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MOTHER TONGUE AND LITERATURE TEACHING IN SMART CITIES: HOW TECHNOLOGY IS RESHAPING THE FRONTIERS OF EDUCATION

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Abstract:
Nowadays, mother tongue and literature teaching became vital for our future. It is through them that we will be able to educate the citizens of the future by making them aware, through language and literature, of their identity, values and cultural matrix. However, as technologies evolved, our cities not only incorporated technological innovations, they became new cities, smart cities. The so-called smart cities are changing the concepts of education and learning. Thus, in order to prepare to adapt mother tongue and literature teaching, we must first understand this new reality and, secondly, think of ways to connect smart city and the teaching of the humanities, mother tongue and literature.

Keywords: mother tongue, literature, teaching, smart city

1. Introduction

It is a well-researched fact through research that children who receive education in their mother tongue in the early years have better overall learning outcomes and, in particular, significantly higher levels of literacy. Despite overwhelming evidence on the value and benefits of mother tongue education, few countries invest in it. Policy-making that incorporates these outcomes must be central to addressing the poor quality of education in the developing world (Pinnock, 2009) in a society increasingly dominated by technology and affecting all dimensions of human beings, particularly where we live mostly, in cities.

The teacher, when making use of the various existing technologies, must appropriate them, in a very conscious attitude and consistent with the objectives to be achieved. Students should seek, in the virtual environment and digital technologies, other possibilities for interaction and promotion of knowledge, autonomously and dynamically, not only for teaching the mother tongue, but also for literature. The challenge is to incorporate technologies into the classroom and transform the relationship between mother tongue, literature and the new concept of smart city.

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It is through mother tongue and literature that we can convey the values and cultural identity of a people throughout the lifelong learning process. These channels are fundamental in the formation of the individual and the future citizen. It is with them that culture is transmitted, and with it, knowledge about the essential communication tool, the mother tongue, and a fundamental semiotic system: literature. Thus, to understand how we can migrate the humanities to this new context, we must think about uniting mother tongue and literature teaching with smart cities and their technological and educational potential.

Let us first try to understand the global and educational dynamics of smart cities so that, on second thought, we can realize this inevitable integration into a new technological world.

2. SMART CITY Concept

This urban model is seen as a path to the development of cities through creative solutions that make the use of available resources more efficient, reducing the negative mark of man in the environment. If we think about the social, cultural, security and technological advancements through civilizations over the centuries, we can easily find numerous examples of urban construction with this philosophy. In short, they are essentially collaborative urban complexes, where technology is used for this collaboration, integrating systems to increase the efficiency of community services that facilitate participatory management and the media itself.

According to UN (2011), more than 50 per cent of people are living in cities, about 3.6 billion, with a forecast that by 2050 there will be 6.3 billion inhabitants in urban spaces. This picture tends to worsen when the world's population is expected to increase from 7 to 9.3 billion by 2050. Megacities that bring together 10% of the world's population have also emerged in the 21st century, most of them with severe poverty concentrations and socio-environmental problems. In 2014 there were already 28 megacities with more than 10 million inhabitants, and it is expected that by 2030 there will be 41 megacities (UN, 2014). This unprecedented rate of urban growth creates the urgency to find smarter ways to manage this monitoring (Pardo & Nam, 2011: 282).

According to studies by the United Nations, in the year 2050, two thirds of the world's population will live in cities (2019). Today, to manage and predict the challenges these numbers raise, we are increasingly talking about the concept of Smart Cities. The concept of smart city is very broad and is still in an emerging phase, so its definition is still in progress. This concept is used worldwide with different nomenclatures, contexts and meanings. It may even have its origin in Smart Growth (Bollier, 1998), a movement of the late nineties that evoked new policies for urban planning. If for some, a smart city should be defined in an urban context, that is, more efficient, sustainable, equitable and livable, others argue in a context where technology is predominant.

This concept has been studied by researchers and technology companies and we have seen the emergence of consistent sources for the concept, worked by SIEMENS (2004), CISCO (2005) or IBM (2009), as Harrison (2011) points out.

It is therefore necessary to live up to citizens' expectations and to innovate in a number of core areas such as planning, management, services and infrastructure, creating a balance between technologies, their users and sustainable and harmonious growth.

Komninos (2006) begins by defining the concept of smart city:

> "*Intelligent communities and cities belong to an emerging movement targeting the creation of environments that improve cognitive skills and abilities to learn and innovate. They represent environments that enable superior cognitive capabilities and creativity to be collectively constructed from combinations of individual cognitive skills and information systems that operate in the physical, institutional, and digital spaces of cities.*" (2006, p. 1)

Below is a set of different perspectives on the concept of smart cities:

> *"ICs have been frequently defined as virtual reconstructions of cities, as virtual cities. The term has been used interchangeably as an equivalent of 'digital city', 'information city', 'wired city', 'telecity', 'knowledge-based city', 'electronic communities', 'electronic community spaces', 'flexicity', 'teletopia', 'cyberville', covering a wide range of electronic and digital applications related to digital spaces of communities and cities (1). • Another meaning was given by the World Foundation for Smart Communities, which links digital cities with smart growth, a development based on information and communication technologies. 'A Smart Community is a community that has made a conscious effort to use information technology to transform life and work within its region in significant and fundamental, rather than incremental, ways' (2). • ICs are defined as environments with embedded information and communication technologies creating interactive spaces that bring computation into the physical world. From this perspective, intelligent cities (or intelligent spaces more generally) refer to physical environments in which information and communication technologies and sensor systems disappear as they become embedded into physical objects and the surroundings in which we live, travel, and work (3). • Intelligent cities are also defined as territories that bring innovation systems and ICTs within the same locality, combining the creativity of talented individuals that make up the population of the city, institutions that enhance learning and innovation, and virtual innovation spaces facilitating innovation and knowledge management (5) and (6)."* (2006, p. 1)

Subsequently, he quotes Ishida (not forgetting Schuler or Kryssanov) and presents four examples of Smart Cities:

> "• *A commercial digital city, which concentrates on commercial information with principal scope of making money for its owners. Digital cities created by America Online (AOL) follow this model and are structured as portals similar to 'yellow pages'. They provide local information, relevant news, community resources, entertainment, and commerce, together with advertising local markets such as auto, real estate, employment, and health. • A policy-driven or governmental digital city, the digital city of Amsterdam, which was created to facilitate*

communication between the municipal council and the citizens. • A virtual city, the virtual Helsinki, which represents the city using 3D models of buildings and public spaces, offering virtual tours and broadband communication between the citizens and various service providers located in the city. • A multi-purpose digital city, the digital city of Kyoto, in which people can get information on traffic, weather, parking, shopping, take a view of the physical environment and sightseeing thought 3D models and panoramic pictures, and have opportunities for interaction with other residents and visitors." (2006, p. 4)

The first definition of the concept that becomes truly permanent refers to the project developed by the Vienna and Delft polytechnics in conjunction with the Department of Geography of the University of Ljubljana in 2007. This project defined smart city as a city that should have visionary performances. related to six dimensions: smart economy, smart social, smart governance, smart mobility, smart environment and smart living (Center of Regional Science, 2007).

However, Rizzon et al, citing Grabys, note a concern that results from the emergence and development of Smart Cities:

"*Grabys (2014) presented the concern with the role of the citizen and the exercise of their citizenship in contrast to the monitoring and management of data in smart cities. The author presents a particular case study, The Connected Sustainable Cities (CSC), developed by the Massachusetts Institute of Technology (MIT) and Cisco as part of the Connected Urban Development (CUD) initiative. The CSC project executes governance distributions via proposals for sustainable, intelligent and efficient environments through ubiquitous computing scenarios to adapt to existing and hypothetical cities. The project proposal defends smart city as the key to solving resource scarcity and climate change problems (Mitchell & Casalegno, 2008). In this sense, the citizen is a data point, being a data generator monitoring environments and interacting with intelligent systems, giving feedback. According to the author, smart city still raises questions about the policy of urban exclusion, about who is able to be a participating citizen in a city that is fed through access to digital devices."* (2017, p. 133)

Zhuang et al. highlight the relevance of learning environments in Smart Cities, but also mention that there are numerous perspectives on this concept that translate into different definitions:

"*Learning environments should be regarded as important parts of a city, even in a smart city. But there is no clear definition of smart city (Nam & Pardo, 2011; Neirotti, Cagliano, Mangano, & Scorrano, 2014). Hollands (2008) stated smart city as an "urban labeling" phenomenon. Researchers tried to define smart city in different aspects, such as dimensions of technology, people, and institutions (Nam & Pardo, 2011). The typical technology-oriented definition was "an instrumented, interconnected and intelligent city" by Harrison et al. from IBM (Harrison et al., 2010). Another definition of smart city was people oriented. Paskaleva (2011) viewed smart cities as "people-based, human and progressive in their deployment of*

digital technologies, not to hardwire themselves, but instead to be socially inclusive in using them to foster good governance and create services capable of improving the quality of life." Finally, the governance-oriented definition of smart city refers to the administrative and organizational aspects of the city. Relatively, smart city is a new concept and new mode to promote the wisdom of urban planning, construction, management, and service by using the Internet, cloud computing, big data, geospatial information integration and other new generation information technology (National Development and Reform Commission, 2014). In general, smart city is under a widespread use of Information and Communication Technologies (ICT), which help cities better utilize the resources in different urban domains (Neirotti, Cagliano, Mangano, & Scorrano, 2014)." (2017, p. 2).

Thus, smart cities are cities that can combine formal governance with democratic participation based on information technology in an urban ecosystem, and offer the balance between technology, business and people (Ben Letaifa, 2012). In addition to the concept of intelligent city, many others have appeared in the literature as an attempt to define the new urban planning strategy: creative cities, wiki cities (Calabrese et al, 2009), cities 2.0 (Chadwick, 2009), sentient cities (Shepard, 2011), open cities (Partridge, 2004) and net cities (Castells, 2004). Smart Cities are cities that are preparing for the future, planning their growth and evolution rationally and objectively and anticipating the problems that come with unreasonable and unsustainable growth, defining strategies based on the sustainability of their systems and moving towards metabolism. Circular. These cities share knowledge and culture, inspire and motivate their inhabitants to be part of building a better city, increasing their sense of inclusion and participation.

Smart Cities projects have a huge impact on citizens' quality of life and aim for a more informed, educated and participatory society in social life. According to Glaeser and Berry (2006) quoted by Pardo & Nam (2011: 285), urban growth rates are parallel to education rates, stating that cities with more educated human capital are more successful in attracting more skilled and consequential labor. economic development.

The concept of Smart City began to influence Education itself and the education system. These days, we've talked about smart campuses, for example, which means universities have also joined in this big change. With the smart campus, we get huge improvements and changes in terms of pedagogical innovation, as reported by Villegas-C, W., Palacios-Pacheco, X., Luján-Mora, S.:

"A critical point of a smart campus is to create optimal learning environments with tools and academic methods that match the needs of students. With a big data architecture, this is possible through having the ability to analyze a huge amount of data from different sources, and then correlating the data and presenting it to the interested parties so that they can take preventive and corrective measures as appropriate. (…) All the systems of a university campus generate data that is available in different repositories. The acquisition mode is based on the IoT systems, which, in this work, connect to a private cloud. The implemented distribution presents the essential processing capabilities for the production workflow to establish metrics that

promote the availability, scalability, and reliability of the services. The availability of information converted into knowledge helps detect patterns in the way students learn, and what their needs are. Once these needs are met, all those involved in learning within the smart campus assume their role with effectiveness, thanks to an environment that is adapted to their needs. (…) Our proposal includes a process of transformation to a smart campus that has many advantages with respect to the responsible management of resources, considering that each action follows a process of analysis and that each decision depends on the integration of many variables. At the beginning, it can be considered that it is a system that requires many trained personnel; however, the implemented method is scalable, and it is possible to create scenarios where the results can be measurable and compared with traditional models. The potential advantages compared with a traditional model focus on the development of learning and generate comfortable ecosystems, which are friendly to the environment. The big data architecture deployed contributes to the treatment and analysis of data to such an extent that it is possible to determine the needs of each person and customize the services to suit their needs. In specific cases, where the academic activities proposed by the teachers do not conform to the student learning model, the analysis of the data allows for identifying and recommending the best activities for each student, improving learning in the community. This process, simple as it seems, is more important since, by improving learning, student dropout rates are reduced, and the academic effectiveness indexes known as the graduation rate are improved." (2019, p. 23 – 24).

The concept of Smart City begins to influence the entire education system from the most basic level of education. Indeed, Cunha et alii write the following:

"*In the field of educating the young, initiatives include: Incorporating technology into educational centers such as connectivity, devices, digital whiteboards, interactive programs, and other products that enable students to learn as naturally as they play; Integrate digital content and tools / platforms. The goal is to facilitate access to new information and enable its sharing, both among students and with teachers and parents; Manage schools and enable both student enrollment and parenting through digital platforms."* (2016, p. 85)

Today's education systems are primarily intended to accompany these changes by introducing reforms in pedagogy, increasingly including technology in education, to increasingly promote student-centered, research-based and projects. This means that we move into the so-called smart learning environment. About this concept, write Nikolov et al:

"*The International Association for Smart Learning Environments embraces a broad interpretation of what constitutes a smart learning environment. A learning environment can be considered smart when it makes use of adaptive technologies or when it is designed to include innovative features and capabilities that improve understanding and performance. In a general sense, a smart learning environment is one that is effective, efficient and engaging. According to Spector, what is likely to make a learning environment effective, efficient and*

engaging for a wide variety of learners is one that can adapt to the learner and personalise instruction and learning support. This suggests that appropriate adaptation is a Hallmark of smart behavior." (2016, p. 344)

Moreover, these new environments will be instrumental in revolutionizing education and breaking down barriers to pedagogical innovation:

"*These environments are expected to break the boundaries of the traditional learning and enable the detection of the learner's location, environment, proximity and situation. This would provide a fully contextualised learning process in order to provide learners with learning scenarios in their own living and work environments, leading to significantly better learning experiences."* (2016, p. 350)

Zhuang et al., Quoting Chin, point out that Smart Cities will be responsible for transforming the entire education system at all levels, including lifelong learning:

"*Chin (1997) stated that smart learning environments are based on information communication technology, centered on learners, and with the following characteristics: the environment can adapt to the learning style and learning ability of diverse learners; can support the learners for lifelong learning; can support the learners for their development. Koper (2014) points out that smart learning environments are physical environments, which are improved to promote better and faster learning. Smart learning environment is a high level of digital environment, and can support "easy, engaged, and effective learning" in any place, at any time, in any way, and with any pace, which can also actively provide the necessary learning guidance, hints, supportive tools or learning suggestions for learners (Huang, Yang, & Hu, 2012; Hwang, 2014)."* (2017, p. 4)

Another issue that arises about Smart Cities is the opportunity to create strong momentum with universities to bring knowledge and skills in direct connection with the development needs of cities. On this issue, Ransom (2019) investigated the European Smart Cities by selecting in a particular and more focused way eight cities: Bucharest (Romania), Darmstadt (Germany), Dublin (Ireland), Lille (France), Milan (Italy), Nottingham. (UK), Warsaw (Poland) and Zaragoza (Spain). Each city has different needs and opportunities, and each has a different history of partnership working between the university and city hall. Together they illustrate three fundamental lessons:

*"First, **universities should focus on their competitive edge**. Given limited resources and the complexity of urban challenges, universities need to concentrate their efforts on those activities and in those places where they can add most value. This includes combining insights from across academic disciplines, sharing and contextualising lessons from other cities, monitoring and evaluating progress, communicating the benefits and drawbacks of smart city activities and making use of the university estate. Second, **universities and city halls need***

***to build deep links**. Successful partnership working between universities and cities emerges from effective processes for identifying and tackling challenges. These include encouraging the activities of boundary spanners – individuals able to effectively work across sectors and institutions – and supporting secondments and jointly funded positions. The act of responding to competitions (for funding or other rewards) can be particularly effective in building and maintaining relations between different organisations. Mapping university research on urban problems and developing links with the city can spur new activity. Formal and informal structures, such as physical hubs for collaboration or forums for universities to present their research, help build deeper links. Third, **universities and cities should put inclusiveness first**. Universities have a responsibility, by leading projects, conducting research and working with partners, to ensure their work on smart cities is inclusive – meaning a focus on all people in society and the challenges they face. Staff should build effective community engagement into projects and be mindful to avoid accidentally excluding intended beneficiaries. Effective communication is critical. If universities are not aware of the limitations of new technologies, of the potential pitfalls of smart city policies and of the need to be constantly focused on inclusivity, they can end up reinforcing the exclusion and marginalisation present in cities."* (2019, p. 5).

Moreover, Ransom and the British Council define 8 recommendations divided in three areas, as follows:

*"**Short-term -** 1. **Central university teams, or heads of faculties,** should map the work they are doing on issues relevant to their city, identifying research projects, business engagement and any links between university and city staff. 2. **University leaders** should strengthen personal links with their counterparts in city hall, and incentivise staff working on particular issues to do the same. Any potential boundary spanners–individuals who are well-placed to develop new projects that involve partners from across the city –should be supported and encouraged (see part two). The **British Council**, with a presence in hundreds of cities across the world, could also convene a session for university and city staff to build links and discuss city challenges and responses, while sharing examples of what has worked elsewhere. **Medium-term -** 3. **University and city leaders** should create structures that build on personal links between the university and city hall. These should not be overly bureaucratic. Part two gives some examples of different models. An effective structure will bring in multiple universities, can demonstrate the relevant research and innovation work of universities, and give space for debate, evaluation and analysis. Jointly funded posts, secondments or exchanges between universities and city hall (in both directions) can be effective, particularly if they have a clearly defined mandate across both institutions. 4. Community participation and a focus on people from all parts of society should drive smart city work. **University and city staff** should build effective community engagement into projects and be mindful to avoid accidentally excluding intended beneficiaries (see part three). Effective communication is critical, as is building data literacy (see parts one and three). 5. **University staff** should involve students in efforts to tackle challenges facing the city (see box one). 6. International*

learning and networking across European cities has benefited both universities and city halls, and several large projects facilitating this have been funded by the European Union. The ***British Council*** *could support smaller, softer peer learning projects between (and within) multiple cities focused on specific city challenges. Programmes such as Leading Places in the UK could provide a model (see part two).* ***Long-term -*** *7.* ***City and university leaders*** *should consider physical centres of collaboration that bring staff from both institutions together, such as joint laboratories or research centres. These can encourage the mixing of disciplines, perspectives and ideas to solve deep-rooted and complex problems (see part one). 8. Successful smart city programmes balance quick, visible wins while taking a long-term perspective, recognising that effective change can be a slow and sometimes messy process.* ***University and city leaders*** *should try to adopt a long-term perspective, building flexible projects that can outlast electoral cycles and vice chancellor/presidential appointments. Developing high-level agreements and joint strategies may help, as can developing work jointly with partners across the city (including residents and industry)."* (2019, p. 26).

3. Conclusion

It is noted that there is something in common among the best ranked cities: they all have a solid school system and a well-educated population. After all, with education, the chances of better using intelligence are much greater. It is the obligation of all, society, the private sector and the public sector, to fight for the improvement of our education. This concept refers to cities that prepare for the future and plan their growth rationally and objectively, anticipating the problems that arise from the unsustainability of their metabolism. Smart Cities are not only the operating model for the future of urban life, but also strategies and opportunities to correct ever-increasing problems. Therefore, the challenge for languages, literatures and cultures is to adapt to this new social and educational context. We cannot ignore the new context surrounding the teaching of the humanities. Technology is no longer just in the classroom, it's everywhere and around us in our own cities. The city has become a huge, open and interactive school, as we have seen. Our challenge is to bring the humanities into this paradigm and combine new ways of teaching and learning with key domains such as mother tongue and literature.

As Zhang et alii wrote: "*Above all, the aim of learning environments in smart cities is to support citizens' smart learning, smart learning can provide strong support for citizens' life-long learning, which is also the key feature of self-evolution of the urban system. (…) Additionally, smart learning is an important part of the construction of smart city."* (2017. P. 19 – 20).

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