Researching the Sustainability of Teacher Professional Development

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Abstract.
This paper looks at ways of researching the sustainability of teacher professional development. The focus is placed on the relationships within and between learning environments and teacher professional profiles. Two principal perspectives are proposed linking the concepts of autopoiesis, organization and structure as a model for analysing these relationships and those of resilience, transformability and force-field analysis for investigating the sustainability of change and consequent development.

Key words.
Learning environments; teacher professional profiles; professional learning and development; autopoiesis, organization and structure; resilience, transformability and force-field analysis

Perspective: Theoretical, research and educational visions

Fields: Social processes and structures

Issues: Teacher professional development

Introduction

The aim of this brief and prospective paper is to explore a possible theoretical framework for researching the sustainability of teacher professional development. Sustainability is considered in terms of "an educational culture [that is] a transformative paradigm which values, sustains and realizes human potential in relation to the need to attain and sustain social, economic and ecological wellbeing, recognizing that they must be part of the same dynamic" (Sterling, 2001:22). Putting sustainability at the heart of professional development in education is considered as crucial for its efficacy. The professional development of teachers is a process of professional learning that takes place within the learning environments in which they work. Change must be sustainable for both teachers and environments since together they must be mutually sustaining. The framework proposed draws on various sources from different but overlapping fields that share a common inter- and trans-disciplinary perspective.

Education as a cultural practice takes place within and through the relationships between complex systems that include individuals, groups, the learning environments they inhabit, the communities in which they are embedded and the educational systems of which they are a part. Developments in any of these systems depend on the complex interactions of each one and between all of them. Teachers work in learning environments in order to promote processes of learning. In this respect education can be considered in terms both of the relationship between teachers and the learning processes of their students and of the teachers themselves who learn during and from their endeavour to teach. Teacher education can be seen as the product of teachers' professional learning processes, and the outcomes of their learning can be seen as sustainable teacher professional development when they give rise to something which promotes durable and ongoing change in terms both of thinking (understanding and modifying habits of mind) and acting (experimenting and consolidating new ways of being and doing).

What then are the characteristics of sustainability in professional development and what kinds of approaches for research in this field can be outlined? In particular, this paper focuses on the relationship between individual and group teacher professional development and learning environment development, inasmuch as the learning processes of teachers determine and are determined by the collective learning processes of the learning environments they inhabit and help to build. Teacher development is a motor for change in learning environments but also dependent on propitious conditions within those same environments. At the same time, professional development occurs within the confines of a given professional profile, constituted by the spheres of action involved and the competences required, which in turn determines what is the possible variety of developments of that profile, and the possible ways in which these developments can manifest themselves, in individuals and groups of teachers.

Autopoesis, organization and structure

This relationship between environment, profile and development can usefully be examined by using the description of the nature of living things as systems, both in terms of *autopoesis*, the capacity of a system to reproduce and maintain itself, and of the relationship between organization and structure that defines this capacity, as proposed by Maturana and Varela.

> "… [An] organization denotes those relations that must exist among components of a system for it to be a member of a specific class. Structure denotes the components and relations

that actually constitute a particular unity [or thing]…" (1987:47).

Organization thus describes the relationships that both constitute a system as a whole and determine its characteristics as a given type. Systems of the same type have the same organization. Schools as learning environments have the same type of organization and this can be analysed as a composite of four variables: *space*, in terms of the physical locations that constitute the environment, *time*, in terms of the definition of when and for how long things happen in those locations, *people*, in terms of the roles played by the participants within the environment, and *activities*, in terms of what is actually done and by whom within the various locations. In the same way, from the perspective of the profile of teachers as members of a profession, organization can be considered as a question of the elements that constitute it. The spheres of action involved within the professional profile of teachers can be analysed in terms of formal and informal contexts, lessons, conversations and meetings, with individuals or groups of students, colleagues and families, while the competences required can be seen as the knowledge-building, communicative, methodological and operational, personal and social abilities developed within these spheres. Within this perspective, competence is considered as:

> … the ability to *orientate oneself* in life in such a way as to promote sustainability. In this sense, *orientation* is considered as identifying a position (for example, in space, in time, within thought processes) and taking a direction (for example, a point of reference, a pathway, a way of proceeding), thereby adapting to the circumstances presented by environments and specific settings. In other words, competence is the ability to understand situations with particular characteristics and act with

awareness in order to achieve objectives … (Dodman, 2016: 20).

Structure refers to the particular manifestation of a given example of organization, in terms of the characteristics of these components and their interactions. Just as all cells have the same autopoietic organization, which can then manifest numerous different cell structures, so learning environments offer many examples of different structures that derive from the particular ways in which they decline and combine the variables of space, time, people and activities. In the same way, a professional profile is characterised by different practices within given spheres of action and the various ways in which competences can grow and be manifested. Moreover, a particular cell, or any other kind of system, changes its structure over time, and Maturana and Varela argue that the changes it undergoes are determined by *the nature of its structure at that point in time*, rather than by its interactions with its environment. Structural change is concerned with maintaining autopoiesis. Environmental perturbations encountered "trigger" change, but do not determine it. It is rather the structure itself that determines what can and what cannot be a trigger and what can and cannot be triggered. In this way, we can say that change in learning environments and in teachers themselves depends on the nature of their structure at a given point in time and the extent to which that nature can furnish a predisposition to a certain kind of change. Any attempt at promoting learning environment and teacher professional development that fails to take account of their organization and, more specifically, the particular nature of their structure, will be unsustainable.

How do the structure of a specific learning environment and the structure of a specific teacher profile determine given outcomes? To what extent do they permit or limit, open or close, new horizons for development? In what

ways do they determine the kinds of environmental perturbations that can best trigger structural change in terms of teacher professional development? What follows is an attempt to indicate some areas for research necessary in order to be able to understand and facilitate processes of change.

Relationships within and between learning environments and teacher professional profiles

If we take each of the variables that constitute the structure of learning environments, we can identify various key aspects that characterise the relationships within such systems. In terms of space, features such as the conception of given locations like classrooms, their fixed or flexible nature, the configuration of specific work spaces, the availability and functionality of given resources, all constitute interrelated factors which determine possible changes. Similar features related to time, such as linearity, circularity, duration and flexibility are equally influential. As regards people, of particular significance are the definitions of their roles and the kinds of practices and problems that can emerge in terms of *clarity*, *conflict* or *ambiguity* (between expectations and interpretations of the roles by a given person and between different colleagues), *overload* (in terms of too many expectations or taking on too much) and *underload* (too little to do or having roles that are not stimulating or gratifying), together with the ways of declining those roles in terms of collaboration (working together to help each other according to one another's needs) and cooperation (working together in order to realize common processes and products). The activities which take place in the environment can then be considered as the variable in which space, time and people become manifest through what people do (the types of learning activities proposed), how they do it (what types of interactive patterns and technological resources are used) and how they evaluate what happens and the

outcomes produced (the validity and efficacy of choices and the assessment of the learning that takes place).

A complex and dynamic relationship then exists between these variables of learning environments and the components of teacher professional profiles. All the spheres of action outlined above are a specific composite of space, time, people and activities. And each sphere requires and can be a fertile microenvironment for promoting competences. As I have argued elsewhere (Dodman 2016), in terms of all learning processes, including therefore those of teachers as professional learners, competence should be seen as principally a knowledge-building process and not just as a knowledge-applying process, as is often the case in much literature. Research should help us understand what factors facilitate teachers in building knowledge about learning processes, about learners, about external factors which influence learning and other types of knowledge necessary for their professional profile. Research should also focus on aspects of communicative competence such as understanding, interpreting, interacting, narrating, describing, explaining, on aspects of methodological and operational competence such as planning steps and pathways, making and testing hypotheses, using technologies, handling activities, assessing learning, and on aspects of personal and social competence such as reflecting and evaluating, respecting, collaborating, cooperating. Moreover, it is essential to identify and collect indicators (observable data that give information and can be interpreted) for each of these competences and of how durable their nature can be.

Resilience and transformability

A further source useful for offering insightful perspectives concerning questions posed when researching the sustainability of professional development is provided by two terms which are recurrent in much

sustainability literature: *resilience* and *transformability* (Clark, 2001; Raskin et al., 2002; Walker et al., 2004; Chapin et al., 2010; Folke et al., 2010, 2011; Westley et al., 2011).

> We define resilience as "the capacity of a system to absorb disturbance and reorganize while undergoing change, so as to still retain essentially the same function, structure, identity, and feedbacks" ... and transformability as the capacity to create untried beginnings from which to evolve a fundamentally new way of living when existing ecological, economic, and social conditions make the current system untenable (Westley et al., 2011: 763).

In terms of teacher professional development*, resilience* can be seen as the capacity to reorganize and maintain the integrity of one's professional profile in the face of perturbations (during teaching and all kinds of other situations related to professional learning) while undergoing change, and *transformability* as the capacity to develop new ways of being in order to make that change durable. Within the framework of autopoiesis, the capacity to reorganize and maintain integrity corresponds to structural change that develops in learning environments and teacher professional profiles while preserving their type of organization. In this sense, integrity is a composite of "function, structure, identity and feedbacks", as proposed by Westley et al., and can provide us with a fertile perspective for analysing relationships between space, time, people and activities and between spheres of action and competences, between what can act as a trigger for change and what can be triggered as change. In what ways can we consider integrity in terms of learning environments and teacher professional profiles and their development? In one sense, integrity concerns the capacity to remain integral (both for the school and the individual), in terms of being "whole" or

"complete". Change cannot threaten the integrity of the overall organization and its particular structure or it risks causing disintegration. At the same time, while not everything can be changed, change that occurs in a part of the structure still has to involve the whole structure or it risks being isolated and ephemeral, unsustainable because not sustained by the relationships within that structure. In another sense, integrity is also the quality of being "honest" and "just", in that values are rendered explicit and there is a commitment to reflective practice and systematic questioning of ways of acting and being, in order to make them as *coherent* as possible with those values. Integrity is thus a prerequisite for transformability and a predisposition toward change, inasmuch as coherence is not a static state to be achieved but rather a dynamic process of developing new ways of acting and being as well as of adapting to experience and its perturbations as triggers of professional learning in individuals and groups.

Coherence and community

From the perspective of the characteristics of professional learning at the level of the teacher as individual, coherence can be analysed in terms of four interrelated elements that feed into and out of each other. Coherence needs *repetition*, in the sense of continuity and enrichment, in that previous experience is reiterated, but also within the context of the addition of some new element. In this way, repetition leads to *progression*, incorporating the new into the given so as to create a sense of moving in a certain direction, thereby building a pathway to follow. Progression requires *systematicity*, in that there is the perception of interdependence and consequentiality, a clear relationship between specific actions, outcomes and increasingly global dimensions that involve the learning environments in which development takes place. Moreover, systematicity interacts with *pertinence*, thereby meaning that the new is clearly

perceived as significant and useful within one's professional practice, functional in terms of one's professional learning and the subsequent development.

These characteristics of professional learning and development are interrelated with other elements at the level of teachers as members of groups. Change can come about only if there is both a perceived need to adapt to experience, a necessity or desire to move towards new outcomes, and an ability to create and nurture interpersonal relationships. In order to be sustainable, the characteristics of change must co-emerge (manifest themselves in terms of reciprocal needs) and co-specify (define themselves in terms of reciprocal answers) through a process of co-learning within given spheres of action and co-construction of competences within professional development communities ''with the capacity to promote and sustain the learning of all professionals in the school community with the collective purpose of enhancing student learning'' (Bolam et al., 2005: 145). To achieve this, groups need an environmental culture based on a system of shared values and norms, a focus on learning through reflective dialogue, building meaning together through exchanging and conversing. A crucial aspect of the relationship between organisation and structure, resilience and transformability, is the way in which every learning environment develops a particular culture capable of promoting the learning (for students and teachers) that is its very reason for being. To what extent is a given culture able to understand, devise and implement change? To what extent does it facilitate the functioning of groups that must share competences, resources and responsibilities, undertake action and assess the validity and efficacy of what has been planned and the way it has been put into practice?

Teacher professional development and force field analysis

Each one of these questions must be related both to the *here and now* experience of teachers in a given learning environment and the way in which this facilitates or hinders their ongoing development. If, as Sterling states, realizing human potential and wellbeing "must be part of the same dynamic", by modifying Lewin's (1936) assertion that human behavior can be analysed as a function of the relationship between a person and her/his environment, we can apply the following equation: Human Potential + Wellbeing = f (Person, Environment). Furthermore, by using Lewin's force-field analysis, we can consider such contexts in terms of factors that facilitate or create obstacles to change (Lewin, 1951). The model proposed is based on analysing the forces driving change and the forces restraining it. Where there is equilibrium between the two sets of forces there will be no change because the *status quo* is *frozen*. In order for change to occur, there must be a phase of *unfreezing* whereby the driving forces can be increased and the restraining forces decreased. In this respect, researching teacher professional development can be seen as providing ways both of identifying and understanding forces at work within the learning environment and also how a process of unfreezing can be promoted in order to facilitate change. If such a process does not take place, the risk will always be that of unsustainable change leading to reverting to old practices as the only apparent way of maintaining structural integrity.

Conclusions

This paper is an endeavour to propose perspectives and consider their applications in research within two interrelated contexts of development: that of teachers as professionals and that of the learning environments in which they work. In order to be sustainable in one of these, change must take place in both. The professional learning of teachers is an outcome of propitious circumstances and occasions, not of direct or

intentional causes, and the particular structure of professional profiles, together with that of as their environments, determine what can trigger change and what change can be triggered. The types of input that can function as perturbations in this sense can be internally-generated through personal experience in teaching-learning situations and collective participation in research groups, as well as externally-generated, for example, by attending courses or seminars and participating in networks and inter-institutional collaborations, or a mixture of both. Research into what types of perturbations can give rise to teacher professional development and how these function can be seen as a question of understanding autopoietic organization and the structures it can give rise to, through investigating the forces that can facilitate or impede the resilience and transformability that permit sustainable development in terms of human potential and wellbeing.

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