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# THE LEARNING GARDEN IN THE 21<sup>ST</sup> CENTURY: EDUCATION FOR SUSTAINABILITY AND CURRICULUM DEVELOPMENT FOR TEACHER EDUCATION

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## ABSTRACT

Issues such as depletion of the biosphere, earth's increased environmental fragility, the new demographic trend, and the necessity to feed a planet populated by billions, all these issues, will influence the science of curriculum design in the upcoming years. Task of the educational research appears to be that of looking for more effective strategies: to answer to environmental challenges i.e. include environmental education in the teacher education curriculum. Drawing upon a set of teacher education theories and practices, this study illustrates a set of possible implications of the garden on teacher education for environmental sustainability. The garden is here specifically considered a place suitable for education for sustainability and curriculum development for teacher education. The need for updating the curriculum is also an opportunity to rethink the school practices i.e. a pragmatic set of actions dedicated to human development. How integrate environmental education in the curricula? The paper will draw upon a set of additional questions i.e. Can installing a productive school garden enhance teacher preparation? Can the practice of farming promote ideas such as localism and food self-sufficiency? How to link learning gardens and urban gardens?

**Key Words:** Curriculum, Teacher Education, Learning Gardens, Sustainability Education

## 1. INTRODUCTION

### 1.1 Localism and teacher education

The garden is considered an approachable teaching tool that has a positive impact on students' development. A school garden can be conceived to be a healthy, beautiful, and meaningful space for students as well for teachers. For instance, school-based gardens can teach students healthier eating habits. On another hand, a garden can inspire the design of a new curriculum to improve knowledge of the food's nutritional value i.e. prevention, guidelines for school health programs, lifelong healthy eating, in-service preparation in nutrition education for farmers (Graham et. all, 2005). Finally, a garden can act as a magnet that brings together students of different ages.

Gardening is a practice that requires care and dedication trough time. The practice of watering and the tilling the soil, the pruning and the fertilizing of plants are activities that need to be done at specific time during the day and during the for the duration of the year. A garden that it is not well taken care loses radiance and beauty a few weeks after abandonment.



The garden offers a real situation in which one can observe and evaluate the significance of the presence of the farmer for the life of the garden. A garden always needs someone who will take care of the plants; for instance, when we leave town for a vacation, only then, we remember that gardening is a practice requiring constant attention and care. The garden is a localized place that lives and prospers after specific sets of conditions such as the lightening condition, the temperature condition, the quantity of water falling during rainy days. The farmer imposes a rational order on the lot for the garden. The zoning of the space helps the gardener to physically interact with the space of the garden. However, the garden is not only mere space. It is also the set of rules implied to design the garden. The design of the garden is constituted by a number of main steps the planting and the establishment of the garden is the first step. However, it is the condition necessary but sufficient to create a garden. Usually the landscape architect is called to accomplish this first step. The sustainability of the garden is guaranteed by many agents. Among those the farmer is the principal. However, an urban garden— or a school garden – follows under a different set of rules. This set must be recognized as a valid set for the sustainability of the garden.

## 1.2. A pragmatic approach to teacher education

There is a need to plan for linking the school gardens to a larger set of educational values. The rethinking of the school gardens as academic tools implies the merging of the sustainable education into the academic curriculum. A wide range of studies have been made stressing lacks of education policy and the necessity for curricular changes in education. Teacher education must advocate this process. Essentialism shaped the teacher profession in the 20th century (Imig & Imig, 2006). Teacher education claims autonomy in the 21st century (Zeichner, 2006; Loughran, 2007; Ravitch, 2007). Transforming teacher education through clinical practice is a comprehensive strategy to prepare effective teachers (Berliner, 2000; Kumashiro, 2010). Reorganizing teacher education is a key strategy to improve the school (Zirkle et al, 2007).

The imperative quest for teacher efficacy grows hand in hand with a change of paradigm in teacher education (Darling-Hammond, 2010; Fullan, 2010). A motivational paradigm for effective teacher can change education in the 21st century (Ashton, 1984; Weiner, 2007; Block, 2008) Emerge the necessity of rethinking the National school-system. It imposes reflections on traditional educational practices. How to prepare young teachers to face new educational challenges? The garden is considered an operating subject for teacher education's curriculum reform. The garden is an agent promoting socialization of the practice of teacher education that is centered on an analysis of urban education. Changes in teacher education ask for pragmatic responses. Training future generations of teachers require emphasizing teacher efficacy. In this sense, there is a call to develop new curricula for teacher educators.

Moreover, the garden is a place of development and encounter (i.e. humans and non-humans). The practice of learning in the garden is multifaceted. A garden is a space in continuous evolution and transformation. A garden allows a large variety of experiences and processes (i.e. experience and learning). All these aspects are an imperative part of the garden as a teaching space. A garden promotes sensorial and emotive development and phenomenological learning experiences (Barnett, 2000).

Teaching teachers in a garden is a metaphor for change. Epistemological and methodological bases of naturalistic inquiry are grounded into reality and the physical space (Guba & Lincoln, 1982). Critical pedagogy, eco-literacy, and planetary crises play a role in the debate on teacher education reform (Kahn, 2010). The pragmatic standpoint of experiential learning is at the base of the general debate on the learning garden (Gaylie, 2009; Nielsen & Andersen, 2010). Educators can explore new viewpoints on the teacher's role in the teaching practice in the garden. Teachers' educators and teacher education students both experience the surprises of the landscape and the sensation of learning in the garden.

This paper stresses the importance of the garden as a teaching tool for teacher education students. It does it by encouraging actions and practices enhancing the possibility of an extension of the notion of the academic use of the gardens. It draws upon the idea that developing a garden-based curriculum creates healthier citizens, better communities and sustained localism. It is considered a positive model for instructional design and teacher education curriculum development and sustainable education. The study is also of interest for teachers and scholars among those interested in issues such as school de-segregation, human rights and school, environmental and social justice and school. Limitations



of this study are in the extent of the topic of the research and in the relatively scarce quantity of data showing positive links between gardens, teaching education and curriculum development. More research is needed in this regard.

## **2. METHODOLOGY**

A large variety of available journal papers have been considered in this paper. This literary review focused on the subject of the learning garden. The learning garden is as space for the student teacher and curriculum development, in this review. Primary and secondary resources are used. Indirect material examined includes books and articles. A deductive, context dependent, research approach is applied. This study is based on an analysis of a number of scholarly journal articles concerning teacher education's curriculum reform. The study is strictly restricted to North America. Moreover, the article analyses authors' description of the social and the intellectual conditions under which emerge new trends in teacher education. Teacher education's reform, its function, the message it conveys, the relationship with sustainability education. Finally, the article also considers teaching reports and discussions with a large variety of stakeholders that include local residents, scholars, professionals, students, administrators and community leaders. This is considered a significant aspect of the communication and, for this reason; it was added as a part of the literary review on the specified subject.

## **3. SUSTAINABILITY EDUCATION**

### **3.1 curriculum development**

#### *3.1.1 Applying Indigenous knowledge*

The study draws upon a set of researchers' investigations focusing on specific questions i.e. the garden as a place for teacher education and for curriculum development, sustainability education as approachable teaching paradigm, sustainability education and teacher education's disciplinary identity, teacher education's legitimization in the 21<sup>st</sup> Century. Review of literature crosses different sections. I made an attempt to investigate and explore sections lingering at the crossing of the disciplines of planning and education. Specifically, I related to teacher education and implications of cultivation for teacher education curriculum development. I stressed the use of the school garden in academic instruction, use, which has been explored in recent years (Graham et al, 2005). Pre-service teaching and pedagogies of transformation are related and the garden is a place of teaching and transformation. Sustainability transdisciplinary education curricula link arts, science, and service-learning at the present days (Clark & Button, 2011). The garden is optimal for developing competencies of sustainability education (Gaylie, 2009). Bridging gardening and teacher education also implies to advocate the idea of preparing reading specialists is sustainability to become competent travelers in intricate urban settings (Johnson, 2006). Moreover, I related service-learning to sustainable education in this paper. Service-learning is an authentic teaching strategy to deliver a standards-driven curriculum (Emerson et al, 1995; Soslau & Yost, 2007). In this regard I have considered a set of specific strategies. For instance, the competent use of storytelling has showed to have a positively impacts teacher education curriculum development (Doyle & Carter, 2003). Outcomes coming from recent studies on indigenous culture have showed that minority teachers offer precious contributions to change teacher education professional socialization (Dixson & Dingus, 2008).

The relationship between people and the land is at the base of the culture of indigenous culture of environmental sustainability (i.e. lands capacity, and the cultural importance of non-human species). The practice of the use of the garden as a teaching space is a rooted in aboriginal culture and natives have much to teach about how to approach the land respectfully. The future generations of teacher education students can learn lessons of inclusion in the garden by developing a post-colonial gaze of the land. Some peculiar physical places have the power to animate the indigenous humanities in education. The garden is one of these (Battiste et. all, 2005).

Increase diversity implies include minority teachers for professional socialization. Minority teachers accumulated a great experience in working among underserved populations (e.g. African American women). Sustaining the experiences of minority teachers in teacher education reform provides a set of precious insights for teacher education reform (Dixson &



Dingus, 2008). The No Child Left Behind Act (NCLB) has severely criticized the set of traditional paths of teacher education. NCLB has called for improving the school performance of under deserved children. NCLB putted under lenses of observation the entire public school system in the United States. The idea of utilizing expertise from past experience might fuel NCLB ideology in a new way. In this sense, educational reform can offer a unique opportunity to revitalize the set of traditional teaching practices.

### 3.1.2 Sustainability literacy/illiteracy

The phenomenon of sustainability illiteracy emerged in recent decades (i.e. climate change, food insecurity, environmental injustice, and immigration policy). The school system failed to play a leading role— to form a new environmental enthusiastic generation of leaders on sustainability literacy. However, in order to accomplish this daunting task, the school needs to promote a wide range of instructional practices to support reading and writing instruction (i.e. approaches, methods, and curriculum materials).

Developing new knowledge for a sustainable development mean rethinking to how educational institutions respond to the call for sustainability. By including the idea of sustainability in the actual curriculum the search for a new educational paradigm can favor a plausible change in the field of sustainability education. A renewed teacher education curriculum can have a positive impact on teacher's development, in the near future. Sustainability and teaching are mutually connected. The learning garden is at the intersection of the set of different cultural elements and practices (see: figure 1).

Significant initiatives for the rethinking of teacher education and sustainability include initiatives relate to the development of core teaching competences for educators. Including sustainability in the curriculum can open up new venues for teacher educators among those longing to embrace new learning strategies (i.e. inter-disciplinarily, problem-based learning and community service learning. These practices come together in order to define and, to some extent: to re-frame the discipline of teacher education in the 21st century (Sims & Falkenberg, 2013). Moreover, the telling of stories of a sustainable future means consider the use of narrative as a teaching tool has gained ground in recent decades. Stories are an effective tool of persuasion.

## 3.2 The garden as a discursive space

### 3.2.1. Storytelling and conflict resolution

20<sup>th</sup> Century pedagogues showed an inclination to see themselves as controllers. Knowledge is something that transfers between teachers and students. Moreover, by changing the context of our learning spaces, teachers can learn to turn down control and learn with their students. This model of teaching does not apply to adult students who look for stronger motivations to help to solve practical and well circumscribed issues. Through stopping and slowing down: a garden has the power to deconstruct complex theories into practical arguments.

Storytelling is a practice that involves the knowledge of series of specific communication techniques (i.e. rhetorical techniques). Using the practice of storytelling in order to reinforce teachers' critical skills goes hand in hand with the introduction of new curricula for the development of the teacher education (Doyle & Carter, 2003).

Rhetoric is a practice initially developed to hand down oral knowledge in the pre-classical civilizations (e.g. Homer). The relationship between teacher and student is a dialectical relationship, according to rhetorical teaching. The relationship is based on trust and on the communication opportunities offered by the dialogue and by discourse. In this perspective, storytelling is an interesting tool to explore the curriculum of teacher education.

More specifically, storytelling (i.e. the study of cases, the writing of personal narratives) has shown to be successful in a variety of situations of teacher training. For the deepening of this theme: it is appropriate to clarify a number of key terms (i.e. curriculum, investigation, expectation, understandings, subjects, actions, and requirements). Can the use of narrative be an agent capable to reframe the practice of teacher education? How?



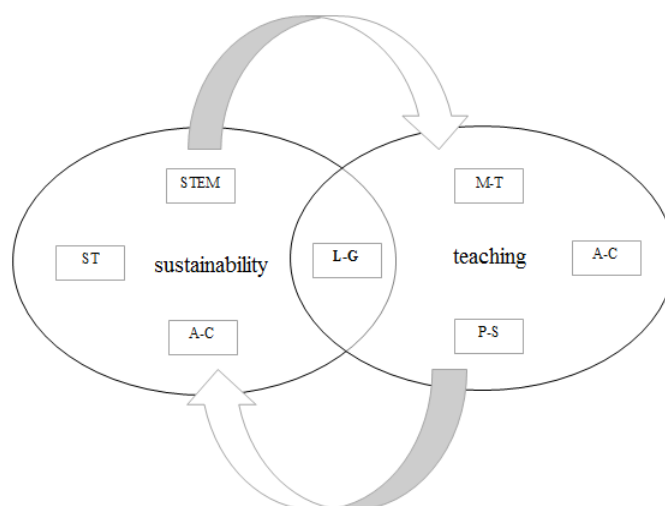
### 3.3 The garden as open field

#### 3.3.1. Inclusion, differentiation and reflexivity

Inclusion and differentiation in teacher education is an instructional practice that implies an action of countering the notion of colonial space in education (i. e. normative order, and traditional order). If from one hand, the community of teacher educators is ready to meet the requirement for the development of a more integrated national curriculum, on another hand: there are sets of limitations that slow the route toward full integration (i.e. colonized classrooms, and unilateral decolonization) (Battiste et all, 2005).

The notion of differentiation is a reaction to the idea that the North American school system still represents the Eurocentric teaching system. This system indirectly favors the reproduction of colonialism within the school system. Teacher education can play a role in the effort of decolonizing education and educator. One solution is to integrate the set of native cultural values into a new curriculum. It can help enlighten the lack of a set of pedagogical practices of decolonizing of the school. This historically marginalized indigenous population can be a key component of National Education reform. New teaching strategies need to be developed in order to collect a larger variety of voices in the research (i.e. indigenous researchers). On another hand, there is a necessity to favor dissemination of Indigenous voices. In this perspective, a large variety of stakeholders must be able to work in a close proximity to the community of teachers (i.e. Indigenous elders, families, teachers, and support workers).

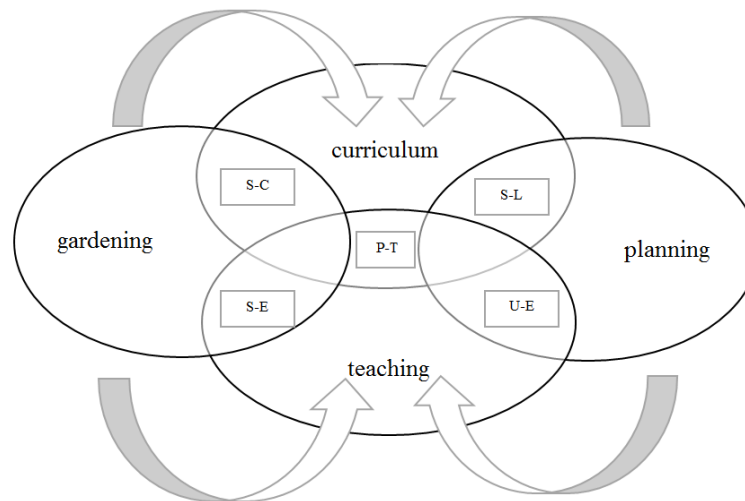
(Figure 1, Sustainability and teaching are mutually connected in this figure. The learning garden is at the intersection of the two figures. In the figure: L-G is Learning Garden, A-C is Aboriginal Culture, S-L is Service Learning, P-S is Professional Socialization, STEM is STEM Curriculum, S-E is Sustainability Education, ST is Storytelling, M-T is Minority Teachers).



(Figure 2, the pre-service teacher occupies the center of the graph. Different practices shape the figure of the pre-service teacher in the garden. Gardening, curriculum design, planning and teaching are linked to create a unique profile of student teacher. The learning garden emerges at the intersection of converging figures that express sharable values and pragmatic objectives of teacher education in the 21<sup>st</sup> Century. In the figure: S-C =



**Sustainability Curriculum, S-E = Sustainability Education, S-L = Service-Learning, U-E = Urban Education, P-T = Pre-service Teacher).**



#### 4. CONCLUSION AND IMPLICATION OF THE STUDY

Scope of this study is to investigate and explore the possibility to use the garden as a teaching tool for teachers' education. The garden is a freer space compared the urban space. What applies to the city cannot fully apply to the garden in term of coding and restrictions. The garden follows its own specific set of rules that are governed by patterns that are both cyclical and intermittent. Rethinking the learning garden as a space of emergence can open up to an unexplored set of possibility related to teacher- education curriculum development.

The quest for innovative teaching tools has been persistent in recent decades. Traditional routes in teacher education and college education have been under lenses of observation in recent years (i.e. No Child Left Behind Act). A set of options have been offered to answers these needs for change. However, these options give little attention on the nature of the populations that will enter the teaching profession in the next decades (i.e. Creative Class). Moreover, in this paper, I mentioned the constituents of a non-traditional science education model (i.e. sustainability, trans-disciplinary). Academic disciplines such as science, technology, engineering, and mathematics are grouped under the acronym STEM. It is an acronym used when describing teaching strategy and curriculum sets in schools: to advance students' eagerness in technology. In the specific case of this article: STEM curriculum indicates a learning tactic linking creative thinking, scientific thinking, and service-based learning and gardening. The sustainability transdisciplinary education model (STEM) specifically focuses on teacher education students (Clark & Button, 2011).

From a methodological approach the implementation of learning gardens for teacher education curriculum focuses on how a STEM curriculum integrates the sciences and arts (i.e. geography, environmental science, communication, art history, aesthetics, and teacher education). This approach aims to strategically linking the university to a rapidly changing society. The concept of transdisciplinary was here included in order to open academia to a deductive and context-related inquiry approach to science and technology.

Moreover, sustainability is a key word for university students in teacher education to go beyond the classroom link to a community larger than academia. Moreover, sustainability-focused courses are meant to de-segregate urban gardens such as urban public schools gardens, Museums gardens, and parks. A Sustainability-focused curriculum offers an opportunity



to physically access gardens in places otherwise difficult to access (e.g. school gardens settled in segregated and self-segregated hoods).

Role and function of the garden in teacher education is that of understandings and enhancing the human and non-human interaction while addressing issues related to natural capital's spoilage, environmental health issues, biodiversity conservation, and practical implications of the garden on both human and social development (i.e. teachers' (Clark & Button, 2011). (Figure 1, shows the privilege position that the pre-service teacher occupies in the school. The centrality of the pre-service teacher is at the base of future curriculum development. Different practices shape the figure of the pre-service teacher in the garden. Gardening, curriculum design, planning and teaching are linked to create a unique profile of student teacher. The learning garden emerges at the intersection of converging figures that express sharable values and pragmatic objectives of teacher education in the 21<sup>st</sup> Century (see: figure 2).

In the end, one can say that, changes in teacher education ask for creative responses. Training future generations of teachers require emphasizing interactions and processes rather than disciplines. In this sense, the garden is a welcoming place in which teacher educators can help developing curricula stressing empirical and pragmatic approach to teaching and learning (Johnson, 2006; Sosla & Yost, 2007). In the garden, pre-service teachers naturally indulge on sensorial and receptive experiences of the particular world in which they operate.

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