

TIMES AND SPACES IN AN ON-LINE LEARNING ENVIRONMENT

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Résumé : On propose une lecture de l'environnement d'apprentissage en ligne comme chrono tope dont on va analyser les différentes typologies d'espaces et de temps. D'une part, les espaces spécifiques et le temps de la conception, de l'autre l'autopoïèse de l'environnement qui s'établit progressivement comme espace riche et dense de relations grâce à l'intersection de plusieurs espaces et plusieurs temporalités différentes.

Mot-clés : environnement d'apprentissage en ligne, chronotope, temps, espace, autopoïèse

Summary : This contribution proposes an interpretation of an on line learning environment as a chronotope, through an analysis of different spaces and times: first, the focus is on specific spaces and the design time; then, the learning environment autopoiesis, which builds itself during time, will be investigated as a space dense because of relations, overcrossing many different spaces and times.

Keywords : on line learning environment, time, space, chronotope, autopoiesis

Sommario: Si propone una lettura dell'ambiente di apprendimento on line come cronotopo, analizzandone le diverse tipologie di spazi e di tempi: da una parte gli spazi specifici ed il tempo della progettazione, dall'altra l'autopoiesi dell'ambiente che si costruisce nel tempo come spazio denso di relazioni, intersecando più spazi e più temporalità differenti.

Parole chiave : ambiente di apprendimento on line, tempo, spazio, cronotopo, autopoiesi

TIMES AND SPACES IN AN ON-LINE LEARNING ENVIRONMENT

An on-line learning environment is the result of the interaction among several and multiple spaces and times, in a dialectic between two different interpretation levels: the so-called “physical” one (i.e. the layout and the specific environment tools, intersecting with the design time) and the “relational” one, i.e. the level drawn by the relationships within the learning environment (building a space-time which continuously evolves).

By analysing one of the platforms (LCMS, Learning Contents Management Systems) used for e-learning at the University of Macerata, this contribution proposes a theoretical reflection based upon the Bakhtinian chronotope as a paradigmatic concept (Bakhtin 1981), to demonstrate how space and time variables are constantly changing according both to the on-line learning process and to the relationship evolution, determining the continuous autopoiesis of the environment.

1 - INTRODUCTION

This contribution wants to propose an interpretation of an on-line learning environment as a space and time *synolon*, by using the Bakhtinian idea of “chronotope” to show matching points and connection elements with the structure and the articulation of the variables determining the environment autopoiesis.

On one hand, you have the so-called “physical” spaces and times, dealing both with the layout (tools, spaces and their visual layout) and the specific temporalities involved in a learning process (length, deadlines, i.e. a “designed” time). On the other hand, you have some spaces and times arising from sharing and negotiation, which outline a relational nature since they merge from interaction among users and tools.

Starting from the dialectic between physical and relational spaces and times, the on-line learning environment is not a mere resource in which different relationships take place (among users and contents, or among users themselves), but it turns into an actual

autopoietic system: a plot, a texture continuously evolving and modifying according to its internal interactions.

The purpose of the contribution is therefore to use the chronotope paradigmatic idea in interpreting an on-line learning environment through a space-and-time perspective, also showing how each element into the process has been read as a plot, without the possibility of separating the spatial and temporal dimensions: a “light” environment as the digital one is, completely virtual and merely consisting of mathematical algorithms, which turns into a dense space-time continuum, full of relationships and characterized by a relational density.

The result is a plot, a chronotope, shared by multiple spaces and times determining the environment autopoiesis. The autopoiesis idea, originally used by Maturana and Varela, has also been adopted by P. G. Rossi (2001) to define the on-line learning environment as a complex system, an autopoietic space developing itself during time and also modifying itself according to the external input even depending on its internal rules. The evolution/creation of the on-line environment takes place during the development process according to the resources, the users’ writings and the communicative interactions within the environment itself. Consequently the users’ readings and writings are considered as events, re-defining and also modifying the whole system. The idea of event itself refers to integrating space and time variables: the event is, in fact, a dynamic entity with a beginning and an end, having its own temporality determined into a space context (Nack, 2003).

Starting from this consideration, the contribution proposes to underline the relational variable relevance, as a decisive element in drawing the on-line learning environment like a sort of dense space-and-time continuum. This density, in particular, merges from various spaces and various temporalities integrating one another: from interpreting the on-line learning environment

using “physical” space and time variables, to the perceiving of dense and fluid spatialities and temporalities, also in perceiving and experiencing the environment as a whole, a fluid process without interruptions, a result of many levels interacting and overlapping to determinate a continuously evolving system.

The complex system is not only an autopoietic space building and developing itself during a time segment, but also a multilevel space wherein many spaces are involved and which is built through multiple and various temporalities.

Pier Giuseppe Rossi (2001) defined an on-line learning environment as a logical map of the learning process, wherein many elements are integrated: support contents or resources, products/projects made from the users/students, communication tools, evaluation items and so on. Far from an idea of “information luggage”, the on-line learning environment becomes a workplace where the various actors meet, interact, communicate, collect and also produce materials and contents (*ibidem*). Beyond that the on-line learning environment becomes a “place”, a qualified space wherein the richness of the internal relationships and interactions allows to perceive its density. The Bakhtinian idea of chronotope is maybe the most suitable one in providing a key for the complex environment nature, and in drawing the specific space and time typologies involved. In this contribution a specific on-line learning environment, used at the University of Macerata in delivering academic courses (i.e. blended or full on-line post-graduate courses), is analyzed.

2 - THE ON-LINE LEARNING ENVIRONMENT AS A CHRONOTOPE

In the essay *Forms of Time and the Chronotope in the Novel* Bakhtin (1981) gave a definition of the chronotope (or spacetime) as the interconnection among spatial and temporal relationships, which confirms the tight bondage between space and time. Time could even be defined as the space’s fourth dimension. Moreover, Bakhtin affirms that literature took artistically possession of those relationships creating its own chronotope, a literary one, wherein the fusion of space and time creates sense and concreteness, giving birth to the “artistic chronotope”: time

becomes dense and solid, and above all visible; while space flows into time’s movement according to the plot. Space shows then time’s feature, together with its sense and measure

Slavishly following the Bakhtinian text, the chronotope definition can be basically transposed to define the on-line learning environment, with the sole difference that in this context it will not be considered as “artistic”.

The on line environment is both a close connection of space and time (or, as we shall see, spaces and times), and a whole (a virtual but however complex and organic system) achieving a sense and being concrete throughout the interactions, and determining the whole system autopoiesis.

In this virtual environment, time becomes dense and solid (as to stick to Bakhtin’s definition) at two levels at least: from a designing point of view, its density merges into the deadlines and the duration flow, as formal dimensions; the different steps articulation and organization are defined through a linear process; the temporal density is moreover evident when all the different temporalities are overlapping and intersecting, arising from the multiple elements involved into the system autopoiesis: the specific temporality of each tool, the users personal times, the inter-subjective temporalities emerging from the relationships among users.

Far from being visible in an artistic dimension, such a temporality, so dense, within the environment becomes clear in a relational point of view, by intersecting different levels, even spatial; each tool, in fact, is first of all a space, a part, a spatial section of the environment allowing the users to communicate, both through materials and resources, and through writings and interactions.

Interactions developing during time also determine a modification of space – or spaces, which are not only filled by contents and redefined according to social dynamics, but are overlapping and continuously changing the structure within the environment.

As temporality becomes dense, so even spaces intensify: on one hand, by multiplying physic or specific spaces, that are spatial portions being visible and accessible (i.e. the layout and

the visuospatial organization of tools); on the other hand, by multiplying the relationship spaces (i.e. the spaces which are determined by communication and interaction among users, or among users and tools). This spatial density finds an integration within the relational temporality: the connection among writings, tools and relations creates a plot, a narrative process. An example of this narrative development of personal identity is given by the portfolio, a tool allowing to build up identity through one's own narration of the learning path (Rossi et al., 2006). From a collective perspective, instead, all the process is given as a narration, not only in a temporal sequence of different steps, but also as a shared process, built by the whole community and onwards negotiated.

Overlapping and intersecting different spatial and temporal levels, the on-line learning environment can be read not only as a chronotope, but also as a chronotope including many other chronotopes, i.e. each tool, as the analysis will show.

3 - A LEARNING ENVIRONMENT MODEL: LOOKING AT TOOLS BETWEEN SPATIALITY AND TEMPORALITY

The analysis considers one of the platforms used in on-line courses at the University of Macerata. In particular we focus on a recent full on-line course oriented to create new e-tutors for e-learning in our University. This platform, developed by CELFI (*Centro per l'E-Learning e la Formazione Integrata* – E-Learning and Integrated Training Centre), offers a simple and intuitive layout wherein several tools and spaces for communication, interaction and course activities are integrated.

At a first look it is possible to recognize a first specific spatial typology: the so-called “physical” spaces which are represented by those sections of the platform designed for communication and presenting a specific layout as a precise appearance. Such spaces can be divided at least into two varieties: firstly, the process is parted into phases or modules, which therefore are articulated according to the contents and – above all – to the communication tools. Each one of these spaces for communication (blogs, webforums, bulletin board, archive) reflects its own nature

and then carries out a precise functionality : thus they are called “specific” spaces, since they are determined by the function they perform.

Beside the spaces previously analysed, which we called “physical” (because they are mathematical algorithms) or “specific” (characterized by their own function), we must also consider the “designed time”, such as the duration (i.e. the course length, or one module or one phase length, delimited by a starting and an ending time). This is a formal or “institutional” time, an objective one, which is previously fixed and determined.

Furthermore, a series of spaces and times, merging both from the interaction among user and tools, spaces and contents within the environment, and from users interacting among them (students, teachers or e-tutors) must be taken into consideration. The main aspect to be underlined is the impossibility to parcel out these spaces and times in order to read them; so the chronotope idea becomes an adequate concept to be used as a keyword, even with some variation as to orient it towards an on-line learning environment. So the next step is to specifically deal with the analysis of each tool, and looking at the various involved spatialities.

First of all, each tool possesses its own intrinsic spatiality, given by a mathematical algorithm and taking up a precise page portion: this way, the physical space is displayed both by an interface and by its function; it functions then as an open and public space, giving access to and allowing interaction among many users (i.e. blogs, webforums, bulletin board, “*Chi Siamo*” that is the virtual classroom). It can also be, however, a private or individual space if it is accessible just for the student and not sharable with other users (i.e. a portfolio). Each tool offers its own spatial level: we can have many tools working at the same time, that is many “spaces” to use. The specific or fixed spaces within the on-line learning environment are represented by all the digital space portions showed through the interface: these are not only bounded in a visuospatial level, but also defined depending on their own functions. Therefore, each tool represents a spatial boundary, setting a precise part of video into which performing specific actions.

It is yet necessary to consider that to each section of physical or specific space some specific temporalities necessarily correspond. First of all, there is the tool intrinsic time, which implies a distinction between synchronous and asynchronous tools (i.e. with a simultaneous temporality in the first case, and a deferred temporality in the second one). Beside a “specific” time, however, a basic linear temporality must be contemplated, which is the one underlying the learning path by showing the phases progression: past-present-future.

At this level of the analysis, the environment is still perceived as a simple working space, containing resources and materials and allowing relationships among users, and among users and resources, even though at multiple levels. Nevertheless, a deeper investigation shows the multiplicity of different spatial and temporal levels, according to which it is reasonable to move on from the concept of space as visuospatial organization (i.e. interface and contents articulation) connected to a linear and designed temporality, as to adopt a new perspective of the learning environment in which space and time become dense, both overlapping various levels and creating a social network full of internal relationships which grant the environment an absolutely dynamic and autopoietic characterization, and helping to draw in real time its evolution and transformation.

4 - FROM ‘SPECIFIC SPACE’ TO ‘DENSE SPACE’

As already said, the environment is composed first of all of physical spaces. But what kind of spaces are they? They are specific spaces because they are defined by their own use; they also are “light” spaces, such as digital spaces made by mathematical algorithm, intangible and virtual.

Such physical spaces, however, appear full of communications and interactions which are spread by algorithms; the users interactions are, in fact, basically made by digital elements. This physical space for visual communication, however, is filled by relationships and communicative dynamics which – as well as tracing digital spaces with an alphanumeric code – make the virtual space dense. This density is due to the nature and quantity of

overlapping relationships, and to the intersection of different communicative levels among users, and between users and tools. Therefore the environment density brings the attention back to a reading of the online learning environment itself as an overlap of three networks: tools, spaces and writings (Rossi, 2001). This articulation could be integrated by specifying which are the different spatial and temporal typologies; first of all, these spaces can be public/collective or private/individual, according to their function. Collective spaces are open to the whole community, such as the bulletin board (for communications to the whole virtual classroom), the archive (containing materials and resources that will be organized in each module), the “chi siamo” (that is the virtual classroom itself, with the complete list of each user’s personal page), a blog (as a space for informal communication), and the webforum.

Beside these public and open spaces, available to the whole community, there are also some close, private, individual spaces. An open space is an environment section in which everyone can communicate with each other: a blog, for instance, is a kind of “living room” where everyone can visit us and express his/her opinion in an informal way. A close space, instead, is the private blog, internal to personal ePortfolios, or the Portfolio itself: these are spaces available only to the user and the teacher (or e-tutor), not sharable with other users. It is not only a space closed to the participation of other users, but also a space for reflection and self-evaluation. In this context the narration is shared just with the user him/herself and the e-tutor, so this space is bounded from a relational point of view. The portfolio is therefore an intimate space, to which each user commits him/her personal narration of the learning process.

Hence, tools are specific spaces. Moreover, they allow tracing multiple communication levels, drawing many spatialities according to different temporalities: on one hand, tools for synchronous communication (chat, private messages) are organized depending on a simultaneous time; on the other hand, all the asynchronous tool (bulletin board, webforum, blog) are determining a space-time plot with a different nature, settled by personal rhythms and multiple times intersecting (growing from the specific time of each tool, subjective times

of each user, and from the inter-subjective times).

The ePortfolio holds a singular function: it is the only really private space, and it is in addition the very tool reproducing the narrative aspect of the learning path. The chronological narration is not due therefore to deadlines coming one after another, but to the personal identity building process occurring into the learning process, throughout different steps drawing an evolution in individual reflecting processes.

A dialectic movement among those spaces determines an evolution in the on-line learning environment definition and nature: it is not just a working space but also an inhabited place developing relationships, and built over sharing.

5 - FROM 'LINEAR TIME' TO 'MULTIPLE TIMES'

In the on-line learning environment there are also many different temporalities. First, and most evidently, there is a design time, organizing and articulating the whole process.

It's a linear temporality: the learning path, in fact, is characterized by a length, a period between a start and an end, so determining an evolution due to the before-during-after sequence, that is also a past-present-future sequence.

Within this linear time (that is a designing or designed time, and therefore predetermined) many other times can be traced, such as where the training path develops into units (areas or modules). Each area or module (physical and temporal subdivision of the path) will equally grow in a linear way according to activities and deadlines.

By conducting a deeper analysis on the tools within the environment, some more times can be found:

- first of all, the intrinsic temporality for each tool, which is a specific one because emerges from the characteristics of the tool itself (synchronous, asynchronous);
- the subjective temporality resulting from the interaction between user and environment (the personal fruition

time, connected with the designed one);

- the inter-subjective temporality, which is the result of the interaction among users.

All these 'time' examples interact as to define a very complex situation where the temporal dimension splits up into many times and flows at the end in a sole "compound" temporality. Such temporality is not the mere sum of each temporality. On the contrary, it is composed by the multiple spatial and temporal levels and determines space/spaces and time/times within the learning environment, thanks to the evolution of the internal relationships. Such relationships are influenced by the "physical" nature of the environment, in a spiral which prevents from separating the two levels both in objective analysis and personal perception.

6 THE LEARNING ENVIRONMENT AS A DENSE SPACE-TIME

As a space-time continuum, the environment becomes dense for its internal relationships; it is in fact defined by individual and collective spaces and times, which articulate themselves progressively, above all in those learning paths dealing with negotiation and interaction, like the one here described. From a first phase with times and spaces individually and personally organized, the working space becomes a collective place for negotiate and design, and the users participation encourages the creation of a rhythm and a temporal process (Rossi et al., 2007).

Into such an environment many individual spaces (i.e. blog or ePortfolio) and common spaces (i.e. webforums, intended for interaction) coexist. In the same way, there are many individual times (concerning individual activities) and common times (group activities). On the basis of this analysis, it is necessary to underline how those levels are overlapping and drawing a space-time intersection. The environment continuously builds itself and becomes autopoietic throughout a transformation due to specific and complex, individual and common times and spaces. These different levels so overlap and generate a fluid path, perceived as a whole: it is a chronotope.

According to the learning path characteristics, an evolution can be found within the environment: from an individual space-time continuum to a common space-time continuum. Originally centred on individual perspectives, the virtual classroom often starts to “live” the environment, so perceiving a common space-time continuum. Consequently this evolution can be found in a strict link between a reflexive individual space such a portfolio and a common space, enriched by the users’ presence and experiential background (Rossi et al., 2007).

As a result, it becomes clear that the environment spatialities and temporalities cannot be read in a separate way, as they concur to create a “synolon”. If a learning environment is defined by three networks: writings, tools and spaces (Rossi, 2001), time becomes a paste or a glue, drawing the three networks environment structure.

5 CONCLUSIONS

In the end, this contribution proposes an on-line learning environment definition as a chronotope, containing many chronotopes within itself: the tools, which are spatial-temporal interconnections. Each tool, in fact, shows both a physical spatiality (layout), and an internal time (given by some formal aspects of each tool); beside this, each tool shows a dense temporality (as a space building relationships) and several time overlapping.

The environment is this way a dense space-time continuum: its density is determined by the relationships and their evolution during time according to interconnections at different levels. It is then necessary to talk about times, and not merely about time. First of all the institutional time of the course: a linear narration with past-present-future in sequence. This linearity becomes complex when meeting other different temporalities: the users’ time, the internal time of each tool and their evolution (for instance, a Portfolio and its linear sequence of past-present-future, articulated in three sections: selections, projection, connection), the inter-subjective times (given by communication and rhythm, negotiation, designing and sharing).

The different levels interconnecting space and time variables subsequently cause a constant evolution of the environment, re-building itself

over and over according to different factors: the structural container (a working space), the contents (materials and resources), the writings (according to the relationships among users, or between users and tools).

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