

## **Rhythms in Education and the Art of Life**

### **Lefebvre, Whitehead and Steiner on the Art of Bringing Rhythmical Transformations into Teaching and Learning – Part I**

**Arve Mathisen**

*Rudolf Steiner University College, Oslo/ Norway*

**ABSTRACT.** These two articles deal with rhythms in education, a topic that has thus far been taken up in educational research or thinking only to a limited degree. Gert Biesta has pointed to how temporal notions such as change, learning and development are often connected to a simplified, linear conception of time and to a one-sided rationalised view of education (Biesta, 2013). By focusing on the rich variety of rhythms in teaching and learning, these articles have let other dimensions of time come to the fore.

The first article gives a brief overview of research on rhythms in education, and introduces Alfred North Whitehead and Henri Lefebvre's thoughts on rhythms. The second article presents Rudolf Steiner's ideas on this topic, and concludes with a discussion of all three approaches with regard to ideas relevant for today's classrooms. None of the contributions are treated as prescriptions or systems to follow, but instead as 'lenses' for getting closer to the life and art of temporal processes in education.

From Lefebvre, a sensitised and therapeutic approach will be presented, taking into account the potential liberating forces in social as well as natural rhythms. Whitehead's ideas invite his readers to envision a developmental panorama of education in terms of the breathing rhythms of freedom and discipline, aiming at fostering wise, responsible and competent citizens. Steiner has brought a wealth of concrete suggestions to teachers and, at the same time, has given far-reaching spiritual perspectives to what takes place when learning and teaching unfold rhythmically.

*Keywords:* rhythms in education, art, Lefebvre, Whitehead, Steiner

**ZUSAMMENFASSUNG.** Diese beiden Artikel behandeln Rhythmen in Pädagogik und Erziehung, ein Thema, das bisher nur in begrenztem Masse in entsprechende fachbezogene Forschung oder in akademisches Denken aufgenommen wurde. Gert Biesta hat aufgezeigt wie zeitbezogene Begriffe wie Änderung, Lernen und Entwicklung oft verbunden sind mit einem vereinfachten, linearen Zeitverständnis und mit einer einseitigen rationalisierten Erziehungsauffassung (Biesta, 2013). Durch den Fokus auf die reiche Vielfalt der in Erziehung und Pädagogik wirksamen Rhythmen, treten andere Zeitdimensionen hervor.

Der erste Artikel gibt einen kurzen Überblick über Forschung zu Rhythmen in Erziehung und Pädagogik und führt ein in Alfred North Whiteheads und Henri Lefebvres Gedanken zum Thema Rhythmus. Artikel 2 stellt die Ideen Rudolf Steiners dar zur Rolle des Rhythmus in Erziehung und Pädagogik und schließt mit der Diskussion aller drei Ansätze unter besonderer Berücksichtigung von Ideen, die für den Unterricht in der Gegenwart relevant sein könnten. Keine dieser Ideen wurde als Rezept oder zu befolgendes System behandelt, sondern eher als ‚Linsen‘ für die Annäherung an das Leben mit und die Kunst des Umganges mit Zeitprozessen in Pädagogik und Erziehung.

Von Lefebvre wurde ein sensibilisierter und therapeutischer Ansatz dargestellt, der die potentiell befreienden Kräfte sowohl in sozialen als auch in natürlichen Rhythmen berücksichtigt. Whiteheads Ideen laden den Leser dazu ein, in Bezug auf die atmenden Rhythmen von Freiheit und Disziplin ein erzieherisches Entwicklungspa-

norama zu entwerfen, welches verantwortungsvolle und kompetente Bürger ausbildet. Steiner hat eine Vielfalt konkreter Vorschläge für Lehrer entwickelt und gleichzeitig weitreichende spirituelle Perspektiven ausgeführt zu den Prozessen, die stattfinden, wenn sich Lernen und Unterrichten in rhythmischer Weise entwickeln.

*Schlüsselwörter:* Rhythmen in Erziehung und Pädagogik, Kunst, Lefebvre, Whitehead, Steiner

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What shall we do about time in education? Shall we discard it, as Biesta (2013) contemplates, and make a temporal ‘time-out’ to avoid all of the difficulties related to governing and measuring time in education? Critical of how time seems to be misused in educational discourse and policy, Biesta asks whether it is “possible and desirable to take time out if we want to get at what makes education educational” (p. 87). He points to how notions such as change, learning, development and progress are easily connected to a simplified, linear conception of time, accompanied by hidden power structures and a one-sided rationalised view of education. The present two articles propose a different way of dealing with the same dilemma. Instead of considering taking time out of education, the intention here is to investigate possible ways of getting into time in an educational way.

By focusing on the rich variety of rhythms in education, other dimensions than the measurability of time come to the fore. Today’s schools are under increasing pressure with regard to time efficiency, and much attention has been given to this issue (Scheerens, 2014). It seems, on the other hand, almost forgotten that time is part of the materiality interwoven into all human activities, and that within the measured temporal frames and structures of schools, there are still plenty of micro-practices that are not, or at least only partially, colonisable by the prevailing educational time politics. To be encouraged by Rancière, one could say with him “that emancipation is in fact a way of putting several times into the same time” (Rancière, 2013, para. 19).

This first of two articles gives a brief overview of research on rhythms in education, and introduces Alfred North Whitehead and Henri Lefebvre’s thoughts on rhythms. The second article presents Rudolf Steiner’s ideas on this topic, and concludes with a discussion of all three approaches. The main intention with the two articles is to examine and present these three authors’ thoughts on rhythms in education and everyday life, looking for ideas relevant for today’s classrooms. Before dealing with the three authors in more detail, a short introduction to research on rhythms in education will be given.

Schools are among the densest and richest places on earth with regard to how time, temporal structures, timings and durations are instantiated and lived out. Time in education will partly appear as rhythms. Language, learning and communication are embedded in rhythms (Cowley, 1994; Jaegher, 2006), and there is a musicality to all human interaction (Malloch & Trevarthen, 2009). The days and weeks of a school year are organised into a multitude of lessons and homework activities. Within this fine-grained and often fragmented temporal structure, the deepest processes of learning and development are expected to take place. It is here children and youth spend substantial parts of their lives. Still, the phenomenon of rhythmicity in educational settings has scarcely been investigated or developed.

The integration of learning and development into a linear understanding of time has been criticised by several authors, as it makes schools vulnerable to economic forces, power structures, and other influences (Adam, 1995; Biesta, 2010; Duncheon & Tierney, 2013; Rosa, 2010). Hartmut Rosa describes it this way:

Just think of the way education is almost all about the habitualization of temporal norms: learning to defer gratification, to stick to schedules and rhythms, to resist and even ignore bodily needs and impulses until ‘the right time’ has come, and, first of all, to hurry up. (2010, pp. 76–77)

Besides such critical voices in educational thinking, the most prevalent research on rhythms in education today deals with the influence of the 24-hour circadian rhythms on pupils’ attention during the school day. Research results have been relatively consistent across studies, showing that starting the day later, especially for adolescents, leads to enhanced school performance (Klein, 2004; Schmidt, Collette, Cajochen, & Peigneux,

2007; Valdez, Reilly, & Waterhouse, 2008; Vollmer, Pötsch, & Randler, 2013; Öztürk, 2014). A qualitative study into the rhythms of teaching was conducted by Clandinin & Connelly (1986). More recently, Allan & Evans (2006) have argued for a normatively based implementation of rhythms into today's schools: "To live effectively in a rapidly changing world, we need to have a more complex grasp of the rhythmic character of how we reason and relate" (p. 12).

In Germany, with some schools establishing longer days, there has been a focus on the rhythm of the school day, and a change to less complex timetables, often with a prolongation of lessons from 45 to 60 or 90 minutes (Höhmman & Kummer, 2007; Ramseger, 2009). In addition to the structural aspects of school rhythms, a few German authors have dealt with rhythmic variations in learning and teaching (Rittelmeyer, 2002; Scheuerer, 2008; Schmelzer, 2007; Schultheis, 2011). Burk (2006) has, for example, developed the idea of a child-oriented rhythmical temporality. Recent empirical studies on Waldorf education refer to rhythms in teaching and learning as essential to its pedagogy (Liebenwein, Barz, & Randoll, 2013; Woods, Ashley, & Woods, 2005).

The following presentation of Whitehead, Lefebvre and Steiner's thinking on rhythms in education is organised in an inverse chronological order, starting with Lefebvre as the most contemporary, and ending with Steiner, who was the first of the three to develop ideas on educational rhythms.

## Lefebvre's rhythmanalysis

Henri Lefebvre (1901–1991) was a French sociologist, philosopher and political activist. During his lifetime, Lefebvre was a prolific writer and well-known figure in France, taking part in intellectual and political debates from the 1920s onwards and throughout most of the century. Outside his homeland, however, he was barely known during his lifetime. Recently, Lefebvre's thought has received broad international attention because of the combined materialist and emancipatory interests expressed in his writing (Kipfer, Saberi, & Wieditz, 2012). Although Lefebvre wrote as many as 70 books and 300 articles on a wide array of topics, outside France he is primarily known for his studies on space and, to a lesser degree, for his work on temporality and rhythm. Lefebvre's impact on education and educational research is limited, but a growing number of publications have recently been using his ideas in educational contexts (Green & Hopwood, 2015; Hopwood, 2013; Jacklin, 2004; Leander, Phillips, & Taylor, 2010; Middleton, 2014).

Lefebvre distanced himself from contemporary structuralist, phenomenologist and existentialist movements in French thinking, and sought, according to Elden (2004), a way of combining a philosophical stance with an emancipatory activism and an orientation towards experience and praxis. Lefebvre wrote with a wish to change the world, and made himself known as a vanquishing voice against all forms of fascism and nationalism. Based on his deep engagement with Marx, Lefebvre was concerned about how everyday life is governed, produced and restrained by capitalist modes of production and consumption. Lefebvre thus builds on critical and emancipatory elements from Marxism, but extends these into everyday life, beyond the economic sphere of work and production where Marxism originally had its focus.

## The everyday

His two books, entitled *Critique of Everyday Life I and II*, came out in 1945 and 1961 respectively. A planned third volume was never published but would have dealt more extensively with time and rhythms. Lefebvre's little book on rhythms was published posthumously in 1992, a year after his death. Twelve years later came the first English translation, entitled *Rhythmanalysis, Space, Time, and Everyday Life* (2004)<sup>1</sup>. In one of his most quoted statements, Lefebvre points to the ubiquitous nature of rhythms: "Everywhere where there is interaction between a place, a time and an expenditure of energy, there is rhythm" (2004, p. 15). Before going into more detail on Lefebvre's rhythmanalysis, a short introduction to his ideas on the everyday will be given.

1. The term "rhythmanalysis" was not coined by Lefebvre, but was taken over from Gaston Bachelard, who, in turn, had found it in the work of Lucio dos Santos, a Brazilian philosopher (Elden, 2004, p. 195).

Lefebvre was concerned with the habitual, repetitive and usually unknown qualities of how people live. Starting with the assumption, “nowadays, we do not know how we live” (1991, p. 195), he sets out to investigate in the broadest possible sense how people live, regarding family life, holidays, love, sex, sleep, rest, play, and the numerous other events and routines of daily life. To him, a deeper understanding of the everyday reveals a double perspective. There is more to the everyday than just being a humdrum of predictable activities. Something important is at stake in the everyday. When Lefebvre asks “Would everyday life be merely the humble and sordid side of life in general and of social practice?”, he answers both yes and no:

Yes, it is the humble and sordid side, but not only that. Simultaneously it [the everyday life] is also the time and the place where the human either fulfils itself or fails, since it is a place and a time which fragmented, specialized and divided activity cannot completely grasp. (2002, p. 19)

Here, Lefebvre points to the possibilities, but also to the fragile and exploitable aspects, of everydayness. He starts out with a belief that the everyday is increasingly threatened and invaded by alienating commercial interests. In his analysis of alienation, Lefebvre draws on concepts regarding time and temporal processes. To a large degree, his investigation of alienation builds on the notions of cyclical and linear time. These two contrasting views on time first occurred in early German science of religion, where cyclical time became associated with ancient Greek philosophy and a linear, teleological account of time was thought to inhere in early Hebrew writings such as the Old Testament (Rosen, 2004). Later studies of the transition from an agrarian to an industrial society have pointed to how the natural, tradition-bound and religiously appropriated cyclic time became suppressed and partly overtaken by the linear ‘machine’ or ‘clock’ time of modernity (Mathisen, 2012). Lefebvre’s point is that everyday life can be studied and understood as being under a double influence of both the cyclic and the linear. He seeks no return to traditional cyclic ways of living, but is interested in revealing how to counteract the linear being too dominating and give life to a fruitful interaction of the two (2002, p. 49).

## An art of living

In addition to advocating an analytical attitude in terms of reflecting critically on the everyday, Lefebvre also envisions the everyday as “an art of living” (2002, p. 146) with the mentioned potential for liberation from the alienating and determining influences of linear time. For Lefebvre, the everyday is where important aspects of life either are realised or fail. The promise of fulfilment hinges on the hidden nature of the everyday, because it partly becomes ungraspable for the alienating impact of modernity. Failure, on the other hand, occurs when the everyday is overtaken by capitalism. Liberating the everyday is about providing new insights, values and status to the routines and invisibility of people’s everyday lives, and this will, to a large degree, depend on giving space to aesthetic experiences and playfulness. On several occasions, Lefebvre highlights the role of art as a means to realise the potentials of everyday life. Looking back to Marx, he envisions:

a society in which everyone would rediscover the spontaneity of natural life and its initial creative drive, and perceive the world through the eyes of an artist, enjoy the sensuous through the eyes of a painter, the ears of a musician and the language of a poet. (2002, p. 37)

Likewise, play is understood by Lefebvre as the harbinger of a “rediscovered spontaneity” (2002, p. 203). In play, Lefebvre sees an activity where people through intensified presence can reconnect to deeper layers of existence and experience moments that “become more real than the real”. He writes:

Play recalls forgotten depths and summons them up to the light of day. By making them stay within the everyday, it encompasses art and many other things as well. It uses appearances and illusions which — for one marvellous moment — become more real than the real. And with play another reality is born, not a separate one, but one which is ‘lived’ in the everyday, alongside the functional. ... We are protesting against the loss of grace and gracefulness. Play is a lavish provider of presence and presences. (2002, p. 203)

Play transforms, according to Lefebvre, hidden or forgotten aspects of the everyday into moments of intensified presence, and into moments of potential “grace and gracefulness”. In these quotes, it seems quite

clear that Lefebvre is not only aiming at revealing what was hidden to the conscious or analytical mind. In addition, he wants to live a richer everyday life, by including art, playfulness and a sensuous attitude and, thus, realising a fuller and more enjoyable participation in the everyday.

## Rhythmanalysis

These small glimpses into Lefebvre's thinking on the everyday can easily be seen as precursors to his later interest in rhythms. In his work on *rhythmanalysis* (2004), Lefebvre gets even closer to his activist and praxis-oriented approach. Like with his work on the everyday, there is a double effort in Lefebvre's writing on rhythms: to provide the reader with an analysis of what rhythms are and how rhythms penetrate the everyday, but also to enable changes in how our lives are lived. He attempts to create a methodical and conceptual toolbox for people who want to be initiated as professionals into the world of rhythms. Lefebvre's *rhythmanalytical* project is highly original in its attempt to envision a possible schooling for a future profession, the *rhythmanalysts*. In several places, Lefebvre compares the *rhythmanalyst* with the psychoanalyst (2004, pp. 19, 23, 44), and while pointing to core differences, he maintains an overall therapeutic orientation. This intention of cure is, for example, expressed in how he distinguishes between a *eurhythmia* and an *arrhythmia*, a healing versus a pathological aspect of rhythm.

The living body presents numerous associated rhythms; hence an *eurhythmia*, when in the state of good health. Pathology, in a word illness, is always accompanied by a disruption of rhythms: *arrhythmia* that goes as far as morbid and then fatal de-synchronisation. (2004, p. 68)

The *rhythmanalyst* aims at making non-forcing interventions through rhythms. These interventions have "a goal, an objective: to strengthen or re-establish *eurhythmia*" (2004, p. 68). Lefebvre further maintains that a "*rhythmanalytical* therapy would be preventative rather than curative" (2004, p. 68). Here the link to education becomes obvious. To create *eurhythmic* timetables, lessons, ways of interaction and power relations at school can be envisioned as pedagogically sound *rhythmanalytical* interventions.

## The *rhythmanalyst*

In an educational context, the second chapter, entitled "The *Rhythmanalyst*: A Previsionary Portrait", is of particular interest. The topic here is a tentative description of a person capable of analysing and enacting rhythms. Teachers have responsibility for organising the complex time structures and temporalities in their classrooms. They are embedded in both cyclic and linear time qualities given from outside, and within these given frames, teachers are orchestrating their pupils' learning through variations, repetitions, introduction of new materials, etc. An appropriate question could be: What can teachers learn from Lefebvre's portrait of the *rhythmanalyst*?

For Lefebvre, the body constitutes a starting point for *rhythmanalysis*. The *analyst* must learn to listen to her body, study its rhythms, and get to experience how these rhythms interact with external events. According to Lefebvre, the *rhythmanalyst* "draws on his breathing, the circulation of his blood, the beatings of his heart and the delivery of his speech" (2004, p. 21). Subtle bodily rhythmic variations are worth attending to. Blinking eyelids and the finest bodily sensations can become organs of perception for the *rhythmanalyst*. In the end, even thinking is bodily for Lefebvre. The *rhythmanalyst* "thinks with his body, not in the abstract, but in lived temporality" (2004, p. 21).

The other core ability of those wanting to understand and intervene in rhythms of the everyday relates to how the senses connect to outer events. The *rhythmanalyst* is directing her senses towards movements among people and in nature. Lefebvre points to how the *analyst* should listen to all kinds of sounds, see the finest details, and even include the sense of smell in becoming aware of rhythms (2004, p. 21). In his evocative language, Lefebvre invites his readers to a kind of rhythmic temporal sensing:

Go deeper, dig beneath the surface, listen attentively instead of simply looking, of reflecting the effects of a mirror. You thus perceive that each plant, each tree, has its rhythm, made up of several: the trees, the flowers,



the seeds and fruits, each have their time. .... Continue and you will see this garden and the objects (which are in no way things) polyrhythmically, or if you prefer symphonically. (2004, p. 31)

Even the deep time of inert objects is attended to. A withering stone has its own rhythm. Lefebvre states: “To the attentive ear, it makes a noise like a seashell” (2004, p. 20). All of this can be seen as examples of how a rhythm analyst can educate her senses and make herself sensitive to the finest movements and transformations around her. This kind of sensing includes an emotional as well as a conceptual relation to what is going on in the world (2004, p. 22).

The sensing body becomes for Lefebvre an intersection where phenomena and events from outside can be experienced in relation to the multiple rhythms taking place inside the body.

The rhythm analyst will not be obliged to jump from the inside to the outside of observed bodies; he should come to listen to them as a whole and unify them by taking his own rhythms as a reference: by integrating the outside with the inside and vice versa. (2004, p. 20)

Instead of equipping the rhythm analyst with standard ethnographic tools such as notebooks, cameras or video recorders, Lefebvre has conceived of a method that is radically participatory. Through taking part in events, though a sensitised bodily presence, the analyst will attempt to apprehend rhythmical qualities of everyday life. Simultaneously grasping a rhythm and being grasped by it is at the heart of Lefebvre’s method.

To grasp a rhythm it is necessary to have been grasped by it; one must let oneself go, give oneself over, abandon oneself to its duration. Like in music and the learning of a language (in which one only really understands the meanings and connections when one comes to produce them). (2004, p. 27)

This amounts to an ability to attend to the interaction of one’s own rhythmic body and the multiplicity of surrounding rhythms. For Lefebvre, such a participatory investigation is possible through a certain presence, a concept to which he repeatedly returns.

## Presence and the mediated present

A rhythm analyst will need to distinguish between the *present* and *presence* (2004, p. 23). The present, in Lefebvre’s thought, either is re-presented through media or appears the way things usually present themselves as inert and dead. Presence, on the other hand, is the immediate, the act of becoming, the unfolding of events where the interaction takes place in bodily presence. This is “strong time” in contrast to the mediated “weak time” (2004, p. 50)<sup>2</sup>.

Today, a substantial part of everyday experience has been transformed into a mediated present. When seen from a rhythmical point of view, Lefebvre is highly critical of such a broad exposure to the representations of media, and he contends that for the rhythm analytical gaze, a mediated present shows its other face. He writes: “if you have the ability to take the flows and streams (T.V., the press, etc.) as rhythms among others, you avoid the trap of the present that gives itself as presence” (2004, p. 23). It is not difficult to see what Lefebvre aims at here. By attending to the rhythms of media, another view of the mediated message is made accessible for analysis. Suddenly, the screen itself gets attention, with its flickering and flowing display of contents. How do the rhythms in your body relate to rhythms of mobile phones, computers or television sets? To the rhythm analyst, sensual and bodily aspects of the mediated content can come to the fore. Lefebvre thus ascribes sensible, affective and even moral significance to what has presence, what is unfolding in its original materiality and rhythm. The mediated present he simply calls “parodies of presence” (2004, p. 23).

So-called inert things do initially present themselves as immobile, as present in Lefebvre’s terms. However, this turns out to be only part of the picture. For the rhythm analyst, all phenomena can be perceived as being in movement and, thus, display rhythmical features.

The act of rhythm analysis transforms everything into presences, including the present, grasped and perceived as such. .... the act of rhythm analysis integrates these things — this wall, this table, these trees — in a dramatic

2. Lefebvre’s view is contrasted by Derrida, who sees a logocentrism inherent in the concept of presence (Derrida & Bass, 2001).

becoming, in an ensemble full of meaning, transforming them no longer into diverse things, but into presences. (2004, p. 23)

With the current developments of the Internet and social media more and more integrated into the everyday, Lefebvre's rhythmical perspective can bring critical insights into how mediation influences everyday life, especially in terms of its impact on bodies and real-life interactions. A full chapter in Lefebvre's book is devoted to "the media day" (2004, p. 46).

## Rhythms of learning

Lefebvre also deals explicitly with rhythms in relation to learning and development, although his writing on this topic is quite enigmatic and rudimentary. He approaches learning by taking into account different levels such as: "material bodies, living bodies, social bodies and representations, ideologies, traditions, projects and utopias" (2004, p. 43). In Lefebvre's view, learning takes place on all of these levels. Each level has its own distinct rhythms of learning and development, but is also part of an interactional and mutually influential whole. Although these rhythms may be analysed and interpreted, they will still partly retain their complexity and non-reducible character. Lefebvre contends that "educators know" (2004, p. 40) the rhythms of learning, but does not go into much detail on this topic. He is more explicitly concerned with the dressage of animals, and points to similarities regarding the basic techniques that turn humans into members of a group or a society. Dressage is based on repetitions of "a certain act, a certain gesture or movement" (2004, p. 39). The routines and rites of the everyday can thus be seen as rhythmically based learning, working deep into the formation of habits and other kinds of tacit social capacities. In this sense, Lefebvre is mostly dealing with the first three of his educational levels.

Lefebvre gives one example of a concrete learning rhythm. This is a triadic movement with the following phases: "activity–repose–entertainment" (2004, p. 41). The first step consists of an activity lasting for a certain period of time. The next step is taking a break, stopping the activity, and letting time pass for a while. Sleep or having a siesta is mentioned by Lefebvre as an example of such repose. The third step involves assessment in terms of rewarding the good work done. This model is, according to Lefebvre, "convenient for armies, religious and educational establishments, for offices and monasteries alike" (2004, p. 41).

Can there be any freedom for individuals taking on such a profoundly formative and partly unconscious kind of learning, one might ask. Lefebvre clearly sees the determining forces at play in dressage, which, according to him, takes away spontaneity and initiative, leaving "little room" (2004, p. 40) for liberty. On the other hand, Lefebvre states that liberty realises itself in its own private or withdrawn space and time.

Liberty is born in a reserved space and time, sometimes wide, sometimes narrow; occasionally reduced by the results of dressage to an unoccupied lacuna. Creative activity, as distinct from productive activity, proceeds from the liberty and individuality that unfurl only in conditions that are external (to them). (2004, p. 43)

There was a break, repose, in the middle phase of Lefebvre's triadic learning model. Moments of rest, of leaving the active part of learning, also indicate times and spaces where freedom and creativity can prevail. Intervals in the structure of dressage constitute a significant part of everyday lives, and this is precisely where Lefebvre envisions the entrance of liberty. Such a view implies a recognition of abilities in the human subject that are not fully subjectable to conditioning, and relates to what Lefebvre writes about the transformative role of play and the arts. Here, Lefebvre attends to the potentials and mysteries inherent in moments of rest, in the non-doing, non-active phases of learning and development.

## Rhythms and relations

Towards the end of his book on rhythmanalysis, Lefebvre discusses the phenomenon of social rhythms. Social relations can take the form of alliances out of sympathy or choice, or they can be imposed by force. From a rhythmic point of view, there is a difference between freely chosen alliances and forced relations: "Once one discerns relations of force in social relations and relations of alliance, one perceives their link

with rhythm. Alliance supposes harmony between different rhythms; conflict supposes arrhythmia” (2004, p. 68). There is a clear division here between forced relations and their arrhythmic expressions, and alliances indicating a rhythmic harmony.

In education, with its complex world of relationships, a rhythm analytical study of interactions and power relations between, for example, teachers and pupils could reveal new aspects of this well-known educational issue. It is also possible to interpret Lefebvre as taking a normative stance here — good alliances prevail in good rhythms and do good for all parties. In a similar vein, the connections between forms of sympathy and rhythms have been explored with regard to reading and literature by Martin, who points to a rather obvious experience: “Following rhythm demands attention and demands sympathy” (Martin, 2013, p. 190). Lefebvre broadens his elaboration of alliances and their rhythmic implications in an analysis of Mediterranean cities: “Our hypothesis is therefore that every social, which is to say, collective, rhythm is determined by the forms of alliances that human groups give themselves” (2004, p. 94).

The question arises as to how human selves relate to each other and to the myriad of structures imposed on them by institutions and cultures within a given society. Lefebvre asks “how are rhythms ‘of the self’ and rhythms ‘of the other’ determined, orientated and distributed?” (2004, p. 99). There is, of course, no simple answer to this question, but according to him, resistance to the influence of external forces implies a striving for diversity. Lefebvre concludes: “In rhythm analytical terms, let us say that there is a struggle between measured, imposed, external time and a more endogenous time” (2004, p. 99). This struggle can be regarded as omnipresent in today’s society, and is a core educational issue. Externally regulated timetables and the imposition of a plethora of non-pedagogical interests are partly defining and restricting contemporary schools. The rhythm analyst Lefebvre is obviously critical towards this imbalance of forces, and he would have liked to see schools as places where diversity and freely chosen alliances reigned to a much greater extent.

Schools are particular instances of everyday life. They are ridden with repetitions and threatened by many forms of alienation. Can a rhythmic analysis of schools make visible where boredom lures and where thriving initiative and engaged learning take place? The educationally relevant ideas in Lefebvre’s book on rhythm analysis can undoubtedly be directed towards the teacher as a potential analyst. The relations and activities in the classroom could equally evidently be seen as a site to be analysed and possibly transformed. Lefebvre’s text provides a view of teaching and learning as presences, and as relations and acts of becoming. A teacher rhythm analyst might promote pupils’ well-being by strengthening the eurhythmic elements within the overall polyrhythmic character of teaching and learning. To be able to do so, a teacher needs to use her senses, and be sensitive to how her own body interacts and responds to what goes on among her pupils. Based on her rhythmic insights, she might bring a spontaneity and playfulness into her teaching. She might value the breaks and intervals between sessions of activity, and regard those as essential to the process of learning. Her analysis of mediated content and the difference between the re-presented and a full presence might influence her way of using technology. Perceiving relations at school in terms of its rhythmic manifestations could make her aware of alliances and power structures in new ways. Lefebvre’s toolbox for analysing and liberating the rhythms of everyday lives could thus provide education with a requisite therapeutic and transformative perspective on learning and teaching.

## Whitehead’s rhythms of education

Alfred North Whitehead (1861–1947) was a British polymath. He first established himself as a mathematician and only relatively late in life did he turn his attention to philosophy of science, education, metaphysics and cosmology. According to Bertrand Russell, it was the death of Whitehead’s son as a fighter pilot during the First World War that inspired his turn to education and philosophy (Stengers, 2011). Whitehead’s subsequent works covered a wide array of topics, and today he is recognised as being influential in the development of mathematics, physics, biology, ecology, economics, psychology, theology and education.

As an educational thinker, Whitehead belonged to a wave of progressive education sweeping across Europe and the United States during the first decades of the 20th century. Most proponents of the *Reformpädagogik*



movement shared the ideas of breaking with the rigid and formal learning promoted in the old schools, letting the child and its developmental needs be at the centre, and integrating arts, imagination and practical activities into school life (Skiera, 2003). In this regard, many of Whitehead's thoughts on education resemble those of his contemporaries: John Dewey in the US, Georg Kerschensteiner and Rudolf Steiner in Germany, Maria Montessori in Italy, and Jiddu Krishnamurti in India, to name a few. It should also be noted that the phenomenon of rhythm was a much more prevalent theme at the beginning of the 20th century than it is today (Binckes, 2010).

The educational works of Whitehead consist mainly of lectures he held between 1912 and 1928, later collected in his book entitled *The Aims of Education* (1967). Here, rhythms in education is a main topic. Furthermore, the last lecture from his book *Science and the Modern World* is devoted to educational issues (Whitehead, 1948). In this lecture, Whitehead deals with the role of arts in the future of education, making an explicit connection between education, art and ethical values<sup>3</sup>. "The Rhythm of Education" was the title of a lecture Whitehead published in 1922. A year later, he broadened his analysis in the article "The rhythmic claim of freedom and discipline" (1923). The following presentation is based on these two texts, now available as chapters two and three in *The Aims of Education* (Whitehead, 1967).

### Threefold rhythmic development

Whitehead bases his concept of rhythm in education on Hegel's analysis of progress into the three stages of thesis, antithesis and synthesis, but chooses to describe them in the more educationally relevant terms of *romance*, *precision* and *generalisation*. In their broadest sense, these stages indicate the most important modes of learning, or as Whitehead states, they represent the "natural cravings of the human intelligence" (1967, p. 32) from infancy and childhood into the age of young adults. The stage of romance implies letting pupils get a motivating and experience-based overview of the subjects taught. Precision means exactness in learning, memory of facts, and mastering of rules. Generalisation is for Whitehead a return to the spirit of romance, but this time the overview is not experience-based, but instead initiated by ideas and a comprehensive understanding of possible unifying ideas.

These three stages of learning represent a processual metamorphosis of learning: from an exploring and inductive orientation, via rigorous detail-work, to how ideas can be deductively applied to make the world a better place in which to live. For Whitehead, a slow rhythmic movement from stage to stage lays out the full landscape of learning in a developmental and transformative perspective, with each phase of the rhythm lasting several years: "Till the age of thirteen or fourteen there is the romantic stage, from fourteen to eighteen the stage of precision, and from eighteen to two and twenty the stage of generalization" (1967, p. 38). At the same time, Whitehead insists that all processes of learning should follow this triadic structure. Each lesson, for example, should be formed according to the same rhythmic scheme. And adding to the complexity, he also pointed to how different subjects afford these stages at different ages. Language, for example, enters into the stage of precision long before science. Whitehead's conception of rhythms in education is thus built on a very simple structure that is continuously repeated in manifold ways, from the smallest unit of a lesson to the span of more than twenty years. It resembles an organic formation where parts display features from the whole.

### The stage of romance

In his educational lectures, Whitehead pays most attention to the stage of romance. This is the opening up of a new learning experience. This is where wonder and excitement play a leading role, where the fullness of

3. There is an interesting and symmetrical relation between Whitehead's purely philosophical works and his educational ideas. Whitehead gave out his book on education in 1929, the same year in which his main oeuvre, *Process and Reality*, was published. After turning to the philosophical questions of process, organism and cosmology, Whitehead did not further develop his thoughts on education. In a way, his educational reasoning anticipated many of his later ideas, and his fragmented thoughts on education have been analysed and extended based on his later works (Riffert, 2005; Allan, 2012). Whitehead never expressed himself on how his educational ideas could be related to his later philosophical works (Lawrence, 1965).

experience is attained through sensory and bodily engagement, “to allow the child to see for itself and to act for itself” (1967, p. 33). He states:

The stage of romance is the stage of first apprehension. The subject-matter has the vividness of novelty; it holds within itself unexplored connexions with possibilities half-disclosed by glimpses and half-concealed by the wealth of material. (1967, p. 17)

Education for romance should let pupils take part in discoveries, and let them feel like they are experiencing something new, awakening their curiosity. The word “romance” indicates a passionate or loving relationship to the subject at hand. Whitehead’s Platonism might give reasons to associate his romance with the Platonic idea of *eros*, a deep affectionate connection with the beauty, truth and goodness in their earthly manifestations (Hull, 2002). In this sense, romance might be similar to Charles Sanders Peirce’s understanding of a “scientific eros” which “mirrors a profound curiosity, a desire to learn, a longing for understanding, and an intense desire to find things out” (Strand, 2005, p. 315). Undoubtedly, for Whitehead, emotions play a central role at this stage. Romance “is a process of discovery, a process of becoming used to curious thoughts... It is dominated by wonder, and cursed by the dullard who destroys wonder” (1967, p. 32).

The stage of romance aims at presenting the learners with a vivid and full learning experience, a holistic entrance into each new field of learning. Teaching in the vein of romance will bring much more than any learner could grasp conceptually, and let pupils encounter a rich manifold of perceptions, activities and emotions. For Whitehead, this overflow in experience is preparing the ground for pupils’ deeper understanding of the subject, for attaining a relation to it, giving them a taste of its potentials. Whitehead’s romance could thus be understood as a hermeneutic ‘breathing in’, as a fresh and life-giving start of the knowledge process. He writes: “There is no comprehension apart from romance” (1967, p. 33). The idea of an overflow frees education from instrumental attitudes. There is more to a school subject, there is more to a child, and there is more to a learning encounter than can be consciously handled by any teacher. Whitehead’s first rhythmic movement thus becomes an invitation into a rich and real life at school, an education partly beyond the command of teachers and curricula.

Whitehead maintains that teaching in the style of romance will be a challenge for teachers. The educational environment should be carefully selected according to the subject matter and the abilities of learners. New learning experiences and materials should be presented in a lively and engaging way. Whitehead emphasises how a pedagogy of romance must accord with the developmental ‘needs’ present in the actual pupils.

The environment within which the mind is working must be carefully selected. It must, of course, be chosen to suit the child’s stage of growth, and must be adapted to individual needs. In a sense it is an imposition from without, but in a deeper sense it answers to the call of life within the child. In the teacher’s consciousness the child has been sent to his telescope to look at the stars, in the child’s consciousness he has been given free access to the glory of the heavens. (1967, pp. 32–33)

Linking teaching to experience-based learning and child development was deeply rooted in progressive educational thinking at the beginning of the 20th century<sup>4</sup>. Whitehead’s significance lies in seeing the experience-based stage of romance as part of a larger educational rhythm where precision and generalisation also belong.

## The stage of precision

Whitehead’s next movement in his rhythm of education is the stage of precision. This phase of learning is ‘school as we know it’, according to Whitehead. Here the grammars, the facts, the exactness and, yes,

4. Having in mind the later critique and re-evaluation of developmental stages in education (Morss, 1995; Dahlin, 2013), it can be worth looking more closely at how Whitehead expresses himself when he writes how “it answers to the call of life within the child”. The concept of an educational rhythmicity aiming at bringing teaching in dialogue or resonance with the “life within the child” can be seen as an alternative to the cognitive developmentalism later proposed by Piaget. It could be argued that by aligning the rhythmic movements of education to the greater developmental rhythms of a life, education expands its visions into taking a sensitive and relationally humble part in the developing life of a child. This stands in contrast to an educational psychology with prescribed developmental tasks for the child to pass or fail.

precision are in focus. He mentions “the perfecting of writing, of spelling, of the elements of arithmetic, and of lists of simple facts, such as the Kings of England” (p. 22) as examples of precision. Compared to how much he writes about the stage of romance, precision gets very little attention in his lectures on education. It is indeed a necessary component of the overall rhythm of education, but Whitehead seems more concerned with giving precision its right frames and restricting its tendencies to dominate, than to elucidate its potentials: “There is, indeed, always the temptation to teach pupils a little more of fact and of precise theory than at that stage they are fitted to assimilate” (1967, p. 34).

Precision is given its rationale as a disciplined second step following the freedom of romance. It aims at acquiring the craft of basic attainment within each subject. Romance opens up, stirs the emotions, evokes engagement, and enacts multiple perspectives. When children have dwelled for a while in the freer apprehension of romance, as Whitehead contends, they will long for fact and precision. This transforms the ‘opening up’ quality of romance into something that pupils can accomplish, an added value of wisdom: “The discipline, when it comes, should satisfy a natural craving for the wisdom which adds value to bare experience” (1967, p. 32). Precision turns out to be an indispensable and potentially fruitful part of Whitehead’s educational rhythm, but must constantly be kept within its boundaries in order not to dominate and hamper the freer breathing of learning and teaching.

### **The stage of generalisation**

The third and last rhythmic movement in Whitehead’s educational scheme is generalisation. Generalisation is often conceived of as an abstract summary or fusion of particulars into a more general concept. In this way, generalisation can imply a reduction, as, for example, in statistics when measured findings can be generalised to a certain population. Whitehead’s generalisation is far from being reductive. It is what brings the small and large rhythms of education into fruition and mastery. Contrary to being abstract, generalisation is “a return to romanticism with added advantage of classified ideas and relevant technique. It is the fruition which has been the goal of the precise training” (1967, p. 19).

For Whitehead, a child’s first conscious and targeted use of language is a sign of generalisation. That is when a certain freedom has been reached, and a more profound level of self-orientation can take place. Obviously, this first achievement of generalisation in language opens up for new wonders and new discoveries in the realm of romance. The child is on its rhythmical journey between exploration, practising of details, and the attainment of dexterity. Another example of generalisation would be the pupil who masters grammar and basic literacy skills. She is now ready for grasping and being grasped by literature in a new way, both understanding it on a deeper level as well as creating literature herself.

In terms of formal education, Whitehead locates generalisation primarily at the university level: “The spirit of generalization should dominate a University. The lectures should be addressed to those to whom details and procedure are familiar” (1967, p. 25). The student at this level “should start from general ideas and study their applications to concrete cases” (1967, p. 26). While romance clearly is based on an inductive approach to learning, Whitehead’s generalisation turns this upside down into a deductive mode. However, this is a deduction not based on any pure ‘first principles’, but rather on the achievements of years of sense-based exploring and precision-exercising modes of learning. In this vein, Whitehead’s rhythm of education resembles the ‘rhythms’ of research, necessarily alternating between observations and the application of concepts. And, yes, he points to similarities: “In this sense, education should begin in research and end in research” (1967, p. 37).

Active wisdom is considered the outcome of Whitehead’s generalisation, and for the idea of an active wisdom to be realised, the skills appropriated at the preceding stages should be turned into habits. According to Whitehead, reliable habits are the foundation of what he terms an “active freedom of application” (1967, p. 37). The integration of habit into the rhythm of education articulates a bodily orientation towards learning and mastery. Whitehead thus includes the habit-forming body in his inductive–deductive rhythmic interweaving of the three modes of learning. Whitehead’s understanding of habits is similar to Polanyi’s

later conception of tacit knowledge (Polanyi, 2009). Both imply a rhythmic view on processes of learning, knowing and habituation. Every new learning task mastered and turned into an unconscious habit lays the foundation for new discoveries, for new romances and periods of precision in the language of Whitehead, and into new conscious or focal aspects of knowledge for Polanyi. Both authors understand the process of knowing as transformative and emergent in the sense that a dynamic movement between qualitatively different stages affords new abilities, new knowledge, and, at the same time, provides a ground for further exploration and development.

### **Freedom and discipline, life and innovation**

Most rhythms consist of alternating polarities embedded in a flow of time, like the daily rhythm of light and darkness, the shorter and longer durations in music or our breathing in and out. In what sense can Whitehead's threefold structure be understood to constitute a rhythm? This becomes clearer in his lecture from 1923 where the stages of romance and generalisation are characterised as impulses of freedom, and the stage of precision is recognised as discipline. Whitehead writes:

The two principles, freedom and discipline, are not antagonists, but should be so adjusted in the child's life that they correspond to a natural sway, to and fro, of the developing personality. It is this adaptation of freedom and discipline to the natural sway of development that I have elsewhere called *The Rhythm of Education*. (1967, pp. 30–31)

If a lesson is built up according to Whitehead's rhythmic structure, the start in the spirit of romance implies an element of freedom, the continuation into precision indicates more disciplinary modes of working, and the generalisation in the end opens up into freedom again. In this way, a lesson, or a longer developmental journey, formed after Whitehead's ideas, would alternate between freedom and discipline. Still, Whitehead's triad is not simply a to and fro between polarities. There is a tension and also an implicit drive towards development and transformation in the fact that even if romance and generalisation are associated with freedom, they are very different. Moreover, this difference creates not only a rhythmic variation, but also something like a spiralling, developing movement.

As already mentioned, Whitehead's rhythmical understanding of education combines the richness of interweaving rhythms on many levels, not unlike the multiplicity of biological rhythms in living organisms. Education and complex life can be seen as clearly associated in Whitehead's works. In a broader perspective, Whitehead saw rhythms as expressions of life: "wherever there is some rhythm, there is some life" (1919, p. 197). And as in biological life, simple rhythmic structures allow for emergence and complexity when short-term rhythms become superimposed on longer rhythmic spans. The outcome is a rich and open conception of educational rhythms conceived in a maximally simple matrix. He writes:

I am convinced ... that there is not one unique threefold cycle of freedom, discipline, and freedom; but that all mental development is composed of such cycles, and of cycles of such cycles. Such a cycle is a unit cell, or brick; and the complete stage of growth is an organic structure of such cells. (1967, p. 31)

For Whitehead, this symphony of rhythms — this rich pedagogy of repeating and alternating differences — is united in a drive towards growth and novelty. Rhythms thus become a vehicle of emergence, as Allan comments:

Generalization is the recognition that truly to master a discipline is persistently to rethink its conditions, to reconceive its theories and redesign its methods. To master a discipline is to perfect the world it fashions by surpassing it, and to do so again and again, worlds without end. (Allan, 2012, p. 58)

This is no reductive scheme in Whitehead's rhythms, producing simple and replicable ways of teaching, but rather a philosophy of education attending to its complexities, richness and drive towards innovation and a renewal of values. Seeing Whitehead's rhythm of education in the light of emergence points to the developing and partly non-predictable nature of learning.

## Art, ethics and the fulfilment of education

The role of art and creativity are the final aspects of Whitehead's educational rhythms to be taken up here. Whitehead uses the term "art" in a very wide sense, including the art of thought, the art of teaching, and the art of life. Embedding education in an overall artistic and creatively oriented view of life constitutes a significant aspect of his thinking. Art thus becomes both an activity that can be integrated into learning and, at the same time, an overarching aspiration for education as a whole. Whitehead envisioned an education imbued with art on many levels: from the use of literature in mother tongue learning and visual arts in history, to students finally attaining the goal of mastering the "art of life". Art is for Whitehead intimately connected to a life characterised by wisdom, initiative, style and joy. Writing metaphorically, he states: "I am not now talking of the training of an artist, but of the use of art as a condition of healthy life. It is analogous to sunshine in the physical world." (1967, p. 58)

For Whitehead, art in education is a vehicle of moral transformation, guiding students towards developing "an artistic sense" of values:

Education is the guidance of the individual towards a comprehension of the art of life; ... This completeness of achievement involves an artistic sense, subordinating the lower to the higher possibilities of the indivisible personality. Science, art, religion, morality, take their rise from this sense of values within the structure of being. (1967, p. 39)

Looking back to Friedrich Schiller, who in 1794 wrote his famous *Letters upon the Aesthetic Education of Man*, it becomes clear that both Schiller and Whitehead saw aesthetics in education both as a fulfilment and as a mediator of values. Schiller wrote: "By beauty sensuous man is led to form and to thought; by beauty the spiritual man is brought back to matter and restored to the world of sense" (Schiller, 2005, p. 57). Ultimately, Schiller links aesthetics and his famous *play* to freedom and to ethics. The same is true for Whitehead. His generalisation is a stage of freedom where art and aesthetics become conveyors of values, but also ends in themselves. Following the tradition of Europe's great educational forefathers, Whitehead here aligns with thinkers such as Comenius, Pestalozzi and Herbart, who linked the 'aims of education' to an achievement of moral conduct. In the same spirit, Whitehead sees his last stage in the rhythm of education as the accomplishment of an ethically informed knowledge relating the individual to her environment. The emergence of a responsible, wise and ethically oriented student is Whitehead's vision of the outcome of his multiple rhythms of education.

Summing up Whitehead's ideas on rhythms in education, it becomes clear that several rhythms are involved in his basic triadic movement between romance, precision and generalisation. In addition to the ones just mentioned, there are moments of inductive and deductive learning, alternating phases of freedom and discipline, and dynamics of conscious focusing and the formation of habits. This gives teachers a rich repertoire of ideas regarding how to create variation and spur development in their classrooms. Seeing Whitehead's rhythm of education in the light of development and transformation brings the argument back to where it started, in Hegel and his dialectics. For Whitehead, this symphony of rhythms — this rich pedagogy of repeating and alternating differences — is united in a drive towards a value-oriented growth and novelty, with art as an important mediator, and the art of life as its goal. Teachers contemplating these ideas might get in touch with the greater perspectives of education and thus see the links between everyday classroom activities and the ethical challenges of humanity as a whole.

In the second article, Rudolf Steiner's ideas on rhythms in education will be presented, followed by a discussion of the significance of the three authors' contributions to understanding and realising rhythms in education.



## Literature

- Adam, Barbara. (1995). *Timewatch: The social analysis of time*. Cambridge: Polity Press.
- Allan, George. (2012). *Modes of learning: Whitehead's metaphysics and the stages of education*. New York, NY: SUNY Press. Kindle Edition.
- Allan, George, & Evans, Malcolm D. (2006). *A different three Rs for education: Reason, relationality, rhythm*. Amsterdam: Rodopi.
- Biesta, Gert. (2010). *Good education in an age of measurement: Ethics, politics, democracy*. Boulder, CO: Paradigm Publishers.
- Biesta, Gert. (2013). Time out: Can education do and be done without time? In T. Szukdlarek (Ed.), *Education and the political: New theoretical articulations*. Rotterdam: Sense.
- Binckes, Faith. (2010). *Modernism, magazines, and the British avant-garde*. Oxford: Oxford University Press.
- Burk, Karlheinz. (2006). Mehr Zeit in der Schule – der Rhythmus macht's. In K. Höhmann & H. G. Holtappels (Eds.), *Ganztagsschule gestalten – Konzeption, Praxis, Impulse* (pp. 92-106). Seelze-Velber: Kallmeyer Verlag.
- Clandinin, D. Jean, & Connelly, F. Michael. (1986). Rhythms in teaching: The narrative study of teachers' personal practical knowledge of classrooms. *Teaching and Teacher Education*, 2(4), 377-387.
- Cowley, Stephen J. (1994). Conversational functions of rhythmical patterning: A behavioural perspective. *Language & Communication*, 14(4), 353-376.
- Dahlin, Bo. (2013). Poetizing our unknown childhood: Meeting the challenge of social constructivism. The romantic philosophy of childhood and Steiner's spiritual anthropology. *RoSE - Research on Steiner Education*, 4(1).
- Derrida, Jacques, & Bass, Alan. (2001). *Writing and difference*. London: Routledge.
- Duncheon, Julia C., & Tierney, William G. (2013). Changing Conceptions of Time: Implications for Educational Research and Practice *Review of Educational Research*, 83(2), 236-272.
- Elden, Stuart. (2004). *Understanding Henri Lefebvre: Theory and the possible*. London: Continuum.
- Green, Bill, & Hopwood, Nick (Eds.). (2015). *The body in professional practice, learning and education: Body/practice: Cham*: Springer.
- Hopwood, Nick. (2013). The rhythms of pedagogy: An ethnographic study of parenting education practices. *Studies in Continuing Education*, 36(2), 115-131.
- Hull, Kathleen. (2002). Eros and education: The role of desire in teaching and learning. *The NEA Higher Education Journal*(Fall), 19-31.
- Höhmann, Katrin, & Kummer, Nicole. (2007). Vom veränderten Takt zu einem neuen Rhythmus. Auswirkungen einer neuen Zeitstruktur auf die Ganztagsschulorganisation. In S. Appel, H. Ludwig, U. Rother, & G. Rutz (Eds.), *Jahrbuch Ganztagsschule 2007: Ganztagsschule gestalten* (pp. 264-275). Schwalbach, Taunus: Wochenschau-Verlag.
- Jacklin, Heather. (2004). Discourse, interaction and spatial rhythms: Locating pedagogic practice in a material world. *Pedagogy, Culture and Society*, 12(3), 373-397.
- Jaegher, Hanneke De. (2006). *Social interaction rhythm and participatory sense-making: An embodied, interactional approach to social understanding, with some implications for autism*. (D. Phil.), University of Sussex, Brighton.
- Kipfer, Stefan, Saberi, Parastou, & Wieditz, Thorben. (2012). Henri Lefebvre: Debates and controversies. *Progress in Human Geography*, 37(1), 115-134.
- Klein, Joseph. (2004). Planning middle school schedules for improved attention and achievement. *Scandinavian Journal of Educational Research*, 48(4), 441-450.
- Lawrence, Nathaniel. (1965). Nature and the educable self in Whitehead. *Educational Theory*, 15(3), 205-216.

- Leander, Kevin M., Phillips, Nathan C., & Taylor, Katherine Headrick. (2010). The Changing Social Spaces of Learning: Mapping New Mobilities. *Review of Research in Education*, 34(1), 329-394.
- Lefebvre, Henri. (1991). *Critique of everyday life*. London: Verso.
- Lefebvre, Henri. (2002). *Critique of everyday life; volume 2: Foundations for a sociology of the everyday*. London: Verso.
- Lefebvre, Henri. (2004). *Rhythmanalysis: Space, time, and everyday life*. London: Continuum.
- Liebenwein, Sylva, Barz, Heiner, & Randoll, Dirk. (2013). *Bildungserfahrungen an Montessorischulen: Empirische Studie zu Schulqualität und Lernerfahrungen*. Wiesbaden: Springer.
- Malloch, Stephen, & Trevarthen, Colwyn (Eds.). (2009). *Communicative musicality: Exploring the basis of human companionship*. Oxford: Oxford University Press.
- Martin, Kirsty. (2013). *Modernism and the rhythms of sympathy: Vernon Lee, Virginia Woolf, D.H. Lawrence*. Oxford: Oxford University Press.
- Mathisen, Arve. (2012). Temporal design in auditors' professional learning: Contemporary epistemic machineries and knowledge strategies in risk auditing. In K. Jensen, L. C. Lahn, & M. Nerland (Eds.), *Professional learning in the knowledge society* (pp. 85-108). Rotterdam: Sense Publishers.
- Middleton, Sue. (2014). *Henri Lefebvre and education: Space, history, theory*. London: Routledge.
- Morss, John R. (1995). *Growing critical: Alternatives to developmental psychology*. London: Routledge.
- Polanyi, Michael. (2009). *The tacit dimension*. Chicago, IL: The University of Chicago Press.
- Ramseger, Jörg. (2009). Rhythmisierung – der Versuch, eine gute Zeitstruktur zu finden. Vorschläge zur Gestaltung des Ganztags im Berliner Bildungsprogramm für die offene Ganztagsgrundschule. In S. Appel, H. Ludwig, U. Rother, & G. Rutz (Eds.), *Jahrbuch Ganztagschule 2009: Leben – Lernen – Leisten* (pp. 121-130). Schwalbach, Taunus: Wochenschau-Verlag.
- Rancière, Jacques. (2013). In What Time Do We Live? *Política común*, 4.
- Riffert, Franz G. (Ed.) (2005). *Alfred North Whitehead on learning and education: Theory and application*. Newcastle: Cambridge Scholars Press.
- Rittelmeyer, Christian. (2002). *Pädagogische Anthropologie des Leibes. Biologische Voraussetzungen der Erziehung und Bildung*. Weinheim/München: Juventa
- Rosa, Hartmut. (2010). *Alienation and acceleration: Towards a critical theory of late-modern temporality*. Malmö: NSU press.
- Rosen, Ralph M. (2004). *Time and temporality in the ancient world*. Philadelphia, PA: University of Pennsylvania.
- Scheerens, Jaap (Ed.) (2014). *Effectiveness of time investments in education: Insights from a review and meta-analysis*. Dordrecht: Springer
- Scheuerer, Alexander. (2008). „Rhythm Is It!“ – Rhythmisierung, Ganztagschule und schulische Förderung In S. Appel, H. Ludwig, U. Rother, & G. Rutz (Eds.), *Jahrbuch Ganztagschule 2008: Leitthema Lernkultur* (pp. 53-64). Schwalbach, Taunus: Wochenschau-Verlag.
- Schiller, Friedrich. (2005). *Letters upon the aesthetic education of man*. Raleigh, NC: Hayes Barton Press.
- Schmelzer, Albert. (2007). Rhythmen lassen leichter lernen. *Erziehungskunst*(9), 926-932.
- Schmidt, Christina, Collette, Fabienne, Cajochen, Christian, & Peigneux, Philippe. (2007). A time to think: Circadian rhythms in human cognition. *Cognitive Neuropsychology*, 24(7), 755-789.
- Schultheis, Klaudia. (2011). Rhythmisierung und Ritualisierung im Schulalltag. In S. Hellekamps, W. Plöger, & W. Wittenbruch (Eds.), *Schule: Handbuch der Erziehungswissenschaft 3: Studienausgabe* (pp. 559-566). Paderborn: Schöningh.
- Skiera, Ehrenhard. (2003). *Reformpädagogik in Geschichte und Gegenwart: Eine kritische Einführung*. München: Oldenbourg Wissenschaftsverlag.

- Stengers, Isabelle. (2011). *Thinking with Whitehead: A free and wild creation of concepts*. Cambridge, MA: Harvard University Press.
- Strand, Torill. (2005). Peirce on Education: Nurturing the First Rule of Reason. *Studies in Philosophy and Education*, 24(3-4), 309-316.
- Valdez, Pablo, Reilly, Thomas, & Waterhouse, Jim. (2008). Rhythms of Mental Performance. *Mind, Brain, and Education*, 2(1), 7-16.
- Vollmer, Christian, Pötsch, Farina, & Randler, Christoph. (2013). Morningness is associated with better gradings and higher attention in class. *Learning and Individual Differences*, 27(0), 167-173.
- Whitehead, Alfred North. (1919). *An enquiry concerning the principles of natural knowledge*. Cambridge: Cambridge University Press.
- Whitehead, Alfred North. (1923). The rhythmic claims of freedom and discipline. *Hibbert Journal* (21), 657-668.
- Whitehead, Alfred North. (1948). *Science and the modern world*. New York, NY: Mentor Books.
- Whitehead, Alfred North. (1967). *The aims of education, and other essays*. New York, NY: The Free Press.
- Woods, Philip, Ashley, Martin, & Woods, Glenys. (2005). *Steiner Schools in England*. Bristol: Centre for Research in Education and Democracy, Faculty of Education, University of the West of England.
- Öztürk, Ergün. (2014). The effect of circadian rhythm on elementary students' reading comprehension. *Biological Rhythm Research*, 45(6), 861-868.