

# **Paradoxes of Freedom. An Archaeological Analysis of Educational Online Platform Interfaces**

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## **Interfaces**

### ***Abstract***

Many schools and students across the globe are now engaging with educational digital platforms in their teaching and learning experience. Platforms are changing what education is and how it is experienced. In response, educational research has devoted increasing attention to the so-called platformisation of education. This article contributes to this focus of attention, proposing a conceptual framework for the analysis of the configuration of platforms and the kinds of learning experience and learners they create the conditions of possibility for. Using Foucauldian archaeological methods, we present an analytics that focuses on three interrelated axes, the spatial, temporal and ethical configurations of educational platforms. We identify some theoretical tools for the analysis of the educational experience that platforms make possible, thinkable and desirable. We show how digital platforms produce a paradoxical kind of digital learner, whose autonomy and freedom to choose, connect, produce, accumulate, perform and enact is configured within an epistemological space demarcated by the tensions between modularisation and hypertextuality, linearity and co-existence, performance and character/potential. Reflecting on this, we consider the working of a careful, unrelenting, and empirically vigilant digital gaze, which secures a very specific educational experience.

**Keywords:** Educational Online Platforms; digital learner; digital gaze; neoliberalism; archaeology

## **Introduction**

The use of digital platforms in blended and on line educational settings is nowadays a key vector of a fundamental re-configuration of the educational experience across the globe. Van Dijk, Poell and de Waal (2018, p. 4) refer to this re-configuration as *platformisation*, a process involving the use of platforms, i.e. programmable and technologically mediated architectures made up of interfaces, algorithms, data and business models, that are designed to construct the educational experience, educational knowledge and the learner in new ways.

*Platformisation* involves three intertwined economic, political and educational processes: the growth of a profitable EdTech global market, the problematisation of tradition classroom-based modes of schooling that identifies in digital technologies as the ‘solution’ to their shortcomings, and the concomitant establishment of educational online platforms (hereafter EPs) as constitutive elements of the contemporary educational experience (Williamson, 2016). IT industries and a plurality of profit and non-profit EdTech providers now act as a leading educational force, offering ‘learning’ solutions to governments, universities, schools and teachers that are claimed to be adaptable, flexible, scalable and cost-effective (Ball et al. 2017, Selwyn et al. 2020).

EPs are designed to address multiple educational issues: the provision of online learning, the management of learning in blended settings, home learning and early childhood education, the promotion of classroom engagement, language learning, test-preparation, the design of innovative schools, school administration and learning analytics.

In contemporary political debate digital technologies and EPs are powerfully positioned by the rhetoric of reform as a ‘technical magic’ to enable the ‘opening up education’ and enhance learners’ freedom, making education more accessible, personalised, transparent, and effective. The claim is that they will liberate ‘the power of learning – awakening curiosity, stimulating

innovation and enjoying the discovery of the world’ for young learners who are ‘digital natives’ (European Commission, 2013; OECD, 2018).

As a result of the global expansion of the EdTech market and the proliferation of education policies promoting digitalisation, EPs have become part of the ordinary learning experience for an ever-growing number of students around the world (Van Djick et al., 2018, p. 117). Three aspects, among others, are of interest for understanding how *platformisation* is re-working the idea of education, how education is organised, what it means to be educated and the way we live the educational experience as teachers, learners, parents, analysts, researchers and citizens:

- *Platformisation* as a space of convergence for multiple and heterogeneous technologies, policies, actors, interests and educational frameworks, where EdTech providers and technologies are key cultural, political, policy and economic players in the rewriting of future education (Ball et al. 2017);
- The mobilisation of educational frameworks and visions for future education that position technological devices and online learning as key instructional components within broader educational ecosystems (Cherner and Mitchell, 2020);
- The development of educational conventions, recurrent design patterns, space-time frames and social norms that regulate the *platformised* educational experience (Decuypere, 2019) and establish particular kinds of regularities in the epistemology and politics of education (Gillespie, 2010).

This last point is particularly significant in relation to the graphical user interfaces (GUIs – see figures below) which platforms employ as social and physical ‘points of contact at which different bodily or machinic systems meet’ and as cultural devices, that are connected to

distinct forms of power and surveillance, and that mediate everyday experiences of education and enable particular kinds of agency for their users (Gane and Beer, 2008, p. 54).

### *Towards an archaeology of educational platforms interfaces*

In the emerging body of literature that addresses *platformisation* a variety of analytical resources are mobilised to disentangle the materiality and the operability of EPs and to reflect on their performative capacity to re-frame the educational experience and re-make its subjects (Erstad & Sefton-Green, 2013; Nemorin, 2017; Decuyper, 2019). To contribute to this literature, and building on previous work, we focus on the educational epistemology of EPs and in particular of their GUIs, and the ethical effects of the *platformisation* of education, with specific reference to the making of the learner (Grimaldi and Ball, 2019).

Drawing on Foucault's method of archaeology (Foucault, 1973) and a set of studies in the field of media archaeology (Manovich, 2002; Ernst, 2011; Parikka, 2012), we address GUIs as epistemic surfaces and question the specific forms of spatialisation of the educational experience they embody, the temporal structures that re-order the form and format of such an experience and the processes through which it is attributed value. An archaeological framework invites us to focus on the particular educational freedoms and form of autonomy that EPs and their interfaces create the conditions of possibility for. Three distinct processes of formation are considered: a) the configuration of educational digital space and the kind of reason according to which the learner is made as a subject through the educational experience of such a space; b) the temporal sequencing and pace of the educational experience, and its teleological features; and c) the kind of norms through which educational experience and its

subject(s) are classified and given value, and overall difference is produced. Following from this, four areas of inquiry can be delineated:

- *fields of visibility*, i.e. ways of seeing and perceiving that are characteristic of the learning experience that occurs through the platform interfaces;
- *forms of rationality*, i.e. ways of thinking and questioning that platform interfaces make actual, mobilising specific vocabularies and procedures for the production of the truth of the learning experience;
- *dividing practices*, i.e. modes of acting, intervening and directing of the educational experience that are embodied in the materiality of the GUIs and that bring about the identification and constitution of certain bodies, gestures and desires as individuals (Patton, 1989, p. 264).
- *modes of identity formation*, that is ways of forming subjects that involve both the exercise of particular educative, therapeutic or training procedures being applied to individuals in order to make them into subjects of certain kinds (Foucault, 1997).

The aim is to demonstrate the potential of such an analytics for understanding the different modes by which, through their interaction with and immersion in platform GUIs, learners are made subjects and the kinds of educational freedom and autonomy that educational online platforms produce. We address this using illustrative examples from a widely used EP, Blackboard Learn (<https://www.blackboard.com/learning-management-system/blackboard-learn.html>), launched in 1997 by Blackboard Inc, a powerful US-based, global EdTech provider. Blackboard Learn is a blended learning management system (BLMS), an EP constituted by a set of web-based software applications with strong mobile platform support that offer tools for e-learning, virtual classrooms, course administration, assignment management, progression tracking, grading, and student collaboration. It is designed for both

blended pedagogies and e-learning programs and contains functionalities for both. In the global BLMS market, Blackboard Learn plays a prominent role, being one of three systems that share the majority of the BLMS market (together with Moodle and Canvas - Kuran et al. 2017). In order to provide examples of the potential of an archaeological framework, using a demo and free online tutorials, we analyse the multiple forms assumed by Blackboard Learn's student dashboard interfaces, addressing them as discursive surfaces of emergence. That is, concrete operations that generate governmental effects (Ernst, 2011, p. 239) that 'may make some [actions] easy to conceive and render others unthinkable' (Manovich 2002, p. 76).

Here, an archaeological analysis allows us to identify a distinctive set of epistemological tensions that demarcate the spatial and temporal configurations within which the constitutive elements of the educational experience and the learner as a subject become apparent. The learner is made visible, knowable, malleable and, overall, governable through EPs within the spatial tension between *hypertextuality* and *modularisation* and the temporal tension between *co-existence* and *linearity*. In this way we identify the conditions of possibility for the formation of a paradoxical kind of educational freedom whose activities of choosing, connecting, producing, accumulating, enacting and learning are regulated through both the norms of performance and character/potential. Freedom and regulation constitute a neoliberalisation of pedagogy and learning, the opening of multiple possibilities of self-education and a distinct potential for securing the educational experience (Ball, 2017; Grimaldi and Ball, 2019). We contend with van Dijck et al. (2018, p. 7) that through interfaces, algorithms and protocols, platforms afford particular usages and users, and that they encourage some user interactions and connections and discourage others.

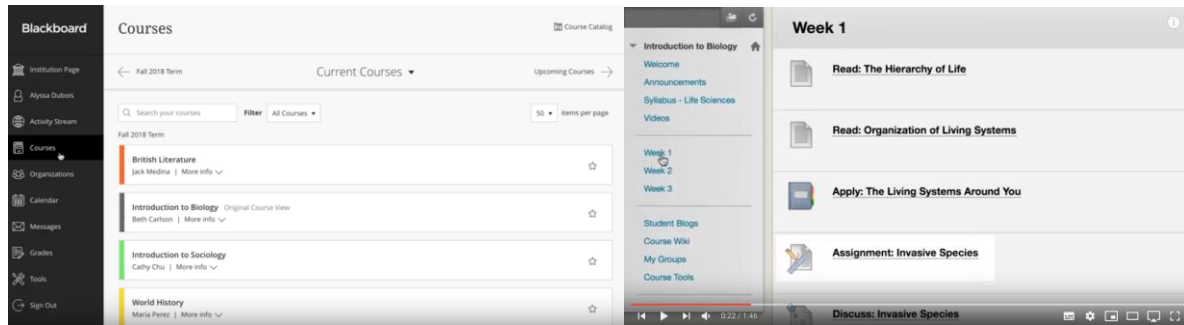
## Configuring the Educational Digital Space

The student dashboard of most BLMSs are configured in a way familiar to internet users. Once logged in, a variety of ‘obvious’ activities become possible through its interfaces (see Figure 1). The learner becomes part of a virtual space within which different kinds of data and information (text, data, figures, video, audio, links) are made available to facilitate a process of ‘learning’ – an expectation that the viewer/user will gain some topical insight or acquire a skill through reading, searching, exploring, writing, creating, elaborating, matching, splitting, connecting, associating and assembling. Looking at these interfaces archaeologically involves giving attention to the forms of spatialisation through which the learning experience is constructed, managed and at the same time opened up to view (Foucault, 1973). This implies addressing GUIs as the surfaces of emergence of a set of visibilities and rationalities that make the learning experience possible and produce its subject.

In the case of Blackboard Learn, it is possible to identify two interlocking spatial framings, the *hypertext* and the *database*, and two related but different rationalities according to which the learner is made as a subject through their participation in such a space: *choice as connecting* and *choice as ordering*. The Blackboard Learn student dashboard homepage (see Figure 1) is one out of many examples of EP GUIs where a sequential mode is encapsulated within a spatial one, as a result of the interlocking of these two spatial framings.

Figure 1 - The *hypertext* and the *database* as forms of spatialization of the learning experience





Entering into a relation with the dashboard, the student finds herself immersed in a navigable space of flatness within which the course catalog stands as an ongoing activity of nodal and associative re-ordering of the available data, information, learning experiences and hypertextual paths to be followed. Such a space is a networked world of relationality that operates through an increasingly expanding connectivity (Edward and Usher 2008, p. 117). The learner is positioned in an already connected space (ibid, p. 126), where mobility unfolds through associative linking and an hypertextual logic of movement. Learners can shape their learning environment, following multiple links searching, filtering, and opting for different visualisations, constantly moving back and forward between activity streams, courses and lessons, groups, chats, blogs, time plans, external and internal multimedia and multimodal resources, tasks, assignments and evaluations (see Figure 1). Hypertextuality, as the possibility of establishing and following links among the modular elements of the educational experience, makes possible a constant state of multidirectional movement and enables a multiplicity of entwinements in a space of potential and unknown possibilities (Sennett, 2007). If choice, autonomy and freedom in such a space assume the form of the assemblage and (re)connection, knowledge becomes more ephemeral, and more amenable to be re-sequenced and refashioned in the act of reading, writing and composing. Hypertextuality is a form of spatialisation that entitles and invites the learner to enact and become the subject of

different narratives. In the malleable and variegated space of the hypertext, 'it is always possible to create frames within frames' and activate different (but designed) narratives in 'different parts of the screen through the combination of texts and images, as a result of the interaction between the interface, the user and the platform work' (Manovich 2002, p. 272). As Decuyper and Simons (2016, p. 139-141) observe, when immersed in a student dashboard, like that pictured in Figure 1, the learner is faced with a potentially infinite number of paths that can be followed and multiple possibilities for knowing, presenting and making herself knowable by indefinite others. This spatial organisation of learning, at a first glance, distances itself from the factory logic of traditional classroom learning, that is linearly ordered, standardized in its contents and design, repetitive and sequential (Edward and Usher, 2008, p. 117).

At the same time, the interfaces of a BLMS like Blackboard deploy a second form of spatialisation that interlocks with hypertextualisation. Courses, texts, audio-videos, pictures, links, attachments, assignments, data visualisations and so on are, in fact, 'stored' in the depth space of the database form (see Figure 1). As Manovich (2002, p. 57) notes, the database is a cultural form that 'offers a particular model of the world and of the human experience' and 'affects how the user conceives of data which it contains'. This is a vertical and hierarchical spatialisation, where ordering assumes the shape and logic of the menu (choose and pick), and educational choice and experience are produced as a 'menu-based interactivity', 'in which all the possible objects which the user can visit form a branching tree structure' and the learner continuously faces 'with choices and let her pick' (Manovich 2002, p. 57). The database as a form of spatialisation produces a modularised space for learning (Höhne and Schreck, 2009, p. 501), constituted as a collection of discrete samples/modules (courses, modules, didactic units, assignments, sources, teachers, assistants, learners' performance, and so on). These

small and self-sufficient ‘atoms’ can be edited, combined and re-combined into small or large-scale objects, and yet at the same time ‘they continue to maintain their separate identity’ and independence and, importantly, can be accessed separately (Manovich 2002, p. 51). As we have observed elsewhere, the educational experience (as both provision and consumption) is rendered as a collection of discrete pieces that can be organised and ordered autonomously by a ‘free’ learner who is moved by a ‘maker’ ethic, confronting a world made of atomistic building blocks to be rearranged and played with. Educational experience and contents are modularised and turned into a fragmented but integrated group of components which can be differently chosen and assembled ‘to form a working system of construction elements’ functionally oriented towards the attainment of competences’ (Grimaldi and Ball, 2019, p. 11). In such a modularised space, the tightening of the hierarchical ordering into the Menu grid corresponds also to an increasing variability of the possible contingent rearticulation of such a space. The objects of the educational experience can exist in different, potentially infinite, versions.

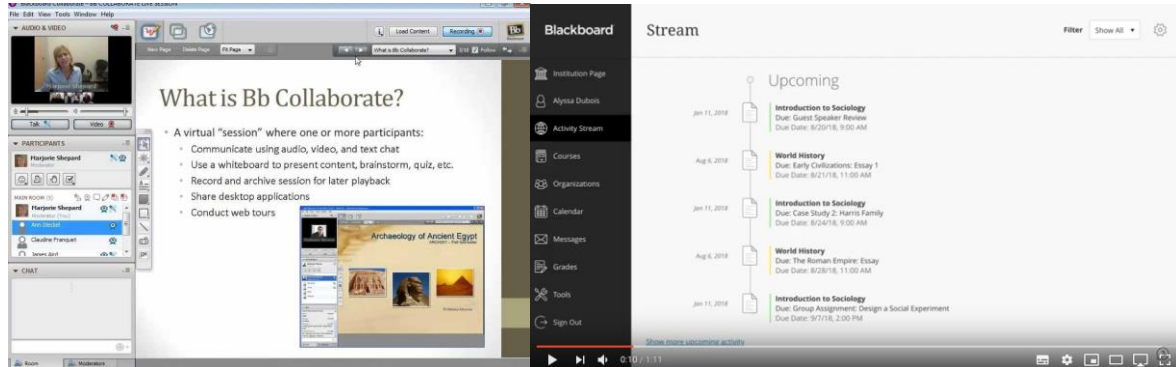
The modularised space has two significant traits: updateability and scalability. Its single atoms and/or bundles of relations within a given structure can be reworked periodically through automatic or manual updating. At the same time, ‘different versions of the same media object can be generated at various sizes or levels of detail’, giving the possibility to the user of changing at any point the scale of their experience, going from a complete course/module/unit to a particular ‘shot’ (Manovich 2002, p. 58). Finally, modularisation as a form of spatialisation enables the intensification and acceleration of numerical representation of learning, that is of the process by which, through the generation of real-time data the continuous experience of learning is broken into a set of numerically represented discrete units.

Thus, an archaeological perspective allows us to identify a first tension in the spatialisation of the learning experience on EPs like Blackboard Learn. Learning and the learner as a subject become visible and unfold in-between the continuous interlocking of two spatial configurations, the flat, connective and unbounded space of hypertextuality and the hierarchically ordered and programmable space of the database. Here the learner is made as a paradoxical autonomous chooser, where learning as choice is simultaneously an activity of relatively unbounded navigation in a flat space of connections and connectivity, and a practice of re-ordering of modular and updateable elements that is constrained within the space of a hierarchically structured software menu.

### **Re-Sequencing the Educational Experience**

The second issue that an archaeological analytics invites us to address is the temporal sequencing and pacing of the educational experience and the relation of this to its teleological features. GUIs are surfaces of emergence for a set of temporal structures that organise the learning experience, narrate visually an history of its subject and attribute it some teleological features. In the case of Blackboard Learn, the two spatial framings outlined previously intertwine with the actualisation of two different temporal structures that govern the learning experience: the time of *co-existence* and the time of *linearity*. As in the case of spatialisation, it is also possible to single out two related different rationalities according to which the learner is made as a subject through the educational experience while immersed within these temporal structures: *mobility as repetition* and *mobility as accumulation* (see Figure 2).

Figure 2 - Co-existence and linearity



Through immersion in the dashboard interfaces, the learner is constantly positioned within spatialised and distributed time, where different activities and applications can be run simultaneously. Overlapping windows can make operational multiple time-flows and narratives, and texts, messages, notes and data can be visualised, produced and accumulated through the spatial montage of a variegated present. The learning experience can potentially spread in many different directions and proceed through activities of unfolding and switching between, for instance - lessons, hypertextual searches, reading, collaborative working or assignment completion (see Figure 2 left side). Here the time of learning is a time of juxtaposition, of the slow and the fast, of the side-by-side, where multiple time-flows intersect and detach from one another (Van Den Broeck, 2020).

Similar considerations can be extended to the learning objects, 'that are often created by multiple authors and constantly develop in time' (Parikka, 2012, p. 124). In Blackboard Learn a wide array of collaborative work and videoconferencing (Blackboard Collaborate), interactive activity (Blackboard App) or evaluation software (Blackboard SafeAssign and

Analytics for Learn) can run and used simultaneously. In this way, micro-temporal layers of learning experience emerge as supplementary to the seemingly solid, permanent, continuous and closed macro-time of the course, the classroom and the subject matter (Edwards and Usher, 2008, p. 120). In such a configuration of time, the learner is a multifunctional subject, and multiple activities can all be undertaken in the same space (Decuypere and Simons, 2016, p. 141).

In all of this, access to contents and spaces, visualisation, connections and communication have a dynamic immediacy. In the constantly unfolding processes of learning the dichotomy of reversibility/irreversibility loses relevance: it is always possible for the learner to go back, start again, move on or more circuitously, go faster or slower. Unfolding and switching offer potentially endless forms of repetition. The time of learning can unfold as a loop, a repetition, created by the circular movement of the individual learner which gives rise to a progression of learning events, that are established in the constant need to be (self-)assessed in order to understand if further repetition is necessary. This is the endless time of the ‘attempt’, which makes possible different routes and paces of learning. The linear flow of learning is altered ‘through control structures, such as "if/then" and "repeat/while"' (Manovich 2002, p. 266). The loop learn-assess-self-evaluate-learn becomes the “engine” which puts the narrative of the effective learner in motion.

Co-existence and looping create the possibility for a particular kind of rapidity, an accelerated but variegated time where the subject is expected and invited to be always in motion in activities of searching, archiving, connecting, adding, storing, preserving, self-evaluating and, ultimately, learning. Learning is thus (re)conceived within the tropes of speed and speediness that are embedded in the internet imaginary (Beer, 2018). Immediacy, connectivity and the compression of the hypertextual space act as the correlate to speed, with speed becoming a

‘realm of ordering to which [the learner] becomes subordinated’ (Edwards and Usher, 2008, p. 125). Through such a temporal structuring, the learner is made as a subject who is expected to show ‘the will-to-speed’ and the ‘desire to get somewhere,’ mobility is valued for its own sake (Edwards and Usher, 2008, p. 125).

Nevertheless, our reading of the temporal structures that organise the learning experience on Blackboard Learn is that the will-to-speed and the imperative of ‘fast mobility’ in a variegated time-frame of co-existence are paradoxically interlocked with a time of *linearity*. In the frame of the overall spatial montage of learning, the student interfaces encapsulate the time of co-existence within a linear and progressive production of time (see right side of Figure 2).

That is to say, activities, courses, assignments and grade interfaces enact a time where identity is constructed through narrative as developmental history. Learning within such a temporal structure is recordable, traceable and exteriorisable, in as much that it becomes visible as a set of outcomes, realisations and completions. As van Dijck et al. (2018, p. 121) observe, ‘data tracking can be used to register fine-grained information about the time a student needs to solve a problem, to record the cognitive stages in problem-solving, to measure the amount of instruction needed, or to trace student interaction’. Within this framework of recording time is irreversible, it establishes continuity and duration, and positions the punctual present as the time within which to imagine, plan and organise the future. A non-volatile regime of learning memory (Kirschenbaum 2008, p. 89) enables anticipation, profiling and modeling through analysis and feedback. In this case, interfaces operate as an external memory, capable of retrieving minute, exact and often standardised information about students as and when needed. This varies from practical tasks and realisations to assignment scores, course grades, evaluation rubrics and teacher feedback, organised through synchronic visualisations or time series. Memory becomes cumulative and developmental. It becomes the external and

objectified archive to (self)generate a learner profile, connecting learning and moments of evaluation together in a way that is preformatted by the design of the interface as a form of user-generated analysis.

Thus, a second epistemological tension emerges here. The hypertextual and modular learning experience on a platform like Blackboard Learn unfolds between the continuous interlocking of these two temporal structures. Learning is encapsulated in a fundamental linearity, in that 'learning' is developmental (in relation to an end point, or a series of points) and exteriorisable in data, scores and responses, but at the same time, different 'routes' and paces to learning, as validated forms of completion are made possible, which include (potentially infinite) doubling back and repetition. Between the unfolding time of co-existence and the cumulative time of linearity and exteriorized memory, the learner is invited to desire at the same time mobility as repetition, looping and openness to a process of variegated, fast and unpredictable becoming, and mobility as developmental within a (planned and delimited and thus) predictable narrative that proceeds through accumulation and towards a completion.

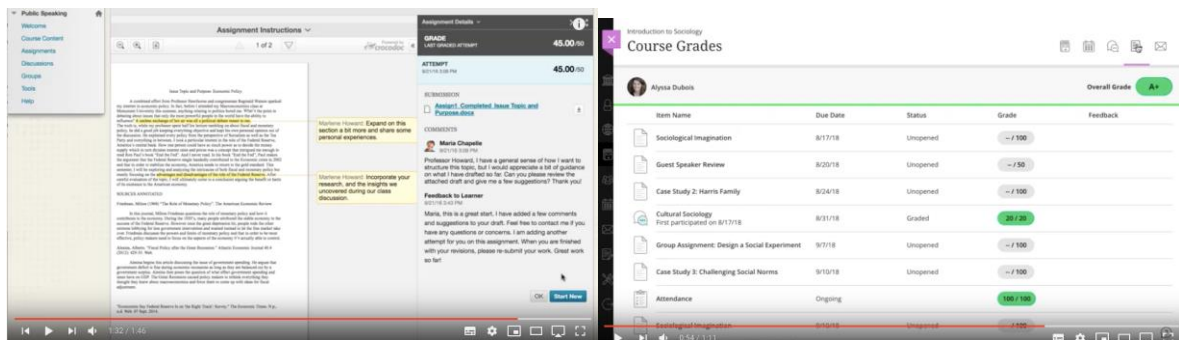
### **Valuing the Educational Subject and the Production of Difference**

A third archaeological question concerns the kind of norms through which educational experience and its subject(s) are classified and given value, and how overall difference is produced through the operation of EP interfaces. Valuing here is intended as part of the production of a specific set of principles for the establishment of educational reality. Our argument is that the spatio-temporal nexus of the educational experience described thus far



constitutes the conditions of possibility for two paradoxical processes of educational value creation: educational value as *character formation* and educational value as *data* (see Figure 3). As in the case of the spatial and the temporal framing of the educational experience, it is also possible to identify two related but different rationalities according to which the learner and her educational experience, mediated through a platform like Blackboard Learn, are made as a subject/object of value: *value as activation* and *value as performance*.

Figure 3 – Value as character and data



The interfaces of a BLMS like Blackboard Learn offer to the learner multiple possibilities to visualise their educational activities/experiences through processes of narrating and assembling, but also grading, matching and scoring. The value of an educational experience (and relatedly, of the learner as subject) can be constructed and understood within the depth time of an interaction with teachers and groups of peers around a distinct set of materialisations (assignments, uploaded tasks, online conversations, and so on – see Figure 3 left side). According to the features of the spatio-temporal configuration they inhabit, learners are valued along a specific set of dimensions: autonomy, reliability, responsiveness, creativity, the will to improve and the capacities of to choose, plan and connect, as brought

into reality by the digital traces they leave. Educational value is the value of achievement, of competence and realisation, and of the capacity to address a task and an assignment. The educational subject-of-value here is the one who shows a distinct character, the capacity of activation and self-ownership, the capacity to exploit the potentially infinite possibilities for freedom that the platform as a space of connectivity unfolds (or is supposed to unfold) in front of it. An educational experience of value is personalised, and difference is produced through activation, self-mastery and uniqueness.

At the same time, through online surveillance and the ‘construction of identities through sorting,’ two normalised dimensions of the educational experience are constituted (Nemorin, 2017, p. 17). Within the space/time of freedom a set of conditions of possibility are created for (an autonomous, creative and active) personhood, framed and articulated by performance as data. When it comes to the issue of grading, for instance, the kind of visualisations made available to the student by the BLMS rely heavily on numerical and ordinal grading data (see Figure 3 right side). Value here is constructed out of adjustable parameters, it is visualised in terms of frequency of occurrence and it is not ‘located within a person’, rather it is produced through ‘a process of linking the biological and the computational across people, datasets, and modelling methods’ (Goriunova, 2019a, p. 6). This is a relative and analytical value that depends on the positioning of datafied performance within a hierarchical order. Value here is scalable, it can be anatomically dissected into micro-performances and has both a synchronic (comparative) and diachronic (improvement) dimension. It can be defined as the value of a singular performance as compared to others and as part of a process of development (a history of micro-performances). Performance data produced by a platform like Blackboard Learn are a technical device that makes the student into an individuated learning subject, who is however assumed to have a soul and a capacity to be reflexive and self-improve. Such a

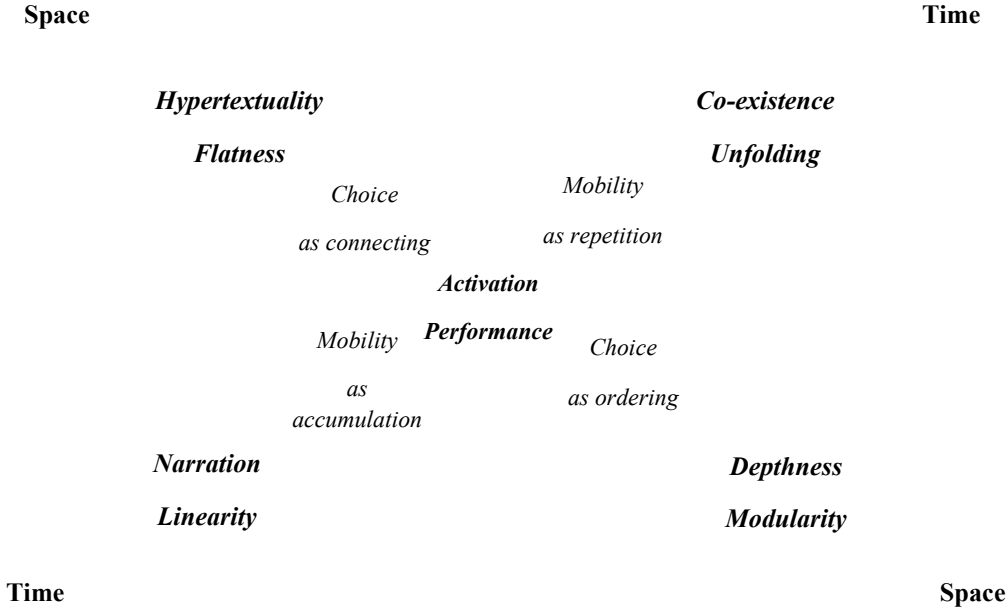
student is also endowed with the capacity to reflect on their educational experience as a coherent whole that makes sense through the mediatory technique of performance visualisation. Here BLMS interfaces and their visualisations act as key devices in ‘creating meaning through reflection, [externalized] memory and the practices of assigning meaningfulness to [datafied learning] events and experiences’ (Goriunova, 2019a, p. 5). Through the translation of learning into data processes and ‘tracking systems that continuously relate individual progress to standardized performance’ (van Dijck et al. 2018, p. 118), the body is converted ‘into pure information’ such that it can be rendered more mobile, malleable, comparable and predictable (Nemorin, 2017, p. 17).

Thus, in a spatio-temporal configuration of this kind, the learner is invited to make choices (as connecting and ordering) and move (as repetition and accumulation) within a paradoxical space of value creation and the production of difference. On one side, the learner is invited to be active and enterprising, i.e. to enact a certain subjectivity through the crafting of a digital persona, with all the related artful practices involved in maintaining such a persona. On the other side, this involves continuous work on and the policing and solicitation of an online self through the datafied visualisation of its value. The BLMS promises to the learner individualisation, singularity and a learning experience as multiplicity, i.e. the possibility ‘of standing out via the creation of a singular occurrence’ and ‘yet such a singularity can only be produced through constant aggregation, comparison, sorting and re-arrangement’ of performance data (Goriunova, 2019b, p. 135).

### **Paradoxes of Freedom. Digital learning as activation and performance**

In mobilising a Foucauldian archaeological framework in the analysis of the kind of learning experience and learning subject that EPs and their GUIs create the conditions of possibility for, we have sought to demonstrate what such an analysis can and might do in this field of inquiry. This brings to attention the space, time and ethical frames which are constitutive of the learning experience of an active and performing digital student (see Figure 4).

Figure 4 - Digital learning as activation and performance



Our initial exploration of how EPs (re)configure the learning experience allowed us to identify two divergent processes of spatialisation and two forms of visibility of the educational experience: the flat, horizontal, open, connective, always changing and potentially unbounded space of the hypertext, and the depth, bounded but accessible, planned and malleable space of the module. In attending to how these two forms of visibility intersect in a platform like Blackboard Learn, we have identified in the experience of learning a fundamental epistemological tension. The learner is positioned as an autonomous chooser hailed by and formed within activities of relatively unbounded connection, but is also subject to a multitude of practices of hierarchical re-ordering. In relation to the former, learning appears to the learner (and the teacher) in its positivity through the diachronic and multiple narratives of its movements (activities, tasks, assignments, logs, times of completion, interactions, and so on). In relation to the latter, the multiplicity of these narratives is continuously coded into synchronic/tabular data visualisation. In the visibility of activity and performance data, the experience of learning is founded and constituted. At the intersection between these multiple forms of spatialisation and temporalisation, emerges a particular kind of digital learner, who is the object of a government of individuality and a form of government by individualisation (Foucault, 1982, p. 211).

When immersed into navigable but modularised educational spaces and variegated but irreversible temporal frames, and while being at the same time invited to be different and continuously 'normalised' through performance data, the digital learner is constituted and enters into a game of continuities and discontinuities between the fundamental values of the 20<sup>th</sup> century education (a knowledge-based curriculum, centrality of the teacher, collective affordability, and education as a vehicle for equality) and the post-industrial principles of individual customisation, flexibility, production on demand and "just in time" delivery, and

the cultivation of potential (Sennett, 2007; Biesta, 2013; van Dijck et al. 2018). There is here the functioning of distinct forms of duality between the production of freedom and discipline (Grimaldi and Ball, 2019). The users of an EP like Blackboard Learn are intermittently or simultaneously invited to represent, through digital traces, their learning as an autonomous, fast and proactive activity of choice, selection, and meaning-making. Here the matter of value in the educational experience becomes the valuing and evaluation of difference, individuality and uniqueness as opposed to conformity. Freedom as choice, mobility as fastness (the will to speed) and governmentality feed one upon the other. Learners are seduced through a powerful discourse of uniqueness, into the possibility of selecting their own particular learning path, of constructing their own customised educational experience, by selecting from a large (but not infinite) number of choices. They are freed from an asymmetrical positioning within the teacher-learner relationship, teaching is reframed as the targeting of each individual student separately. Concurrently, they are made morally responsible for their own educational experience and its outcomes (Edwards and Usher 2008, p. 122), being invested with the responsibility (and the related anxiety) to customise their own educational experience.

Nonetheless, 'the flexible digital learner' stands as a distinct technical mode of individuation (Wark, 2019, p. 66), through which the user becomes a meaning-taker, whose value and identity as an educational subject is defined through an aggregation of exteriorised performance data represented through closed, tightly ordered, linear, developmental and comparable modes of visualisation. In this case the matter of value in the educational experience becomes the valuing and evaluation of outcomes, with the educational experience being understood as the value (usually numerical) of its objectified outcome(s) (Edwards and Usher 2008, p. 122). From and in relation to these valuations, EPs like Blackboard Learn constantly ask questions and question the learner; they constantly investigate and record her

learning experience; they institutionalise the search for excellence and improvement, and reward it (Foucault, 2004, p. 25). Facing these valuations learners are required to produce a development narrative, they are made sense of and invited to make sense of themselves in these terms. This involves the re-assembling of choices, paths, performance data and utilising a certain kind of knowledge of oneself, which is itself a feature of the organisation (classification, sorting, retrieving, streaming) of data and of the database. As Goriunova (2019a, p. 5) puts it, data refers to and makes up a plastic subject, one outside to the self - a data double. This is a form of abstracted knowledge that adheres to a body and travels with the person, a 'meta self', a narrative of our excellence and productivity that is both expansive and reductive. We assist in 'the multiplication of the individual, the constitution of an additional self' (Poster 1990, p. 97) – a version of what it is that we have become and what we might become. The platform represents its data and the doubles it constructs as authoritative, trustworthy and expert – irrefutable.

The data double is 'a mutable construction that is always in the process of being assembled' and, at the same time, 'has a capacity to acquire enough consistency to become active, transducing various actions on persons back to them. Its ontological uniqueness perhaps lies in a way of capturing something in humans, and in coming back to them, through encounters, events, and processes of mobilization'. As such it is always potentially 'optimisable' according to desired needs (Nemorin, 2017, p. 17).

Within such an epistemic spatio-temporal configuration and this set of doubles, learning becomes an activity moved by a desire which will never achieve resolution (Manovich 2002, p. 269) – a state of being, an irreconcilable relationship between the learner and the ever-expanding universe of knowledge. The digital flexible learner is a subject 'lost in space' impelled by the will-to-speed (Edwards and Usher 2008, p. 125). The loop learn-assess-self-

evaluate-learn becomes the “engine” which puts the teleological narrative of the effective learner in motion, where the attempt to reach a state of fulfillment is caught within an inescapable loop of learning experiences. Here learning becomes a set of punctuated acts of freedom endlessly oscillating between a closed instrumental rationality of self-education, a control-based/securitarian educational governmentality and an anti-dialogic communication (a neoliberalisation of pedagogy and learning – see Ball, 2017). This opens possibilities for an education that goes beyond the binary opposition (and separation) between the production and consumption of the educational experience. As Van Den Broeck argues (2019, p. 14), the attractiveness of such an educational experience derives from a particular kind of duality of freedom and restraint, where ‘form and formlessness hence do not exclude but instead require and profit from each other’ and because learning comes ‘with a considerable degree of freedom’, one voluntarily (and happily) submits to the grip of its forms of closeness.

The free and active digital learner, and learning itself, are subject to a careful, unrelenting, and empirically vigilant digital gaze, which constitutes a particular kind of truth about learning and the learner (Foucault, 1973, p. xiii). Such a gaze is designed, constructed and animated at a distance in the collaborative efforts of the designer, the analyst and the engineer (Beer, 2018) and closer at hand by the interpretations of the teacher or instructor. It scans the entire learning experience, ‘taking in and gathering together each of the singular events that occurred within it; and through the act of seeing, it turns itself into a datafied and visual language that states and teaches about learning’ (Foucault, 1973, p. 114). The learner ‘sees data’ and ‘is seen by data’ (Beer, 2018, p. 134) and through datafied visualisations her value is made transparent for the exercise of (self)government. Here the digital gaze is not ‘reductive, it is, rather, that which establishes the individual [as a learner] in his irreducible quality’ (Foucault, 1973, p. xiv). The digital eye, as a projected gaze, endlessly works to



absorb the experience of learning in its entirety, and to master it, establishing itself as ‘the servant’ of learning and the master of truth about learning (ibid, p. 115).

What we have presented in this article is not a definitive analysis, rather we lay out a set of ‘abutments and anticipatory strings of dots’ (Foucault 1991, p. 90). Our analysis opens a field of problematisation, highlighting the need for future research on the enactment of the learning experience through specific EPs. We have proposed a conceptual framework for the analysis of both the configuration of graphical user interfaces (GUIs) and the kind of educational freedom they create the conditions of possibility for – along the vectors of visibility, rationality, division and identity. Within the learning process, we suggest, the learner is constantly confronted by and informed – made up - by their data double. The double, an adaptive, constantly updating digital configuration, acts back on the embodied subject, who is ‘invited’ to compose, decompose and recompose themselves in its image. Visibility, calculability and comparability operate together to hail a malleable, flexible, self-improving, responsive – and essentially neoliberal subject. Further, we have outlined a critical ontology of the educational experience, as produced by and through EPs. This involved both questioning the limits they impose on the learner and the relation of these limits to the current concrete socio-historical conditions that define the historically contingent and yet apparently necessary forms of online and blended education. Further conceptual elaboration and empirical research are needed in order to understand how the tensions, dualities and paradoxes we have identified play out differently according to platform design and in the multiple enactments of learning epistemology in the use of these platforms in schools and homes.

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