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ABSTRACT

Didactic action is a complex and adaptive process, in which the teacher should consider the students' individual characteristics through diversified methods and *non-linear* logics. The paper proposes a research design focused on the interconnection between De Bono's Six Thinking Hats theory and Berthoz's paradigm of simplicity. It aims to make participants more aware of their way of thinking and acting, thus promoting an inclusive and adaptable education for everyone.

L'azione didattica è un processo complesso e adattivo, in cui il docente dovrebbe considerare le peculiarità dei discenti con metodi diversificati e seguendo logiche prassiche *non lineari*. Il lavoro, nello specifico, propone un disegno di ricerca sull'interconnessione tra la teoria dei sei cappelli di De Bono e il paradigma della semplicità di Berthoz, per rendere i futuri docenti più consapevoli circa il proprio modo di riflettere e agire, promuovendo un'educazione inclusiva e adattabile a tutti e ciascuno.

KEYWORDS

Simplicity; inclusive didactics; non-linearity; Six hats for thinking; complexity

Semplicità; didattica inclusiva; non Linearità; sei cappelli per pensare; complessità

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1. Introduction

In the contemporary educational context, the teacher's didactic action is configured as a complex, dynamic, and multidimensional process (González-García et al., 2019), in which cognitive, relational, emotional, and organizational factors interact (Gennari, 1996). To interpret and orient this complexity, it is necessary to have theoretical and methodological tools capable of capturing the multiplicity of levels involved (Sibilio, 2014). In this perspective, this paper proposes an analysis of didactic action through the integrated lens of Edward de Bono's (2015) six thinking hats and the concept of simplicity developed by Alain Berthoz (2011).

De Bono's six hats represent a lateral thinking technique that allows you to explore a problem or situation from different and complementary perspectives: emotional, rational, critical, creative, organizational, and metacognitive. Applied to the school context, the theory of the six hats offers a multifaceted key to interpreting the teacher's action, allowing the different dimensions of his work to be distinguished and enhanced. In this regard, it is possible to find elements of commonality with the scientific reflections of Alain Berthoz, a physiologist of perception and action who, in his theory of simplicity (Berthoz, 2011), hypothesizes that the solutions devised by living organisms to decipher and deal with complexity can be considered valid and applicable to the entire class of *complex adaptive systems*. One of the rules of simplicity described by Berthoz is *deviation*, that is, a rule that attempts to solve the problem, but originally, and using, and experimenting, a plurality of trajectories, perhaps even unknown, to solve the problem itself. The prerequisite for the use of deviation in education can be identified in the subject's ability to deal with the complexity of problematic situations using *creativity* (Goleman et al., 2017), *divergent thinking* (Guilford, 1950) and *lateral thinking* (de Bono 2015; 2015a), which have shown interesting educational implications and are corroborated by a rich scientific literature. Starting from these premises, the aim of this paper is therefore to explore how the six hats can be used to support learners in reading their teaching action in a non-linear key, also thanks to the use of patterns and rules of use implicit in simple action can enhance the ability to make educational decisions in an integrated way, located and flexible. This analysis, therefore, would offer a theoretical and operational contribution to the reflection on teaching professionalism, proposing an interpretative model that recognizes the richness and articulation of didactic thought in its most authentic and conscious expression.

2. Didactic action between *linearity* and *non-linearity*

Teachers, in the age of *complexity*, due to the presence of a plurality of *stimuli* and innovations, find themselves facing several personal and educational needs of their learners, which places them in a posture of constant adaptation, as well as in the necessary condition of deconstructing certain operational rigidities in favor of non-linear trajectories (Sibilio, 2015). It is necessary, however, that through the action of the teacher, learners also learn to *decipher* all stimuli and problems, as well as to look for strategies to deal with them (Sibilio, 2020), trying to find innovative and *non-linear* strategies (Sibilio, 2012; Sibilio & Zollo, 2016), which are placed on the great line of *creativity* (de Bono, 2015a). In this sense, the logic of creative thinking, if applied in the educational experiences included in the construction of the teacher's skills, could prove to be an interesting strategy for solving problematic situations.

Specifically, the concept of linearity of teaching implies a conscious and/or unconscious tendency of the teacher to adopt didactic action schemes defined as “linear”, rigid, and that compress creativity and lateral thinking, useful for the identification of trajectories other than conventional ones. On the scientific level: *“the linearity of teaching corresponds to a possible interpretation of the type of relationships between the actors, objects, and events of the teaching-learning process that follows a specific line of action that can be repeated. [...] This track of linear didactic action appears as a negation of interaction in favor of a modeling of action that proves to be unanchored from the understanding and interpretation of the soft sciences (Frauenfelder, 1994)”* (Sibilio, 2020, pp. 155-156).

The different articulations in which linearity can manifest itself, as well as the risks and limitations, are many. For greater clarity, it is useful to describe the different forms of linearity that can be traced in the teacher's actions. The first form of linearity is linearity in the relationship *theory-praxis* and *praxis-theory*. It manifests itself when teachers adopt practices strictly related to a specific theoretical model, as the practice is configured as *“a generative modality of theoretical models and as the place for the development of interpretative systems of the teaching-learning process”* (Zollo et al., 2018, p. 23). The second form of linearity, i.e., *egocentric* linearity, takes shape when the teacher's action is carried out through a replication of his or her cognitive and learning style during the teaching process and due to a blindness to the complexity of the teaching action and the peculiarities of individual learners. As regards the third type, linearity in *action schemes*, we refer to the implementation of some routines to anticipate the results of one's teaching action. This can imply further processes of homologation, i.e., a reiteration of the scheme

of action regardless of the educational needs of the learners, as well as the need to “economize”, useful for simplifying the teaching situation and mastering it better. Added to this is the analogy that is, of a tendency to generalize the didactic situations, the needs, the outcomes of the didactic action in a mechanical way.

The last type of linearity, i.e., *linearity in the perception of teaching outcomes*, is understood as the propensity to evaluate the outcomes of one's actions to other teaching experiences and not considering the specificities of the group with which one is interacting. In light of these considerations, these types of modes of action could compromise the teaching-learning process and hinder the active participation of all students in teaching activities.

Therefore, it is considered appropriate to *rethink* the professionalizing paths aimed at teachers so that they can have the necessary tools to deal with the complexities of the training activity.

This implies the need to design training courses that allow the teacher to acquire useful skills to use problem solving strategies in a divergent and unconventional way, in a flexible, innovative way and adapted to the peculiarities of the learners by implementing the principles of lateral, creative and divergent thinking (De Bono, 1998; Guilford, 1950; Zollo, Kourkoutas, & Sibilio, 2015). In the same way, it is considered appropriate to promote the development of reflective skills “on the *mechanisms of perception and action that exert an influence on the educational outcomes of learners leads to consider the fundamental factors of the generative systems of teachers' skills, restoring to the teacher a proactive role in the dynamics of inclusion*” (Aiello et al. 2016, p. 18). To achieve these goals, the development of a creative and divergent thinking, defined by De Bono as *lateral*, through the method of the six hats for thinking and the approach of simple teaching could encourage teachers to explain and identify the links between beliefs, perceptions and actions thanks to activities of conscious preparation of the transpositional act. Operating according to the trajectory of the six hats implies, however, the need for the teacher to improve in his or her perceptive action, which is useful for better understanding the meaning of the teaching action itself, having a greater awareness of one's own self, as well as the recognition of what is different from oneself, from an inclusive perspective.

3. Perception and action in the teacher's didactic action

In the contemporary educational context, the relationship between *perception* and *action* constitutes a central axis for understanding the didactic interaction and the

complexity of the teaching-learning process. Historically, the conception of action has undergone a profound transformation: from the Aristotelian and Thomistic vision, in which action was based on alignment with a theoretical and metaphysical order (Aristotle, trans. 2000; Thomas Aquinas, 1954), we have passed, between the eighteenth and nineteenth centuries, to interpretations that see action as a means of accessing knowledge and as a generative dynamic (Sibilio, 2020). Thinkers such as Goethe (1835), Fichte (2007), and von Cieszkowski (1997) have highlighted the transformative dimension of human action, with important repercussions on the educational field, in which teaching becomes a performative and relational act.

Perception is no longer a neutral and passive act but becomes an integral part of the action: perceiving means interacting with the other, grasping signals, times, emotions, and intentionality. In the didactic field, this implies that educational action must be constantly regulated based on the perception of the other, in a dynamic balance that allows the continuous adaptation of the teacher to the context (Sibilio, 2020). The act of teaching is no longer unidirectional, but an interactive dance where meanings are negotiated and the timing of learning is regulated (Leibniz, 2011).

In the framework of contemporary philosophies of action, a double level emerges on the one hand, action as an expression of free will, influenced but not determined by external conditions (Laberthonnière, 1904), on the other hand, action as a pragmatic event, in which learning arises from the concrete interaction between teacher and learner (Sibilio, 2020). Educational pragmatism emphasizes the need for a living connection between theory and practice, in which knowledge is not transferred, but built together, within a shared experience. Knowledge, in this perspective, does not precede action, but is its emerging product (Jensen, 2002).

In the twentieth century, reflection on action was enriched thanks to the contribution of philosophers such as Anscombe (1957) and Davidson (1980). The latter proposes a conception of action rooted in biological events, which considers educational intentions as emerging from an interaction between nature and culture (Davidson, 1980). Teaching is thus configured as a biosocial act, in which the teacher's action transmits not only skills, but also values, identities, and social norms (Sibilio, 2020).

From a sociological point of view, authors such as Parsons (1962; 1965) and Weber (1961) underline the importance of reading educational action as a social process that integrates individual intentionality and institutional constraints. Teacher-student interaction is a meaningful human relationship, involving negotiation, mutual recognition, and meaning-building. Znaniecki (1967) introduces the concept

of continuous adaptation, according to which educational action is influenced by the availability of means and the context, requiring a systemic management of teaching.

Educational interaction, as a process of *reciprocal influence* (Nedelmann, 1992), is characterized by variables such as frequency, duration, degree of activity, and predictability (Sibilio, 2020). These dimensions make clear the need for flexible action, capable of responding to the changing needs of the class group. In addition, perception plays a fundamental role in the management of emotions, communication, and the creation of a relational climate conducive to learning.

In this perspective, didactic action can be interpreted through the lenses of different theories of action: *symbolic interactionism* (Goffman, 1974), which focuses on meaning constructed through relationships; *the theory of exchange*, which values reciprocity in the educational relationship; and the *theory of alternatives of choice* (Parsons, 1962), which highlights the role of values and evaluation in teaching decision-making. *Cognitive metaphors* (Lakoff & Johnson, 2022) also become tools to shape educational reality, helping teachers and students conceptualize experiences and learning paths.

Finally, the teacher is called upon to exercise conscious control over the action, understanding his or her role not only as a transmitter of content but as a transformative agent, capable of harmonizing the complexity of the classroom (Liu & Ball, 2019). Educational interaction is, therefore, the place where perception and action merge, generating a network of shared meanings that build the educational identity of the individuals involved (Sensevy, 2012).

The relationship between perception and action represents, therefore, a central node in educational reflection, where teaching is understood not as a linear transmission of content, but as a dynamic, generative, and interactive process. The transformation of the concept of action, from a substantial element of classical metaphysics to a tool for access to truth and knowledge, has had a significant impact on teaching practices, shifting the focus to the relational and *transformative function* of acting (Fabbri & Romano, 2017). In this perspective, perception is not only a passive activity, but an *active condition* that orients and modulates educational interaction: perceiving means grasping times, intentions and emotional states, integrating them into the flow of educational action. Teaching, then, is configured as a *performative act* (Vick & Martinez, 2011) that requires awareness, intentionality, and the ability to adapt, characteristics that make educational action a process of continuous harmonization between institutional constraints, individual motivations, and social context (Sibilio, 2024). Furthermore, educational action,

conceived in a biosocial key, becomes the place where biological, cultural, and symbolic components are integrated (Cassirer, 2009), restoring a profound and transformative meaning to the relationship between teacher and learner. The pragmatist approach emphasizes the living connection between teaching and learning, emphasizing how knowledge emerges from experience and the reciprocity of interaction (Sibilio, 2020). In this way, perception and action are intertwined in the teaching activity as tools through which educational meaning is *negotiated, regulated, and constructed*, in a path that recognizes the complexity and interdependence of educational processes. The construction of this path can involve the use of a creative didactic action, in which chromaticism, as in the case of De Bono's theory of hats, becomes a tool to encourage the development of divergent thinking as well as inclusive processes.

4. Colours to *diverge* and *include*

The first theory on the concept of divergent thinking dates to the American psychologist Guilford (1950), who opened up to new solutions and was able to give life to a new associative mode of the elements to achieve objectives, alongside the convergent thinking that had characterized scientific research up to that moment. According to the scholar's perspective, therefore, *convergent thinking* operates within established schemes, addresses the problem with a certain method and, through the latter, finds the only possible solution; *divergent thinking*, on the other hand, acting outside the established schemes, allows us to approach the problem with a new approach, arriving at *original solutions* and identifying the creative process with the typical dynamics of problem solving (Zollo, Kourkoutas & Sibilio, 2015). Creativity is an exclusive characteristic of a few exceptional minds and becomes the hallmark of human thought, the natural expression of the individual's interiority. Another theorist, who has made creativity the cornerstone of human action, was de Bono (2015a). The Maltese psychologist and doctor applying creativity to the business world and linking it to business competitiveness, defines it as "*the ability to think and act differently that can be developed systematically and deliberately by anyone willing to put into practice the principles of lateral thinking*" (de Bono, 2015a, p. 28). An application of creativity for the development of problem-solving skills. A scholar, through the metaphor of the hat, learns to deal with problems by taking different points of view and proposes six different perspectives from which an idea can be generated. This premise is useful to understand how, through the creative and divergent process results can also be produced in the recognition of the other than oneself, in the awareness that the

hat worn by the other represents his way of expression, his value to be recognized, accepted and supported, in an adequately inclusive vision.

Edward de Bono's reflection starts from the way we deal with problematic situations, in many cases considering only one point of view and thus reducing the possible solutions. According to the scholar, every way of solving a problematic situation can be compared to a hat that not only defines a certain type of thought, but also has its colour (de Bono, 2015); Therefore, instead of trying to cover all aspects with thought, it is possible to separate the various types of thinking and carry them out distinctly. The colour that distinguishes the hats (white, black, green, red, blue, yellow) represents a much broader mode of expression; It takes on a symbolic meaning. It becomes a means to guide the individual to activate mechanisms of *perception of diversity*, of different ways of dealing with reality, using colour as an interpretative key, as a tool to accept the different way of looking at the world, as a different method of valuing diversity, adapting to a thought that is not lateral, but inclusive, respectful of *everyone*. Von Goethe himself (1970) considered colour as the action of light capable of *expressing passions and actions*. Colour, therefore, is a representation of oneself that finds meaning only in the relationship with the other, in the awareness that with the other, the total process of recognition of belonging to a nature is realized. Color, therefore, expresses the sensitivity of the individual, strong feelings, both positive and negative, capable of providing insights about us and others (Carluccio, 2008). Kandinsky himself in "*The Spiritual of Art*" (1989) explains the semantics of colour, according to which black is synonymous with despair, meaning and end, from which other colours unfold, a symbol of *rebirth* and continuation, the beginning of new worlds to be explored. Colour, therefore, is an expression of conditions, experiences, personal and shared experiences, a means of re-meeting and integration of different colours which, in union, give rise in any case to chromatic balance. Declined in the educational field, the exercise of lateral thinking theorized by de Bono would require experiential paths for the construction of the teacher's professional skills, to be carried out through activities that introduce the subject's ability to exercise flexibility and deviation in the didactic transposition. This finds points of contact with Berthoz's (2011) theory of simplicity, which focuses on the patterns and rules of use put in place by organisms to adapt to change and complexity and which also finds interesting points of connection in teaching.

5. The simplicity in didactics

The complexity of learning contexts implies the need to study effective strategies so that students with their individual needs can feel involved, interested, and actively engaged in the learning process, so that they can get the maximum benefit from what the school has to offer them (Fredricks et al., 2004). On the other hand, there is still a lot of debate about what skill set teachers should possess to feel well-equipped to act professionally and effectively (Aiello et al., 2021). However, in the field of national pedagogy, a perspective adopted by neurophysiology, Berthoz's Theory of simplicity, has increasingly taken hold, providing a vision of how complex systems adapt harmoniously by activating a series of biological devices that have appeared during evolution (Aiello et al., 2021). This theory could represent a good paradigm to orient the teaching action in a perspective of systemic thinking, as it provides a series of solutions with which the actors in an *“epistemologically complex system such as education, can understand the system and achieve important things from their perspective”* (Van Geert & Steenbeek, 2014). In other words, it could be a useful guide for meaningful planning and action in education, ensuring action that is inclusive on the one hand and engaging on the other. In his theory of simplicity, Berthoz identifies a set of *“biological devices, or processes [that] have appeared in the course of evolution to enable animals and people to survive on our planet [by] processing complex situations very quickly, elegantly, and efficiently, taking into account experience and anticipating the future”* (Berthoz 2012).

The cognitive physiologist and neuroscientist identify a list of six properties or patterns of action that constitute the tools for life and six rules that define the framework of reality (Aiello et al., 2021). These are applied independently or in parallel to create different patterns of action and interaction to effectively solve complex problems. These cognitive processes work in cooperation with emotion that quickly attaches values to possible solutions based on memory of past decisions or regret to anticipate the future. In line with complexity thinking, the principle of intersubjectivity is fundamental in its theory as it allows complex adaptive systems to understand and predict not only the consequences of their actions, but also the intentions of others (Berthoz 2003; ,2012). Logic, therefore, is not linear, i.e. it does not relate a problem to a single solution, or even reproductive, automatic, i.e. by adopting a solution that others have technically modeled (Sibilio, 2023). The logic of simplicity, when we must understand what something is for each of us, brings us back to the relationship between the process of understanding and that of explanation.

Focusing on the teaching-learning process, it is useful to believe that this theory can guide teachers to deal with the complexity of inclusive educational contexts (Aiello, 2012; Aiello et al., 2013). This is possible because there is an analogy between the characteristics of *Complex Adaptive Systems* and the teaching-learning process (Sibilio, 2012; 2015; 2017; 2023), stating that the latter is a dynamic system that constantly interacts with many other elements that are part of a larger system. Such interactions are highly characterized by non-linear behaviours that require constant reorganization, which in turn leads to emergent structures that are highly unpredictable (Aiello et al., 2021). Consequently, by tracing the properties and rules within this process, it is hypothesized that, if teachers become aware of these innate laws and these tools that regulate behaviour within adaptive complex systems, they will be able to deal with emerging complexity more effectively (Sibilio 2015; Aiello et al.2016).

So why should teachers become aware of such laws and tools if they already use them to deal with the complex scenarios they encounter? As with any instinctive gesture, whether it's a reflex action, such as breathing, or a learned behaviour, such as walking or driving, we tend to develop habits that we are not aware of (Aiello et al., 2021). There is evidence that improving, changing, or eliminating some of these trends can improve our well-being. Focusing on breathing, for example, can reduce fatigue and anxiety (Burtch et al., 2017). Focusing on posture can help relieve back pain (Qaseem et al., 2017), while focusing more on driving improves performance and, in turn, limits road accidents (Allahyari et al., 2008). Supporting this view is the importance given to reflective practice before, during, and after action as a fundamental competence and fundamental practice in all professions for transformative action (Schön, 1983) – without exception for teachers (EADSNE, 2012; Shulman, 2004).

Berthoz's theory has been, to date, applied in several research fields as a guide to understanding how complex systems organize themselves to thrive in harmony with their environment. Rules and properties, *catalysts* in the process of deciphering, coping with, and overcoming complexity, provide a feasible approach to dealing with complexity rather than denying it. This theory can be considered suitable to guide research and practice in different educational systems since it is based on premises that are neither context-specific nor related to the culture of the time (Berthoz, 2012; Sibilio, 2014). In the educational context, it is important to adopt a dynamic and multifactorial approach to effectively address the complexity of teaching, especially in inclusive environments. A first central aspect is represented by the property of *separation of functions and modularity* in the face

of complex teaching tasks, which the teacher can break down into simpler and more specific activities, each of which responds to targeted objectives and which the teacher mediates from time to time through mediation channels adapted to the specificity. Once completed, these parts are then integrated into a broader and coherent teaching project, capable of leading to the general objective of learning. This process makes it possible to make even the most complex activities more manageable (Berthoz, 2012; Sibilio, 2014; Aiello et al., 2021). Secondly, teaching often requires a considerable amount of *speed*. In situations where pupils show disinterest or when unforeseen events occur, the teacher must be able to react promptly, adapting activities or proposing effective alternatives. The ability to make quick and functional decisions is essential to maintain high involvement and continuity of the educational process. Another key property is *reliability*, which translates into the ability to minimize errors and maximize the chances of success. Teachers who adopt differentiated strategies, adapting teaching and assessment methods to the learning styles of individual learners, can ensure greater teaching effectiveness. In this way, learning becomes accessible to all, contributing to real school inclusion. Alongside this, *flexibility* and *adaptation to change*, combined with vicariance, allow teachers to choose the most appropriate strategies based on emerging stimuli and needs. Each class is a unique context, with varied interests, preferences and rhythms. The possibility of changing the teaching approach, using a plurality of methods, makes teaching more adherent to the reality lived by students and more effective in promoting their full participation. The property of *Memory* also plays a decisive role: the experience gained over time allows teachers to foresee problematic situations and to prepare, in advance, functional strategies to manage them. Continuous observation and reflection on past practices thus become valuable tools for improving classroom management. Finally, an element that completes the picture is *generalization*, or the ability to transfer what has been learned from one situation to another. This process allows teachers to capitalize on knowledge and skills acquired in different contexts, making them useful for taking on new challenges as well. In inclusive environments, where the variables involved are diversified, this ability is particularly valuable for ensuring educational continuity and coherence.

As far as the rules of use are concerned, it is interesting to highlight that in the teaching-learning process, different neuroeducation principles can contribute to promoting more effective and innovative teaching approaches. Among these, the first is given by *inhibition and rejection*. When making a choice all other available options can be inhibited or rejected, because they may not be very useful in the application in a certain context rather than another, but not useless. This approach

implies a strong use of creativity, in the dimension of promoting the inhibition of habitual automatic responses to encourage the generation of new and original solutions (Sibilio, 2014; 2023). Another relevant principle is that of *specialization and selection*: living organisms tend to select sparingly only the information essential for the achievement of specific objectives. Similarly, in the educational field, it is essential to propose stimuli that capture the interest of students, carefully selecting the contents to be presented (Berthoz, 2012; Sibilio, 2014; Aiello et al., 2021). This is followed by the principle of *cooperation and redundancy*, which refers to the ability to integrate available information to ensure consistency and reliability in cognitive processes. *Redundancy* allows for reinforcement of information through repetition, reducing the probability of error and increasing the stability of learning (Berthoz, 2012). Also important is the rule of *probabilistic anticipation*, according to which teachers, in teaching planning, constantly evaluate the possible reactions and results of students, making decisions based on an analysis of probabilities and expected consequences. This anticipatory capacity guides the continuous adaptation of educational action. The rule of *detour* introduces the possibility of addressing problems in a *non-linear way*, choosing solutions that are more complex, but which prove to be more effective in simplifying the resolution of educational difficulties (Berthoz, 2011). Finally, the rule of *meaning* emphasizes the importance of giving meaning to educational action through the definition of clear objectives and targets. Attributing meaning links intention to action, making the learning experience more motivating and engaging for the learner.

6. The six hats as modes of human action

The famous aphorism by René Descartes (1596-1650) "*Cogito, ergo sum*" expresses the importance that human beings have always attributed to thought. The ability to think, according to Moseley et al. (2005), concerns the adoption of different mental processes to solve problems, make decisions, plan, evaluate ideas, and organize information. It also allows us to integrate each new experience into a new scheme.

Edward de Bono (2007) also argues that the ability to think implies knowing how to search for meaning and defines it as a mental process in which the purpose of thinking is to collect information, use it to find original solutions, and make sense of experience (de Bono, 1970). In addition, these processes can be oriented by two different types of thinking: vertical thinking, or traditional thinking, and lateral thinking. Vertical thinking is what we often use daily. It is a linear, logical, and analytical type of thinking in which we follow a series of sequential steps to reach

a conclusion or solution. In vertical thinking, we try to apply rules, logic, and reasoning to solve problems and deal with situations. Lateral thinking, on the other hand, has a different approach. It involves looking at problems in different ways and finding solutions from new angles (Jesson, 2012, p.76). Lateral thinking is an intentional process that concerns the elaboration of new ideas, gives rise to processes of transformation and innovation through a change of perspective and a departure from habitual thought patterns (de Bono, 1970). It is a “[...] way of making use of the mind. It is a mental habit, a mental attitude” (de Bono, 1970, p. 11) that allows information to be remodelled in a transformative way.

So, while vertical thinking is based on logic and the linear sequence of steps to solve problems, lateral thinking focuses on innovation, creativity, and exploring new ways of thinking to find original solutions. De Bono points out that both types of thinking are important and can be used in combination to address different challenges. In fact, in *Creativity and Lateral Thinking* (2015a), de Bono's concept of lateral thinking is described as a process that combines the two types of thinking. During the phase in which lateral thinking is adopted, numerous ideas are generated to explore a wide range of possibilities, generating ideas and innovations. Subsequently, linear thinking will allow you to evaluate and select the best solution.

Therefore, because lateral thinking encourages the exploration of new perspectives and the elaboration of unusual connections between different ideas, it is often associated with creativity. The latter is a capacity that, for more than a century, has been the subject of a debate at the international and national levels due to a difficulty that has emerged about the possibility of framing the nature of such a complex phenomenon. Concerning the educational context, creative thinking is considered a higher-order thinking skill that plays a fundamental role in promoting pupils' learning and improving their ability to solve problems and generate new ideas (Ahmed, 2017; Astuti et al., 2021; Rosca & Todoroi, 2019). Numerous models are most frequently used to define creativity, including those that associate creativity with cognitive processes (Baer, 2014; de Bono, 1970), personality traits (Eysenck, 1993, 1994), or social factors (Fasko, 2001; Feldhusen, & Treffinger, 1980; Guilford, 1950). Among these, the concept of creativity promoted by the Maltese doctor lends itself well to a possible point of conjunction with the theory of simplicity. Originally conceived for the corporate world, this strategy has also found its place in educational contexts, allowing teachers and educators to promote, in their learners, the development of problem-solving skills, critical thinking, and encourage them to analyze problematic and complex situations with

a multidimensional approach to problems (de Bono, 2015). The analysis is supported using some hats that metaphorically symbolize six distinct ways of thinking:

- the *white hat* alludes to the “informative” dimension and invites pupils to collect and analyse data and facts relevant to the issue or problem objectively. This objectivity forms the basis for the development of decision-making skills;
- the *red hat* legitimizes emotions, intuitions, and sensations because, according to de Bono, they are founding components of thought as every decision to be made is based on a value judgment;
- the *yellow hat* can be defined as “*conjectural-positive*” because it involves curiosity, ideation, and implementation. According to this perspective, students should identify solutions with an optimistic approach to the challenge that presents themselves;
- the *black hat*, unlike the previous one, highlights the logical-negative aspect. The task of the thinker in the black hat is to indicate the weak points objectively, to highlight the risks, dangers, defects, problems that could arise. By identifying obstacles, this modality improves the effectiveness of the proposed solutions;
- the *green hat* symbolizes creativity, innovation, lateral thinking. It fulfils the function of producing new ideas and new ways of seeing things;
- the *blue hat* is the symbol of supervision and control. The wearer has the responsibility of enforcing the rules, defining goals, managing time and facilitating discussion.

Therefore, this method in teaching represents an opportunity for students to learn to think by wearing any hat to solve complex problems and develop problem-solving, critical thinking, and decision-making skills. In this sense, in a protean and complex environment such as the school environment (Morrison, 2012) which is characterized by a plurality of educational needs expressed by learners (Pavone, 2015; Cottini, 2017), the use of lateral thinking is essential for teachers who, to overcome the risks of linearity in teaching, should find appropriate solutions for the resolution of these problematic situations.

7. Creativity in a perspective of simplicity

From the descriptions conducted so far on the concepts of creativity, divergent thinking and lateral thinking, interesting food for thought emerges on the possible didactic declinations of these theories in the perspective of a simple didactics, that

is, of a didactic paradigm capable of *deciphering* and *coping* with the complexity of training processes and educational contexts. The simplicity assumes that human organisms can adapt flexibly to problematic situations, using operating *models* and *rules* of use (Sibilio, 2014). If we want to link simplicity with lateral thinking and, consequently, with creativity, it is possible to identify significant analogies (Guilford, 1967; Goleman et al., 2017). Among the distinctive traits of creative, divergent, and lateral thinking analysed are *flexibility*, *reliability*, and *deviation*, identified by Berthoz as properties and rules of simplicity, i.e., tools and rules of simplicity that allow us to decipher and deal with complexity, including *educational complexity*. *Flexibility* and *reliability* to change are configured, in fact, as a property of simplicity of the educational system and of the didactic and inclusive action, which must “*be able to perceive, capture, decide or act in many ways (vicariance) depending on the context, compensating for deficits, dealing with new situations*” (Berthoz, 2011, p. 9). These are, therefore, tools that allow you to extricate yourself from the protean difficulties of the learning experience, seizing the opportunity to expand knowledge through action from the problematic situation. Similarly, de Bono (2015) proposes to use thought not to solve individual problems, but to grasp new interpretations of reality.

The search for different adaptive solutions and alternatives to usual situations constitutes, in this sense, the expression of a freedom of choice in the wide repertoire of possible solutions to avoid getting lost in complexity. Berthoz sees precisely in this the rule of simplicity, grafted onto the search for this plurality of original solutions to problems (Zollo, Kourkoutas & Sibilio, 2015). In this sense, further rules of simplicity such as *inhibition*, the rule of rejection and the principle of deviation appear useful to bring out the potential of creative thinking, which requires precisely the ability to inhibit and reject automatic and immediate solutions, identifying flexible operational strategies that, through accessory complexities, bring out new modes of didactic action capable of favouring the learning process. These educational actions are also suitable for promoting inclusive paths (Sibilio, 2014; 2015). In light of these reflections and considering the systemic perspective outlined, the acquisition of *creative thinking* skills, in line with a simple vision of teaching, could be a valid strategy to promote training interventions aimed at deciphering complexity, favouring effective and inclusive paths of action.

Berthoz's Theory of simplicity therefore offers biological and cognitive tools to deal with complexity, while De Bono's lateral thinking offers strategies for creative problem-solving. These two perspectives complement each other as they both

suggest non-linear ways of thinking and the ability to anticipate, adapt and solve problems dynamically and innovatively, for this reason teachers can develop an educational approach that not only responds to the individual needs of students, but also stimulates their active participation and creative thinking, promoting an inclusive, engaging and dynamic learning environment.

Metacognition (referring to the awareness of one's own thought process), in this sense, is an essential skill for teachers, who must be able to reorient their approach, wearing all “hats”, according to the needs of the students and the unpredictable dynamics that emerge in the classroom. Each principle and each simple property, therefore, needs a different cap, as hypothesized in Tables 1-2.

Simplexity properties	Six hats to think
Specialization and modularity	White Hat
Rapidity	Yellow Hat - Black
Reliability	Blue Hat
Flexibility, vicariance, and adaptation to change	Green Hat - Red
Memory	White Hat
Generalization	White Hat

Table.1. Properties of simplexity and six hats for thinking

First of all, it is useful to highlight how the separation of functions and modularity, as well as memory and generalization, are placed under the sign of the white hat, which represents the neutral and informative approach: the teacher, in this dimension, assumes the role of organizer of knowledge, capable of presenting clear and structured information, but also of fostering transversal connections between concepts, thus promoting a deep and flexible understanding of the action. Speed, a quality often required in the rhythm of contemporary teaching, is read through a double gaze: that of the yellow hat, which enhances its effectiveness and responsiveness, and that of the black hat, which invites us to keep attention on quality and the risks of excessive speed. The teacher should therefore know how to balance operational readiness and critical rigor.

Reliability, a key component of teaching professionalism, finds expression in the blue hat, a symbol of ordering thinking, planning and coherence. Being reliable means ensuring a predictable and structured environment where students can feel safe and oriented. Finally, properties such as flexibility, vicariance and the ability to adapt to change are linked to the interaction between the green hat, which

embodies innovation, and the red hat, which expresses empathy and attention to the emotional climate of the class. In an ever-changing educational context, the teacher should be ready to reinvent strategies and respond sensitively to the changing needs of students, integrating creativity and intuition into their daily action.

Simplicity rules	Six hats to think
Inhibition and the principle of rejection	Red – White Hat
Specialization and selection	White Hat
Cooperation and redundancy	Blue Hat
Probabilistic anticipation	Yellow – Black Hat
Detour	Green Hat
Sense	Red Hat

Table.2. Rules of simplicity and six hats for thinking

At the same time, the teacher is also called upon to inhibit and select: knowing how to say “no” to misleading or irrelevant stimuli, as required by the principle of rejection, is a skill that arises from the interaction between the Red Hat, who grasps the emotional dimension of the educational relationship, and the White Hat, who guides in logical and informed evaluation. Cooperation and redundancy, often invisible but fundamental in building a stable and safe learning community, emerge under the blue hat, highlighting the need for regulatory thinking that harmonizes educational interactions. Probabilistic anticipation, i.e., the ability to predict reactions and learning developments based on subtle clues, is supported by the positive vision of the yellow hat and the critical sense of the black hat: the effective teacher is the one who knows how to read the needs of the class in advance and prevent its difficulties. In this perspective, even the deviation becomes a resource: under the green hat, the exit from the box is transformed into educational innovation, the ability to propose alternative and stimulating paths. Finally, the profound meaning of educational action, which is rooted in relationship and intentionality, is enclosed in the red hat: it reminds us that teaching is not only transmitting knowledge, but also getting in touch with the emotions, motivations, and stories of students.

For this reason, in the present work, it is believed that the metaphor of de Bono's six hats gives the possibility, through the imagination of the hat worn, to reflect and analyze one's own didactic action. In addition, proposing this metaphor as an exercise within training groups provides not only the possibility to think about the

perception of one's own teaching action, but also to take note of the fact that there is often a discrepancy between the teacher's perception of his or her own action and that which others have of it.

8. Design of methodology

8.1 Research objective and hypothesis

The aim of the study is to understand whether a training course focused on simple teaching and creativity can influence the self-perception of future support teachers, assessed through the application of De Bono's six hats for thinking.

Starting from the research objective which is to investigate the variation of the self-attributions of De Bono's six hats, before and after the training course on simplicity, a variation in the self-attribution of incoming and outgoing hats is hypothesized, and reasons for the variation that indicate a centrality of peer interaction and creativity in the variation of hat self-attribution.

8.2 Participants and Procedure

The participants in this study are 763 students attending the Specialization Course for educational support activities for pupils with disabilities in the upper secondary school of the University of Salerno (IX cycle), voluntarily participating in the procedure.

The trainees completed a questionnaire aimed at detecting changes in attributions before and after training on simple teaching and divergent thinking. The training course lasted 30 hours, took place as part of the teaching activities of the teaching of *"Special Didactics: metacognitive and cooperative approach"*, and was structured on topics related to divergent thinking and simple teaching. The first ten hours were reserved for the theme of cooperative learning and divergent thinking. Subsequently, the students were divided into small groups, of a maximum of eight members, and were asked to attribute one of the six hats to think of De Bono to themselves and all the members of the group. Subsequently, training on simple teaching was started, divided into five hours of theoretical lessons on the reference framework (Berthoz, 2011; Sibilio, 2014) and fifteen hours of practical activity relating to the exercises of simplicity in which each student has declined the properties and rules of simplicity in the context of general, special and disciplinary teaching starting from a class context defined by the same. Specifically, each participant carried out the exercises individually and following periodic discussions

with the members of the group and with the teacher. At the end of the activities and exercises, each trainee was asked to answer the questionnaire aimed at detecting the changes in attributions after training.

8.3 Tool

The tools used were administered at the entrance and exit: in particular, the Questionnaire on didactic action already validated by Zollo et al. (2018) was used in order to assess whether there were changes in the action of teachers after the training of simple teaching; moreover, a questionnaire structured with Google Forms was used divided into three parts: a first section is dedicated to collecting socio-personal data (gender, age, whether he has worked as a curricular and support teacher and the highest academic qualification), the second section is specific on the attribution of one of De Bono's six hats "*Which of De Bono's six hats to think represents him the most?*", the third and last part is dedicated to the attribution of hats to the members of the group. At the end of the course, a questionnaire with open questions was administered aimed at investigating the factors that led to a change in the attribution of the hat.

8.4 Data Analysis

The analysis of the data took place on two levels: quantitative and qualitative.

As for the quantitative data, a comparison was conducted between the initial and final self-attributions of De Bono's six hats for thinking. The statistical analysis included the calculation of frequencies and percentages related to the attribution of incoming and outgoing hats. A variation analysis using chi-square tests was also applied to verify the statistical significance of the observed differences. In parallel, possible associations between participants' socio-demographic characteristics and changes in self-attributions were explored.

For the qualitative analysis of the open-ended answers, a thematic coding was carried out using an inductive approach, aimed at identifying significant recurrences in the motivations for change. Particular attention was paid to identifying references to creativity, peer collaboration and the recognition of the rules of simplicity in one's teaching practice.

The integration of quantitative and qualitative data made it possible to obtain an in-depth and articulated view of the phenomenon under study, highlighting the cognitive and relational dynamics activated during the training course.

9. Conclusions

The complexity of the educational process requires that teachers possess adequate skills to address the different educational needs. Adopting non-linear didactics, based on the rules of simplicity and Edward de Bono's Six Hats for Thinking, can help teachers navigate the complexity of the school system and the classroom, operating in a pragmatic and creative way (Sibilio, 2014; 2020; 2022; 2023).

The hypothesis is that through the metaphor of De Bono's six hats, in a training course on simple teaching and creativity, he can help change his perception of himself in dealing with complex situations. Training on the adoption of elegant and simple strategies may have fostered greater awareness of non-linear teaching and, considering what has been said, of the centrality of creativity in dealing with problematic situations. In the ever-changing knowledge society, creativity is among the tools that allow you to exploit what you have learned in real time, to develop new ideas, theories, products, and knowledge (EU, 2018; Cachia et al., 2010). Therefore, it is important to adopt teaching models that foster creativity, as an underlying element of all key competences for training (EU, 2018; Law 107/2015).

In conclusion, the intent is to underline the importance of a non-linear educational approach that integrates simplicity and creativity. This approach not only improves teachers' ability to manage the complexity of the education system, but also prepares them to be more flexible, innovative and able to respond effectively to contemporary challenges.

Author contributions

The work is the result of the scientific collaboration of the authors; however, the authorial attribution is as follows: Alessio Di Paolo is the author of the paragraphs 1. "Introduction", 2. "Didactic action between linearity and non-linearity", 3. "Perception and action in the teacher's didactic action" 4. "Colours to diverge and include", 5. "The simplicity in didactics", 7. "Creativity in a perspective of simplicity", 8. "Design of methodology" and 9. "Conclusions"; Naomi La Manna is the author of the paragraphs 6. "The six hats as modes of human action" and co-author of the paragraphs. 2. "Didactic action between linearity and non-linearity", 5. "The simplicity in didactics", 8. "Design of methodology"; Maurizio Sibilio is the scientific supervisor of the work.

References

- Ahmed K. A., Sharif N., & Ahmad N. (2017). Factors influencing students' career choices: empirical evidence from business students. *Journal of Southeast Asian Research*, 2017(2017), 1-15. DOI: 10.5171/2017.718849.
- Aiello P. (2012). *Il Cammino Della Ricerca Didattica Sul Corpo In Movimento Verso La Semplicità Aspetti epistemologici e metodologici* (pp. 1-116). Pensa Editore.
- Aiello P., Di Tore, S., Di Tore, P. A., & Sibilio, M. (2013). Didactics and simplicity: Umwelt as a perceptive interface. *Education Sciences & Society*: 1, 2013, 27-35.
- Aiello P., Pace, E.M., Sibilio, M. (2021) A simplex approach in Italian teacher education programmes to promote inclusive practices. *International Journal of Inclusive Education*, DOI: 10.1080/13603116.2021.1882056.
- Aiello P., Sharma U., & Sibilio M. (2016). La centralità delle percezioni del docente nell'agire didattico inclusivo: perché una formazione docente in chiave semplicità?. *Italian Journal of Educational Research*, (16), 11-22. Disponibile su: <https://ojs.pensamultimedia.it/index.php/sird/article/view/1772>.
- Allahyari T., Saraji G. N., Adi J., Hosseini M., Iravani M., Younesian M., & Kass S. J. (2008). Cognitive failures, driving errors and driving accidents. *International journal of occupational safety and ergonomics*, 14(2), 149-158. DOI: [10.1080/10803548.2008.11076759](https://doi.org/10.1080/10803548.2008.11076759).
- Anscombe G.E.M. (1957). *Intention*. Oxford: Blackwell.
- Aristotele (2000). *Metafisica*, trad. a cura di G. Reale. Milano: Bompiani.
- Astuti Y., Zaini M., & Putra A. P. (2021). Development of popular scientific book on the type of shrimp in coastal waters of tabanio for enhancing critical thinking skills of senior high school students. *BIO-INOVED: Jurnal Biologi-Inovasi Pendidikan*, 3(1), 44-52. DOI: [10.20527/bino.v3i1.9555](https://doi.org/10.20527/bino.v3i1.9555).
- Baer J. (2014). *Creativity and divergent thinking: A task-specific approach*. New York: Psychology Press.
- Berthoz A. (2003). *Emotion and Reason, the Cognitive Neuroscience of Decision Making*. Trad. Giselle Weiss. Oxford: Oxford University Press.
- Berthoz A. (2011). *La semplicità*. Torino: Codice.

Berthoz A. (2012). *Simplexity: Simplifying principles for a complex world* (Giselle Weiss, Trans.). New Haven & London: Yale University Press/Paris: Éditions Odile Jacob.

Berthoz A. Ferraresi S. (2015). *La vicarianza: il nostro cervello creatore di mondi*. Torino: Codice.

Burtch A. R., Ogle B. T., Sims P. A., Harms C. A., Symons T. B., Folz R. J., & Zavorsky G. S. (2017). Controlled frequency breathing reduces inspiratory muscle fatigue. *The Journal of Strength & Conditioning Research*, 31(5), 1273-1281. DOI: 10.1519/JSC.0000000000001589.

Cachia R., Ferrari A., Ala-Mutka K., & Punie Y. (2010). *Creative learning and innovative teaching: Final report on the study on creativity and innovation in education in EU member states* (No. JRC62370). Belgio: Joint Research Centre.

Carluccio C. (2008). *Disegno arte e immagine*. Napoli: CUES.

Cassirer E. (2009). *The Philosophy of the Enlightenment: Updated Edition*. USA: Princeton University Press.

Cottini L. (2017). *Didattica speciale e inclusione scolastica*. Roma: Carocci.

Davidson D. (1980). *Actions and Events*. Oxford: Clarendon Press.

De Bono E. (1998). *Creatività e pensiero laterale*. Milano: Rizzoli.

De Bono E. (1970). *Lateral thinking. A textbook of creativity*. UK: Mica Management Resources.

De Bono E. (2015). *Sei cappelli per pensare*. Milano: Bur.

De Bono E. (2015a). *Creatività e pensiero laterale*. Milano: Bur.

EADSNE (European Agency for the Development of Special Needs Education). 2012. "Profile of Inclusive Teachers". <http://www.european-agency.org/sites/default/files/Profile-of-Inclusive-Teachers.pdf>.

Eysenck H. J. (1993). Creativity and personality: Suggestions for a theory. *Psychological inquiry*, 4 (3), 147-178. DOI: https://doi.org/10.1207/s15327965pli0403_1.

Eysenck H. J. (1994). Creativity and personality: Word association, origence, and psychoticism. *Creativity Research Journal*, 7 (2), 209-216. DOI: <https://psycnet.apa.org/doi/10.1080/10400419409534525>.

Fabbri L., & Romano A. (2017). *Metodi per l'apprendimento trasformativo: casi, modelli, teorie*. Roma: Carocci.

Fasko D. (2001). Education and creativity. *Creativity research journal*, 13 (3-4), 317-327. DOI: https://psycnet.apa.org/doi/10.1207/S15326934CRJ1334_09.

Feldhusen J. F., & Treffinger D. J. (1980). *Creative thinking and problem solving in gifted education*. Dubuque, IA: Kendall/Hunt.

Fichte J. G., & Matteo Vincenzo D. A. (2007). *I fatti della coscienza, 1810/11*. Milano: Guerini e associati.

Fredricks J. A., Blumenfeld P. C., & Paris A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of educational research*, 74(1), 59-109. DOI: https://psycnet.apa.org/doi/10.1207/S15326934CRJ1334_09.

Gennari M. (Ed.). (1996). *Didattica generale*. Milano: Bompiani.

Goethe J.W., (1835). *Faust*. Milano: Bietti.

Goffman E. (1974). *Frame Analysis. An Essay on the Organization of Experience*. Massachusetts: Harvard University Press.

Goleman D., & Boyatzis R. (2017). Emotional intelligence has 12 elements. Which do you need to work on. *Harvard business review*, 84(2), 1-5. Disponibile su: <https://hbr.org/2017/02/emotional-intelligence-has-12-elements-which-do-you-need-to-work-on>.

González-García N., Sánchez-García A. B., Nieto-Librero A. B., & Galindo-Villardón M. P. (2019). Attitude and learning approaches in the study of general didactics. A multivariate analysis. *Revista de Psicodidáctica (English Ed.)*, 24(2), 154-162. DOI: <https://doi.org/10.1016/j.psicoe.2019.03.001>.

Guilford J. P. (1950). Creativity. *American Psychologist*, 5, 444-454. DOI: <https://psycnet.apa.org/doi/10.1037/h0063487>.

Jensen B. B. (2002). Knowledge, action and pro-environmental behaviour. *Environmental education research*, 8(3), 325-334. DOI: [10.1080/13504620220145474](https://doi.org/10.1080/13504620220145474).

Jesson J. (2012). *Developing creativity in the primary school*. UK: McGraw-Hill Education.

Kandinskij V. (1989). *Lo spirituale nell'arte*. Milano: Edizioni Se.

Lakoff G. & Johnson M. (1987), *The Metaphorical Logic of Rape*. Metaphor and Symbol, 2 (1), pp. 73-79. DOI: https://psycnet.apa.org/doi/10.1207/s15327868ms0201_5.

Laurillard D. (2013). *Teaching as a design science: Building pedagogical patterns for learning and technology*. Londra: Routledge.

Legge dell'8 ottobre 2010, n. 170. *Nuove norme in materia di disturbi specifici di apprendimento in ambito scolastico*. Disponibile su: https://www.istruzione.it/esame_di_stato/Primo_Ciclo/normativa/allegati/legge170_10.pdf.

Leibniz G.W. (2011). *Nuovi saggi sull'intelletto umano*. Firenze: Bompiani.

Liu K., & Ball A. F. (2019). Critical reflection and generativity: Toward a framework of transformative teacher education for diverse learners. *Review of research in Education*, 43(1), 68-105. DOI: <https://doi.org/10.3102/0091732X18822806>.

Morrison K. (2012). *School leadership and complexity theory*. Londra: Routledge.

Moseley G. L. (2005). Distorted body image in complex regional pain syndrome. *Neurology*, 65(5), 773-773. DOI: [10.1212/01.wnl.0000174515.07205.11](https://doi.org/10.1212/01.wnl.0000174515.07205.11).

Nedelmann B. (1992). L'ambivalenza come principio di socializzazione. In *Rassegna Italiana di sociologia*, XXXIII, 2, pp. 235-255.

Parson T. (1965). *Il sistema sociale*. Milano: Comunità.

Parsons T. (1962). *La struttura dell'azione sociale*. Milano: il Mulino.

Pavone M. R. (2015). *Scuola e bisogni educativi speciali*. Milano: Mondadori Università.

Qaseem A., Wilt T. J., McLean R. M., Forciea M. A., & Clinical Guidelines Committee of the American College of Physicians*. (2017). Noninvasive treatments for acute, subacute, and chronic low back pain: a clinical practice guideline from the American College of Physicians. *Annals of internal medicine*, 166(7), 514-530. DOI: <https://doi.org/10.7326/M16-2367>.

Rosca I. G., & Todoroi D. (2011). Creativity in conscience society. *Amfiteatru Economic*, 13(30), 599-619. Disponibile su: <https://econpapers.repec.org/scripts/redir.pf?u=http%3A%2F%2Fwww.amfiteatru>

ueconomic.ro%2Ftemp%2FArticle_1067.pdf;h=repec:aes:amfecov:13:y:2011:i:30:p:599-619.

Sensevy G. (2012). About the joint action theory in didactics. *Zeitschrift für Erziehungswissenschaft*, 1-14. DOI: [10.1007/s11618-012-0305-9](https://doi.org/10.1007/s11618-012-0305-9).

Sibilio M. (2012). *La dimensione semplessa dell'agire didattico*. In *Traiettorie non lineari nella ricerca. Nuovi scenari interdisciplinari*, 10-14. Lecce: Pensa.

Sibilio M. (2013). *La didattica semplessa*. Napoli: Liguori Editore.

Sibilio M. (2015). La didattica semplessa: Una traiettoria non lineare della ricerca educativa. *Revue de Synthèse*, 136, 477-493. DOI: <https://doi.org/10.1007/s11873-015-0284-4>.

Sibilio M., & Zollo I. (2016). The non-linear potential of didactic action. *Education Sciences & Society-Open Access*, 7(2). DOI: [10.3280/ess2-2016oa3947](https://doi.org/10.3280/ess2-2016oa3947).

Tommaso d'Aquino (1954). *De Unitate Intellectus Contra Averroistas*. Torino: Marietti.

Sibilio M. (2017). *Vicarianza e didattica. Corpo, cognizione, insegnamento*. Brescia: La Scuola.

Sibilio M. (2020). *L'interazione didattica*. Brescia: La Scuola.

Sibilio M., & Galdieri M. (2022). Il potenziale corporeo nell'azione didattica. In *Educazione degli Adulti: politiche, percorsi, prospettive Studi in onore di Paolo Federighi*, 191-201.

Sibilio M. (2023). *La semplicità: proprietà e principi per agire il cambiamento*. Brescia: Morcelliana.

Schon D. A. (2024). *Il professionista riflessivo: per una nuova epistemologia della pratica professionale*. Bari: Edizioni Dedalo.

Shulman L. S., & Hutchings P. (2004). *Teaching as community property: Essays on higher education*. San Francisco: Jossey-Bass.

Unione Europea (2018). *Raccomandazione del Consiglio del 22 maggio 2018 relativa alla relativa alle competenze chiave per l'apprendimento permanente*. Disponibile su: [https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:32018H0604\(01\)](https://eur-lex.europa.eu/legal-content/IT/TXT/PDF/?uri=CELEX:32018H0604(01)).

Van Geert P., & Steenbeek H. (2014). The good, the bad and the ugly? The dynamic interplay between educational practice, policy and research. *Complicity: An International Journal of Complexity and Education*, 11(2). Disponibile su: <https://files.eric.ed.gov/fulltext/EJ1074495.pdf>.

Vick M. J., & Martinez C. (2011). Teachers and teaching: Subjectivity, performativity and the body. *Educational philosophy and theory*, 43(2), 178-192. Disponibile su: <https://doi.org/10.1111/j.1469-5812.2009.00552.x>.

Von Cieszkowski A. (1997). *Prolegomeni alla storiosofia*. Milano: Guerini e Associati.

Von Goethe J. W. (1970). *Theory of colours* (No. 3). New York: Mit Press.

Weber M. (1961). *Economia e società*. Milano: Comunità.

Znaniecki F. (1967). *Social Actions*. Cambridge: Russell & Russell.

Zollo I., Di Gennaro D. C., Girelli L., & Sibilio M. (2018). Formazione docente e non linearità: Prospettive semplesse. *Education Sciences & Society*, 2, 20-38.

Zollo I., Kourkoutas E. E., & Sibilio M. (2015). Creatività, pensiero divergente e pensiero laterale per una didattica semplesse, *Educational Reflective Practices*, 1, pp. 5-17. DOI: 10.3280/ERP2015-001001.