# Pedagogical complexity and sociolinguistic resilience in Mesoamerican language learning: the CPEW matrix (reloaded)<sup>a</sup>

Complexity Theory has been linked since the beginning to social sciences.<sup>c</sup> It is now more and more applied to linguistics and sociolinguistics, as shows the main topic of this workshop. Our purpose here is to link it to activities and productions of *communities of practice*.<sup>d</sup>

We aim to apply some basic assumptions of *Complexity Theory* to the underlying pedagogical patterns of coparticipative educational workshops (hence, CPEW) hold in Mexico, from 2010 to date, on Mesoamerican languages (especially Oto-Manguean and Yuto-Nahua languages).

So, we need to define first...

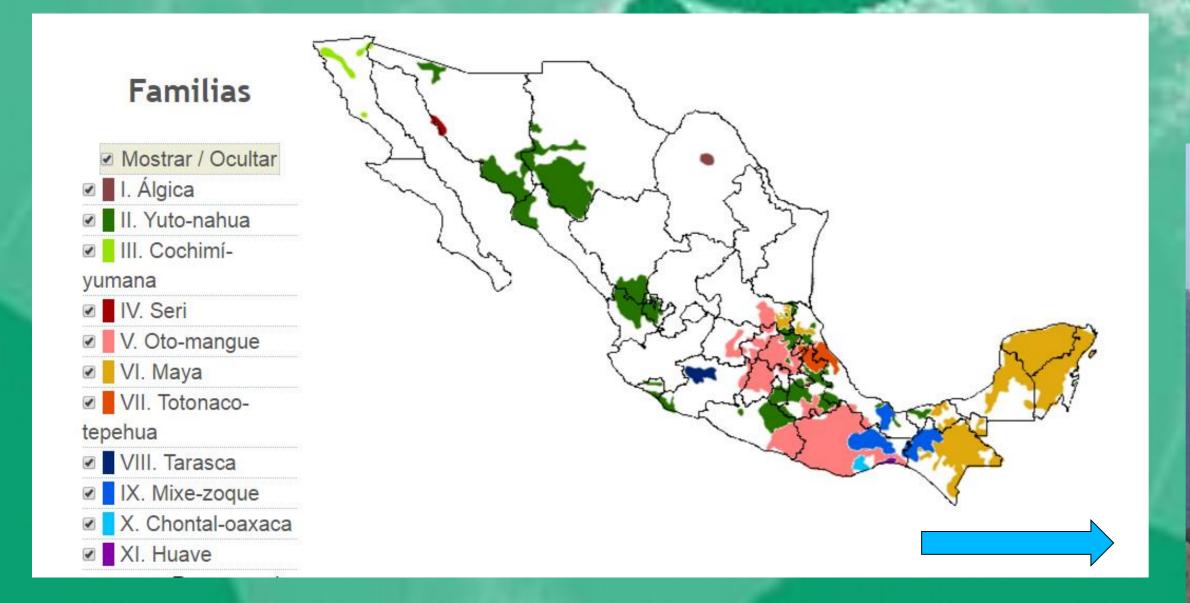
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#### What is Complexity Theory?

Complexity Theory is not only a *holistic metaphor*, as has been applied by some social approaches in language planning, even if this metaphor is useful to understand that several variables converge in this kind In some way heiress of fractals study, Complexity Theory is more than math's. Contrasting Euclid's geometry (lineal, static, and continuous in a well defined order), Mandelbrot's work proposes a *new philosophical and mathematical synthesis* (1975 [1985]: 2), where objects are dynamic, non-lineal, and irregular, giving a place to study uncertainty, chaos, scales and change. These components are also present in human relationships. They should be considered in natural language study,

#### **MEXICAN CONTEXT:**

11 languages families, at least 70 linguistic groups. Native speakers : approximately 7 millions.<sup>g</sup>



In the *CPEW* workshops (Co-Participative Educative Workshops), our focus is to stimulate *diamesic processes*,<sup>h</sup> making written and oral texts interact. The texts and didactic units in indigenous languages are worked out by native speakers of Mesoamerican languages during the CPEW sessions. Most of them are school teachers who support and get involved in training in formal components of bilingual education.

#### of phenomena.<sup>e</sup>

Complexity Theory is not only *geometry*, as some fractal's fans wonder on the study of universal structures, inspired from Mandelbrot work's (1975 [1985]).<sup>f</sup>

Considering the myths and realities of "indigenous" educational policies in Mexico,<sup>h</sup> the *CPEW* team develop a methodology to study language and culture, improving, at the same time, native language learning and sociolinguistic resilience. Fabio Pettirino, one team member, describe this methodology as *complex to conceive, but simple to apply.*<sup>i</sup>



C.E.

specially if it is based on fieldwork.

This new approach, as compared to Euclidian and lineal approaches, brings a series of intellectual tools which can prove strikingly useful in resolving bilingual educational problems faced by minoritized languages and linguistic communities endowed with a high dialectal diversity.

> This "complex simplicity" characterizes **CPEW** methodology. It made possible for the IUF MAmP & EM2 Labex EFL team to realize 32 workshops since 2010, 17 of which are available on internet, thanks to the "Cross-mediated endangered language elicitation" (EM2) operation of the Labex-EFL (strand 7):<sup>j</sup>

> > axe7.labex-efl.org



Based on modern and ancient narrative, the CPEW methodology offers, and continues to develop, the following activities trough a critical approach:

2. Invisible communities workshops (here, in Nahuatl)

## Taller Santa María Teopoxco (2011)





1. Foundation Myths, called "Sun & Moon"

2. Contemporary narratives, including: a) Invisible Communities; b) Dialogues of animals; and c) Description of animals using different person subject agreement and/or tense or aspect.

**3.** "Easy" Grammar.

### For example...

3. "Easy" Grammar (here, Mazatec, SM Soyaltepec)



Taller de gramática realizado del 23 al 24 de agosto del 2013, en la

1. Mazatec sacred mountains myth

EFL oune Arais of

Nangui Xicoón Nindo Nangui naxin ini-íso, nangui Xicoón nindo (L5) Jñoón kuajton ntijle, Jñoón Kuaj-xgón ntijle Jñao chita najxa, xije nxíngo (CA). ntijxo chita Xije Kijsee je xe kicoón níndo. Xi xombe tee Xixjeén, jsakaco najmixo je xe kinoon níndo XI naxin bejnangale.

Jāra chita toóxo sijele, ntinso xo, Xraja xo, naxin Xro(Rc) tonga nisi nxo Kuaa ngo tojna nguiaa (FT) tijnexo nga je xe chita Xinë sijcxen; ngo

		EGORIAS	
Ls=L	ugares	sagrados	(nindo)
CA = Cc	onsejo de	ancianos	(nchinga)
FT = Or	ganización	y fuerza de	trabajo
MR = M	ercado		
RT = M	anejo de	rituales - cos	MOVISION .

agencia de Corral de Piedra, Municipio de San Miguel Soyaltepec (Distrito de Tuxtepec), con la participación de profesores de la Red CMPIO Plan Piloto (Coalición de Maestros y Promotores Indígenas de Oaxaca).

workshops. These frames can be reproduced *iteratively*, at different levels, taking different complex and unexpected shapes...

This activities or "módulos" (i.e.

framing chunks) are our fractals as

they help us to work out the *frames* 

of action<sup>k</sup> of our co-participative

These intricate patterns of *corpus elaboration* and *cultural revival* and *legitimation* through *CPEW* are linked, at least, by the following interconnected features: a) how may be and iterative *learning*, as a result of experience, particularly watching, listening, writing and reading participant's mother tongues, which is often unexpected on non-literary languages communities ; b) *Flexibility*, instead of deterministic rules of education linearly imposed ; c) *Self-organisation*, which implies the negotiation of educational contents in interaction, out of a simplex canvas.<sup>h</sup> Participants to the *CPEW* build together a particular and unique *participation framework*,<sup>k</sup> making visible their language and culture, but also developing a critical as well as an emancipatory pedagogy put into practice, *hic et nunc*.



In this way, the CPEW methodology promotes a *pedagogy* of freedom.<sup>1</sup> Finally, as has been suggested earlier in this poster, these workshops tend to *infinity*, as fractals and fractal models, because they can be applied to a non finite set of sociolinguistic contexts and ecological situations, being neither *universal* nor *static*, but rather *reflexive* and *self-organizing*, as they work as a *dynamic process* and a resilient creative system, resorting to both *learning* 

systems and decision systems. Even more, they contribute

to understand sociolinguistic variation from a complex

perspective.<sup>m</sup>

 $f(z) = z^2 + c$ 

FT( niki nxo kuao nga tojña nguioo RT( nkuao Xine - nkuao binjsen). MR( jexi soyale ngoxin nixako toon.

Notes

(a) Fractal image: Example of sin-Mandelbrot by Tim Meehan. Source : http://paulbourke.net/fractals/juliaset/(consulted may 2016).
(b) This work is part of the program "Investissements d'Avenir" overseen by the French National Research Agency, ANR-10-LABX-0083 (Labex EFL). Specials thanks to Emmanuel Avilés González for his mathematical help to understand fractals. Many thanks for Jean Léo Léonard for the conception of this matrix.
(c) See, for instance, Talcott Parson's Systems Theory (1937), in sociology, and Gregory Bateson works on *Mind and Nature* (1979), in anthropology, psychiatry & epistemology.

(d) Wenger, Etienne. 2006. *Communities of practice. A brief introduction.* See: http://wenger-trayner.com/wp-content/uploads/2015/04/07-Brief-introduction-to-communities-of-practice.pdf

(e) Bastardas-Boada, Albert. 2013. "Language policy and planning as an interdisciplinary field: towards a complexity approach". Current Issues in Language Planning, Vol. 14, 3-04, pp. 363-381.

(f) Mandelbrot, Benoît B. 1985. Les objets fractals. Ed. Flammarion, France.
(g) Linguistic families spoken in Mexico. Source: INALI 2009. On-line: http://www.inali.gob.mx/clin-inali/mapa.html (consulted may 2016).
(h) Léonard, Jean Léo, Avilés González Karla & Gragnic, Julie, 2013.
"Multilingual Policies put into Practice: Co-participative Educational Workshops in Mexico", in Hogan-Brun, Gabrielle (éd.), 2013. Current Issues in Language Planning: Language planning as a complex practice, 14, 3-04, pp. 419-435.

(i) Photo: Cuicatlan, Oaxaca, Mexico.

(j) See : http://axe7.labex-efl.org/taxonomy/term/12

(k) Goffman, Erving. 1981. *Forms of talk*. University of Pennsylvania Press, Philadelphia, USA.

(I) Freire, Paulo. 1998. *Pedagogy of Freedom*. Rowman & Littlefield Publishers, USA.

(m) See Léonard, Jean Léo. 2016. Diversification, Diffusion, Contact : Modelisation géolinguistique et complexité, *Lalies*, 36, E.N.S. de Paris, pp. 9-79.