The Routledge International Handbook of Learning

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Publication details
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Published online on: 15 Dec 2011

How to cite: Etienne Bourgeois. 15 Dec 2011, Piaget's Constructivism and Adult Learning from: The Routledge International Handbook of Learning Routledge
Accessed on: 22 Nov 2023
Piaget’s constructivism and adult learning

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Learning theory

Is Piaget’s constructivism still of any relevance to adult learning theory today? This provocative question deserves to be raised in the light of the numerous criticisms that can be – and have been – addressed to Piaget’s theory as a frame of reference for understanding adult learning. Let us remind ourselves of some of them. Piaget’s theory of intelligence implies that the most advanced stage of cognitive development, namely, the ‘formal operations’ stage, is to be attained at adolescence and that no further ‘progress’ can in fact be expected beyond this stage. This assumption has long been challenged by two major findings. One is that a more advanced stage of thinking can be observed beyond the formal operations stage, namely, ‘postformal thought’ (Baffrey-Dumont, 2000; Sinnott, 2009). Moreover, the very notion of development stages has long been questioned, at least in the area of adult education. For example, since the 1980s, the éducabilité cognitive (cognitive educability) movement has challenged the idea that the cognitive functioning of an adult at a given age can be wholly characterised by any single stage in all areas of his or her life (e.g. Paravy and Martin, 1996; Sorel, 1994). In other words, cognitive performance and development are, to a large extent, contingent to situations and activity domains. A similar argument can be found in the theory of Multiple Intelligences (Gardner, 2006, 2009).

Piaget’s theory has also been criticised for its lack of consideration for the social dimension of learning, from two points of view. First, his theory overlooks the importance of social interactions in learning (and more broadly, cognitive development). This criticism has been widely developed by some of Piaget’s colleagues in Geneva and gave rise to the so-called Post-Piagetian socio-constructivism movement from the late 1970s (Damon, Butera and Mugny, 2008; Doise and Mugny, 1981, 1997; Mugny, 1985; Perret-Clermont, 1979). Second, from a historico-cultural perspective, Piaget’s theory could also be blamed for taking the developing and learning individual as an abstract ‘epistemic subject’ and for not sufficiently taking the cultural dimension of learning and development into account (Bruner, 1996; Smith, Dockrell and Tomlinson, 1997; Wenger, 1998; Wertsch, 1991; Wertsch, del Rio and Alvarez, 1995). Likewise, from an activity-theory perspective (Barbier and Durand, 2003; Durand, 2009; Engeström, 2009; Engeström, Miettinen and Punamäki, 1999), Piaget’s approach could also be challenged for tending to consider the learner’s interactions with the environment and the learning process as taking place in a ‘vacuum’, disconnected from the particular activity, situation and context in which it necessarily takes place. From an activity standpoint, learning is viewed as inherent in the activity itself, not the individual; it is a property
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(the ‘transformative dimension’) of the activity, not the individual. From a similar standpoint, questions could also be addressed to a constructivist approach to adult learning as to its relevance to workplace and organisational contexts. Whereas much of the research on adult learning today focuses specifically on such contexts, this kind of setting was far removed, to say the least, from Piaget’s experiments with children. Yet another set of criticisms would concern the lack of consideration for the psychodynamic aspects of learning in Piaget’s theory. A significant part of research on adult learning today has focused on the relationship between the cognitive dimension of learning and psychodynamic variables such as biographies (Alheit, 2009; Dominicié, 2007), self-concept and identity (Barbier, Bourgeois, de Villers and Kaddouri, 2006; Bourgeois, 2006a, 2006c; Bourgeois and Nizet, 1999; Kaddouri, 2006), emotions and body (Damasio, 1994; Dirkx, 2001, 2006) and various motivational beliefs, such as perceived task value and expectancy (Bourgeois, 2009b).

Let us admit that, in the light of so numerous, varied and convincing criticisms, it may seem difficult today, at first glance, to keep claiming the relevance of Piaget’s theory for understanding adult learning. Nonetheless, we suggest that the challenge could be taken up, if we can clarify and discuss some major issues involved in those criticisms. Three of them appear to be particularly important.

The informative vs transformative learning issue

As often emphasised by Piaget himself (1964), his theory of learning and development is constructivist in two ways: first, it focuses on the way in which reality is mentally constructed by the subject through his or her interactions with the environment and the role that those constructs play in these interactions (as opposed, he says, to the Behaviourist paradigm). Second, it focuses on the process through which those mental constructions are mobilised by the individual in his or her interactions with the environment are elaborated and transformed over time in the course of those interactions (as opposed, he says, to the Gestalt Psychology paradigm). At the risk of oversimplification, the process unfolds as follows (Piaget, 1967, 1968, 1975).

As a starting point, let us take an individual being confronted with a given task in a given situation (either in a formal education or training setting, in daily life or in the workplace), with a given intention (e.g. to choose and perform the adaptive behaviour and action requested by the situation). 1) He or she will activate and retrieve cognitive schemata (an implicit or explicit theory, a belief, a script, etc.) that have previously been learned and stocked in his or her long-term memory. 2) He or she will subsequently use the activated schemata as a ‘matrix’ (structure d’accueil) in order to select and organise the available information stemming from his or her interactions with the situation, with a view to making sense of the particular situation and eventually to identifying the conduct to be adopted in the situation (‘assimilation’ process). In other words, in such a process, external information is gradually ‘incorporated’ into the pre-existing schemata that have been activated to deal with the situation. 3) In this sense-making process, it may happen that a discrepancy occurs between the activated cognitive schema and the information being processed through it (‘cognitive conflict’). When this happens, the activated schema is ‘disturbed’, which will engage the subject in an attempt to restore the ‘equilibrium’. It must be underlined here that Piaget clearly distinguishes between two types of cognitive conflicts (1975). One is called lacunary conflict (conflict lacunaire). This happens when the activated schema meets entirely novel information and appears to be insufficient to account for it. In this case, the pre-existing cognitive structure appears to be incomplete and therefore unable to account for the new piece of information. A very common example of this is when someone simply does not know the answer to a question that is asked of him or her. The second type of cognitive conflict (‘contradiction’) occurs when the activated schema meets a piece of information that questions its validity. In this case, the problem is no longer that the schema appears to be incomplete to account for the novel information, but that it is contradicted by it. A common example of this is a conversation in which someone deals with a partner who expresses an opinion that is opposed to his or her own. Piaget also distinguished basically two major strategies for overcoming a cognitive conflict. One is
called homeostatic regulation strategy. It consists of managing to adapt the disturbing information to the pre-existing schema in such a way that the latter is eventually left unchanged. For example, someone may simply ignore the potentially disturbing information, or reinterpret it in a way that eventually makes it compatible with the prior schema. For Piaget, such a strategy leads to the restoration of the past equilibrium. It can therefore still be considered as a part of the assimilation process as it leads to preserving the integrity of the prior structure. Therefore, in this case, no learning has occurred, as the initial structure has not been transformed. The second strategy for solving a cognitive conflict is called homeorhetic regulation strategy. It consists of adapting the prior schema to the new information, rather than the other way round. In other words, by doing so, the individual adjusts (‘accommodates’), i.e. transforms his or her prior schema into a new, more adaptive one (équilibration majorante). Therefore, in this case (and only in this case) learning occurs. This reminder enables us to address two controversial questions that are often raised in relation to Piaget’s theory.

They both have to do with the question of what is transformed in learning. In the debate over the theory of ‘transformative learning’ (Mezirow, 2009; Mezirow and Associates, 2000), it is suggested that transformative learning is a particular type of learning that is to be distinguished, by definition, from ‘informative’ learning (Kegan, 2009). Regarding the latter, Kegan considers that ‘Learning aimed at increasing our fund of knowledge, at increasing our repertoire of skills, at extending already existing established cognitive structures all deepen the resources available to an existing frame of reference. Such learning is literally in-form-ative because it seeks to bring valuable new content into the existing form of our way of knowing’ (ibid., p. 42). This kind of learning is viewed by the author as a ‘meaning-forming’ process, i.e. ‘the activity by which we shape a coherent meaning out of the raw material of our outer and inner experiencing’ (ibid., p. 44). On the other hand, so-called transformative learning aims at transforming the very frame of reference that was used to form meaning, instead of forming meaning within the pre-existing frame of reference. It is viewed as a process of ‘reforming our meaning-forming. We do not only form meaning, and we do not only change our meanings; we change the very form by which we are making our meanings. We change our epistemologies’ (ibid., pp. 44–45). From Piaget’s constructivist perspective, such a distinction is problematic indeed, in two respects.

First, what is in fact at stake here is the common distinction between ‘knowledge’ and ‘representation’ in contemporary cognitive psychology (Richard, Bonnet and Ghiglione, 1993). While both are forms of mental construction, the latter (representation) refers to the local, ad hoc meaning that is ‘formed’ in and about the given situation on the basis of (1) the raw informational material provided by the situation and actually attended to by the individual, and (2) the pre-existing mental frame of reference (Piaget’s ‘schema’) that has been activated to process this information. On the other hand, ‘knowledge’ refers to the very frame of reference that has been used as a basis for the ‘meaning formation’ activity. In this sense, ‘meaning forming’ cannot be assimilated to any kind of learning at all, it simply corresponds to the understanding (sense-making) process. We will therefore speak of ‘learning’ only if the frame of reference being used as a matrix for the meaning-forming process is actually transformed as a result of the meaning formation, assuming that this may not always be the case. For example, in trying to solve a problem, I will attempt to make a diagnosis of the situation on the basis of both the information available and my relevant prior knowledge to process it. By doing so, I am simply gradually forming a meaning of the situation, which does not necessarily entail any transformation of the prior knowledge activated. In this process, I might even happen at some point to modify my initial diagnosis (for example, because some new information has been taken into account or reinterpreted), again without any subsequent transformation of my prior knowledge. In short, from this perspective, learning is by definition transformational or transformative, whereas so-called informative learning cannot really be viewed as learning.

Second, we suggested elsewhere (Bourgeois and Nizet, 2005) that the schemata (frames of reference) that are activated and used in the ‘sense-making’ process can be viewed as hierarchically embedded cognitive structures, from the more specific to the more general ones. Now, referring to Watzlawick et al.’s...
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distinction between Level 1 and Level 2 types of change (Watzlawick, Weakland and Fisch, 1974), we can assume that lower level frames of reference may change (as a result of their use in ‘local’ meaning-forming activities) within higher level frames of reference. In some cases, this change at the lower level would not bring about any change at the higher level (Level 1 change), but, in other cases, they might do so (Level 2 change). In other words, the above-mentioned ‘informative’ learning (taking place within a pre-existing frame of reference without modifying it), as well as ‘transformative’ learning, can both concern frames of reference.

Finally, for the same reasons, the distinction between, on the one hand, ‘cumulative’ (or ‘assimilative’, or ‘additional’) learning and, on the other hand, ‘transformative’ (or ‘transgressive’, or ‘accommodation’) learning (Illeris, 2004) does not make any more sense from Piaget’s perspective. In his model, again, learning occurs only if accommodation of pre-existing structures happens (in this sense, assimilation itself can never be equated to any learning), while accommodation (i.e. learning) can happen only if assimilation has occurred in the first place. In Piaget’s view, accommodation and assimilation are inherently interrelated; they are consubstantial, as two sides of the very same process, that is, the ‘equilibration’ dynamics.

The individual vs social learning issue

As pointed out above, one of the most widely spread – and sometimes hottest – debates about Piaget’s constructivism deals with the individual–social issue. This debate basically concerns the question of who learns. From various sides, Piaget’s theory of learning has been blamed for being over-focused on the individual, but we should clearly distinguish here between two versions of this criticism. On the one hand, the ‘neo-Piagetian’ socio-constructivists (see above) agree with Piaget’s view of learning as an individual inner cognitive process based on a dynamic equilibrium between assimilation and accommodation processes, with the notion of ‘cognitive conflict’ at the core of this dynamic. However, they go a step further by emphasising the key role of social interactions as a facilitator of this process. In short, they argue that, under certain conditions, learning is facilitated by the fact that the cognitive conflict occurs in the framework of a social interaction between the learners and others (and hence becomes a so-called socio-cognitive conflict). What once was an inter-individual cognitive conflict between two partners in interaction is gradually internalised by the learner to become an inner (intra-individual) conflict, eventually bringing about internal changes within the learner’s cognitive structures.1 In keeping with Piaget’s constructivism, the neo-Piagetian socio-constructivism therefore remains individually centred. The same argument would basically apply to theories of cooperative or collaborative learning (Johnson and Johnson, 1998; Slavin, 1990). The other version is provided by other theories – mostly referring to Vygotsky – that look at learning as an inherently social process. With Vygotsky himself, the focus in learning eventually remains somewhat individual: learning is always rooted in social interactions in the first place and gradually becomes internalised by the individual. However, it is always mediated by cultural tools, or artefacts, which implies that learning, too, is always rooted in culture. In neo-Vygotskyan theories of learning, the ‘subject – mediating artefact – object’ triangle cannot be disconnected from a community of practice (Lave and Wenger, 1991; Wenger, 1998), the social network in which it takes place2 or, the activity (Engeström, 1987). In other words, learning is only a dimension inherent in a given situated activity, with its own (socially based) rules and norms, division of labour and social relationships structure, tasks, objects, culture, etc. With those more recent approaches, the shift in the central unit of analysis is gradually from the individual, to the dialogic set of partners, the community and ultimately the activity. In those radically ‘social’ approaches to learning, the latter is no longer viewed as inherent in the individual subject, but rather in the social unit and activity in which it necessarily takes place. A similar view can be found in those theories that look at learning primarily as a characteristic of organisations (Argyris and Schön, 1996; Nonaka and Takeuchi, 1997).

Although Piaget himself did not happen to be particularly interested in the social dimension of learning, his model does not a priori exclude the individual’s interactions with his or her social environment, whether
in terms of interactions with significant others (as demonstrated by the neo-Piagetian socio-constructivist approach), or position in a small group, work team, organisation, or community of practice. Nor does it of course exclude the impact of culture in the learning process. Simply, all these social interactions, which can be indeed considered as inherent in the learning process, are looked at from the individual’s standpoint, from the point of view of what happens in the individual’s inner learning process or outcomes as a result of those interactions. As a colleague of mine once put it ‘one always learns alone, but never without the others’.

The individual–social debate about the Piagetian model is sometimes difficult, mainly for epistemological reasons. I suggest that there are basically two ways of going about this debate. One is to look at things in terms of points of view. For example, if we examine the course of a collective activity on the workplace in a given organisational context, we can either look at the learning process from the standpoint of the individual collaborator involved in the activity and look at the way the dynamics of the activity, the work team and the organisation act upon and interfere with the individual’s inner learning process. Or, we can look at what happens in the work team dynamics in terms of collective learning, in relation to both the individuals’ contribution to the collective process and the organisational context. Or else, we can address the organisational level directly, for example, by examining the organisational conditions and mechanisms through which individual and team learning contribute to organisational change. The difference between the three approaches is only a matter of standpoints, of ways of looking at the interplay between the individual and the collective dimensions of learning and activity. Lorino and his colleagues’ work (Lorino and Teulier, 2005) provides a perfect example of such an epistemological position. However, problems arise as soon as one reifies those standpoints. This would be the case, for instance, when the choice to look at what happens at the collective level (the collective activity and its social setting) would lead one to decide at some point that learning at the individual level simply does not exist at all, that learning is inherently and exclusively a social process. Or, conversely, focusing on the individual level would go along with the decision that learning is, by nature, an individual matter exclusively.

The cold vs hot cognition issue

Piaget’s model clearly focuses on the cognitive dimension of the learning process as transformation of the individual’s inner cognitive structures. Little attention has been paid in his approach to the psychodynamic aspect of learning, that is, the learner’s engagement in learning. In this sense, it can be qualified as a ‘cold’ cognitive approach. In Piaget’s theory, we can see how the learner cognitively deals with a given situation, how he or she is making sense of the situation, how and under what conditions the pre-existing frames of reference that he or she mobilses may transform themselves in this sense-making process. But it does not account for why the individual has engaged in this process in the first place; why he or she has chosen to cope with this situation, rather than another one; and, once engaged in it, why, or for what, does he or she persist in his or her striving to achieve his or her goal or, on the contrary, drop out when facing a difficulty. Of course, Piaget, as a biologist, has always strongly insisted on the functionality of learning. This process is ultimately aimed at dynamically maintaining the individual’s adaptation to his or her environment, ‘equilibrium’ between his or her mental structures and the changing information that he or she is constantly confronted with. But this idea is so general that it is hardly helpful to understand, say, why specifically an illiterate person decides at some point in his or her life to enter an adult literacy programme, what he or she is looking for and expecting from such an engagement, or why, precisely, when confronted with a particular difficulty in the learning process, he or she will persist until full completion and success, or drop out on the way. Likewise, as already mentioned, Piaget insists on the fact that a cognitive conflict can be overcome either by ‘homeostatic’ or by ‘homeoehesic’ regulation but, again, this says nothing about why the individual will ‘choose’ between these two modes of regulation; or why in some cases he or she will tend to resist change and therefore turn to a homeostatic strategy that will maintain the status quo of his or her pre-existing
frames of reference; or in other cases, will accept the challenge of change and uncertainty. How does the individual manage the balance between the mixed feelings (attraction and repulsion, approach and avoidance, desire and fears) that he or she may experience in relation to learning?

To address these questions, we need to account for the motivational dimension of adult learning, that is, to identify the motivational beliefs directly and indirectly involved in the cognitive dynamics of learning and the specific role that they play in such dynamics. We further suggest that two types of motivational constructs are of particular importance, namely, the meaning and value attributed by the individual to the learning activity, on the one hand, and his or her expectations of success in this activity, on the other (Bourgeois, 2003, 2006b, 2009a, 2009b; Bourgeois and Nizet, 2005; Bourgeois and Vandamme, 2005; Neuville, Frenay and Bourgeois, 2007; Wigfield and Eccles, 2000). In particular, such an investigation inescapably leads one to look at the relationship between the learning process and both the individual’s biographical and identity dynamics (Alheit, 2009; Barbier et al., 2006; Bourgeois, 2000, 2003, 2006a, 2006c, 2009a; Bourgeois and Nizet, 1999, 2005; Deltand, 2008; Dominicé, 2007; Kaddouri, 2006; Tesser, Stapel and Wood, 2002). Finally, it should be underlined that the motivational, biographical and identity dynamics underlying learning also involve cognitions, which, as such, can also be transformed. Hence, Piaget’s constructivism can also be useful to account for such transformations.

In conclusion, Piaget’s constructivism appears to remain quite relevant for understanding the cognitive dimension of adult learning, essentially as an on-going process of transformation of the individual’s mental frames of reference underlying his or her situated interactions with the environment and changing in the course of those interactions. Although Piaget himself did not pay much attention either to the social dimension or to the psychodynamic dimension of learning, his theory does in no way exclude those dimensions a priori. In fact, our understanding of adult learning would benefit considerably from integrating these three – cognitive, social and psychodynamic – dimensions into a broader comprehensive model of learning, and from focusing specifically on the interactions between these dimensions, as already suggested, although in somewhat different terms, by Bourgeois (2009a) and Illeris (2004, 2009).

Notes
1 See Bourgeois (2004) for a review.
2 See the concept of ‘distributed learning’, in use mainly in the study of collaborative web-based learning environments.
3 Philippe Carré, personal communication.

References
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