

Redefining Educational Boundaries with Technology: the Systemic Perspective

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Abstract

This paper examines global trends in education reform from the point of view of specific references selected within the systemic branch of educational literature. It is argued that a sharper consciousness of the specificities of the global educational environment, with a correspondingly sharper differentiation of the offer of the mainstream educational players, will have to come about in the near future.

Communication, the primary constitutive element of educational reality, is gradually expanding into latent domains made available by new technologies and activating in them completely different educational languages and different codifications of educational success. Implications and suggestions for research that can highlight the challenges this surplus of ways for experiencing education may pose to the traditional forms of regulating the educational provision are included.

Keywords: social complexity, communication boundaries, educational change, functional differentiation, learning environments

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The Background and Purpose

Education is assumed to be a relatively specialized field of study. Nevertheless, it is perhaps surprising to acknowledge just how much theoretical production, related to a quite broad range of educational topics, does not come specifically from educational researchers or practitioners. This study aims at contributing to the development of a closer understanding of one of these outsider points of view on educational matters, one that can be roughly related to *Systems Sciences*, or *Systemics*. That perspective, which sees learning as a regulatory mechanism of complex adaptive systems, is progressively becoming more prominent, in education and in other fields of human and social inquiry, due to the growing interest in holistic research, one that is sensitive, or, at least, not totally blind, to the "ways of the whole."

More than reflecting a genuine interest in educational questions, the "incursion" of this outside perspective into the educational debate seems to reflect a higher level of awareness of the substantial gap that separates the purpose, socially assumed to be the one of the formal educational system, and the instrumental means, or the technology, assisting the practical success of the deliberate actions required for realizing it. Apparently, a lot has still to be done in terms of exposing the ideology and false beliefs pervading the educational debate, which is manifestly focused more on what education is not and what ideals it does not correspond to than on what education is and why it is the way it is. According to Qvortrup (2005), "more preaching and threatening is not necessary, neither is the spread of obedience and reasonableness, rather the dominant theme will be the exposure and discrediting of official facades, ruling moral concepts and common beliefs" (p. 2).

According to Luhmann (1995), worldwide reform attempts, faced with the challenges posed by the incomprehensible complexity of the educational circumstances, tend to fill in the void of understanding with idealizations and simplistic explanations. Educational agents are forced to embark in social synchronizing rituals, or, according to Snoek (2006), in ritual-like behavior, in the hopeful conviction that through it the necessary solution to the problems will emerge. Marion (1999) establishes a provocative parallel between educational reform initiatives and the rain dances of the Native Americans. "Rain dances leave us feeling good. If something does change following the rain dance, we are quick to credit our efforts; if nothing happens, we often ignore the fact as we plan our next dance" (p. 213).

What cannot be enlightened behavior, due to the dramatic contingency of the situation can, apparently with advantage, for society, and also for the individuals, be replaced with good manners, or good behavior. According to Luhmann (1995), "ritualizations, religious and otherwise, possess a similar function. They translate external uncertainties into an internal schematism that either happens or not, but that cannot be varied, and therefore neutralizes the capacity for deception, lies, and deviant behavior" (p. 185).

The fact that many of the educational activities are essentially invested with ritualistic meaning creates all kinds of obstacles to the general viewpoint of "truth." The cognitive, or "sincere," way to address the facts, interested in stating the educational world "as it is," is faced in many educational contexts with insurmountable difficulties, which ultimately end up confining it to a remote possibility. As a

consequence, many reform attempts manage little more than to enact an atmosphere of conflict and to end up in impenetrable confusion. Many measures of educational policy, being conceived in linear terms and proposing deliberate interventions to achieve specific outcomes, tend to confront themselves with realities too ambiguous and contradictory to be even susceptible of normative handling and, as a natural consequence, to fail in delivering the intended solutions. Attempts at solving the educational system's problems tend to be helpless in the task of obstructing the "solutions" that indeed emerge, without any kind of premeditation, as indeterminable outcomes of stealthy, hard to grasp, systemic dynamics.

In many respects, according to Luhmann and Schorr (2000), the formal educational system describes itself in a counterfactual way. In fact, structural formation within the system is clearly not giving mainstream educational organizations the necessary ability to adapt to the 21st century's fast changing circumstances. The global educational infrastructure is nightmarishly bureaucratic, in some cases, visibly, on the verge of collapse; no longer is socially, politically or economically, responsive. Even if the formal educational systems of a few countries are looking ahead, the majority of human beings is, beyond doubt, being educated for the past.

This kind of output of the educational system justifies serious concerns. Nowadays, a considerable number of university graduates do not find jobs compatible with their academic qualifications. The massive increase in the number of students worldwide raises the question whether the formal educational system is going to respond in order to provide all students with knowledge and skills that can be applied outside the educational system. The world is becoming hyper-connected and, consequently, hyper-complex. The industrial model of command and control does not fit anymore. Will schools and universities be able to significantly develop personal and professional capability or are students irrevocably condemned to get their diplomas without being transformed in significant ways by the overcrowded system? Are changes in ritual-like behavior going to make any difference in this state of affairs?

Most reform initiatives tend to presume educational action as deficient, but is it really? Is the behavior of the educational agents the main obstacle compromising the emergence of significant change in the system? Or is it something else? What makes the formal educational system want to change in the first place? What are the real conditions for change? What can educational agents (and political, economical, etc.) do to influence significant change in the system? These questions were the starting point and the motor of the theoretical curiosity presiding over the writing of this paper.

The Primacy of Communication

Education is normally equated as action oriented to the achievement of learning goals. One evaluates the learning needs of a targeted population, formulates the learning outcomes, and selects the teaching strategies and resources to achieve them. Little attention is given to the communicative context in which that kind of action will have to come about. Pedagogical intervention, however, can only achieve its stated goals through communication; it can only be successful in realizing its educational aim, which is always, roughly speaking, to change people, if it manages to be successful as communication. According to Luhmann (1995), education, even if understood as

intentionalized action, "can attain its goal (we would like to omit for the time being the possibility of indirect and unnoticed manipulation) only by communication" (p. 244).

Communication, according to Luhmann (1995), is an emergent form of reality, in most cases just allowing a partial and *à posteriori* indirect recognition. What can be observed is the behavior of the students, taken as an indirect indication of the results of our educational interventions. Furthermore, "communication has no goal or end, no immanent entelechy. It occurs or it does not – that is all that can be said about it" (Luhmann, 1992, p. 255). What multiple interacting agents think and say cannot be determined, not even by them. Communication is a systemic kind of reality, possessing "highly complex structures ... whose dynamics, for any observer, are opaque and incapable of being regulated" (Luhmann, 1992, p. 251).

Education, being dependent on communication, cannot therefore avoid activating side effects other than those that are contemplated. Pedagogical interventions vary strategies and means in the hope of achieving the desired learning outcomes, "but all this produces unforeseen socializing effects within the system. They transform equality into inequality. They motivate and discourage. They link experiences of success to experiences of success and experiences of failure to experiences of failure" (Luhmann, 1995, pp. 206-207). What indeed happens, according to Qvortrup (2005), is never in mutual harmony. On the contrary, each thought and each communicational event challenges previous ones. Participants in communication constantly collide and attempt to achieve dominance over others.

How effective can, then, education be, "conceived of as the rational form of socialization, as effective action" (Vanderstraeten, 2003, p. 138), if the communication required to realize it is contingent and may well not emerge as expected? One cannot simply presume that developments in the way educational agents process meaning can be achieved by instantaneous adjustment. What is, in essence, an evolutive acquisition, as Luhmann (1986) points out, "cannot be intended, conveyed, demanded, reached by pact or ended" (p. 128).

The Improbability of Meaning

People can engage in communication with very little meaning or informational content, intending only to pass the time or to avoid silence. But the foundation of communication is the processing of information; it involves communicators selecting the informative content to convey in their utterances from a repertoire of redundant possibilities. According to Luhmann (1992), these selections are conditioned by what is possible in the communicative circumstances.

Communication does not come about without understanding. "Information should be provided in a form which the sender and the addressee are able to understand" (Vanderstraeten, 2003, p. 135). Each communication asks, thus, for a new communication. "The receiver needs to show understanding" (Vanderstraeten, 2003, p. 136). A communicative process connects communicative events in such a way that each element in the sequence, like in a chain, concludes a preceding one and expects a subsequent connection. Communication organizes its own renewal. According to

Luhmann (1995), communication systems are “life-like,” meaning they reproduce themselves.

“Just like life and consciousness, communication is an emergent reality, a state of affairs *sui generis*” (Luhmann, 1992, p. 252). Communication is also, according to Luhmann (1981), highly improbable, indeed a contra-phenomenon, an effort to surmount a multitude of problems and obstacles, namely, misunderstandings and/or the rejection of the informative content, preventing communication from happening. “Generally speaking the success of communications is improbable. If this improbability is not as great as it usually should be, then this is the effect of the communications media” (Qvortrup, 2005, p. 11).

The Main Purposes of Education

If one would have to identify the most important factor contributing to the survival of the human species on this planet, that factor would be communication. According to Luhmann (1981), “without communication there can be no human relations, indeed no human life” (p. 122).

One of the most important conditions for the continuation of communication is personal identity. “It is not human beings but persons that make communication possible” (Qvortrup, 2005, p. 12). Personal identities are, on the other hand, a product of communication. “Persons are a communicative trick: products of and preconditions for communication” (Qvortrup, 2005, p. 13):

The fundamental function of an educational system is not to impart knowledge, to discipline, etc., but to minimize the improbability of social communication... An educational system achieves this through the function of making human beings persons... Human beings are born. Persons develop through socialization and upbringing/education (Qvortrup, 2005, p. 12-13).

A secondary function of an educational system, besides the personalizing primary one, according to Qvortrup (2005), is career selection. The education system exists to maintain the preconditions for human beings to function in society as persons and to execute the evaluations that realize career selection. Even if some may see this secondary function as somewhat arbitrary and more like a status passage rite, formal education, by being a social mechanism to select people for a range of careers, must continue being concerned with exams and certification. “Naturally, both functions have to be fulfilled by the education system with the help of communications” (Qvortrup, 2005, p. 13).

A fundamental question is how educational success in these two areas of purpose is possible if educative processes use communication as their basic resource? And from this basic question stems many others. What is the main topic of that kind of communication? What do the participants in educational communication talk about among themselves? What is the success code molding this kind of communication and increasing its potential for success? What communicative selections, for example, in the face-to-face interaction system of a classroom, may increase a teacher's probability of success in that complex undertaking of changing persons?

The answer to that fundamental question is not easy. But, according to Qvortrup (2005), what may increase the likelihood of success in that personalizing form of communication is the transmissibility of lifetime, or life process. To Qvortrup (2005), educational communication is communication about things that, once learned, might be of use in another context and at another moment in time.

The Boundary Relations, and the Gatekeepers

The success of education, which, according to Vanderstraeten (2003), is a form of "people processing", can only be inferred indirectly by the patterns of external, visible, behavior of the students. Educational interventions, therefore, produce normative expectations on behavior, "particular patterns of behavior are acceptable, while others are not" (Vanderstraeten, 2003, p. 139). According to the same author (2003), a difference between acceptable and unacceptable patterns of behavior develops within the educational system. Individualized persons, however, according to Luhmann (1995), tend to "treat the prevailing norms as truly unreasonable demands to come about between persons" (p. 231). These persons, according to Luhmann (1995), form a silent reservoir for protest movements of all kinds.

As the system needs to purge itself from a whole set of "inappropriate" behavioral expectations, a strict hierarchy of decision and a stratified form of organizational communication are normally in place. This representation of order, or unity, via reference to hierarchy, short-circuits decisions by purpose or by function, or, more concretely, by problem solutions (Luhmann, 1997). Control figures tend to be power hungry and uncertainty intolerant, with the very high proclivity to use any opportunity to get rid of contingencies.

In its pure form, this organizational model rules out the possibility that the deciding entities can be substituted or replaced under the pressure of negative events following their less "fortunate" decisions. Internal or external attacks to this mainstream form of organizing the educational system, even on the rational that this traditional form of order is incompatible with 21st century learning, tend to end up in parody. In most cases, they will manage no more than to stage a mere carnivalesque inversion of the well-established hierarchical principle they want to confront in the first place.

As a consequence, the system's circumstances are evaluated using a reduced repertoire of criteria, which, according to Luhmann (1997), creates and expands a huge domain of latency (or intransparency). A surplus of ways of communicating and thinking the system, and possibilities for experiencing it, despite not being officially contemplated, are contingently activated. Self-generated blindness towards a huge matrix of communicative and reflective operations (and correlated actions and interactions) is, even if not observed (if transcendent), constitutive of the educational system.

A fundamental question is, thus, how the formal educational system manages to ensure its continuation, or its reproduction, on its own reduced terms? According to Luhmann (1997), the answer is: not with learning. The stability of a hierarchy cannot be secured by means of improved information processing. "Learning makes the world more complex" (Luhmann, 1995, p. 329). An overload of normative determinations, based on byzantine prognoses, would generate even more complexity. Mainstream

educational decisions, paradoxically, need to remain counterfactual. The hierarchical figures and gatekeepers of this form of auto-induced blindness manage to secure the hierarchy, according to Luhmann (1997), by stabilizing the system's boundary relations and, through it, by being successful in preventing the expanding set of latent communication possibilities from introducing volatility into its own decisions.

Hierarchical figures may personally gain by describing the educational system, not as it actually works, but in anachronistic ways, or, more exactly, in ways that it doesn't. It is the requirement of stability of these agents positions within the decisional structure what, for example, according to Luhmann (1997), requires the compartmentalization of learning, not some particular understanding of knowledge.

The design of learning situations and the management of the necessary activities tends to assume a linear progress towards the goal of producing a growing assimilation of information, or the acquisition of specific information processing capabilities, in many cases in the utmost insensitivity to the systemic, above all communicative, requirements necessary to viabilize the venture. That kind of indifference becomes, of course, even more problematic in multicultural contexts. Difficulties in keeping the necessary form of communication alive transform educators, according to Luhmann (1997) in central animators of a, more or less bland, form of communicational intransparency.

The Control of Intransparency

According to Luhmann (1997), the prospects of being able to preserve the latency that protects the hierarchical structure from consciousness and communication that can destroy it, or trigger considerable restructuring, lie in one thing, and one thing only: the capability for blocking consciousness and communication.

But until when, under 21st century circumstances, will this kind of decisional structure manage to keep latent its self-generated (and quickly expanding) form of intransparency? In the progressively more competitive global educational environment, one can even view this problem in terms of the risks that the formal educational system incurs by choosing to define its unity around structure instead of function.

In fact, in specific regards, hierarchical decisions in education are progressively showing to be unsuccessful in avoiding being seen, simply, as irrational. A hierarchy is clearly not the best way to handle a large scope of personal, temporal and factual operative differences without being caught in inconsistencies. All sorts of counter-semantics, both internal and external, exploit this weakness in the expectation of being able to transform the way the system is "handling" the complexity of its circumstances.

The Functional Differentiation

New communication media are leaving the educational system's hierarchical orientation progressively less capable of regulating and, therefore, protecting itself from its self-produced intransparency. Social complexity is reaching a threshold after which it must either be expelled from the system (seen as belonging to the

environment) or finally controlled or worked into. As the former possibility equates to extinction, it matters to analyze the latter, in an attempt to determine how it is probable that the management of contingencies will be, in that case, operationalized.

Any way one may look at it, it discloses a key development as unavoidable. Sooner or later, a sharper consciousness of the specificities of the educational environment, with a correspondingly sharper differentiation of the educational offer, will have to come about. According to Luhmann (1995), the retreat of intransparency, together with a structural transference from a normative to a cognitive style of expectations, will necessarily follow. As a consequence, it will become possible to witness the gradual replacement of the predominant hierarchical orientation of decision processes in education by a functional one. The rationality of the decision-making processes will progressively be established.

The turnaround will not be an easy or even a smooth one. Latency, as a kind of factual reality, will be handled by the hierarchy, as if it were not merely a consequence of deficient cognition (thus, calling for an advance in learning), but a question of reducing the space for free-play in the system (or a matter of power), thus, calling for the imposition of regulations and norms that can do better in disempowering recalcitrant individuals to make their own observations about the facts.

Furthermore, according to Luhmann (1995), the reconfiguration of the system is not going to eliminate the deep-rooted hierarchy. The hierarchical upper strata, or the center of power, will fiercely fight against being dispossessed of its strongholds of domination. It must be expected that it will only concede to the extent it can no longer keep control of the system's boundary relations. The other alternative is losing its *raison d'être* together with its dominant position. Reference to function, indeed, means that all decisions can be questioned and all deciders can be replaced under conditions of unsatisfactory realization of purpose. That alone suffices to stimulate many objections and criticism, understandably, not all coming from the hierarchic figures. According to Luhmann (1997), the unification of the system's operations around a single and primary principle of purpose cannot functionalize the hierarchy, which in the best of odds will assume a dormant role, despite remaining visible, within the functional regime.

One can, supposedly, expect that the global educational system is going to become more entrepreneurial and less managerial. "Function systems have to treat their environments as environments of 'equals,' because nothing but function can justify discrimination" (Vanderstraeten, 2004, p. 260).

The Borderline Spaces and the Game Changers

Systemic dynamics confine sometimes the minds and social systems to vicious circles which reinforce traditional ways of operating, even when an explicit desire for change exists. According to Luhmann (1995), this happens because it's evolution, not rationality that determines the survival of these systems: "the primary, unavoidable choice is whether or not to continue life, consciousness, communication and not whether to maintain or to change patterns" (Luhmann, 1985, p. 34).

Even if society, in the context of its functional restructuring needs, is unsatisfied with its formal educational system and continues demanding from it a different kind of output, one must not expect that the formal educational structure in place is going to eagerly adjust to these outside appeals. Education happens in the context of socialization processes and "it should have become clear by now that the school socializes for the school, not for society. At school it becomes important to be a good student" (Vanderstraeten, 2003, p. 141) and a good teacher, not necessarily a "good" citizen for society or a competent worker for private and public institutions.

In fact, according to Luhmann and Schorr (2000), "during the whole of societal evolution, education has never taken the lead in structural transformations; instead, it has always followed them" (p. 32). As it is apparent, significant change in the system does not come about as a consequence of internal curriculum design deliberations and even less as an outcome of continued reform pressures exercised by other systems situated in context, be they political or economical.

The permanent requirement for reform is, according to Qvortrup (2005), a direct consequence of the growing insecurity of the educational system regarding itself:

The only thing that is known in the educational system is that it is unsure about its own validity and must therefore constantly change. It seems that the more conservative the government, the more important it is to change the educational system. (p. 19)

Recursive reform attempts, more than anything else, seem to express the general dissatisfaction about the fact that education is becoming more and more contingent, or that it is becoming too complex for normative handling.

In reality, educational change is happening right now, the most significant part of it without being announced, or even wanted. New technologies are opening new possibilities for organizing learning through web-based, non-normative, even borderless, active networks, as opposed to the rigid, centrally determined, passive configurations employed by hierarchical structures. Nothing in the educational realm remains as it is. Capability for learning is being added without interrupting the system's organizational form, by "stealthily" occupying as yet semantically unoccupied structural domains to activate different educational languages and different codifications of educational success. This is happening even within highly politicized, passive, educational systems.

Technological innovation is making the communicative and reflective environment of educational organizations more intransparent than ever before. This dramatic rise in the complexity of the educational circumstances will, most probably, continue increasing the instability of the formal educational system in the near future. The need for change will continue to increase, together with the need for stability. With greater uncertainty, or greater contingency, even more room for free-play will become available, which, according to Luhmann (1995), is the factor that can change the conditions for consensus in the overall system and, through it, the complex balance between commitment to learning and non-learning.

The Way

It should no longer surprise us that educational reform is nowadays seen, more than anything else, as an encounter of the educational policy authority with the uncertain, or with the unpredictable, surrounding the operations of the formal educational system. According to Luhmann (1997), the accumulation of demotivating educational reform experiences has made unavoidable the withdrawal of educational policy intervention towards constructivist conceptions. At least policy makers can still expect to understand better afterwards why their measures have not worked.

By understanding the dominant expectational structures prevalent in the educational, economical, and political systems from the viewpoint of these systems' exalted, according to Luhmann (1997), need to maintain the stability of the respective decisional structures, it becomes obvious that there is little theoretical gain to extract from an overt association with claims for or against specific reform initiatives. To a large extent, they are based on simplistic interpretations of the educational situation, particularly the ones describing success in terms of "us vs. them" and advocating action aimed at curbing the kind of behavior normally described as "resistance to change." According to Luhmann (1981; 1995), these disputes always revolve around the same monotonous set of contrary expectations. They ignore, but monopolize the communicational domain and, therefore, exclude, other possibilities. If the only options available are entering the official arenas of the educational debate on the side of the Christians or the side of the lions, the most rational and, above all, more constructive decision is not entering at all.

If one does not want to relax the requirement for truth and, on the contrary, values the scrutiny of facts and verification, one of the main aspects deserving the focus of attention, taking into consideration all that is mentioned above, is the capability of educational research to distinguish between what people talk and write about and that which "makes a difference" (cf. Bateson, 1979). Very interesting would, supposedly, be the investigation of the developments in pedagogy and learning that are being made possible by web-based technology, but in a way that does not ignore the role played by the educational structure. As can be expected, a re-conceptualization of educational matters, taking its point of departure in communication, would do this kind of research a lot of good. Educational research, according to Vanderstraeten (2003), focuses "too much on subjects (teachers/parents, pupils/children) and too little on communication and social interaction" (p. 141). Instead of focusing on educational action or experience, it should focus on the particularities of the educational discourse.

In what respects educational practice, before, as educators, adopting some particularly innovative course of action aiming at influencing or even determining the flow of transformative events in education, we should reserve some time to take a look into the Chinese philosophy classics. They contain the wisdom that works around this part of the world. We might, for example, take into careful consideration "Dao De Jing," the "Book of the Way," namely when it advocates the virtues of the praxis of non-communicating and non-acting, supposedly, as being the most sophisticated form of serving, or at least not obstructing, the creative tension between opposites in the world. It advises us to keep "a hidden yet seeming presence, use it and stay strong" (Roberts, 2001, p. 41). A "self-effacing" and "laissez-faire" approach, no doubt.

Nevertheless, as it is always possible to check, the only one that can grant us access to the space "where things cannot be hidden."

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