Repositioning through resilience in times of crisis: the case of entrepreneurial academic institutes.

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Abstract: History has demonstrated through time a series of crisis situations which either had a regional or global impact. Furthermore, lessons from nature have demonstrated that animals and plants experience incremental or radical changes in their lifecycles, sometimes as an unavoidable part of their natural wellbeing. In the same manner, mankind confronted difficulties and managed to cope with harsh conditions that were proved to be aggressive for its continuity on the planet. Most of the times such crises originated from the simultaneous presence of opposing parts that wished to dominate, impose their own will or simply fight for survival.

Current global economic and financial crisis proved that periods of development and prosperity may easily, be followed by recession and poverty. The quick and sudden penetration of negative consequences to social welfare is characteristic of globalisation. Nevertheless, this paper does not involve the sources of crises or their causes but merely focuses on the crisis management as a current issue and how this could be exploited in a successful manner. This study is followed by a detailed literature review and literature taxonomy is used for classifying and analysing aspects on three main topics: (a) resilience, (b) crisis management and (c) entrepreneurial oriented academic institutes. Also additional literature on knowledge bases and social media is included.

This paper undertakes the concern of how an academic institute could affect its region in a period of crisis and what initiatives have to be taken. Could it become a resilient-pole leading the region to sustainability through change and risk? Could it activate the regional powers, integrate and unleash the stakeholders' learning capacity?

Crises will occur either directed or resulting from faulty decisions. The issue stems from the concern, what the healthy organisations should do in a sick and disastrous environment. Yet it is essential both for the people and organisations to reposition themselves in terms of regional development and acquire a dominant role. Regional development implies social change and transformation and for a region to cope with that, three axes to adopt and build on are suggested; entrepreneurial oriented academic institutes, resilience based practices and post crisis management. The common component of these is: learning.

In periods of flux, entrepreneurial academic institutes could be the actors undertaking the responsibility to converge the available regional powers, towards an area-based regeneration initiative, inspired by the principle that joined-up problems need joined-up solutions. Besides, they could be involved in industrial and regional policies in order to cultivate all forms of creativity and knowledge. The aim should be to reposition themselves in leading the region to unknown paths based on resilience by coordinating a robust set of modern tools such as crowd sourcing, living labs, mass collaboration and social networking; these will prioritise the value of human capital and are expected to alter, in result, the regional knowledge infrastructure.

The entrepreneurial academic institutes have the strategy and the skills to operate in unstable environments with high risk. Therefore, this experience would be proved a valuable resource for diverting to regional sustainability. A resilient region is less sensitive and vulnerable to shocks while resilience can function mainly as an evolutionary concept rather than a protective mechanism. Making decisions that collide with past strategies is rather difficult, especially when these were proved to be successful. The ones, who will deal with it effectively, are expected to be the leaders in the years to come. Repositioning is a continuous adjustment strategy towards the notion of global governance-closely linked to resilience. Late discussions relate resilience to "panarchy"; the model of "network culture" in the global society, based on (a) ecology and complex systems, (b) technology, and (c) politics. In crises, stable axes like education, through academic institutes, may serve as a compass to the future of uncertainty. At least, whilst everything changes there is a survival kit that remains untouched. At this stage the issue of education governance is a significant

contributory factor and may or may not be the pole that is capable of coordinating interdependent activities and realise change in the region.

This paper is an approach on the idea of repositioning a region in the global community through the use of modern social communication technology tools coordinated and administered by entrepreneurial academic institutes. It will be a next challenge to specify a concrete implementation plan which will reflect the original idea.

Keywords: resilience, crisis management, regional development, entrepreneurial academic institutes, education governance.

1. INTRODUCTION

In their paper "Why Europe will suffer more", *Gros and Alcidi (2009)* they forecasted that the cost of current crisis could be larger in Europe than in the USA revealing fundamental asymmetries that exist within Europe in terms of the structure of the member markets. Therefore, recovery is expected to be slower. In the same year, the World Development Report *(World Bank, 2009)* raised the issue of reshaping economic geography. It identified the significance of the clusters, a small set of cities and towns which could be the propeller for economic growth. Clusters direct to regional agglomeration economies that are reshaping urbanization itself- a strategy that creates leading and lagging regions which inevitably correlate through extroversion, proximity, diversity and knowledge spillovers.

Restructuring urbanization is the outcome of the new economic geography commonly called "geo-economy". In such interchangeable environments, repositioning may be a challenge for regional players who wish to survive and lead.

Education remains one of the major axes for the society, sometimes with negative effects. As *Rasche and Escudero (2009)* claimed, in recent years schools have educated many people who contributed to the current crisis-fact that cannot be neglected and has an essence of truth. Thus, education, has been positioned as part of the problem rather than as the solution. It was also revealed that psychology and the issues of perception and noesis are usually behind fake hope and "too big to fail" attitudes. Leveraging and investments derive from man operations while, resilience from social science, environmental studies and nature itself.

Overall, the paper aims to question how an academic institute can reposition itself in a region and contribute to the area-based repositioning, by adopting regional resilience mindset and combining modern social practices with the help of technology.

In section 2, there is a brief description of the question under analysis-which subject would be considered mostly as a proposal to change in a new situation.

Section 3, includes a synthesis and analysis of different literature, retrieved from relevant fields linked to the problem statement; followed by the methodology of literature taxonomy. A technique that contributes to an effective comparison and integration of different views as well as to the guidance of this paper's thinking process.

Section 4, where the solution is presented, takes into account a number of principles, late theories and modern technological tools. It is a simple suggestion on how different regional powers could cooperate by exploiting modern practices, abandoning past successful recipes and adopting a more realistic view.

Conclusions present some final recommendations related to the abilities that an entrepreneurial academic institute can demonstrate and how it can reposition itself while alterations occur as a leader.

2. Problem statement (the concept)

What happens in a constantly changing environment, which suddenly experiences a period of crisis, threatening the living entities? The weaker an organisation is the more vulnerable it becomes-especially in such occasions when their only options are to sustain or die. But what is the expected impact on healthy and strong organisations. Their successful and rational strategy of acting entrepreneurially to embrace uncertainty so far was dealt with risk and return. Following the same path though, in an uneven surrounding, may "bounce back the ball".

What are the initiatives that a region should take in periods of flux; which are the regional powers that could undertake the responsibility to lead in sustainability supporting all those organisations in crisis; and finally how technologies could be recruited in helping to overcome?

Thus, approaching the issue from a regional perspective, it is intended to research the initiative that could guarantee sustainability in a region.

3. Literature Review

According to *Christopherson et al (2010),* crises and disasters quiver thinking and probe given assumptions and measures of success and failure. *Kesetovic and Nadic (2010)* have incorporated in their research a comparative review of crises' characteristics through time *(Appendix I)*. They acknowledged the balance between prevention and elasticity, as the challenge for future crises management. Crisis being a dangerous state for an organism, deducts from it sufficient mechanisms to cope with. Thus, recovery can occur through restructuring or external intervention. Managers are customarily expected to solve crises problems without the adequate information which eventually do not provide the overall picture.

At this stage, sustainability becomes the first target for the organisation, and the region. This is beyond growth and profit or even competitiveness yet more close to collaboration and consensus. It targets more to integration and agglomeration of powers implying also an alternative path for a region, and this is learning how to survive in complex conditions.

Here is an intriguing question concerning economic geography, raised by *Hassink (2010)*; why some regional economies renew themselves whereas others linger on decline? In response, *Simmie and Martin (2010)* claim that adaptation and change are the key processes in the development of regional economies. Additionally, adaptation and adaptability impose the coordination of multiple players in the region *(Pike et al, 2010)*. Paul Krugman's assertion is also noteworthy; regions initially develop, grow and prosper owing to particular path-dependent processes *(Bristow, 2010)*. Path-dependence is a notion associated with not only humans but also organisations along with regions, originating from their decisions' total throughout time. *Hassink (2010)* highlights that a path-dependent process grows out of a system's history as well.

Regional economic development relates to various concepts that except path-dependence include lock-ins, path creation, cluster life cycles, co-evolution, sunk costs and the learning region *(Hassink, 2010)*. For instance, lock-ins is regarded as functional, political or cognitive obstacles that undermine a region.

Christopherson et al (2010), in their analysis argue that the success of a region can be largely measured by past and current economic growth, plus amending measurements, adaptation, convergence and equilibrium. Therefore, growth, profits and competitiveness are not a panacea for a region to sustain, as it is reconsidered. Region could be seen as a manifestation of human actions and social relations- an approach that introduces the idea of transition through time, space and process.

Rodgers et al (2010) claim that this is when a region should consider its strengths and build on them its economic development strategies. Likewise, *Durkin (2010)* concludes that it is important for the region to be able to identify its own assets.

But what are the factors that enable a region to adjust and adapt over time? *Christopherson et al (2010)* present a multi-pillar framework consisting of such factors. *(Figure 1).*
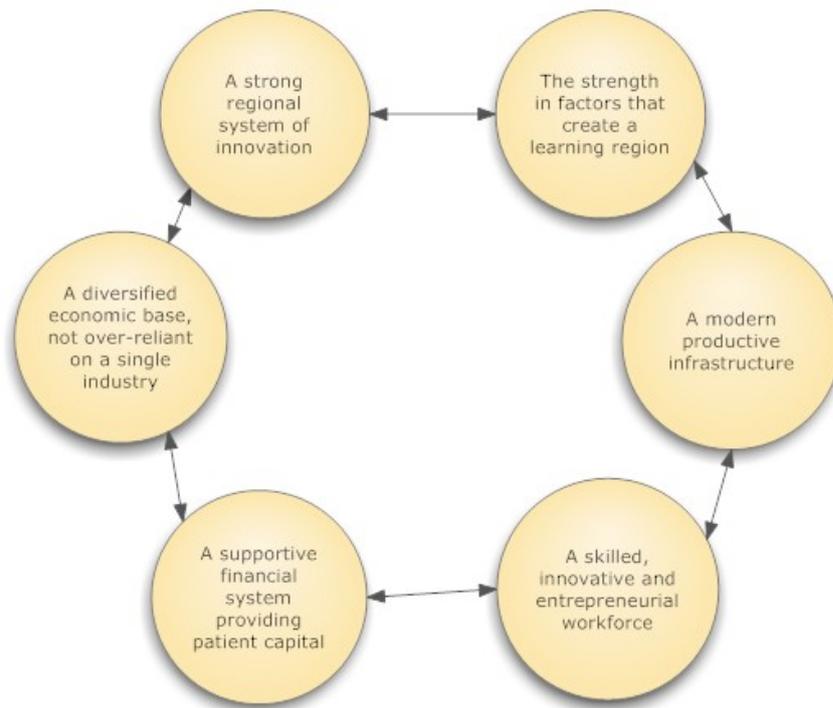
REGIONAL ADAPTABILITY FACTORS

Figure 1. The regional adaptability factors

In addition, *Hassink (2010)* declares that regional adaptability involves history and economic geography, recognising the importance of place-specific elements plus the processes to explain broader spatial patterns of technology evolution. Economic geography handles the economic landscape and its transformation over time and *Durkin (2010),* pinpoints its vital role in economic geography since each region appears to have its own specialties within the globalised system. Moreover, *Pike et al (2010)* declare that economic geography emphasizes the integral role of socio-spatial relations among the social agents of capital, labour, the state, civil society and power, and politics. Such agents shape and being shaped by pathways of change. He links the regional economic geography to path-dependence in the same way that *Hassink (2010)* does. Besides, he signifies diversity and variety existing in a region, claiming that these characteristics unfold the trajectories of change.

At this point, *Pike et al (2010)* corresponds to *Christopherson et al (2010)* in terms of identifying specialisation and diversification as a regional advantage which prevents it from over-dependence upon narrow economic base. Diversity proclaims resilience as a crucial strategy focusing on the need for diverse economies that will be less vulnerable in crises and external shocks. Resilience has originally emerged from building upon concepts of ecology, psychology and disaster studies *(Hassink, 2010).* Diversity is the common link of adaptability and resilience. *Clark et al (2010)* claim that natural system models are frameworks for understanding economic growth and distribution. In contrast, *Simmie and Martin (2010)* assert that regional economies may be analogous to ecosystems in certain respects but quite different in other. Nonetheless, there are interesting links between resilience in natural and human environments *(Hassink, 2010).*

There is much to learn from ecology and nature. Life cycles and attributes apply in human systems, imitating historical and geographical past experiences and like *Hudson (2010)* verifies resilience denotes the capacity of ecosystems, individuals, organisations or materials to cope with disruption and stress and retain or regain functional capacity and form.

Resilience is not yet accepted as a distinguished notion due to its malleability. It means different things in different cases. Above all it relates to exogenous economic shocks and reflects the region's capacity to absorb disturbance and reorganise while undergoing change so as to still retain essentially the same function structure and feedbacks *(Bristow, 2010).* Definitions about resilience are still blurred and contradictory. *Hassink (2010),* for example, opposing to Bristow, insists on the change of structures in a region. He claims that resilience entails decisive action from a region to change its structures and is mostly this, the purpose, rather than adaptation or renewal-

prioritising clearly adaptation rather than resilience. Nevertheless, resilience appears to be a much stronger concept for a region, since it has to manage unpredictable change. Hence, a region should prepare to alter its fundamental structures if continuously changing environmental conditions impose this.

Christopherson et al (2010) present an appealing approach to the properties of regional resilience, describing it as a socio-ecological system (Figure 2).

REGIONAL RESILIENCE ATTRIBUTES

The amount of change that a region can undergo while retaining its structure and functions

The degree to which a region can reorganize

The degree to which a region can create and sustain the capacity to learn and adapt

Figure 2. The regional resilience attributes

This figure focuses on three regional characteristics as these were identified: the amount of change, the reorganisation and the learning. Learning is the key factor.

Another approach by Hassink (2010) introduces the notion of equilibrium in shock effects and post crisis situations. Here Hassink (2010) contradicts Christopherson et al (2010) who work on regional adaptability and resilience. The former accepts the regional economic adaptability as the dominant concept and suggests that resilience should be analysed further. However, the ladders adopt the idea of resilience as a process that encompasses rebound, adaptation and recovery. Evidently, the second is a conclusion of a broader view positioned away from the lens of regional growth, competitiveness and similar modern practices. Furthermore, Rodgers (2011) identifies that people, organisations, regions, and countries are all subject to a diverse and evolving environment and resilience is essential to a positive response to external shocks.

Clark (2010) agrees with Hassink in that for a region, returning to equilibrium after the shock is anything but natural. Moreover, Hassink presents a four-dimension model of resilience which focuses in different types of equilibrium; (a) the back to normal equilibrium, (b) the flip from certain equilibrium to another, (c) the path dependent equilibrium, and (d) the long-term equilibrium. He identifies that resilience was raised as a concept since clusters were proved inadequate to secure sustainability in a region. Although, he is sceptical about resilience admitting that it is relative to the region's learning process.

Regarding Hassink's conclusions, on the other hand Simmie and Martin (2010) claim that organisations consisting of regional economies are continually changing and adapting to their economic environments. Such changes are driven by the acquisition of new knowledge which makes them unstable. They conclude that there is no space for equilibrator approaches. Simmie and Martin first borrowed the panarchy model from ecological science and adjusted it to regional economic resilience. By combining characteristics they built the following four-phase adaptive cycle model of regional resilience. (Figure 3).
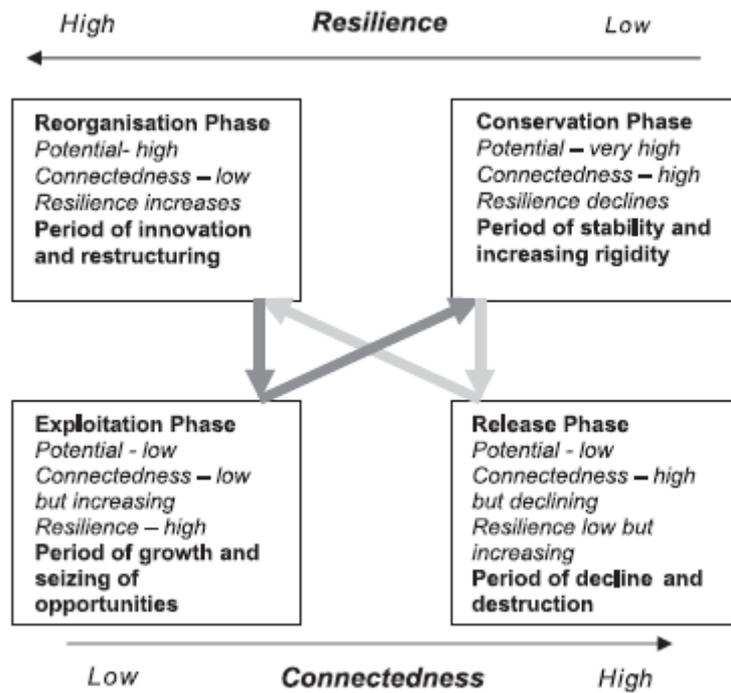
Figure 3. The four-phase adaptive cycle model of regional economic resilience

(Source: Simmie, J. And Martin, R. (2010) The economic resilience of regions: towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society,* 3, p. 33)

Below there is a model that represents the system's life cycle. While concentrating on the degree of resilience that the organisation shows in terms of the phase it experiences one can observe the representation of the two dimensions of resilience and connectedness through the phases that a regional economy experiences. Introspective to each phase, there is a varying level of connectedness which is defined by the level of interdependencies among regional members such as local networks of trust, knowledge spillovers, business associations etc. In times of crises where decline and destruction is the norm, connectedness becomes considerably high.
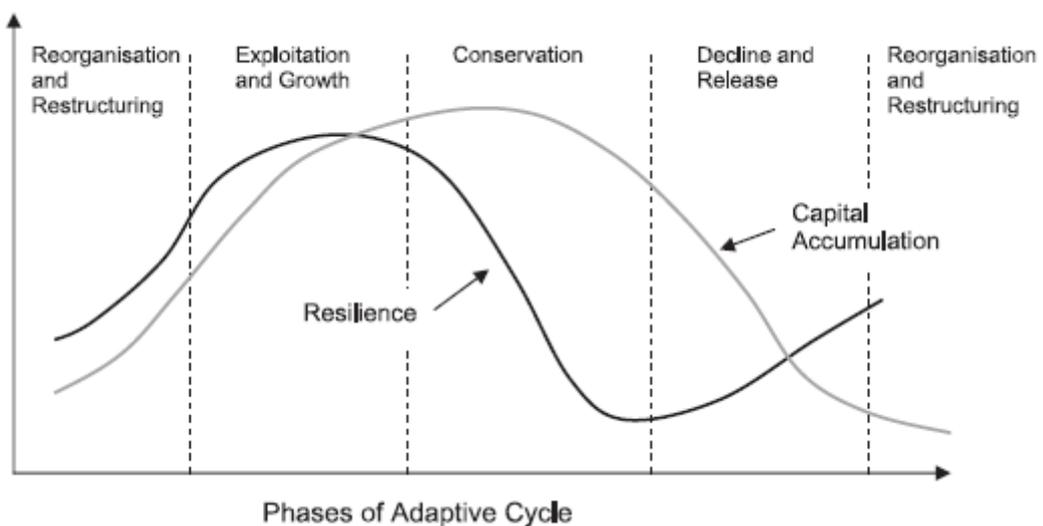

Figure 4. Resilience as a process: variations in resilience across the adaptive cycle

(Source: Simmie, J. And Martin, R. (2010) The economic resilience of regions: towards an evolutionary approach. *Cambridge Journal of Regions, Economy and Society*, 3, p. 34)

The resilience of a regional economy depends both in the longer or shorter term on processes *(Simmie and Martin, 2010)*. The capital accumulation varies through phases as resilience, as seen above *(Figure 4),* and is the total strengths and skills of the region's workforce as well as their capacity to upgrade. Another approach of the four-phase cycle of the system adaptation and change is given by *Pendall et al (2010)* in *Appendix II.*

According to various researchers both adaptability and resilience incorporate the essence of learning. A learning region is actually a resilient region which learns at first how to exploit time, space and process for its own sustainability.

Learning is the key factor in periods of crisis. As *Rosenthal and Kouzmin (1997)* state, crisis is a serious threat to the basic structure or the fundamental values and norms of a social system, which under pressure and highly uncertain circumstances require critical decisions. At this point, we identify common characteristics with resilience recalling what earlier was presented by researchers that dealt with this. Furthermore, *Elliott (2009)* highlighted that the process of knowledge transfer and assimilation, is a key component for the learning framework in an organisation. *Appendix III* contains the mapping of this process. Although local forces or other barriers block learning, learning from crisis directs to knowledge acquisition that depends on regional players, and how they will handle and acclimatize it- which ultimately may be translated into new norms and practices or plain history.

In addition, *Elliott (2009)* characterises integration indispensable to effective learning otherwise its lack would be a barrier. Thus, it is extremely important to define the roles of stakeholders in a region and their interplay. *Veil (2011)* complements that although learning can be beneficial, analysing the crisis after its aftermath, it may lead to hindsight bias. Wrong assumptions will lead you to erroneous learning. The author also recognises three barriers in learning from crisis; (a) the classification with experience where regional players cannot understand the different patterns and signals of crisis, (b) the mindlessness, meaning when players act from a single perspective, (c) the reliance on success, or fake hope, which is based on past successes.

Experience is useful and is considered capital in an organisation. It is actually a component of the social capital. Nevertheless, in a rapidly changing environment, using primarily experience is not always the appropriate technique, as this might retrieve stereotypes that are no longer valid. Moreover, using direct experience in crises situations is rather unrealistic since crises are non-events which do not occur in regular patterns. According to *Rosenthal and Kouzmin (1997)*, crises do not lend themselves to the usual examination of regularities of behaviour and management. Mankind tends to perceive and learn through adopted and accepted frameworks that are mostly experience-based. We perceive what can be understood according to our codification. Managing the unexpected incorporates the practice of thinking beyond limits which provides seeing what others see but do not understand. As *Baran and Adelman (2010)* points out, experience is crucial in developing high-potential employees into effective executives. The administration of crises does not depended exclusively on skilful and experienced managers-the need for learning could be involved. *Baran and Adelman (2010)* propose firstly the vicarious learning, or learning from others who have already experienced crises, secondly simulations, meaning equipping managers with well practiced patterns of problem-solving behaviour, and interpersonal communication training, focusing on being receptive in all viewpoints and acting quickly.

Failing to learn, organisations and regions will continue to incubate vulnerable pathways, which enable potential for disasters. Crisis management refers to the self-incubating crises caused by people's faulty assumptions and wrong interpretations *(Elliott and Smith, 2006).* Many researchers *(Elliott et al, 1997; Milasinovic et al, 2010; Elliott and Smith, 2006) also* agree that the promotion of wider learning on crises situations should be embedded in a new adapted culture especially when we are referring to a region.

Regions encompass the regional stakeholders who are the living capital that enables or blocks the region's resilience. Academic institutes are considered as regional players since these may harness learning. They may as well operate as an integrator of the regional different powers trying to merge their dynamic and outward the derivative. *Rodgers (2011)* claims that Universities should ensure that they provide regional economic benefits from the knowledge they produce.

In a sense, learning process, if administered successfully, could be transformed to wisdom. Wisdom could provide the basis for resilience. This may be cultivated by an active, risk-taking, innovation-oriented and entrepreneurial focused academic institute. Not all institutes are capable to undertake such responsibilities. Normally the issue raised is how an academic institute could be reality-based. *Penaluna and Penaluna (2008)* state that the interaction of an academic institute with the creative industry infiltrates business insight in the institute. An entrepreneurial institute is accustomed to perceiving signals through market lens. There are paradigms and models raised on

this tendency; *Gibb et al (2009)* in their paper on meeting the entrepreneurial development needs of higher education institutions, presented the characteristics that the university should demonstrate as an entrepreneurial organisation *(Figure 5).*

Figure 5. The University as an entrepreneurial organisation (characteristics)

(Source: Gibb, A. et al (2009) Leading the entrepreneurial university:
Meeting the entrepreneurial development needs of higher education institutions.
The National Council for Graduate Entrepreneurship, October 2009, p. 17)

The entrepreneurial institute operates beyond business, bureaucracy and planning processes. It is not strict "marketisation" but it aims to bring the professional "managerialism" into the academic environment. Beliefs like brand equity and customer loyalty are equally important to its contribution that resides in the interaction with stakeholders and the extroversion to the region.

Another example, introduced by *Rache and Escudero (2009),* presents the model of Principles for Responsible Management Education (PRME), an innovative initiative for leading the change by academic institutes. Management education promotes corporate responsibility within the institute and in extent in the region that this operates. It functions as a pole which administers achievements and failures to lead change and confront challenges.

An institute with international standing and global knowledge configuration aggregates the characteristics that are necessary to pilot change. In *Figure 6, Gibb et al (2009)* present a model institute which among others introduces the component of learning as a core process.

Figure 6. Activities and Processes involved in university internationalisation

(Source: Gibb, A. et al (2009) Leading the entrepreneurial university:
Meeting the entrepreneurial development needs of higher education institutions.
The National Council for Graduate Entrepreneurship, October 2009, p. 10)

It is a good starting point for a region to use the above model and identify the suitable institutes that could undertake the initiative to regenerate the region.

What's more, another interesting model, introduced by *Huggins et al (2008)* sets up the regional economic development through the increased interaction across government, business and higher education sectors. Known also as the "triple helix", it focuses on the production of new forms of collaboration and partnership to drive forward regional development. State, industry and academia are regional players that interrelate through knowledge and learning but not necessarily progress under the common perspective of consensus and joint-up objectives. In a sense, this supports or not the localised network approach. Not all three players are underestimated. But the importance of a learning and entrepreneurial academic institute could constitute the break-even point for achieving change.

Gibb et al (2009) once more approached the "triple helix" from the academic institutes' perspective. They emphasize that universities have the power of knowledge diffusion; therefore they can play a stronger regional socio-economic role *(Figure 7).*
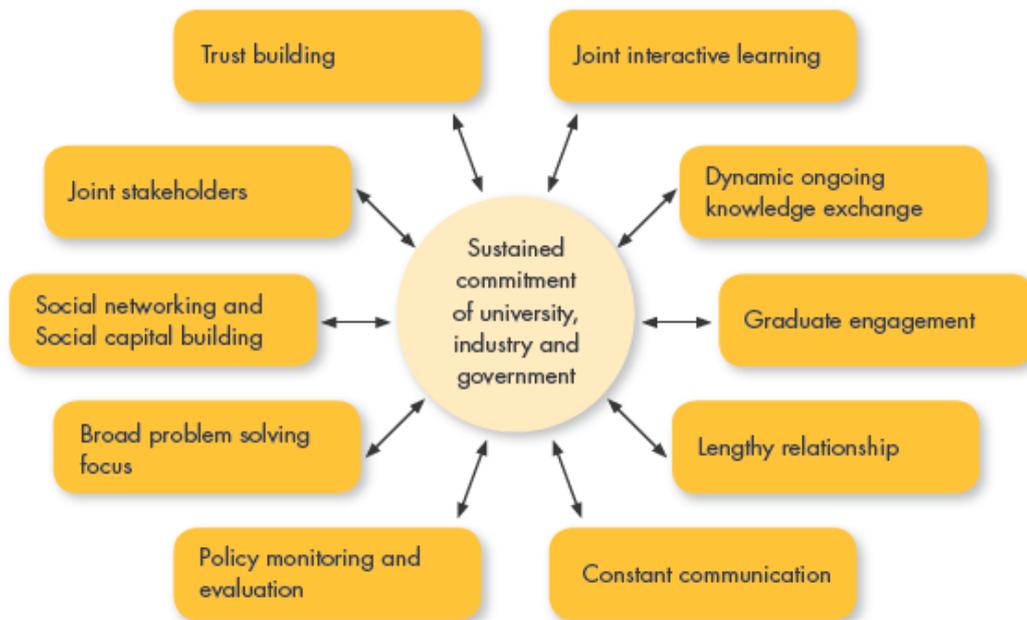
Figure 7. Higher Education, Government and Private Sector Partnership (the basis of the triple-helix model)

(Source: Gibb, A. et al (2009) Leading the entrepreneurial university:
Meeting the entrepreneurial development needs of higher education institutions.
The National Council for Graduate Entrepreneurship, October 2009, p. 13)

The main component though for all parts in this common effort is commitment. Similarly*, Bramwell and Wolfe (2008)* concluded that universities could generate value in the regional economy by applying techniques to attract talents, provide support to the industry and exchange knowledge.

According to *Lessard and Brassard (2010)*, governance is partly a means of conceiving the building of politics based on a network of organisations and actors who move about various political arenas, be they local, central or intermediate. Governance implies that someone plays the role of the regulator in a network of participants given the fact that it administers the most valuable resources. In a resilient region the most valuable resource is learning. Therefore, a successful regional regulator is expected to redistribute learning, integrate all groups and increase the power of resilience in the region. Legal framework may be an obstacle to this; legislation is recognized by various researchers as the leading issue in making a region capable of self-tuning its powers *(Huggins et al, 2008; Lessard and Brassard, 2010).* But if the decision's circle incorporates more players, it validates the legitimacy of the final decision.

Modern practices of sharing knowledge and diffusion of learning include the use of knowledge bases, mass collaboration, crowd sourcing or even the living labs. *Richardson and Domingos (2003)* some years ago identified that acquiring knowledge prevented the rapid spread of various systems. Nevertheless, the internet made it possible to build knowledgeable communities and foster learning, especially under the consideration of serious motivation. A core model of bringing together users (the public) and contributors (regional players) is presented in the next figure *(Figure 8).*

Inference

Rules

Facts

Feedback

Contributors

Collective Knowledge Base

Queries
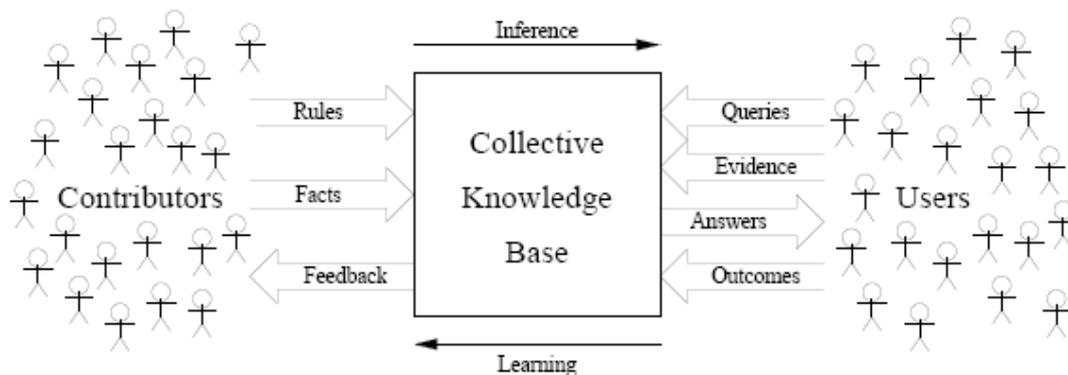
Evidence

Answers

Outcomes

Users

Learning

Figure 8. Input-Output view of a collective knowledge base

(Source: Richardson, Matthew and Domingos, Pedro (2003) Building large knowledge bases by mass collaboration. *Journal of ACM (K-CAP'03),* p. 3)

Following this model, social networking and social media applications could be a stepping stone for reaching the desired level of intercommunication and sharing of knowledge among regional members.

Another instrument for the academic institute to diffuse learning and coordinate powers could be the living labs which can be seen as user-driven open innovation environments *(Guzman et al, 2009).* They are open innovative environments in real-life settings, where user-driven innovation is fully integrated within the co-creation process of new services, products and societal infrastructures in a regional harmonized context (the "Open Innovation Functional Region") catalyzing the synergy of SMEs Collaborative Networks and Virtual Professional Communities in a Public, Private, People Partnership *(Appendix IV), (Santoro and Conte, 2009).* As *Bergvall et al (2009)* defined, a living lab is user-centric innovation milieu built on everyday practice and research.

Moreover, there are additional technological potentials to administer and collaborate such as Communities of Practice (CoPs) which have a more business-to-business approach and interaction. A contemporary way of exchanging knowledge and create instantly expert communities under a common motive and a common target.

4. Proposal of a solution

This paper is an endeavor to bring forth and introduce a different role for the entrepreneurial academic institute in times of crisis, taking into careful consideration various analyses and findings of researchers.

The learning commercialisation activities could be at the upfront in a region, administered by the regional academic institutes which among others could undertake the role of the integrator. Times of crisis, even if their duration is blurred and prolonged, could be seen as opportunities for repositioning and changing of roles.

As concluded in earlier sections, crises jeopardise the structures of an entity (organisation, region, a human being, etc.) and place the status quo- meaning mostly the widely approved elites in various stress tests. Although not universally agreed as a separate concept yet and commonly adopted by natural sciences, resilience seems to cover the gap between what happens during and after a crisis situation. Crisis management deals mostly with specific processes that derive from what we could learn from such situation, how we can cope with it and possibly a fixed repertoire of predefined reactions according to what have learned so far.

But in a constantly changing environment, it is almost certain that series of crises are expected to be part of the coming future. Emergent powers and hidden opportunities in various aspects are volatile and unpredicted. Therefore, it may be an option for a region to re-consider first, the creation of a flexible structured community framework (non-structured region or changing-structured region).

Repositioning lead by an academic institute means that it will establish the new resilient framework upon which regional players will interrelate aiming in transforming the region to a metropolis of learning. A learning region is a resilient region. The academic institute will secure the

interconnection and handle the modern social media and networking to infuse learning and empower local players to innovate *(Figure 9)*.
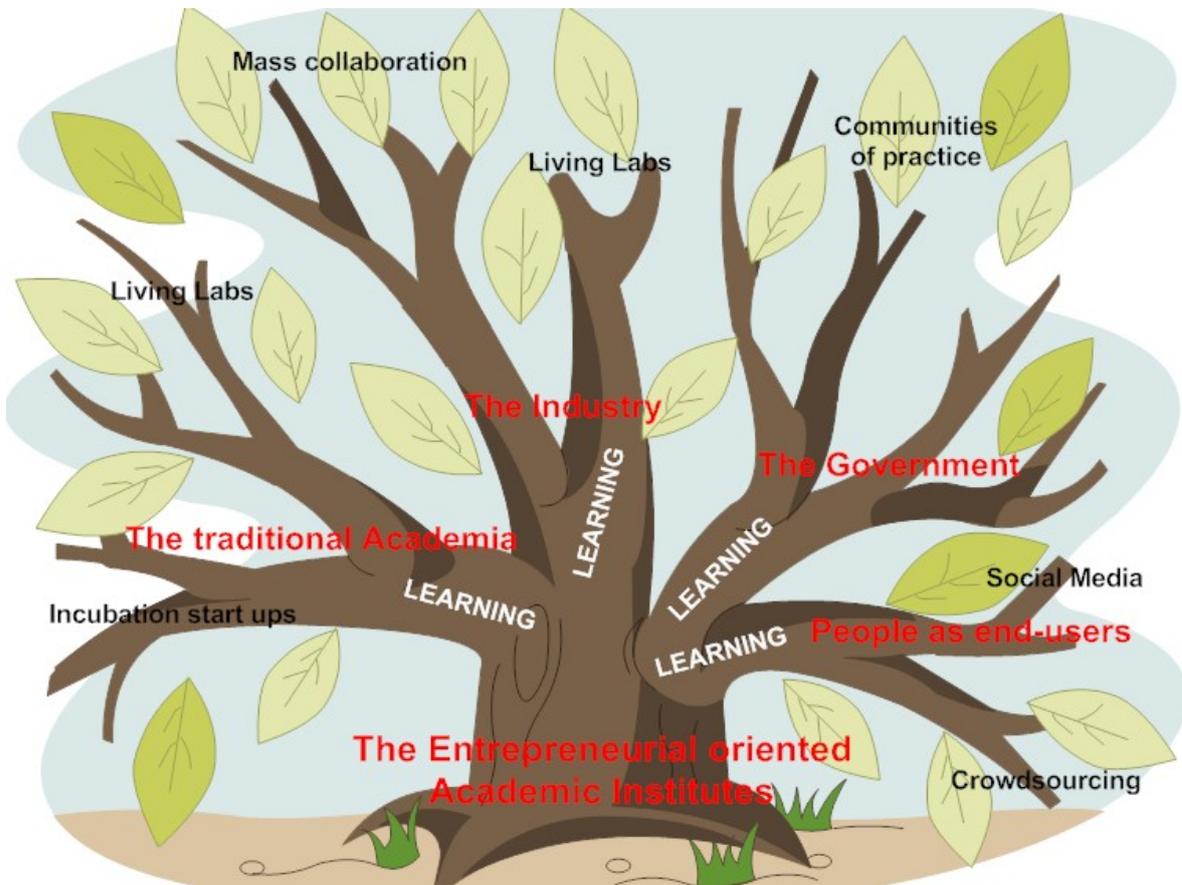

Figure 9. Education Governance and Regional Resilience

The figure above portrays the regional approach of achieving resilience with the lead of academic institutes and the contribution of modern technology. Even in periods of crisis, when external shocks and threats enforce the essence of uncertainty, the region could follow rules of nature, ignore growth and competitiveness adopt social concern and remain resilient in the transition period. Actually this model could be considered as the region's knowledge infrastructure methodically incorporating policies and coordination among players.

Finally, the region could exploit a diversified repertoire of services and products, based on common learning and coordination through a network of knowledge infrastructure administered by the local academic institutes towards resilience.

5. Conclusions

In an era defined by an entrepreneurial knowledge-based economy, academic institutes have become central to their regions *(Nelles and Vorley, 2010)*. An entrepreneurial academic institute demonstrates response to the market structures and the use of knowledge. Being the center for learning, it can redistribute the regional business intelligence. Resilience encompasses adaptability, change, sustainability and incorporates the flexible structures through time which guarantee the existence, the rebound and recovery. Recovery though does not necessarily mean bringing back equilibrium. At this point, we could recall what the first priority was for the designers of ARPNET, the ancestor of internet; their idea was to create a non-structured network which should be linked but independent at the same time so as to make it resilient and easy to recover no matter the level or the nature of damage.

In crises, a region could be prepared to appoint effortlessly the specific pole to undertake the repositioning and lead the region through resilience to sustainability at no growth, with no

competitiveness but with cohesion and consensus among its stakeholders.   This may probably be the blue ocean for a region in periods of flux, when it tries to stay resilient and working from the inside to secure its own assets, strengths and learning capital.

This paper is acquainted with the idea that entrepreneurial academic institutes could play the leading role in their regions. Since learning is the component in demand these days, non-traditional academia could take the lead and bring together different powers. The means should be modern channels of communication and knowledge sharing. Building a technology-oriented community and administering the recycling of knowledge throughout the participants, would direct to learning as the common component.

Academic institutes should realise their broader socio-economic potential.

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APPENDIX I
Characteristics of crises

Characteristics of traditional crises

- A known, isolated event, within the framework of conventional hypotheses;
- The situation is perceived as manageable (technically, economically, socially);
- Costs are relatively easy to calculate, while recovery is possible in the context of already tried systems;
- Limited duration;
- Codified intervention procedures with which specialists are well acquainted;
- Limited number of interveners, all of whom are specialists for one aspect of the problem;
- Clearly defined roles, responsibilities and hierarchy, known to the agencies of intervention.

Characteristics of the modern crisis

- Great consequences (effects), affecting a large number of people;
- Large economic price, overwhelming the capacities of classic insurance systems;
- Without precedent (new), generic and combined problems that affect vital resources;
- An avalanche-like dynamic due to multiple resonating phenomena;
- Poor response on the part of emergency systems, obsolete, inapplicable, even counterproductive procedures;
- Extreme uncertainty, which does not lessen during the entire crisis period;
- Long duration, with threats that change over time;
- Convergence, i.e. a large number of actors and organizations appear on the scene;
- Critical communication problems: with responsible organizations, the public, the media, victims;
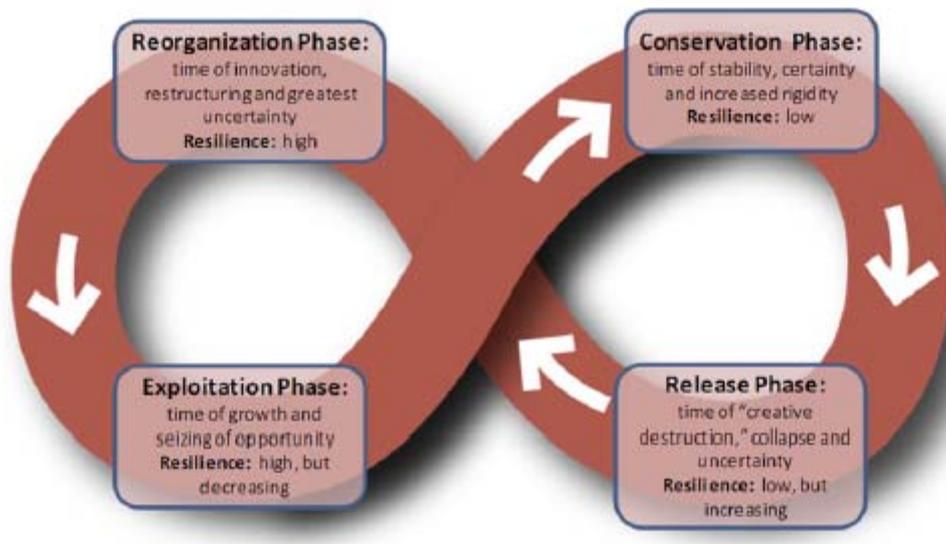- Significant dangers of all kinds.

Characteristic of future crises

- Existence of a pre-crisis and a post-crisis time, with irreversible change;
- Breakdown not caused by a single specific event, with a global resonance of various forms;
- Basic procedures, as well as those that are usually not questioned, are no longer applicable: e.g. fundamental principles, identities, contexts, actors, rules of the game, defense mechanisms, knowledge – all these tools must be reconsidered and problematized;
- Breakdown brings repeated, increasingly frequent crises that suddenly crystallize, occur and disappear in a seemingly incomprehensible and random manner;
- Strongly and deeply rooted in the system's imbalance, breakdowns are even more resistant to conventional treatment;
- Since "decomposition" is the most conspicuous, the prevailing impression is that of a general process of decoupling, of disintegration that is almost impossible to stop;
- Breakdown permeates the entire field of operations. Fundamental problems react in concert, preventing all isolated treatment. There is a sense of loss.

APPENDIX II
The four-phase cycle of system adaptation and change

Reorganization Phase:
time of innovation, restructuring and greatest uncertainty
Resilience: high

Conservation Phase:
time of stability, certainty and increased rigidity
Resilience: low

Exploitation Phase:
time of growth and seizing of opportunity
Resilience: high, but decreasing

Release Phase:
time of "creative destruction," collapse and uncertainty
Resilience: low, but increasing

(Source: Pendall, Rolf et al (2010) Resilience and regions: building understanding of the metaphor. *Cambridge Journal of Regions, Economy and Society*, 3, p. 76)

Appendix III
Mapping the process of organizational learning from crisis

Initial beliefs and norms

'Focusing Event'

Interest Groups
Latent policies
Media agenda
Smokescreen
Terms of reference

Agenda Setting ⟹ **Public Inquiry**

Knowledge Acquisition

Knowledge Transfer

Regulation & standards

Patterns of regulation

Punishment centred versus participative

Barriers & Facilitators

Effects upon Individual & Group

Knowledge Assimilation

No cultural change ⟷ Full Cultural readjustment

(Source: Elliott, D (2009) The Failure of Organizational Learning from Crisis – A Matter of Life and Death?
Journal of Contingencies and Crisis Management, 17(3), p. 159)

Appendix IV
The Living Lab operation phase: Actors and Roles
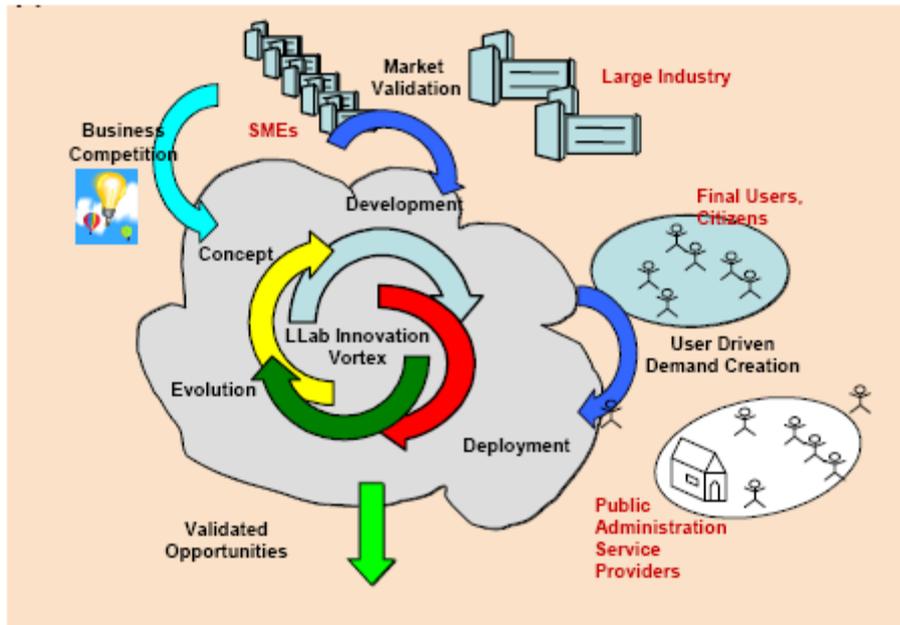
(Source: Santoro, R. and Conte, M. (2009) Living Labs in Open Innovation Functional Regions. *Proceedings of the ESoCE-net, White Paper*, p. 8)