Alignment

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Abstract
The subject of alignment is not new to the world of education. Today, however, it has come to mean different things and to have a heuristic value in education according to research in different areas, not least in neuroscience, and to the attention now paid to skills and to the alternation framework.
This paper, after taking into account all classic references that have already attributed an important role to alignment in education processes, also considers its strategic role in the current situation, outlining the shared construction processes and focusing on some of the ways in which this is put into effect.
Alignment is part of a participatory, enactive approach that gives a central role to the interaction between teaching and learning, avoiding the limits of both behaviourism, which has a stronger bias towards teaching, and cognitivism and constructivism, which focus their attention on learning and, generally, on what separates a teacher preparing the environment and a student working in it.

Introduction

The theories of knowledge that reject a unidirectional relationship from experience to theory, or from the theory of experience, without assigning a prevalent role to either of the two poles[1] propose activities in which the surroundings and the subject engage in enactive dialogue (Varela, 1991; Rossi, 2011).

[1] Among the theories of knowledge that propose to go beyond the Galilean chas, we list (with no claim to exhaustivity): the theories of action (Baudouin and Friederich, 2001; Theureau, 2004; Durand and Veyrunes, 2005; Pastré, 2011; Yvon and Durand, 2012; Altet, 2012; Rivoltella and Rossi, 2012; Hansson, 2014); the theories born from phenomenology and from Husserl and Merleau-Ponty's studies; the theories of complexity (Altan, 1972; 1979; Morin, 1974; 1987; Bateson; 1977; 1984; Lovelock, 1979; Thom, 1980; Ceruti, 1985); the post-constructivist theories (Latour, 2004; Asdal, 2003; 2008; *Knol, 2011;* Herrera, 2012; Wehling, 2006; Rouse, 2006).

Varela et al. present an "enactive conception" of experience according to which experience is not something that occurs inside the organism, but rather something that the organism enacts as it explores the environment in which it is situated (Pessoa et al., 1998; Thompson, 1995; Thompson et al., 1992). A related approach has been put forward by Järvilehto (1998a; 1998b; 1999; 2000), who stresses that perception is activity of the whole organism-environment system (O'Regan & Noë, 2001; Noë, 2009).

According to enactivism, the systems engage in dialogue and, although each one features organisational closure, they synchronise and align through a continued rebalancing characterized by coactivity (Damiano L., 2009; Vinatier & Numa Bogage, 2007). Alignment is not a foregone conclusion, as teachers well know. If we apply Varela's theory to the world of education, the interacting stakeholders are teachers and students and alignment is the result of processes present in a positive educational relationship.

Theoretical references

The need to listen to the student in order to achieve an accord has been noted since the earliest research into teaching. Dewey based his pedagogy on the attention given to the development of the child's abilities and interests (1897) in opposition to what he called consolidated schooling practices, where "the child was thrown into a passive, receptive or absorbing attitude" (Dewey, 1897).

Save as the efforts of the educator connect with some activity which the child is carrying on his own initiative independent of the educator, education becomes reduced to a pressure from without (idem).

This attention does not mean "indulging" the child, an attitude that focuses more on the moment and on solutions without prospects, and which is just as negative in terms of repression. At the same time it also means listening to needs from the both child's viewpoint and that of his or her world. For Dewey, the education process also underlies the balance between the individual and society, the psychologist and sociologist. The hoped-for "participation of the individual in the social consciousness of the race" is not the same as the passive acceptance of rules. Reducing "education to 'adaptation' to society would make it a forced process from without, leading to the surrender of the individual's freedom to an assumed social and political situation". Dewey, thus, envisages a process of mutual and constructive alignment between the individual and society. After Dewey, Ausubel (1960) stresses the importance of connecting previous knowledge with the new paths, underscoring the importance of listening to prior conceptualisation in terms of significant learning.

Equilibration and structural pairing

Piaget talks about equilibration (….). Systems reproduce themselves in a continued interaction with the environment through processes of adaptation. This materialises in two stages, as described by Damiano E.:

> In an initial period, it seems that nothing important is happening: pre-existing schemes are able to tolerate ongoing experiences without obvious disturbances, do not change and it seems as though they are confirmed. This is the stage of assimilation. Moreover, this new experience, if it is indeed new, undermines them until new, appropriate schemes are generated, feeding back into the previous schemes, taking them to completely new, articulated extensions and increases. (…) Ultimately, adaptation occurs with the ability to explain forms of life in the same way as forms of knowledge (Damiano E., 2010, 80).

The process of adaptation is not instantaneous but it is the result of repeated oscillations (*tatennements*) during which the system, based on its own logic, dialogues with the environment through processes brought about by its own internal structure.

Systemic analysis in Maturana and Varela, as in Piaget, starts with biological studies. Although systems interact with the outside, they have an organisational closure and their operation is caused by internal laws emerging from internal organisation (Maturana & Varela, 1987, 63). Therefore, systems are autonomous and autopoietic, i.e., capable of self-generating.

However, systems communicate with an environment and to survive, they continuously exchange material and energy. During this exchange, the environment sends input to the system and the system sends inputs to the environment. These inputs disturb the balances of the two systems, but they do not bring about the transformations that depend on their organisation[2].

> In its interactions, the environment only triggers structural changes in its autopoietic units (it does not define them or instruct them) and the same thing happens with the environment. The result will be all about mutual and consistent structural changes until they integrate: this will mean structural coupling (ibid., 80).

The requirement of this coupling is, therefore, the presence of "mutual changes".

[2] For Maturana and Varela, organisation and structure are two key words: "**Organisation** is the configuration of relationships that must exist between the parts of something so that they can be considered as belonging to a specific class. A **structure** of something is the whole of its components and relationships that together embody a specific unit in the realisation of its organisation" (ibid., 62).

When interactions become more frequent and stable, two or more autopoietic units can be coupled in their ontogeny, triggering transformations that facilitate the interaction itself. At this point, we can talk about *structural coupling (SC).*

> This is a symmetrical relationship of mutual disturbances and compensations, which implicates the emergence of compatible self-generating patterns within the system and the environment. The two systems are connected by a relationship of radical interdependence coming not from the direct action of one on the other, but from the coordination of their forms of autonomy – their respective self-generating processes (Damiano L., 2011).

Social systems also show these characteristics. In these, the emerging system has its own characteristics, which are not always present in their original systems and, at the same time, the individuals comprising it maintain their autonomy and organisation. The class system is an example of SC, as are families and peer groups.

Structural coupling and the principles of simplexity

The paradigm of simplexity and its principles (Berthoz, 2009) can be useful to understand SC. The emerging system can be defined as simplex since it has a greater complexity than the systems at its origin and, at the same time, it puts processes into place that simplify interaction and facilitate the "life" of the systems that comprise it.

The first two principles of simplexity are connected and specular. The first one, the principle of inhibition,

> is used by the brain to increase speed, to operate a selection, a choice made within the complexity of elements, of a phenomenon, a deed, or a situation concerning our relations with our surroundings or the mechanisms of our thoughts (ibid., 13).

Inhibition blocks all of those behaviours that may be destructive for the emerging system, making its operation less effective and allowing attention to be focused on some responses. The second one, the principle of specialisation and selection, envisages the emergence of a personal *Umwelt*, a world with its own languages, procedures, rules and rituals. Specialisation creates procedures and artefacts that simplify certain processes, which could not otherwise be proposed, either due to the noise of the system or to intrinsic difficulties. Many mathematical algorithms present a higher complexity for equivalent basic operations but, at the same time, when learned, they make possible processes

that would require a great deal of time or would cause errors more easily, if implemented with elementary operations.

The introduction of compound variables (ibid., 18) is going in the same direction. In the school system, there are experiences, which in themselves increase complexity but also strengthen SC and boost knowledge processes. By this, we mean outings, study trips, and workshop activities that add to the workload and organisational complexity but in the same way, also boost the emerging structure and the alignment of subjects.

A further principle suggested by Berthoz is cooperation and redundancy. When thinking of the class and its teaching and learning methods, collaboration produces a redundancy of ideas, behaviours and different points of view, which are, however, the source of possible enrichment for conceptual strategy.

Aligment and production of a shared world

The SC materialises in action and thanks to action through two processes: (1) coactivity that allows comparison, mediation and explanation of respective positions, (2) the construction of conceptualisation practices from the emerging system.

Processes based on empathy may explain the link between coactivity and alignment. *Embodied simulation* (Gallese, 2009) describes the operation by which observing the other's action triggers the same neurons that would be triggered in a subject performing a similar action. It is not so much a question of single movements but of the action in its holistic terms, as only thanks to its intentions to be perceived and simulated, the understanding of the other's action occurs through recognition of the action outline.

In his analysis of the relationship between action and knowledge Caruana (2016) proposes overcoming mental representation and talks about *representation in bodily format*[3]. It includes motor, sensorial or affective representations that have undergone a process of pre-adaptation for which a "structure that evolved for a certain function (for example, sensorimotor) takes on a new one but without losing the original" (ibid., 283).

Intersubjectivity is based on going beyond the representationalist viewpoint, typically found in classical cognitive science, and the centrality of action. "A part of my brain represents the world around me in terms of action" (Frith, 2007, 166), or rather, it does not see what surrounds it but thinks in terms

[3] For Caruana (2016, 328/3191) "the error of classical cognitivists has been to conceive mental representations as timeless, static entities".

of possible actions. Action can be seen as an in-between space, as a space-time for mediation, where subjects foresee and operate, where they "face" and imitate one another, experiencing the friction of reality. Foresight and action are intimately bound and alignment between the systems is born of this action.

The second process, i.e., the construction of shared practices and conceptualisation, focuses on the products of the emerging system, the expression of its *Umwelt* (Berthoz, 2009). For example, the routines that belong to and that are recognised by each class are affective, cognitive but also sensorimotory.

Patrizia Balbi teaches in a year three class in a primary school in Pordenone. When the pupils, each in his/her time, finish a complex or difficult activity or in any case, after a difficult activity, they go to the reading corner, a space especially created within the classroom, which is furnished with cushions and upholstered benches, where they can sit with a book from the class library. They read in silence and sometimes, at the end, they talk about what they have read, but there is no "institutional" assignment. "The interest and seriousness with which they undertake this activity," says the teacher, "not only come from a taste for reading, but also from the awareness that they are living a unique, personalised experience, one that qualifies and characterises the group." An activity that came about almost casually, and developed day by day, first in an improvised area and then with greater attention to the details, processes, and the rituals, has gone on to become a habit and an identity "marker". This is now their space and their way of feeling like a group, but it is also an expression of SC. Every teacher has important routines such as this one to talk about.

Oscillating systems

There is just one problem. If the systems are characterised by organisational closure and there is no question of a representational approach to offer the individual an overall view, how is it possible to enable the alignment and empathetic processes discussed previously?

One answer comes from neuroscientific research describing dynamic systems, or in other words:

> systems comprising a series of quantitative variables that change continuously over time, independently and following a set of dynamic laws. In these models, the connection between the individual and his or her environment is removed from the concept of representation and given to others, such as the oscillator concept, keenly aware that the same elements in the central nervous system, neurons and cerebral areas, are all oscillatory. A crucial consequence of this theory is that the very distinction between subject and environment is not included, becoming of no value, unjustifiable: the only entity is the dynamic system (Caruana, 2016).

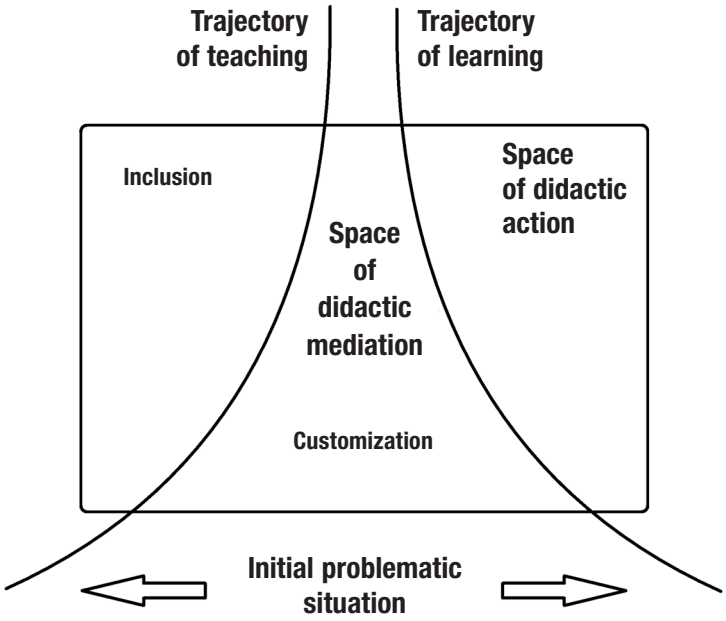
Cerebral activity is rhythmic, always moving, operating according to successive synchronisations (idem). Oscillations are an important element of the brain structure and complex cognitive processes, such as attention, preparation, facilitation, and sequential processing of simultaneous stimuli or top-down, non-hierarchical control emerge from "dynamic interaction, and phase synchronisation between different frequency bands", (idem).

These processes are present in teaching activities and, in the same way knowledge itself can be classed as a dynamic process that is the result of continuous adjustments/oscillations, boosted by reciprocal feedback.

Further confirmation of this is emerging from ongoing studies of the energy consumed by subjects during teaching interaction, in which several students and teachers participated during several work sessions. The energy consumption graph (1) is a rhythmic wave and (2) the single lines tend to be in phase (Giaconi et al., 2015). The oscillation frequency is quite regular in the same subjects, but it can vary from one subject to another while remaining within a range of values ranging from 3 to 6 minutes. The variables that cause the changes are teaching activities and subject participation. The postures of teacher and student are what determine reciprocal oscillations. The fact that the curves are in phase is not a constant, but it occurs frequently and is linked to the type of activity, the teacher's posture and to the involvement required from the students.

The actuality of alignment

Alignment takes into account that there are two trajectories which both change to become asymptotic (Fig. 1). It is obvious to state that the student's posture changes during education, since it is closely connected to the aims of school, which is learning. However, the "mutual transformation" discussed by Varela requires that, for alignment, even the teacher's trajectory is transformed to become asymptotic to that of the student. Listening has always been a quality required of the teacher but today, alignment has a different meaning, the result of a widespread, polymorphic vision of knowledge. Knowledge is no longer an organic, stable body that can be mastered and managed by the teacher alone, but it is also promethean and continously changing. Its reproduction materialises in the recursive processes between immersion and distance, between knowledge and action. The action shows new proposals and interpretations that, thanks to distancing and reflection, are generalised and structured into new conceptualisation.



If knowledge is not a static entity, but a body continuously renewing – in both vertical and horizontal senses[4], the key skills become the following: knowing how to plan, to dialogue with situations; applying existing knowledge in a divergent manner; producing new conceptualisations. Knowledge goes from quasi-religious reference to photographs that will soon be replaced being the alternance between immersion and distancing the means of this transformation. In practice, knowledge clashes with the real world, needs new solutions, and presents diverging behaviour, often unconsciously. Reflection on the practices of distancing causes the emergence of possible divergence, which is generalised, due to a distant view that is not always possible in immersion (Rossi et al., 2016). Therefore, alternance, as well as being a device, or rather, recursion between activities performed in different contexts, is also a concept or recursion between theory and practice (Bertagna, 2016).

In-service training was the first to focus on alternance. In LLL, training is the space in which the practices experienced by the practiser are systematised and observed with a divergent view, bringing out implicit knowledge, to

[4] Verticality envisages the continued development of theoretical systematisation, while horizontality involves contextualising knowledge, thanks to which, using known fragments, we introduce new solutions to solve problematic situations. The two processes are connected and interwoven.

construct improvement processes. Schön had already required the reflective professional, to emphasize the sense of his or her action and to restructure it when faced with a puzzling, problematic phenomenon (Schön, 1993, 76).

During the research-training processes, the skills and knowledge of practisers are as essential as the methodological skills of the theorist. The Collaborative Research model rests on this (Desgagné & Larouche, 2010).

The alternance framework is now pervasive and also allows a rethink of initial training (Rossi et al., 2016). The student brings his or her skill set and experience to school, as acquired in informal, non-formal contexts, which need to be capitalised on but also reorganised. If, within different skills, and including conscious knowledge, we create a story, emergent systems with local coherence are formed (Vasco, 2016). Globalisation makes it impossible to deduce the procedures to be followed in specific contexts, starting with technical rationality and general principles, requiring a limited rationality that is able to work with situation-based processes inclusive of general principles and conscious knowledge. In post constructivism, the teacher does not only prepare the environment before the action (Jonassen, 1999). In fact, while this is ongoing, he or she, together with the students and the context, also regulates and reconstructs a situation-based story at the end of each teaching episode which is complete with significance (Rivoltella, 2014). The teacher uses conscious knowledge but he or she is also aware that the different skills are of equal worth when it comes to producing a suitable solution to the problem of context and expertise becomes fundamental in finding a sense in coactivity and in connecting the different strands.

Like the researcher, in the collaborative research, the teacher is aware of his or her decisive role in the methodological set-up and reconstruction, but he or she also knows that other stakeholders bring with them the experience and knowledge needed for the course to progress. They are, therefore, no longer its sole repository and this leads to a need for alignment.

The man and the environment

The awareness, by which knowledge means action and which is present in many publications on neuroscience (Gallese and Rizzolatti, 2001; Rizzolatti and Sinigaglia, 2006; Noe, 2009; Caruana, 2016), neurodidactics (Frith, 2007; Rivoltella, 2012), life sciences (Maturana and Varela, 1987; Sibilio, 2014; Berthoz, 2011, 2013), action theories (Baudouin & Friederich, 2001; Theureau, 2004; Durand & Veyrunes, 2005; Pastré, 2011; Yvon e Durand, 2012; Altet, 2012; Rivoltella e Rossi, 2012; Hansson, 2014), may also derive from the pervasive action of men on the environment. Aristotle points to

science where the "object must exist and as a result, is eternal" (20), and the wisdom concerning the action, where everything "can be other than what it is" (1140a, 1) and may be pondered. A reasonable question is that today, if the laws of nature are unchangeable and independent of human action, their study may consider taking other paths other than a analysing other than to analyse the action. Are knowledge and action separate and diachronic? Does the latter come from the former?

To answer this, we should first look at the relationship between observation and action.

> Many current neurophysiological, psychophysical, and psychological approaches to vision rest on the idea that when we see, the brain produces an internal representation of the world. The activation of this internal representation is assumed to give rise to the experience of seeing (O'Regan and Noë, 2001).

The two authors propose a different view.

> An alternative proposal is made here. We propose that seeing is a way of acting. It is a particular way of exploring the environment. Activity in internal representations does not generate the experience of seeing. The outside world serves as its own, external, representation. The experience of seeing occurs when the organism masters what we call the governing laws of sensorimotor contingency (idem).

Berthoz (2011) stresses how seeing is a choice requiring aware movements of the upper body and head, as well as movements of the eyeball. Caruana connects seeing to the activation of the microaffordances produced and which produce seeing itself (2016, 591/3191), connecting perception to action (ivi, 19/3191).

From this representational approach to vision, we can move on to the representational approach to scientific knowledge.

The representational approach includes the presence of a macroworld determined by the unchanging laws of Nature, and a microworld in which men operate through their own actions, decisions and the construction of artefacts. It has been a century since we realized that the two worlds have the same scale; they are the same world, also immersed in time and irreversibility.

19th-century thermodynamics, the first field to study irreversibility, and early-20th-century quantum theory with its principle of indeterminacy and complex physics, for which chaos is the source of order, exploded the concepts of eternity and immutability. The theories of action, the need for continued innovation and the necessity of an ecosystemic vision close the circle and claim interdependence between action and knowledge.

Globalisation

Globalisation is another cause that not only leads to a need for alignment, but also redefines its meaning. The different worlds here on Earth are now more connected and interdependent than ever; however, at the same time, it seems to be impossible to find overarching laws and ethics to which we can refer and from which we can deduce the rules in a deterministic manner. This is the impossible nature of a monology, as Bauman would say (1995), and of great narrations, according to Lyotard: in short, of glocalisation. In the 1990s, Bauman compared modernity with post-modernity. In modernity

> To more or less similar extents to the global order ensuring an individual's life struggles, their ordered identity (global, compact, coherent and continued) was moulded like a project, a life project. Construction required a clear vision of the final shape, careful calculation of the steps required to achieve this long-term plan, and awareness of the consequences of every move. There was therefore a close, irrevocable link between the social order as a project and the life of the individual, also as a project. This latter was unthinkable without the former (1993, 239/411).

For Bauman, however, in post-modernity, individuals' projects could no longer cling to solid reference points and uncertainty and anxiety were the result of this "breaking free" of general principles. The image of oneself became fragmented "into a series of instants, each one evoking, possessing and expressing its own meaning" (ibid., 244).

> Selfhood needs to be constructed and reconstructed, constructed again and reconstructed again, based on one or other element [of the identity] at the same time, given that no element can boast a longer duration or, simply, "giveness" (ibid., 246).

Post-modern rationalism had generated the stranger who was not included or expelled, but who lived as a stranger, present and tolerated in the cracks of society.

How to move on from here? Attention shifted onto the right to "choose one's own identity as the sole universality of man/citizen, onto the essential, inalienable individual responsibility for choice, and onto laying bare the complex state or tribal mechanisms that aim to deprive the individual of this freedom of choice and of this responsibility" (ibid., 255).

Today, twenty years on from Bauman's analysis, in post-constructivism (Latour, 2004; Wehling, 2006), being extraneous is widespread and involves the majority of global citizens. There is surely a need to make individual and local choices, but with this safeguarding from supraindividual mechanisms comes responsibility for the human and environmental context in which we live.

There is a growing awareness that local choices have global impact and that the interaction between Nature and Culture, discussed previously, needs to be triangulated with political choices (Rouse, 2002, 14) since nature, science, and politics are co-produced and this implies overcoming crystallised, separatist conceptions (Asdal, 2003, 2008; Latour, 2004; Knol, 2011; Rossi, 2015).

In the world of education, today's students are strangers and cannot be compared with a standard. They are different from one another in terms of culture, ability, knowledge, skin colour, religious beliefs and gender. Integration, if understood as returning to a standard, no longer makes any sense, since there is no standard; customising has no sense, since, on the one hand, it is not sustainable for the teacher to manage as many courses as there are students and, on the other, it would become an endorsement, exacerbating fragmentation. Inclusion remains as the means by which in an open, common and shared task, each person is able to find his or her own role and expresses his or her own potential, provided that there is a final course of reconstruction in the process. Coactivity can guarantee activation of alignment and the SC.

Limited rationality redefines the sense of alignment introduced, with a view to constructivism by Biggs (2003), who indeed discussed "constructive alignment".

> The term "alignment" refers to the fact that the teacher has a teaching environment to support learning activities that will help to achieve the set learning targets: teaching methods and assessments must be aligned to learning activities that are a condition of expected results. The "constructive" aspect refers to the fact that students construct meanings through important learning activities and, knowing what the expected results of their learning will be and the level of same, it is more likely that they will feel motivated and interested in content and activities set by the teacher to facilitate their learning (Serbati & Zaggia, 2011).

Post-constructivist alignment loses the diachronic characteristics that point to a "before", during which the teacher sets out an environment, and an "after", in which the students work.

Alignment, on the other hand, is a process that takes form during the action and includes interaction between subjects as well as their contribution. It is an enactive path in which individuals develop their own identity, while also constructing that of the emerging group.

Alignment practices

To describe alignment practices in teaching, it is necessary to look at three points: (1) initial distance, (2) regulation during the process, and (3)

clarification. In this section, we will look at some ideas, but due to its brevity, the discussion cannot be considered exhaustive.

(1) The starting point for alignment is awareness of the initial distance created by the diversity between two subjects. It is crystallised into a problem that once separated student and teacher, also creates a foundation for their interaction. The problem may be represented by a cognitive obstacle (Brousseau, 1983; D'Amore, 2007), that blocks the student's learning process and points to a limitation in teaching. Other times, the problem stems from social disadvantages experienced as such by the student and the teacher, even if with different awareness.

(2) During the action, alignment is achieved thanks to adjustment, i.e., recursive adjustment in conceptualisation and practice. Cyclical processes of generation [of content and processes] are alternated with revision processes, through which conceptualisation is shared and aligned through continuous feedback from student, teacher and peers (Laurillard, 2014, 117-140). The recursive process leads to alignment, during the process, of the aims and objectives of both student and teacher, who moves forward with awareness of the subjects involved (Entwistle and Peterson, 2004). Dewey already stressed the "importance of learner participation in forming the very purposes that direct his or her activities in the learning process…" (Dewey 1938). Alignment also includes a shared choice of content, task characteristics and assessment strategies (Biggs 1993; 2003, 27; Bransford et al., 2003, 151; Apedoe and Reeves 2006: 326; Fry, 2009, 146; Entwistle and Peterson, 2004, 424; Laurillard 2014, 99).

To describe the regulation process, Vinatier and Numa Bogage (2007) focus their attention on coactivity. The authors describe an experiment involving a support teacher and a pupil with reading difficulties. Thanks to coactivity, a shared world emerges/is constructed during the interaction, based on shared previous knowledge and "representations in bodily format", as Caruana would say (2016), allowing them to deal with the obstacle that is both cognitive and communicative between the teacher and student, and to commence a syntonic path.

(3) Alignment is not an underestimated process, nor is it independent of the awareness of its subjects. To bring out the meaning of the process it is necessary for stakeholders to be aware of its structure, together with its transformation during the process. From this comes a need to make this an outward-looking, visible structure, an artefact, and a boundary object for dialogue starting from the planning stages[5].

[5] For more information about this point, see the PROPIT project started by the research unit TINCTEC (http://tinctec.it). Further information and a free e-book, "Micro-planning" by FrancoAngeli.

Clarifying the project does not mean imposing a path, but sharing the anticipation[6] that is in any case present in every human action, making it an object on which to work. The project artefact then accompanies the course of the project and changes while it is in progress, incorporating the traces to describe the evolution of the alignment process. The project and documentation will together create a single artefact.

On a classic path, the validation of a teaching course comes from achievement of set objectives. Alignment, however, is validated through analysis of phenomenology, making it possible to identify and capitalise on the emerging SC. A final reconstruction of this was not needed in past courses, as the direction was given from the outset. However, if the aim is SC, or in other words, alignment between subjects who interact by building a local coherence, only a final reflection that gives a shape to the shared world and highlights its meaning can close the process. This process, which has analogies with the debriefing present in the EAS method (Rivoltella, 2014), requires the organisation of a plot to connect the concepts elaborated during teaching to some fragments of conscious knowledge. This goes back to a subject discussed in previous paragraphs.

The risks of subjectivity and self-confirmation are present. To avoid them, it is necessary to enable triangulation and comparison between more than one perspective, securely those of the two subjects in dialogue and of the emerging system.

Conclusion

Alignment is an umbrella term that covers the needs of 21st-century global society in which knowledge is continuously reconstructed to meet problems that emerge on a local basis. It describes the processes through which, in the recursion of immersion and distancing, knowledge and innovation take shape, where teacher and student interact. The teacher becomes a companion and knowledge becomes a broad-based, fragmented and distributed object.

Neuroscience explains some of the processes underlying alignment, describing the role of oscillation in terms of bringing together the thoughts and actions of interacting subjects by synchronising them. As suggested by the theory of dynamic systems, only a systemic vision, based on relationships and on reciprocal adjustments, can provide elements for understanding the

[6] We should consider the differences between predicting and forecasting. Prediction, which is so dear to the philosophers and mechanical scientists of the late 19th-century, makes way for forecasting (Rivoltella, 2015), and anticipation (Berthoz, 2011) becomes a key skill for operation.

processes of SC. Oscillation comes from the impossibility of the short-sighted automaton to have an overall view of the system, and suggests acting rhythmically to test and, therefore, dialogue with the world. It is in this process that accords and alignments are created between the subjects in the system, and then new systems emerge.

Once the teaching practices, which identify themselves in the process-product paradigm and which reduce the study of the teaching process to effective behaviours that can be observed, as well as perspectives focused on psychological, constructivist learning, have been overcome, in order to explain current educational practices the following seem to be useful:
(1), the interactionist paradigm, based on the "articulation of the different types of variable that come into play in the *interactive, teaching-learning processes* and involve the teacher, the pupil and the situation at the same time," (Altet, 2012, 291);
(2) the didactic, mediation paradigm, in which the teacher implements a continued balance between the process of enrichment and that of education, with constant presence in the teaching activity (Damiano, 2013, 156-158), and
(3) the *conversational framework* based on the recursion between "generated" and "modulated" which develops in the interactive activities between teacher, student and peers (Laurillard, 2012).

In this viewpoint, which, although different, has some strong analogies, in my opinion, with a view to enactivity, we have alignment as a process. During the action, the subjects, in continued coactivity, implement recursive courses between immersion and distancing, and between acting and reflecting, synchronising their states and moving in the direction of the SC. This creates an emerging system, a placed system, with its own local coherence.

"The successor to objectivism is not subjectivism by way of negation, but rather the full appreciation of participation", as Varela would say (1979).

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