [South Africa. 1997. White Paper on Education and Training] attempt to do- they describe a designerly competence. Perhaps they were developed in an attempt to integrate a collection type curriculum, to remedy the effects of a structure that invests social power in static knowledge and its dispenser- the teacher, undermining the social reconstructivist spirit of the 1997 Education White Paper. How seriously do educators take these "designerly outcomes" in the assessment process given the inherent moral and conceptual complexities (and artistry) involved in assessing critical creativity? An education centred on artistry would problematise the notion of ends with its focus on reflective practice as a referent, allowing students and educators to design, expressively, in communities of practice their own critical educational ends.

Artistry as a form of social praxis, raises the question of agency. How can students act on the world with agency if they do not play a role in critiquing and designing the purpose and ends of their education? Outcomes-based education's separation of means from ends "rests on a positivistic notion of practice, where knowing is separated from doing, where action is only an "implementation and test of a technical decision" (Schön, 1987:39). It is within the means, the messy area of practice that creativity and learning take place. Outcomes relegate artistry to the margins of learning and depoliticize ends.

A reflective practicum may counterbalance the symptoms of outcomes by producing expressive labour rather than instrumentalised labour. Outcomes-based education assumes that a productive workforce produces a stronger economy. Paul Willis (1999:154) argues that the formal productivist curriculum alienates creativity and subjectivity, pushing it underground into the area of consumption. Willis asserts that "relations of production call forth instrumentalism, relations of consumption call forth expressivism" (Willis, 1999: 169). He describes a society split into day and night. By day, workers are engaged in passive, productive alienated labour and by night engage in productive and expressive informal consumption (Willis, 1999:154-158). The implicit irony here is that the instrumental, technical orientation of outcomes-based education attempts to produce the informal, creative, flexible worker but in practice subverts its own intentions by pushing these competences into a domain outside the formal economy. Willis's informal, network economy or "semiotic democracy" (Willis, 1999: 157) of "productive consumers" suggests a form of unalienated labour akin to the work of the designer.

Design as an open-ended educational practice that favours indeterminacy over measurement may become a central pedagogical site of learning in which young people can bring their everyday design practices into the context of formal learning. A great deal of educational literature bemoans the acute mismatch between the everyday experiences of youth and the nature of formal education. It is cited as the reason for the lack of motivation, malaise and apathy that exists in student cultures in today's schools. Giroux (1999:95-96) explains that:

Youth exist between the borders of a modernist world of certainty and order, informed by the culture of the West and its technology of print, and a post modern world of hybridized identities, electronic technologies, local cultural practices, and pluralized public spaces.

Giroux characterizes this experience as "the emerging conditions of indeterminacy and hybridity". He calls for a "border pedagogy" that echoes Schön's reflective practicum:

The pedagogical importance of uncertainty and indeterminacy can be rethought through a modernist notion of the dream world, in which youth and others can shape, without the benefit of master narratives, the conditions for producing new ways of learning, engaging, and positing the possibilities for social struggle and solidarity. (Giroux, 1999: 112)

It is distressing that, in a local context, design is given status as a subject within a collection type curriculum, packaged as a distinct disciplinary area of competence, ghettoised as a special form of creativity, when so much educational theory affirms designerly practice as a meta-practice that cuts through all forms of disciplinary activity. Perhaps this is symptomatic of capitalist and consumerist ideology where creativity rather than economic capital is the primary object of social struggle. A sectoral definition of creativity ensures that artistry is unevenly distributed as a form of symbolic and educational capital.

Design must be reformulated as a generalized form of social and political activism in order to serve as a viable model for learning. Embedded in the very act of design is a radical challenge to traditional modes of education. Design-as-learning is subversive because design is a universal human condition, challenging the division of labour upon which a capitalist system is premised. The classroom reconceived as a reflective practicum, a laboratory for

the design of social futures, has potential to produce practitioners that can not only operate effectively within an economy accessing the “good life” education offers but begin to build a more equitable society where agency is defined in terms of the ability of an agent to facilitate the agency of others. Interrogation into the ethical and political dimensions of artistry is critical. In a world where nations and corporate entities compete to produce and absorb practitioners who have artistry, creativity can be easily commoditised, and converted into alienated capital. The reflective practicum may be a place to imagine a world where everyone is a designer, where human beings are not hierarchised and instrumentalised as units of labour but operate as artists, co-creators in dialogue with one another to shape a vision of a better future.

### **Multiliteracies and the design of social futures- curriculum or reflective practicum?**

The notion of curriculum is problematic in a global situation marked by transformation, crisis and indeterminacy. The call for learning within a context of indeterminacy does not take into account the essentially static and inorganic nature of all curricula. Unlike the agents it mobilizes it cannot learn- accommodate, assimilate, equilibrate or grow in its interactions. Curricula are fossils, crystallizing configurations of skills, knowledge, values and attitudes, encoding, fixing and naturalizing power relations.

So far, I have argued for a designerly learning situation where the objects of learning interact with the producers of these objects to construct the curriculum recursively and epigenetically. If it is true, as I have argued, that design or artistry is central to the production of a new agent, then the reflective practicum appears to offer a wider range of potentials in meeting the demands of a society in transformation. Design-as-learning offers a tangible, methodological synthesis of educational theory that responds to the crises inherent in educational reform. The Multiliteracies group (Cazden et al, 1996) offers key insights into how a new pedagogy may be realized practically by positing design as the key organizing principle for a postmodern education.

Gunther Kress, a member of the Multiliteracies Group, (1998:4-5) argues that social frames are undergoing a radical transformation: the market replaces the state in the production of consumers rather than citizens; a consumerist, information/services-oriented economy is replacing a production, Fordist-oriented one; monocultural societies are becoming pluricultural. The educational implications of transformation call for what he terms a “curriculum of essential dispositions” (Kress, 1998:14-15) that are explicitly design-like: “sensitivity to culture...dynamic change is seen as normal...attitudes need to be engendered which prize innovation through design...culture becomes central, so communication becomes central ...questions of ethics are never hidden from view.”

The Multiliteracies Group provide a powerful argument for a designerly education linking agency to issues of social navigation, power to literacy, presenting a modified picture of Schön’s reflective practicum:

The metalanguage of multiliteracies describes the elements of design, not as rules, but as a heuristic that accounts for the infinite variability of different forms of meaning-making in relation to the cultures, the subcultures, or the layers of an individual’s identity that these forms serve. At the same time Designing restores human agency and cultural dynamism to the process of meaning-making. Every act of meaning both appropriates Available Designs and recreates in the Designing, thus producing new meaning as the Redesigned. In an economy of productive diversity, in civic spaces that value pluralism, and in the flourishing of interrelated, multilayered, complementary yet increasingly divergent lifeworlds, workers, citizens and community members are ideally creative and responsible makers of meaning. We are indeed designers of our social futures (Cazden et al, 1996:28).



Design as a zone of indeterminacy naturally provides the four key elements the Multiliteracies Group (Cazden et al, 1996:23-25) posits as key to a new education: situated practice (Schön's knowing-in-action), overt instruction (Schön's reflection in action and reflection of theories of use), critical framing (critical pedagogy's education for social justice), transformed practice (constructivism's knowledge as a social construct.) What is critical about the work of the Multiliteracies Group is their focus on a methodology for a new education rather than on a set of fixed principles for formalized and static curriculum. What they present is a cogent set of potential pedagogical practices around which a reflective practicum may be constituted.

I hope that this paper has highlighted the significance of design within the broader project of educational reform, and raised questions around its present form and position within the South African education system. To my mind design education as it is conceived, presently, within the National Qualifications Framework offers a narrow, unimaginative, commercial and technical conception of creativity.

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