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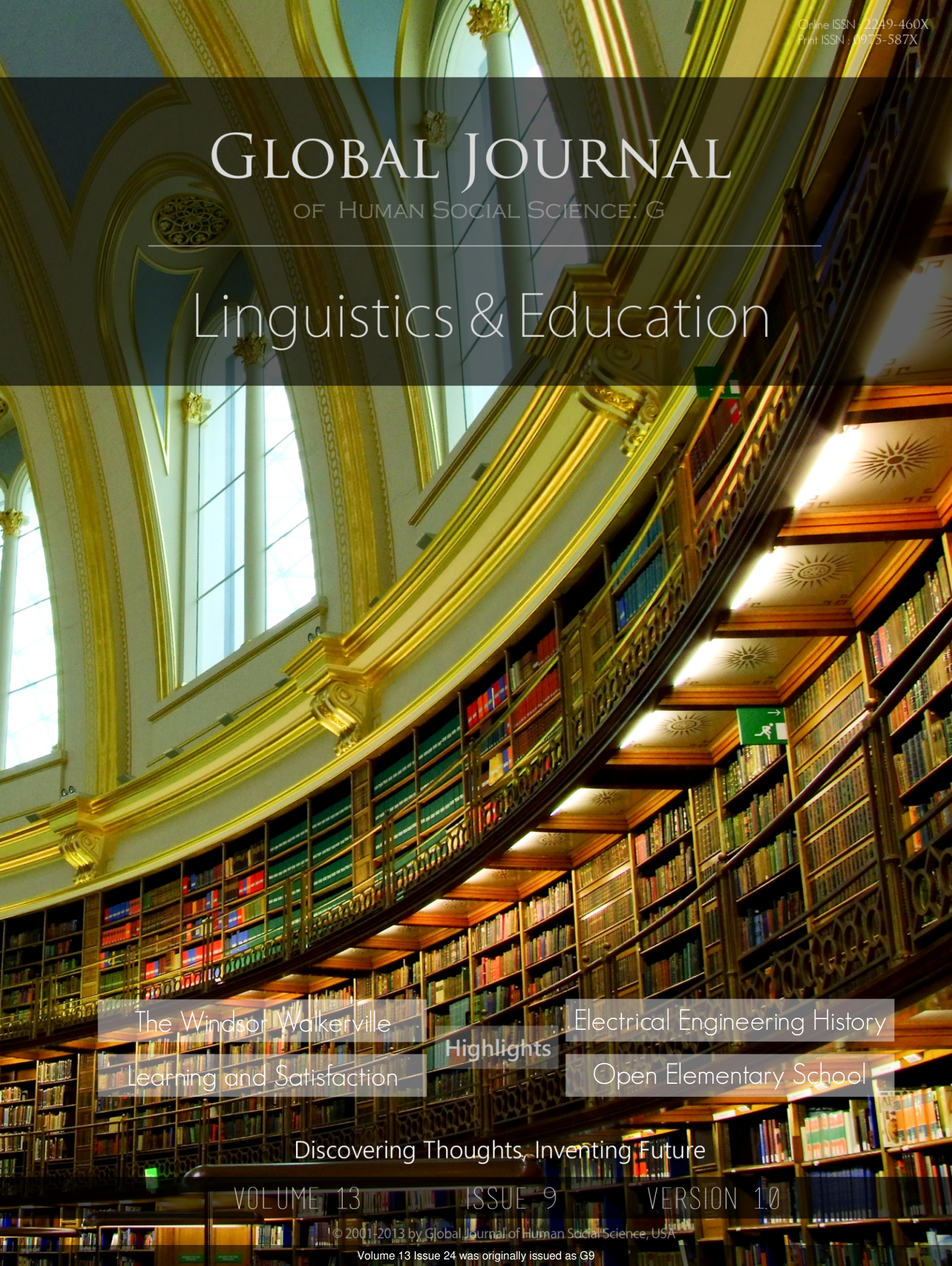

The Windsor Walkerville Learning and Satisfaction

Highlights

Electrical Engineering History

Open Elementary School

Discovering Thoughts, Inventing Future

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Education, Environment and Environmental Education

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Abstract - We cannot stop here to discuss education, assuming that this study aims to analyze their function directed to a particular group, in this case, the pedagogues. Therefore, we can rethink how and why education becomes so essential for this study, since the relationship that man establishes with the environment permeates via education. With all this education is presented as background for the construction of environmental education can be defined as a set of influences on our minds, regardless of our will, exert others, Durkheim (1978).

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Education, Environment and Environmental Education

Theóffillo Da Silva Lopes

I. Introduction

We cannot stop here to discuss education, assuming that this study aims to analyze their function directed to a particular group, in this case, the pedagogues. Therefore, we can rethink how and why education becomes so essential for this study, since the relationship that man establishes with the environment permeates via education. With all this education is presented as background for the construction of environmental education can be defined as a set of influences on our minds, regardless of our will, exert others, Durkheim (1978).

Therefore, there is many ways for education, as in Frere (1997) observed that education is a process of communion between the men and the world, that is, men are educated together mediated world. It is still known in Frere (1997) that education is a political act. Brando, in his book "What is Education?" The author states that:

Nobody escapes education. At home, on the street, in church or school, or in a way we all engage many pieces of her life: to learn, to teach, to learn-and-teach. To know, to do, and to live everyday life mixed with education. With one or several: education? Educations. (...) There is a unique way not a single model of education, the school is not the only place where it happens, and it may not be better; school education is not the only practice, and the teacher is not the only practitioner. (BRANDÃO 1981, p. 11th)

We noted then that education is, over time, something that has been analyzed theoretically by human civilization. "For the state education aims to form the citizen, i.e. equip younger basic conditions to develop citizenship." (FERREIRA, 1993, p.22). So we understand the importance of education for life, human relationships, the development of individuals, given them the ability to transform, to change the actual situations encountered in various human societies.

Based on the quotes that relate to the concept of education, it becomes clear that we should not close our eyes and believe that the educational process is present only in school, you must also believe in the program of non-formal educational intervention. In other words, education should be considered though she manifested in any social sphere. For, as stated by Carvalho (2002), the environment taken as a good, can become an ideal that can move militants, guide policies and, above all, establish a specific educational practice.

Identified, therefore, the school and the community as protagonists of environmental changes. In this perspective we understand that it is through education that we can build a just and sustainable society, and seek to value the cultural, ethical, ecological and social.

As discussed here, human relations and their interference in the natural environment, highlight the educational process as a foundation for building a society in which individuals have the competence to establish behaviors and actions that provide benefits to individuals living in a situation of environmental equity.

II. The Concept of Environment and its Relation to Education

In 1970 pollution becomes present to world levels and alert to environmental preservation becomes evident thus resulting in a real need to prepare future generations for knowledge about the environment.

The crisis that the world through is set in the environmental context, i.e. the environment itself. On a more substantive understand that Brazilian law, but specifically the National Policy on Environment in item I of Article 3, defines environment as the set of conditions, laws, influences and interactions of physical, chemical and biological allowing , house and regulate life in all its forms.

As we can see the definition of the term date of recent times in Brazilian society. In Leaf (2001), we see that concern only appeared before serious aggravating environmental example of acid rain, climate change, pollution and many other factors.

In Gris pun (2008) is pointed out that: it is necessary to extend the meaning of the natural environment to the meaning of the social environment, expanding care for the environment and the social environment, contemplating life values citizen. Including health, sexuality, family, work, science and technology, culture, languages, etc.

This conceptualization of the environment is not always plausibly understood and addressed in the curriculum satisfactorily, because the human being still mostly seen dissociated from the wild. This relationship is not far from what happens with the educational, curriculum geared to environmental education and his

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real principles are still being built throughout the educational process.

For Campos (2006), the relationship between the environment and sustainability requires education, at all levels. Concomitant to this, Campos (2006), also addresses other goals for achieving sustainability that are entirely related to social issues, which leaves in evidence the social character of environmental problems. Among these goals are: satisfaction of basic needs of the population; solidarity with future generations; participation of the population in line with Agenda 21; preservation of vital resources, and a social system fair.

This makes it clear the role of an environmental education process defined and objectified. According to Stone (2006), reorient the way humans live and educate them so that they reach their highest potential aspects and tasks are similar, both have to be seen and addressed in the context of family systems, geographical, ecological and political.

After all, as stated in Lima, *wonders and problem arises, increasingly, the contribution of the educational process in the search for answers to the multiple and increasingly frequent environmental problems*. (LIMA 2008, p. 109)

Considering that education is a continuous learning process, the same when he turns to sustainability must respect all forms of life, should consider values and actions that contribute not only to ecological conservation, as well as to human and social transformation. Such education stimulates the formation of society's criticism, just and ecologically balanced. Lima (2003) considers that the sustainability discourse has implications for education, implications these will emerge as a counterpart to the hegemonic model of capitalist development, so it is necessary so that an Education, according Baillie (2008) contributes to an interactive, participatory and critical to the emergence of a new ethic, this bound and subject to changes in values, attitudes and individual practices. (P. 328).

Therefore, when dealing with environmental education and training of teachers must understand the meaning of the key term for those who will contribute to the improvement of human global society currently required. When we talk about the relationship between the environment and education, we cannot leave out some concepts that are linked to this relationship. Concepts such as Tran are disciplinarily, the transverse, and the meeting point between these, the curriculum.

The term trans disciplinarily was first used in the First International Seminar on multi-and interdisciplinary, the University of Nice in 1970 by the then renowned Jean Piaget, it stimulated further reflection on the mutual influence between the various disciplines, without these consumed their specificities, and would, therefore, in a collaboration for a common knowledge, which is presented in a simple way, and not just to a single discipline. The result of an attitude of Tran's disciplinary methodology is presented as a way of reducing individuality and closure of disciplines. Thus Trans disciplinarily is presented as a vision in harmony with the present, in which the plurality and challenges and make gifts. We can better understand Trans disciplinarily a new attitude and not as the empire on the other disciplines but an opening of all these.

In Ashman (1998), we highlight two basic elements of the concept of trans disciplinarily: "first, it is something more than the mere intensification of the necessary dialogue between the different areas and scientific disciplines, because the question that needs to be explained is the epistemological paradigm shift, and second, the dialogue between the sciences will be deeper if there is a transmigration of fundamental concepts across different disciplines."Also according Jape assume (1992), are conditions for the occurrence of trans: the intelligent man opposed to blindness specialist understanding of complex situations; refusing any territorial nature of power by knowing; abandon the conception of a truth that would be assimilated to the pursuit of causal thing.

In short, Trans disciplinarily arises from the constant claim to apply the dialogue between different stages of learning, without fixing the domination of some over others, ensuring an attitude and a way to guide the mutual influence between professionals and their knowledge. Recommended by the National Curriculum, the Trans disciplinary bring in its essence a logic that integrates knowledge from many disciplines, aiming to exceed the boundaries of every field of knowledge.

Also recommended by Parameters National Curriculum, the transversal appeared at the juncture of pedagogical renewal movements, when theorists envisioned it would be necessary to redefine what is meant by learning and rethink the contents that are taught to students.

Tran's veracity is meant to enable the educational practice, a relationship between learning theoretically systematized knowledge, or learn about the daily life and real life issues. We seek a new way of presenting to the contents and the methodology, the point of view of the subjects. And thus, the Parameters National Curriculum (1996), suggest the cross-cutting themes to satisfy the important issues, relevant, urgent and present, from different perspectives on life every day. Egg: Ethics, Health, Environment, Sexual Orientation, Work and Consumption and Cultural Plurality.

According to Felix Guitar, trans veracity is a dimension that you want to overcome the two deadlocks, namely that of a pure verticality or horizontality simple; trans veracity tends to perform when a maximum communication between the different levels, and especially in different ways. (GUATTARI 2004, p.111)

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The curriculum then arises as a meeting ground between the complexities of the junction of Trans disciplinarily and Tran's veracity. To the letter, or rather, according to the etymology of the word curriculum, we observe that its meaning has multiple meanings such as: the act of running, shortcut racetrack. Therefore, the definition of curriculum goes far beyond what its etymology goes on because its definition is not presented as an easy task, especially for education professionals, since this term has undergone various influences and still has been appropriate, various ways in most cases, contrary to his real specifics. The curriculum brings the culture, the belief, the form of government from a particular place, and this has led to fights involving inflexible principles of education. The curriculum, according to Silva (2005), has always been built to determine effects on people.

In this perspective, the curriculum should be seen not only as an expression or representation or reflection of certain social interests, but also as producing certain social identities and subjectivities. The curriculum not only is he does. It must be recognized that the inclusion or exclusion in the curriculum has connections with the inclusion or exclusion in society. (SILVA, 2005, p.10)

Considering the above conceptualization is evident the importance of the curriculum for a particular model of education that aims to achieve, we also see that the curriculum is not presented in a neutral way, because it brings in traces its roots and nuances of the interests of a particular society . As memories and conceptions, which defines it as disputed territory, as we said Arroyo (2011)?

III. The Concept of Environmental Education

To better understand what environmental education is, let's see what it tells us the first Article of Law 9795 of April 1999:

"Process which seeks to awaken the individual and collective concern for environmental issues, ensuring access to information in appropriate language, contributing to the development of a critical awareness and stimulating confront the environmental and social issues. Develops in the context of complexity, seeking work not only cultural change, but also social transformation, assuming the environmental crisis as an ethical and political issue. "(BRAZIL, 1999, p. 1)

By analyzing the law, is notorious that it lays out guidelines and basic principles of environmental education, but also provide their fundamental goals, which would be one associated with developing an understanding of the environment in its multiple and complex relationships, involving ecological aspects , legal, political, social, economic, scientific, ethical and cultural strengthening a critical awareness of environmental issues and social incentives to engage individual and collective, permanent and responsible in preserving the balance of the environment, including the defense of environmental quality as an intrinsic value of the full exercise of citizenship.

Education involves not only the awareness and critical eye to reality, but aims at the development of citizenship. In this respect, it behaves just educating the construction of social values and the full development of their skills and their critical view of the world. In the case of the environment, is extremely valuable part of the population aware that nature is a key factor of our existence and the survival of future generations? Or as stated by Guimarães (1995) to obtain the participation of all stakeholders, students and educators, in the construction of a new paradigm that includes the popular aspirations for better quality of life socioeconomic and environmentally sound world.

Environmental education should occur in a manner related to human action and its causes; we can still understand it as a change in social values. According to the concept of Environmental Education White (2003), environmental education would be a set of educational initiatives from all sectors of society in the pursuit of environmental awareness.

In relation to the practice of environmental education, see Maturin stated that this should be:

An education that promotes: role in nature conservation and understanding as to exclude the idea of field; living with responsibility for individual and the collective; distance from any abuse. (MATURANA 1998, p. 170)

This implies that education should address learner and educator as change agents of society, which cover each other for the environmental problems of the community, as stated in Guimarães (2000). In both authors is possible to identify that the practice of environmental education can lead the individual to preserve the environment in which they live, because it shows that the human being is a being capable of transforming social reality.

The definition of environmental education in its essence brings the permanent processes of learning and training for individual and collective reflection and building values, skills, knowledge, abilities, attitudes and skills in order to improve the quality of life and a sustainable relationship of human society integrating the environment. In his words, Guimarães proposes:

"Because of this, EA has an important role in fostering the perception of the necessary integration of humans with the environment. A harmonious relationship, conscious of the dynamic equilibrium in nature, allowing, through new knowledge, values and attitudes, the insertion of the student and the educator as citizens in the process of transformation of the current environmental frame work of our planet. "(Guimarães 1995: 15th)

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According to Leaf (2001), Environmental Education brings a new pedagogy that precisely guides the education; implying concrete practices that develop in the middle, which induces transformations of knowledge from a new perception of the relationship between ecological, economic, social, which means making the environment in its physical context, biological, cultural and social as a source of learning that leads to internalize the principles and environmental values in the content, approach and practices of educational processes.

Environmental education should focus on the awareness and imparting knowledge, the promotion of values and habits, skills development, guidance for decision-making, and the search for the solution of environmental problems, as we said Perini and Briton (2006).

Baillie (2008) further defines environmental education as an educational process identical to formal education, only giving it an environmental dimension contextualized and adapted to reality interdisciplinary, linked to local and global environmental issues. Thus, this issue brings to the relationship interdisciplinary environment, society and sustainability more an assumption educational, highlighting the need for ethics education, directed, and emancipator politics.

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From "Gangs of Hooligans" to "Captains and Generals" of the Industrial Army: The Windsor Walkerville Technical School, 1923-1973

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I. Introduction

Specialized public schools which cater to populations traditionally not served well in regular secondary schools are a growing trend in Ontario. Three of the most recent schools that have been opened, or are in the discussion phase are: a school for LGBTQ youth, an Afro-centric school, and a school for low-income students.[1] Much like stand–alone technical schools, the intention behind these schools, is to offer educational space that caters more to "their" needs. In a case study of a stand-alone vocational school in Ontario from 1960 to 2006.[2] Sheryl Freeman found that "vocational schools carried inherent contradictions in which these institutions served both as agents of equality and as perpetrators of social reproduction."[3] Freeman notes that current Canadian policy trends that seek to cater to diversity seem to be extending the lives of these stand-alone vocational schools and justifying their differentiated yet second-class status as a necessity both for the system and the students. Although technical schools are fading slowly from public secondary education, understanding these separate educational spaces has very real application for current-day issues.

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Once technical secondary schools took root in the urban educational landscape of Ontario, they fundamentally changed the overall purpose and function of the provincial education system. Robert Stamp, arguably the preeminent scholar of the history of technical education in Ontario, explained the effect that technical secondary schools had on the provincial education system in the following way:

Schools must now serve [students] all alike in preparing them for occupations they are to follow. Now the school was to function less as the great equalizer and more as the great selector, selecting the most talented for the higher level jobs, and selecting from the rest those destined for office and factory employment...The academic high school would provide the captains and generals for the twentieth-century society, while the vocational courses would prepare the infantry troops for the industrial army.[4]

The Windsor Walkerville Technical School, founded in 1923, (hereafter, WWTS, later called W.D. Lowe Technical High School, WDLTS) did not fit this description. WWTS had a reputation for transforming "gangs of hooligans"[5] into the "captains and generals"[6] of the industrial towns in the Border City region, now Windsor, Ontario. Local and historical context, however, plays a large role in perceptions and expectations of technical secondary education. The stringent entrance examinations required to gain acceptance into high schools in the early decades of the twentieth century may not have been perceived as being the "great equalizer" described by Stamp. Within the context of a growing industrial town in the early twentieth century, options beyond elementary school that offered marketable skills would have been welcomed.[7] The dominance of the automobile industry and specialized parts manufacturing in small machine shops in the local area, helped to insure that WWTS was not considered any less valuable than traditional high schools or even collegiate institutes. Former principal Aitcheson remembered WDLTS as holding an esteemed position in the community:

A Lowe grad had an edge on the graduate of any other school when applying for a job in the trades anywhere in Ontario. And the boys knew it. They had a sense of pride in their school, which sometimes descended to snobbery. I recall lecturing the boys in

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assembly one day for their lordly and patronizing attitude toward students of mere high schools.[8]

The "edge" provided by WDLTS is supported in the literature as well. In all of the extensive data that Robert Stamp refers to in his work[9] it is WWTS that had concrete empirical evidence of an economic advantage, since students learned valued skills that were given preferential treatment in the local economy and job market:

Merchant [Ontario's director of technical education] ...echoed the call for the organization of education to provide better trained workers for the industries and trades. Whether the results lived up to the initial hopes is difficult to document. Merchant's successor as director of technical education [D.A. Campbell] admitted in 1927 that some schools are unable as yet to furnish concrete evidence that the purpose is being attained. The only example that D.A. Campbell could cite was the Ford Motor Company's policy of accepting into its tool-making department only graduates of Windsor Walkerville Technical School.[10]

In fact many local production shops related to the auto industry looked to WWTS to provide apprentices.[11] What made WWTS/WDLTS so successful? This question has perplexed me for many years. Growing up in Windsor, Ontario, in the late 1970s and early 1980s, I often heard stories about how excellent WDLTS was. Some of the school's accolades included having the highest departmental scores in the city in 1966[12], founding the Alpha Kai Omega fraternity in 1929 which later was recognized by the Canadian Junior Football League Hall of Fame,[13] and hosting the largest cadet corps (no. 1112) in the nation which later became the 1112 Royal Canadian Army Cadet Corps Tecumseh Windsor Regiment.[14] The stories, however, were always tempered with the sorrowful reflection that it had been closed as a technical school in 1973.[15] As a student at a vocational school, I was amazed at the pride and loyalty that the graduates of this school shared. I wished I had the same feelings about my own school, whose reputation was that it was for those students who could not succeed in regular high schools. I thought something had gone terribly wrong, but what?

After attending university and becoming a certified teacher, I found myself back in a vocational secondary school in the fall of 2002. The experience of teaching in a vocational high school stirred my interest in educational history. I began reading about the history of technical education in Ontario because I noticed similarities between the vocational school I taught in and the one I attended as a student. Much like the school I had attended twenty years earlier, the population of students at the school where I taught came primarily from poor neighbourhoods and they were often second, and third, generation vocational students. Further, most shop classrooms reflected gender divisions in labour. This similarity to my own experience, combined with the stories of WWTS/WDLTS which stood in stark contrast to my personal experience, prompted me to begin reading about the history of stand-alone technical schools in Ontario.

The literature on technical secondary education in Ontario began with Robert Stamp, who laid the groundwork for understanding how technical education emerged in a larger set of changes in the educational landscape in the early twentieth century.[16] Beginning in the 1960s, revisionist historians critiqued technical education as a way to segregate students according to social class.[17] In this same time period, feminist historians also critiqued specific courses and departments often found in technical schools, such as domestic science and commercial studies, as a way to limit the academic opportunities of female students.[18] Current trends in the literature include analysis of the individual agency of students who attend technical schools and the power students have to challenge educational structures.[19]

An historical analysis of a technical school such as WWTS/WDLTS from the perspective of a vocational student and teacher contributes to the existing literature in that it offers insight into the impact that some changes have had on this type of educational institution over time in Windsor, Ontario, Canada. This understanding sheds light on the contradictory findings noted by Freeman.[20] The history of technical education can inform policy makers in education, but a more complete understanding of how technical schools have changed over time is required. In conducting this research, I hope not only to resolve my own personal questions, but also to contribute to the body of literature on technical education which seeks to understand the ongoing social class and gender divisions that are seemingly inherent in stand-alone technical secondary schools. This research should also offer critical questions for future research on schools intended to serve specialized populations of students who are marginalized in regular secondary schools.

This study utilizes a range of sources including technical school board minutes, architectural drawings, news articles from the *Border Cities Star* (later the *Windsor Star*), photographs, local publications on the history of Windsor and Walkerville, community archives including school yearbooks, pamphlets, reunion publications and scrapbooks, local correspondence and by-laws from the municipal archives, a private publication from the Valliant Corporation, government documents including reports and legislation, and relevant secondary sources. All of these sources will be used to outline the historical factors that have shaped WWTS/WDLTS.

The Windsor Walkerville Technical School opened its doors to students in 1923. The school offered a variety of technical, pre-vocational, and commercial courses in addition to basic academic

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studies. The official purpose of the school was dictated by provincial and federal guidelines that stated that technical schools were intended to entice students not otherwise inclined to go beyond the fourth book (grade 8), and prepare students for work in various industries and business, not university. As such, provincial and federal guidelines also dictated that the courses offered at technical high schools should reflect the local economic needs of their communities. The students of WWTS went above and beyond basic expectations and were prepared to enter a variety of small production shops that made specialized parts for the auto industry. It was a school that had a reputation for turning out not only highly skilled workers but also community leaders. Eugene Durocher (the last principal of WDLTS) is quoted in the Principal's Message in the 1972 yearbook as having "become keenly sensitive to the expressions of pride and loyalty which the name W.D. Lowe evokes. This of course is not surprising since so many Lowe graduates hold key positions in the industrial and commercial life of Windsor."[21] Soon after these words were published WDLTS closed its doors as a technical school in 1973 to become a composite school, marking the end of an era in Windsor's educational system and economy. This paper will focus on the context in which WWTS was established, and how that context influenced the structures and practices of the school.

II. Historical Context

The emergence of technical and vocational high schools in the early twentieth century was part of a larger "new education movement" which represented a philosophical and practical shift from rote textbook-based learning towards education that promised to develop the mental, moral, and physical aspects of students, rather than just the academic.[22] The invention of public schools became part of a larger context in which four critical developments occurred in North America: 1) industrialization and urbanization; 2) responsibility taken for social welfare 3) institutionalization of social problems; and 4) redefinition of the family.[23] These four critical developments are central to schools because of the new role education played in what was traditionally the domain of the family. Schools took on responsibility for a portion of the social welfare and regulation of a large number of children using a method that was factory-like in its approach. Discipline and compliance were common features in large and growing classrooms.[24]

As an institution serving youth, schools were expected to address social problems through regulation and containment.[25] In the context of industrialization and schooling which now included students bound for workplaces other than the traditional professions, part of that regulation and containment had specific meaning for youth destined for manual labour. Youth were viewed as capital or valuable raw materials to be made usable by the state via high schools.[26] While prominent officials like Edgerton Ryerson were concerned about the effect that corporal punishment would have on appropriately socialized citizens,[27] those students destined for industrial work could have been viewed as most benefiting from physical discipline. Popular acceptance of the new education movement went hand in hand with acceptance of capitalism, and the differentiated school system became a miniature version of the social order.[28] Modern schooling was a project of cultural imperialism because it strived to be an efficient vehicle through which children of the poor and of racial and ethnic minorities could move from traditional to capitalist hierarchies.[29]

Since school in its traditional format would not have been the most practical option for some young men, technical schools may have had particular appeal for working class male youth. Further, labour populations were at the center of great public uneasiness just prior to federal legislation that fully supported technical and vocational high schools. High postwar unemployment was aggravated by returning soldiers, and the Winnipeg General Strike attested to the need for drastic measures.[30] In many families in which children were expected to contribute to the family income yet fell short of those expectations in the context of the Depression, part of the appeal of school for male youth was the social reinforcement they received for meeting ideal male gender roles via athletics and cadet training.[31] It was a time of defining new conceptions of social reality.[32] The proliferation of deskilled jobs in factories left those destined for employment within factory production seeking social status and personal fulfillment through extracurricular activities and education.

Mass production placed an increasing reliance on industrial machines and produced a new working-class hierarchy: Some men worked alongside machines, some men had skill enough to fix and maintain machines, some men could make tools and machines, and still others could design and invent new machines.[33] Those involved in the design and creation of machines were the new working-class elite, the new self-made-men in industrial capitalism. The emerging definitions of the new social reality at the Windsor Walkerville Technical School offered opportunities to rise within this new hierarchy, which was no doubt highly attractive to many students. In this local context, social reinforcement for male youth was achieved through the technical curriculum, extracurricular activities, and strict discipline of the school. In the broader historical context and in the local economy of Windsor, WWTS would have been an attractive school option for many working class youth.

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III. The Windsor (and Border Cities[34]) Context

The previous section suggested that the local economy in Windsor was a major reason why WWTS appealed strongly to male working-class youth. This section describes the historical context in Windsor to understand the role of the local economy. Windsor's position adjacent to Detroit, Michigan in the United States is the first important feature in understanding the local economy of the nineteenth century and early twentieth century.

Windsor's geographic location made it an important gateway between Canada and the United States, and as such, transportation routes were important in this economy. In addition to having the most paved roadways in North America[35], Windsor also marks the point of entry for all main trunk lines. A railway tunnel running under the Detroit River was opened in 1910, assisting the commercial and economic growth of the entire mid-west. This first decade of the 20th century was also the golden age of the trolley car and the excursion steamer. Ferry services for both trains and automobiles between Detroit and Windsor added to the transportation landscape[36]. A remarkable feat of engineering by William Livingstone created the Livingstone Channel which opened the lower Detroit River up for large ship navigation in 1912.[37] In the span of less than two decades, the Border Cities became a hub of manufacturing for the automotive industry in Canada. In 1903 the Ford Motor Company was incorporated in Detroit, Michigan, and by the following year, a Canadian branch plant had been established in a small wagon works on the Windsor waterfront. When the U.S. automotive industry established production plants in the Border Cities, population growth followed with attendant economic and social changes.

As the automobile industry bloomed in Windsor, it attracted people to the area. Windsor's population grew from 16,147 in 1909 to 22,077 in 1913.[38] Approximately 1,500 men were employed by the Ford Motor Company. The major automobile plants in operation were the Studebaker Company, General Motors, and the Chrysler Corporation. By 1908, Model T production was in full swing, and by 1913, assembly line techniques were being used[39]. Ford's assembly line production made cars more accessible than ever before. Assembly-line production required a new kind of talent and skill that builders in Windsor had to learn. The stereotype of assembly-line production as a well-planned and finely-honed machine was hardly the reality in the early days. The first site of assembly was a makeshift wagon works owned by Gordon McGregor. The early days of automobile assembly in Windsor are described in the following quotes:

It was a struggle, but McGregor assembled cars one-by-one with chassis and other parts ferried from Detroit, and then relayed by horse and wagon to the factory. Wrong parts were often shipped or lost, forcing McGregor to lose time.[40]

Even as production increased, the pace of activity could seem casual. In 1907 when Robert Conklin, an implements dealer from Kingsville, Ontario, dropped in unexpectedly to buy a car from Gordon McGregor, everyone in the office was at lunch. To kill time, he wandered through the adjacent shed where a few Ford cars of the B, C, K and N class were in the process of manufacture, but there was no one there either. When McGregor finally did return, Conklin ordered a Model N.[41]

The reliance on Detroit for specialized parts production was a critical problem for early assembly efforts in the Border Cities, but gaining the skills and knowledge needed to achieve independence from their parent plants in the United States was a challenge that would have to be overcome. The situation is described best in the book *Windsor 1892-1992: A Centennial Celebration*.[42] In this illustrated history, Windsor is described as lacking technical superiority in its manufacturing processes as compared to Detroit. In the early years of industrial growth, the region was protected to a degree with national policies which encouraged investment in new manufacturing for Canadian markets.

American entrepreneurs sensed opportunities in penetrating the Canadian Market. Windsor branch plants could operate at a price advantage within the Canadian market, using U.S. technology, management direction from the Detroit parent plant and many component parts produced there…The problem of such an industrial gestation is that it was not completely based on indigenous capital; consequently, a portion of the profits was repatriated to the U.S. It was not based on home-grown technology either, and therefore research, development and product innovation did not occur here. This meant that Windsor was unable to achieve a high-level technical work force comparable to that of Michigan.[43]

As the industry expanded, more parts were made in Windsor, and "by the 1920s many new manufacturers had joined in making parts and products for Ford here in the Border Cities instead of bringing in most of the parts from Detroit."[44] Ford Motor Company had taken the effort to report to the Technical School Board that they were experiencing difficulty getting trained die-makers, and had taken to training tool makers themselves in the art of die-making.[45] Slowly, small production shops also began to emerge. These small machine shops were the creative lifeblood of the assembly lines, providing innovative fine tuning to designs of the cars as models evolved and changed. Canada's commitment to technical education had changed too, putting much-needed funding in place for technical secondary schools. It was perfect timing for

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the Border Cities, which had a need for the local building and support of home-grown technical skill.

In the first two decades of the twentieth century the citizens of the Border Cities were witness to a whirlwind of change, brought about by technical innovation and skill. The skills, however, were taking on new forms. New assembly line production demanded knowledge of machines used in assembly, as well as specialized parts production. Early efforts such as the establishment of Windsor Machine in 1923 in response to the needs of the growing auto industry by providing jigs and fixtures for the Ford model T would help make manufacturing and assembly more independent from the U.S.[46] The new demands for skilled labour had a direct impact on education, which gave rise to a demand for technical education. As assembly line production was fine tuned and Windsor realized its reliance on Detroit for the technical skills needed to make specialized parts, technical education became a local issue. This local struggle for technical skill is important for understanding WWTS and the role it would play in the local economy.

The small production plants and tool-making departments at Ford Motor Company extended the life of the apprenticeship system in Windsor. Windsor had identified technical education as a way to supply small production shops' and tool departments' need for apprentices, while most other urban centres saw job training relocated from the factory or shop floor to the school.[47] Employers and students were aware that those with technical skill and business knowledge became part an emerging working class elite, but graduates from technical programs still required apprenticeship training in small production sites. These apprenticeships were highly valuable and sought after. For instance, George Dixon, a tool maker in the Canadian Ford plant in 1906, "earned the incredibly high wage of 35 cents an hour because of his skill making front axles. The average worker made 17 cents at a time when a good meal with a beer cost 20 cents and a hotel room cost 12 dollars a month."[48]

Letters from small production shops were published in the first WWTS yearbook in 1924-1925 attest to the new role the school played in the economy, particularly for the small production sites that were emerging:

We now have in our employ three boys who are graduates of your school, and we do not think we can say more than that in future we intend to make your school our source of supply for apprentices. Your boys have a good knowledge of shop practice, as well as being courteous and attentive to their work, which we feel is the result of their school training.[49]

Another letter that appeared in the same yearbook states the type of work that a graduate might get after completing an apprenticeship:

We have as you know about twenty boys as apprentices in our various tool rooms and the result of their training, we believe, has been eminently satisfactory. These boys come to us at the receptive age – they are pretty well along in mathematics and are ambitious and eager to master the running and operations of the various machines with an unpadded appetite for whatever knowledge may come their way. After two years experience with us we consider that these boys equal qualified tool makers who apply to us for work.[50]

There are 11 more letters like these in the 1924-1925 yearbooks. This tradition of supplying well-trained apprentices to the local small production sites that produced specialized parts for the auto industry (and eventually to a variety of industries worldwide) continued for the duration of time that the school remained open. For instance, Mike Solcz Sr., a graduate of WDLTS and founder of a multinational manufacturing firm, Valiant Corporation, attests to this role. After graduating, Mike Solcz Sr. took an interest in the new and emerging industry of plastic mold design:

Fresh out of High School he was able to hone his skills at Windsor's Knickleson Tool and Die. 'I believe I was the first apprentice hired there,' said Mike Sr. 'I already had a job lined up at International Tools Ltd. (ITL) run by Peter Hedgewick (also a graduate of WDLTS), and was going to start there at 35 cents an hour. I also went to Knickleson and spoke to them. They said they would start me off at 50 cents an hour. It didn't take me long to call ITL and offer my regrets, I was only 18' [years old].[51]

With strong support from local industry, especially the Ford Motor Company, the school enjoyed privileges and prestige that served as incentive to students. Publishing all of these letters in the first yearbook served to let students know about the role that technical education played in creating the industrial self-made man. Once the province had established funding for technical education, it allowed Windsor to develop the kind of education needed to thrive in the local economy.

IV. A Vision for Technical Education

At the suggestion of F.P. Gavin a principal at the Windsor Collegiate Institute in 1913, the Windsor school board began to entertain the idea of introducing technical education. With the support of the province, which had already passed both the Industrial Education Act[52] and the Adolescent Attendance Act[53], Windsor was well suited to meet the changing educational needs of the community. As early as 1913, the Windsor School Board established an advisory committee headed by F.P. Gavin to investigate the possibility of offering "industrial night classes" for both men and women at the collegiate institute where Gavin was principal.[54]

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Once the popularity of industrial evening classes was established, it paved the way for city-wide support of a new technical wing in the Windsor Collegiate Institute to accommodate day pupils.[55] The technical wing of the school was opened to students in 1917 with evening classes continuing as usual. After several years of offering night school, Gavin developed strong opinions about adolescents staying in school rather than working. He wanted to provide alternatives for adolescents in the community, but felt that day classes in particular would address the underlying problems at hand.

In the spring of 1917 Gavin presented his vision for "industrial training" in the *Border Cities Star*.[56] Gavin was deeply concerned about boys who left school in their early teens in order to work. This trend was seen as a serious defect in the social system and a waste of a national resource. Boys who were not properly supervised by the state were considered dangerous and likely to wind up in "gangs of hooligans" and would suffer from "physical degeneracy" and a "deterioration of character" which would render them "handicapped by immaturity."[57] Gavin placed the blame for these "disastrous" results squarely on the shoulders of those who employed child labour without furnishing them with the conditions for growth and training. Gavin saw employers of young boys as receiving a subsidy from the nation, while at the same time, creating a cost for the nation's educational system, since night classes were a corrective measure for the problem created. Thus, child labour had both an economic and a social cost. Gavin had seen these effects via the attendance at the night school. It was his experience in evening industrial classes that provided evidence for his argument in favour of day classes catering to young men who needed to be in school rather than prematurely in the work place. In closing, Gavin states that these boys needed industrial day classes and under the Industrial Education Act of Ontario such accommodations could be offered.

To take this point one step further, an article by George A Courtenay, Chairman and Secretary of the Technical Advisory Board, appeared on the same page of the paper to discuss the type of education needed in the community.[58] This article stated that while Windsor had not yet enforced the Adolescent Attendance Act, some educators advocated a by-law to enforce attendance by those students who would otherwise drop out of school in the third and fourth classes. Courtenay cited London, Ontario, as a town where the Adolescent Attendance Act was put to use and hence was able to establish not only technical classes but to build Ontario's first specially designed technical school. A technical school was Courtney's desire for Windsor as well. Courtenay believed that nothing short of a "Trade School" equipped with "lathes, drills and other machines" would entice the so-called "motor minded" boy to stay in school beyond the fourth book, or after finishing elementary school.

As Gidney and Millar point out, in the first three decades of the twentieth century it was not at all uncommon for many students to end their education without going to high school. Across Canada, "the average length of schooling extended from just under seven years in 1911, to eight years in 1921, eight and half years in 1931, and by 1941, ten years."[59] Without a doubt technical, commercial, and manual training programs would have contributed to the increase in years that students attended school. In Windsor, Ontario, however, it helped that assembly line production was being established and small production shops were proving lucrative as necessary support for the growing automotive industry. To compete with skilled production in Detroit, Windsor had to quickly adapt to the industrial needs of branch plants and prove that home-grown skill could supply parts and labour more effectively and efficiently than U.S. labour even in the presence of easy cross-border access to suppliers.

V. Distinguished Features of WWTS/WDLTS

During the fifty-year period in which WWTS/WDLTS functioned as a stand-alone technical school, it rallied passionate support from its students and the surrounding community. On three separate occasions the school declared itself an "all-boys school," only to have the number of girls in attendance rise again. Regardless of the gender balance, the reputation of WWTS/WDLTS was that of a tough school that served the community's promising young men best. In the words of a former teacher Pat McManus, it was a school where it was "acceptable to lose a game, but never a fight."[60] The school balanced the roughest stereotyped working-class masculinities with a style of discipline that allowed traditional school structures to coexist alongside shop classrooms. Specific historic, economic, educational, and social elements created a context that made WWTS possible. Some of the features that played prominent roles in the school include: WWTS's links to the local economy, the strict discipline at the school, the large physical presence of cadet training, the assistance of federal funding from 1919-1970, and high academic standards. Each one the features listed will be discussed in the following 3 sections, followed by a final section which will revisit the research question at hand, and discuss the application of the results of this research to current trends in education.

VI. WWTS/WDLTS Reflected the Local Economy

The Department of Education in Ontario required a city or town interested in offering technical

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education to request a government-conducted survey of the industries in the region as a prerequisite for approval and funding. As stated in 1919 by Minister of Education, H.J. Cody, "each school meets the industrial needs of the community as effectually as circumstances will permit."[61] The survey was a way to insure that the technical education offered met the needs of the community. The results of the survey would determine not only the type of courses offered, but also the scale to which they would be offered. A common obstacle for many smaller towns wanting technical education was having too small a student population to warrant building a separate school.[62] This concern was especially pressing when there was already a select group of potential students in mind, along with the type of courses most likely to entice them to attend school. In the case of the Border Cities, that select group was "motor-minded boys" who would only be enticed by courses involving "lathes, drills, and other necessary machines."[63] Night classes had been popular in Windsor since they were first offered in 1913, and the advisory committee had been advocating for a technical school for day classes since 1917. Federal legislation passed in 1919 finally presented the opportunity to acquire support for a day school. Immediately, the advisory committee began taking the first steps necessary to enact a grand plan for a large stand-alone secondary school for the entire Border Cities region, which included Ford City, Walkerville, Windsor, Sandwich and Ojibwa.[64]

At the initiative of the Technical Advisory Committee in Windsor, a commission was created. This commission included representatives of both public and Catholic separate school boards from each town.[65] After the first meeting, the commission agreed to contact the Ministry of Education to conduct a survey to determine the extent of the region's need for technical education because the federal government expected the technical school's curriculum to reflect the needs of the local economy.[66]. They requested that the Department of Education in Ontario complete a survey to determine the type and number of industries in the region. The Department of Education sent W.F. Merchant to consult with the commission about the survey, an initial step in the process of getting provincial approval for a new technical school. Merchant opened discussions with the commission by observing that having one school serve five separate towns set a new precedent. The only other case of a jointly-run technical school was the Berlin (now Kitchener) and Waterloo Technical School. That joint venture required provincial legislation to allow both towns to pass bylaws that in turn allowed for a joint technical school board between the two municipalities. The Border Cities could fashion their bylaw in the same way, and new provincial legislation would have to be passed, but it was possible. The results of the survey were presented in the minutes in very general terms. There were 75 different types of manufacturing in the region, with the majority of people (over 6,000) employed in Windsor and Walkerville.

If a city could support a stand-alone technical school, the array of potential courses a school could offer was diverse and wide-ranging, depending on these local surveys. In many Ontario stand-alone technical schools, the options included programs and courses such as: architecture; machine drawing and design; art and design; printing and bookbinding; chemistry and geology; commercial work; industrial shop work, which might include pattern making, auto mechanics, electrical wiring, carpentry, and construction; domestic science, including courses in cooking, home management, hygiene, and dietetics; domestic arts, which could include millinery, costume design, dressmaking, textiles, history of costumes; and in a few cases, agriculture.[67]

WWTS/WDLTS boasted some of the finest shops in Ontario. The foundry, the physical testing laboratory, the metal fabrication shop, and the building materials shop were longstanding features that were unique in Ontario.[68] These shops, which reflected the local economy, made the course offerings at WWTS/WDLTS more diverse than other stand-alone technical schools. As local programming at technical schools faded after 1960 curricula became more aligned with categories of standard basic skills for apprenticeships defined in the red seal trades,[69] or by Colleges of Applied Arts and Technology. The 1962 Roberts Plan expanded technology and trades programs in the high schools, transforming programming that responded to local economic needs into standard programming determined by a stream of study that locked a student into a future location of generic work, college or university programs.[70] Technology and trade options were included for all students regardless of whether they were staying in school for the three, four, or five-year programs but they were disconnected to local labour needs.[71]

The presence of the Red Seal Program, and applied post secondary institutions influenced the curriculum for secondary technical education. The reorganized programming of the time would put technical curriculum at WDLTS out of touch with the local economy at the centre of North America's highest concentration of tool and mould shops. By this time Windsor's small production shops had expanded from strictly automotive parts production to a diverse array of products such as computer castings, infant car seats, and medicine bottles.[72] Within a generation after the reorganization of education under the "Roberts Plan" local pioneers of small production shops like Peter Hedgewick, owner of International Tool & Die, found it difficult to find employees willing to learn the trade to his standards.

Peter Hedgewick was the self-proclaimed grandfather of Windsor's mould industry. After graduating from WWTS he completed an apprenticeship

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at Windsor Tool & Die. With a business plan to make moulds for plastic products, he started a one-man operation that grew into a publicly-traded company employing 1,200 people. Hedgewick trained all his apprentices in all aspects of the business, which equipped them to start their own shops. Hedgewick's training was key to Windsor's innovative and creative local economy. The variety and volume of skilled workers who knew how production worked from beginning to end and could adapt their knowledge to changing demands, made for a diverse and strong local economy. In 1984 when Hedgewick announced his retirement, he said that he "couldn't get anyone to run the place, when I left, everything fell apart, so I sold it out," closing a chapter in the history of local manufacturing in Windsor. [73] The backdrop of this story is that the type of education that gave rise to talent like Hedgewick's no longer existed.

VII. Strict Discipline

Physical discipline at WWTS/WDLTS was imposed on students not only by teachers and principals, but also by cadet trainers. Cadet corps participation came with expectations of obedience and self-discipline. Cadet training legitimated violence as a way to maintain order and control, but also valorized those who accepted physical discipline. Corporal punishment was accepted as a way to develop self-discipline, and was not merely consented to, but glorified as a means by which many male students at WWTS/WDLTS could achieve the status of "captains and generals" of the industrial army. No one modelled this understanding of discipline more clearly than W.D. Lowe himself. Lowe was the first principal of the school and remained principal for 22 years before he died. He was remembered as a:

> Strict (but fair) disciplinarian...His blue eyes were keen, searching and penetrating. I don't think anyone would care to lie to him about anything. He was a humanitarian. He cared about us – the students, and what happened to us. He expected much from us and we were inspired to live up to his expectations. We all I am sure remember him well in assembly on Wednesday mornings – up there on stage...leading us in the national anthem...when 750 voices were raised in unison to sing God save the King...we sang with gusto, abandon and feeling! We had no other choice. Mr. Lowe was up there facing us, expecting us to sing. We sang![74]

Physical discipline as a way to correct and improve student behaviour became part of the culture of the school. At the fiftieth anniversary of the school, members of the Class of '26 sang the school song with enthusiasm:

Proudly we now take our stand,
For the school we love;
To uphold her honoured name.
We will ever strive.
By our efforts to maintain
Victory over all,
We will fight with all our might
For Lowe Vocational[75]

In the record of events for the 50th anniversary, Vi Conosevitch Campbell recalled that WDLTS was a place "where we sung the anthem with gusto – or else."[76] The lyrics of the school song reflect the cultural attitude toward violence as a necessary and proud tradition. This attitude would have been supported by the long tradition of cadet training at the school.

A large part of the disciplined culture of the school was the cadet corps, which brought an honour code to the school. The official code of honour of the cadet corps 1112 stated that each cadet would...aspire to become a citizen of the highest integrity in my community. I shall strive for success in my studies, to be considerate of all persons and their property, and to achieve the highest physical, mental, spiritual and moral standards as a citizen of Canada."[77]

Cadet corps had been well established in many schools throughout Canada by the time WWTS opened. "In 1898, Ontario promised to grant fifty dollars to any school board that had a cadet corps of at least twenty-five boys. Ottawa integrated the cadets into the militia system with the 1904 Militia Act which allowed Ottawa to provide cadet corps with arms."[78] Government support for cadet corps in schools was not only about imperialism, or the practical training it might provide for future conscripts or army recruits, but also about making boys into men.[79] The decision to implement a cadet corps at WWTS could very well have been a reflection of the common belief that rifle training would improve a boy's health, strengthen his moral fibre, and add to their professional, industrial, or labour value when they attained manhood and entered into the serious business of their lives.[80] Thus, rifle training would have been an attractive feature for a technical secondary school seeking to reform so-called "gangs of hooligans."

On December 29, 1923, number 1112, the Windsor Walkerville Technical School Cadet Corps, was formed.[81] By 1928 it grew to Western Ontario's largest cadet corps, winning its first of many Western Ontario Cadet Corps Championships.[82] By the 1962-63 school year WDLTS had the largest cadet corps in the nation.[83] The longstanding tradition of male-only cadet corps came to an official end on July 30, 1975, when Canadian parliament amended the Militia Act by changing the word "boys" to "persons," thereby permitting girls to become members of the Royal Canadian Army Cadets.[84] WDLTS, however, had already admitted a female student to its ranks in 1963.[85] More than 10 years before the legislation changed, the rough and tumble boys at the school had welcomed one brave

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girl into the cadet corps' military band and highlighting her achievement in the yearbook.

The cadets didn't always practice the self discipline that was expected of them, though. John Bruggerman, or "Bruggy" as he was known then, recalled that even though WWTS had the largest cadet corps in the nation, they were still no match for Principal Lowe. Bruggy was a part of that cadet corps and remembers that:

One time we were supposed to march to Landspeary Park. We marched down Elsmere [Ave.], over to Erie [Street] and were supposed to go up Parent Avenue. Instead, the whole platoon turned down and we went to the Capital Theatre. On the Monday, Mr. Lowe called us all in and whipped the whole damn 40 of us.[86]

The discipline at WWTS was strict (as it was in many schools at the time), but so were the expectations for boys who had been a many years earlier, considered dangerous "gangs of hooligans" in the local press by F.P. Gavin.[87] A public display of disobedience like the one described by John Bruggerman had to be dealt with severely; it would have been expected. A principal who did not dispense corporal punishment for blatant defiance would have been considered weak.[88] The fact that this publically defiant group of male cadets was from a technical school particularly made corporal punishment a given. Recent research by Paul Axelrod suggests that a long history of discipline that employed corporal punishment to build durable soldiers.[89] Even in coeducational contexts, corporal punishment was profoundly gendered. Most recipients of corporal punishment were boys.[90] Further, the schools where corporal punishment was most likely to occur were technical and vocational schools.[91]

Given these findings, a group of 40 male cadets from a technical school participating in an publicly orchestrated effort to skip school to go to the movies would have left no doubt about the mode of punishment in the mind of Principal Lowe. Indeed, a technical school whose student body always consisted of more male students, and boasted the largest cadet corps in Canada would have fit the bill for an accepting environment for corporal punishment.

Although corporal punishment officially ended in 2003, it did not disappear from classroom practice without debate. Corporal punishment was a long-accepted method for dealing with behaviours deemed not acceptable in schools. Sadistic and cruel uses of punishment were unacceptable, but rule-bound, formulaic, and carefully recorded application of physical discipline was considered reasonable and potentially rehabilitative.[92] Violence was also tolerated to a degree amongst the boys as an acceptable way to solve problems and also seems to be credited with this rehabilitative function.

In an article from *The Walkerville Times,* former principal, "Scrubby" Aitcheson recalled the school in the following way:

It was a tough school where threats of "knuckle sandwiches" (sometimes brought to realization in nearby alley ways) were the order of the day. But a school with a province-wide reputation for excellence in the trades ... [and] strict discipline was part of the explanation. [The strap] could be applied for such infractions as the use of profanity. And several sharp raps on the cranium, administered by the teacher's knuckles, were the accepted method of attracting the attention of a daydreaming lad. [93]

But discipline was already waning. An edict from on high called for teachers to surrender their classroom straps. Nearly 100 per cent did. Nearly. A Board of Education mogul appeared at the class room door of Pat McManus, who taught at Lowe for [36] years, to demand that he surrender his strap."Take it away from me," replied six-foot, three-inch Pat. The strap stayed.[94]

The stand Pat McManus took was not isolated. Many teachers resisted the pressure to give up the use of corporal punishment in their classrooms. For teachers in the context of the highest incidence of corporal punishment – boys in vocational schools, the strap may have been understood as the only correction "hooligans" understand and respect. Without it, the task of transforming WWTS students into "captains and generals" of the industrial army may have been perceived as the only effective means. In light of recent research on all-boy classrooms in Windsor, Ontario, which found that boy-only environments exacerbate male violence and reinforce dominant constructions of masculinity, it is clear that at WWTS/WDLTS, male violence was perceived to be a factor in achieving student success in the classroom and workplace. And as Blake points out, once a practice is linked to masculinity, change is hard to legislate.[95] Culture like that at WWTS/WDLTS which associate male violence with elite working class success are hard to dismantle unless we can, in the words of Christopher Grieg, approach education for boys in a way that "respects different forms of masculinity and encourages boys to confront and challenge the realities of privilege, power and violence in their lives."[96] Unfortunately, when a particular type of masculinity is perceived to be as less powerful and privileged than masculinities that intersect with a middle class status, violence takes on a more important role in the construction of masculinities. In a working-class context, violence is therefore, much more difficult to give up, challenge or confront. Add to this scenario slashed funding and decreased academic standards for technical education and violence in working class masculinities takes on even more importance.

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VIII. Changed Funding for Technical Schools

After funding technical high schools for 48 years, the federal government suddenly announced that it was withdrawing from all cost-shared educational programs. This announcement was made at a federal provincial conference in the fall of 1966. The federal government explained that they wanted to redirect their efforts to supporting adult education. Minister of Manpower and Immigration, Jean Marchland stated, "We propose to take 100% financial responsibility for the adult, for the person who has left school and earned his living and now needs retraining or further training."[97] This reasoning should sound familiar: it is the exact reverse of the reason provided by F. P. Gavin in the *Border Cities Star* 50 years earlier for supporting secondary-level education as opposed to adult retraining. Gavin recognized that providing educational support to youth was a preventative measure while technical night school for adults was a corrective one. It would seem in this move back to retraining adults, the federal government reversed all of the gains made in communities like Windsor and insured the dismantling of the means by which those gains were made.

In this same announcement, the government stated that an incentive for further construction of technical schools and programs would be offered; the federal monies would be withdrawn altogether in 1970. In fact, this incentive generated a building spree which resulted in 278 new vocational schools and 55 additions to existing high schools between 1961 and 1966.[98] Under this incentive the Windsor school board built 2 more vocational high schools, Shawnee Vocational School (which I attended), and Hands Vocational School (where I taught). Neither of these schools would see a fraction of the same funding that WWTS/WDLTS had for tools and equipment in shops. Instead these schools sought funding by introducing specialized programs such as vocational departments dedicated solely to special education for students with intellectual disabilities. It is only at this point in the history of technical education that we see national support for what was suggested by research conducted on the Central Technical School in London, Ontario. Goodson and Dowbiggan suggest that educational reforms which purported to create a diversity of options for a new diverse group of students "would have the effect of perpetuating and legitimating class differences, that is, exploiting the capacity of educational systems to invest in social distinctions with cultural meanings."[99] Hence the support for the building of new stand-alone vocational high schools that would be from their founding, underequipped, underfunded, and markedly associated to academic inability. This shift in funding left little room for schools such as WDLTS to retain any semblance of the pride and honour they had generated in the past.

IX. Academic Expectations

When WWTS opened its doors to students, its principal, W.D. Lowe, provided an overview of the school in the local press. The new principal explained:

The technical school ranks as a high school. The textbooks are similar to those used in the high schools, the courses of study on the academic side are much the same, and there is the same requirement for entrance. The technical school, however, in addition to affording a general education, will give training in vocations to those girls and boys who will find their employment on leaving school in business, in industry, or in the home.[100]

Announcements like the one that described the standards of WWTS in comparison with other high schools were commonly accepted in other towns that offered technical education at the time. Gidney and Millar explain that during the interwar years, vocational schools "were in the business of completing the general education of adolescents, and the provincial programs prescribed for the vocational schools which always included a substantial academic component, with standards and course content similar to those in the academic program."[101] Even though matriculation exams, or exams required for entrance into university, were not given at technical schools, entrance exams and departmental exams given between grades insured that students at stand-alone technical schools knew where they stood along-side other high schools and students in an atmosphere that favoured academic study and standard examination procedures. Even as exams slowly began to fall out of favour in the 1930s, many schools continued to use standard testing as a way to demonstrate public accountability. In Windsor, departmental exams were conducted well into the 1960s, and WDLTS was able to boast the highest scores in the city in 1966.[102]

Under new policies for technical education after 1960, technical secondary schools became associated with students with intellectual and learning disabilities. This shift had the effect of widening the already existing divide between technical and regular high schools. In the absence of federal funding for technical education when new technical schools were being built, emerging funding sources for students with special needs served as a ready available resource for the new vocational schools. In some cases vocational schools became known as schools for "slow learners."[103] Gidney notes this shift in technical and vocational high schools status by stating that "at mid-century the term vocational school referred to one that taught craft skills to quite advanced levels and required a mix in each grade of shops and conventional academic courses. It was not a

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euphemism for a school serving 'slow learners'."[104] Freeman credits the new association of stand-alone technical schools with special education to the timing of the Roberts Plan, which emphasized "providing practical and useful education to that segment of the population whose strength lies in working with tangible things rather than abstract ideas."[105] Freeman explains that "there is nothing in the [Roberts] policy guidelines to suggest that the program should or would necessarily be housed in a segregated school. In most communities, enrolment would have warranted a separate facility."[106] And many facilities were ready and waiting, since the federal government had offered unprecedented amounts of money to build vocational schools under the Technical Vocational Training Assistance Act.[107] The combined changes to funding for technical education along with the reorganization of programming under the Roberts Plan ensured that the once separate but equal spaces of technical schools like WWTS/WDLTS became segregated spaces for students with intellectual disabilities, associating working class skill with sub-standard academic achievement. The tradition of high academic standards set at WDLTS from its inception in 1923 gave it some immunity to the devaluation of technical education in the province during its last decade. Inevitably though, the educational changes of the time threatened to sully the once-proud reputation and meaning of "Lowe Tech."

X. Conclusion

WWTS was established with a vision conceived by F.P. Gavin of remedying the social problem of boys entering the workplace at too early an age. Gavin saw that boys were often exploited by employers who would not furnish young workers with a proper education, creating a social problem for the city at large and wasting the resources of the nation. Once established, WWTS quickly built a reputation for providing skilled, hardworking, and willing apprentices to the Border Cities' growing automotive industry. In particular, it contributed significantly to the specialized parts production that distinguished the local economy from all others in North America. The WWTS's intimate connection to the local economy was a key factor in the school's documented success. The tradition of producing workers and leaders in the tool and die and mould-making industries launched the school far above the basic expectations of the provincial and federal authorities.

Just prior to WWTS's opening, W.D. Lowe outlined the curriculum in the local press. In this article, the school's purpose "according to provincial guidelines" was clearly laid out. The school was to prepare students for the workplace, not university. Students were informed that no effort would be made to prepare them for university matriculation. Further, students should not expect to gain expertise in just one area of study. WWTS would provide a well-rounded education for all, including basic study in academic, vocational, and pre-vocational courses. Those students, who had fully completed elementary school, could take a full range of academic, vocational, and commercial courses for four years, fully preparing them for various positions in business and industry and sometimes for university or further training such as teaching.

When the yearbooks were printed for the first graduating class, two university advertisements intended to recruit graduates of WWTS appeared. In 1927, one advertisement for the School of Practical Science in Toronto included the information that arithmetic, mechanical drawing, and shop work could substitute for Latin in the entrance requirements needed to get into the university.[108] Some of the girls who were graduating from the household sciences department moved on to get teaching certifications. In 1927 the Ford Motor Company established a policy that gave hiring priority to WWTS graduates in their tool and die departments. If the initial goal of the school was to transform "gangs of hooligans" into students who stayed in school a few years longer in order to gain more skills that would lead to better jobs, WWTS exceeded that goal right from the outset. Some might even say this school created the "captains and generals" of the community at the time, since its graduates included the likes of Peter Hedgewick and Mike Solcz, who went on to be leaders in the field of mold making for plastic products.

While technical schools like WWTS/WDLTS may not have been common across Ontario, the school was created with its communities needs in mind. The fact that WWTS/WDLTS made a lasting impression on its community and significant contributions to machine, tool and die, and mold making industries, makes it a noteworthy part of Windsor, Ontario's history and the history of technical education in the province. WWTS/WDLTS had at its disposal, though, many ingredients which vocational schools today do not. These ingredients include: funding for specialized equipment and cadet training, curriculum flexibility, strict discipline that included corporal punishment, and high academic expectations and standards. These are the very features credited in the local community for the schools success. As noted by Gidney and Millar in their latest book *How Schools Worked* technical programs were very expensive and as such were hard to implement in smaller towns and communities. Unfortunately, the funding that finally allowed many technical and vocational schools to be built was discontinued in 1970. Funding for cadet training was discontinued as well. Academic markers that had distinguished some technical programs were also discontinued and corporal punishment in schools had ceased. For better or worse the ingredients in the recipe

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for transforming "motor minded" boys of the Border Cities, was brought to an end.

The factors that brought WWTS into existence are gone, and technical schools have been transformed into spaces which segregate students. This lesson from the history of technical education has application to current trends of establishing separate educational spaces for specific populations not well served in regular public secondary schools. Even when a separate space is created with the very best of intentions, we must always ask one critical question: How does the separate educational space serve public educational institutions in general? In other words, by creating a separate space, are we supporting exclusionary practices in our high schools? While male WWTS/WDLTS students were successful in the local industrial economy, the school's success was limited to a select group of boys under specific historical conditions. Further, no policy, insight, rules, or regulation can predict or purposefully create that success for any group. Claims to this effect, are simply claims that a population of students is not successful in the existing structures of schools. Is it the responsibility of our education system and schools to identify the "hooligans"[109] and transform them, or to transform existing institutions which claims to offer a "well rounded education for all?"[110]

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13. Ibid. 114.
14. Many letters from local employers in the early year books document that WWTS achieved its goal of adequately preparing its students for work in the local economy. The letters are discussed later in the paper.
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Walking in the Electrical Engineering History

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Abstract - This project presents some new contributions to the science evolution concerning the Electrical Engineering. The collaborations of this project have the task to disclosure key realities that point out benefits to human society, through the applications of Electricity and its teaching. Electricity has been latent in nature and human beings have discovered and developed its potential through millenniums. Electricity utilization by ancient civilizations in the beginnings, its basic knowledge development and applications, as well as the interconnection among Electricity's shapes in nature are true examples of that and are covered in this project. Electrical Engineering fundamentals have been some keystones to state of art. The Electrical Engineering's fundamentals are base for the state-of-the-art and the Electrical Engineering well endowed teaching has cooperated for a building-up of high level professional people.

Keywords : *electrical engineering, history, fundamentals, engineering education.*

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Walking in the Electrical Engineering History

Paulo David Battaglin [α] & Gilmar Barreto [σ]

Abstract - ***This*** **project presents some new contributions to the science evolution concerning the Electrical Engineering. The collaborations of this project have the task to disclosure key realities that point out benefits to human society, through the applications of Electricity and its teaching. Electricity has been latent in nature and human beings have discovered and developed its potential through millenniums. Electricity utilization by ancient civilizations in the beginnings, its basic knowledge development and applications, as well as the interconnection among Electricity's shapes in nature are true examples of that and are covered in this project. Electrical Engineering fundamentals have been some keystones to state of art. The Electrical Engineering's fundamentals are base for the state-of-the-art and the Electrical Engineering well endowed teaching has cooperated for a building-up of high level professional people.**

Indexterms : electrical engineering, history, fundamentals, engineering education.

I. Introduction

WITH the aim to revisit the Electrical Engineering History, we will initially introduce in chronological sequence the development of Electricity knowledge and its applications by ancient civilizations in the beginnings. Thereafter, the process about development of Electrical Engineering's fundamentals will be presented as well as the history of electrical measurement instruments used in Electrical Engineering. Key aspects about the history of generation, transmission and distribution of electrical energy are presented and considerations concerning Electrical Engineering education also.

We have noticed historical facts related to Electrical Engineering have been written on technical literature concerning regional scope up to now. In other occasions, we have noticed key historical facts related to Electrical Engineering have been registered to cover about a short period of time. In order to enlarge our historical view on this subject our task is to gather key information and organize them in a timeline.

II. Beginnings of Electrical Engineering History

The Sumerians had knowledge about Electricity and conductive materials such as copper, silver and iron, around 2500 BC. They used an electro deposition process to cover a copper pottery with silver skin, as per a pottery discovered at southern Iraq and checked by German archaeologist Dr. Wilhelm Konig [1]. This recent information about Electricity applications are worthy to be written in Electrical Engineering literature, even though the electrodeposition discovery has been assigned to Galvani in 1780 AC, approximately 4200 years after the Sumerians.

The Parthian, a dynasty descendant from Sumerians, had lived in Babylon during century III BC. They had knowledge of Electricity, conductive materials such as copper and iron, insulating materials such as bitumen and dry argil, and they had built a so called Baghdad battery, Fig. 1. The batteries were found at an archaeological site in the village of Khujut Rabu near Baghdad city, by the same archaeologist cited before [2], even though the battery invention has been assigned to Volta in 1801 AC, approximately 2100 years after the Parthians.

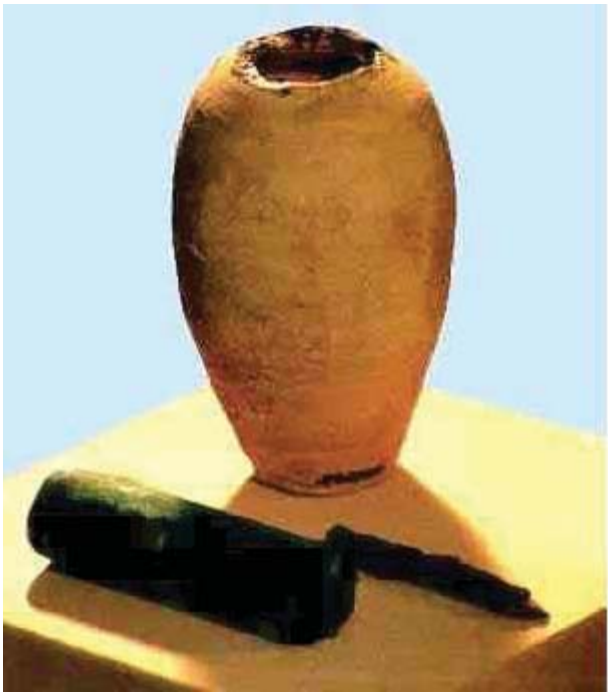

Figure 1 : Baghdad Battery

The Chinese people knew about Electricity of magnetite rock and built magnetic needles around 2637 BC, in the period of Huan-Ti Emperor. Chinese writings dated on 1080 AC· treats about magnetic compass, that is, one century before its first mention in Europe. According to the book Ming Xi Bi Tan written by the Chinese astronomer scientist Shen Kua in the XI

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Century, there were several magnetic needle types on Chinese compasses such as: floating fish-shaped iron leaf, loadstone spoon – Fig. 2, dry-suspended with a single-fiber of silk and the wet. They had built several kinds of compasses and the most used were Ssu-Nan compass during 475-221 BC, the San-He compass during 1127 BC and the Luo Pan compass which is the base of magnetic compasses used by Chinese people currently. They have also developed a technique to magnetize iron needles used to build more accurate compasses [3].



Figure 2 : Chinese compass with magnetite spoon needle

The Greek also knew the magnetite and built the Greek compass during 624-558 BC that was used on ships for navigations around Mediterranean Sea. The knowledge of Electricity in the shape of magnetism and its applications were handled by Chinese and Greek people at that time. In the same period of time Greek knew a vegetal resin called amber. When it was fractioned, it acquired the property to attract light and tiny objects according to the writes of Thales of Miletus, one of the seven sages in ancient Greece. Then Electricity in the shape of electrostatic was known at that time. Historic writings have mentioned cultural contacts among Greek and Chinese people through India during the V-th Century BC. At that time Chinese people knew about electrostatic properties of amber, because they brought it from Burma and Malaysia. Then Electricity in electrostatic shape was known in Asia. The compass was brought by Arabian people from China to Middle East and Europe, and it became useful instrument for navigation; from that time and on Electricity in magnetic shape began to be investigated. There were also contacts among Arabian and Chinese people in the Battle of Talas River, today in Uzbekistan region, during 751 AC and IX-th Century at Canton e Hangchow colonies [3].

In France during 1269, Pierre Pèlerin de Maricourt made several experiments with magnets and wrote a letter called "Epistle of Magnet". The letter was addressed to Suggerius his friend and neighbour. In this letter he explained how to identify the magnetic poles of a compass, described the laws of magnetic attraction and repulsion, and had a description of a magnetic compass that would lead people steps to cities, isles and everywhere. The vision Pièrre had and the knowledge he had forwarded to his friend Sygerus de Foucaucourt, were outstanding at that time. Pièrre had improved a compass when he laid the magnetite needle on a pivot, and placed it on the center of a compass card with several geographic directions. This knowledge was spread out in Europe and was useful during the great navigations in the Middle Age period as well as it was the basis of magnetism studies development performed by William Gilbert in XVI-th Century[4]. Then it is necessary to point out that the experiments performed by Pièrre and spreading of the results in Europe are very important, so that his name should be written in Electrical Engineering literature, even though the magnetism studies have been assigned to Gilbert in 1801 AC, approximately 532 years after Pièrre.

In England, William Gilbert had confirmed the results Pièrre had written in his letter to his friend, and he developed the concept of magnetic field spectrum in 1801. Gilbert's experiments and results were important because they helped the visualization of magnetic lines surrounding the magnetic poles of a magnet. These results were a basis of Oersted research thereafter [5]. Fig. 3 illustrates the key facts related to this section concerning Electricity knowledge development and its applications.

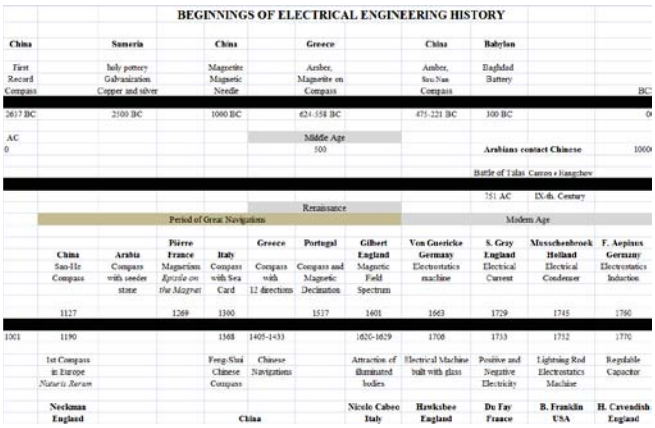

Figure 3 : Beginnings of Electrical Engineering History: 2637 BC – 1770 AC

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III. Fundamentals of Electrical Engineering

During the period of XVIII-th and XIX-th Centuries, scientists and inventors in Europe and in North America were geographically closer than Greeks, Arabians and Chinese people in the beginnings; beyond that they had some faster communication methods than in the beginnings such as ships with improved magnetic compasses, electric telegraph and telephone. In this way, experiments and inventions results were disseminated throughout scientific environments at this period in Countries such as Germany, Croatia, Denmark, Scotland, United States, France, England, Italy and Russia with more efficiency. Consequently, these two aspects (shorter geographic distances and faster communication methods) contributed to speed up the development of Electricity knowledge and its applications.

This development through millenniums up to this period of time showed expansion of knowledge and its applications concerning the different shapes of Electricity like Electrostatics, Electrodynamics, Magnetism and Electromagnetism. These are Fundamentals of Electrical Engineering [6].

In the cited period of time it has been a development concerning mathematics modeling of phenomena Electrical Engineering has dealt with, these are the Descriptions of Electrical Engineering Fundamentals such as the Maxwell's equations. These equations have a broad reach and were developed at the end of XIX-th Century. [7]. The Fig. 4 illustrates a Maxwell's picture.

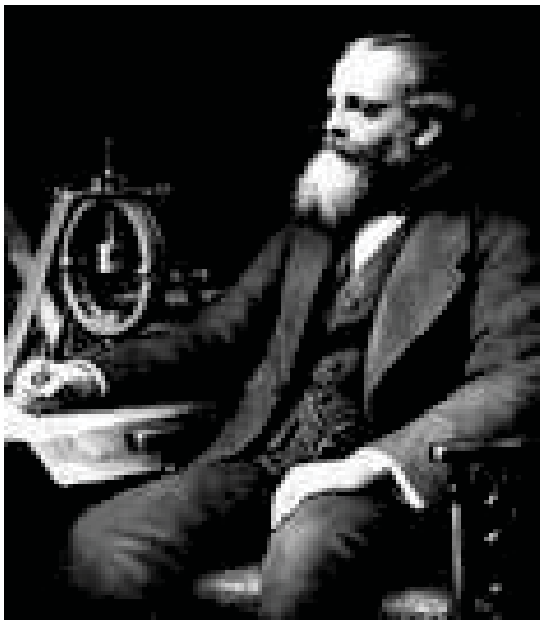

Figure 4 : James Clerk Maxwell

The parameters used in Electrical Engineering have been named along history and their names were assigned to celebrate inventors and researchers' International Committees with members from several Countries have gathered these parameters along of time as well as their units respectively, and have inserted them into the International Systems of Units or SI. These parameters and their descriptions are Fundamentals of Electrical Engineering [8].These fundamentals have been developed and used deeply over the last decades and new inventions and new discoveries are based on them. These results have been applied to products with the highest level of development which we know as state of the art. Some outstanding inventions in the period covered by this section are: direct current generators, telegraph, electric incandescent lamp, radio, telephone and alternating current system. Some outstanding inventions in the XX-th Century are: electronic vacuum valve, semiconductors, integrated circuits, television and electronic computers.

The Electrical Engineering Fundamentals' process of development presented in this section and its development in the following Century are illustrated in Fig. 5 and 6. The Fig. 7 illustrates a Faraday's picture.

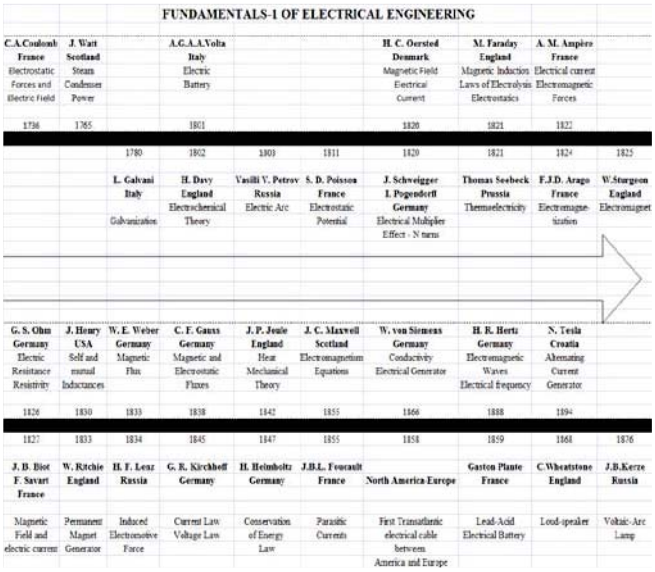

Figure 5 : Fundamentals of Electrical Engineering: 1785-1876

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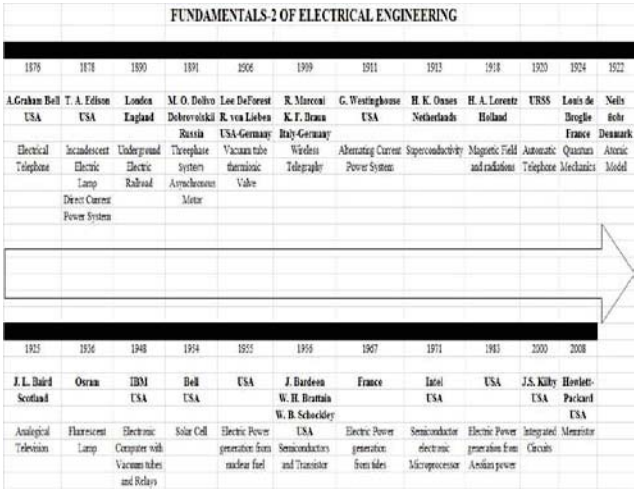

Figure 6 : Fundamentals of Electrical Engineering: 1876-2008



Figure 7 : Michael Faraday

IV. Electrical Engineering Measurements History

Electrical Measurements is a knowledge area of Electrical Engineering that will always demand research and development with the aim to improve its quality on applications which need information processing. Modern techniques have been developed on Electrical Measurements and they have been given a significant contribution to get the best design solution. From XVIII-th Century up to now there have been huge developments of electrical measurements theory, measurement methods and quality concept of measurement which have been put on the electrical instruments [9].

Electrical measurement instruments were called electrometers and electroscopes in the XVIII-th Century. Some of them were designed and built by scientists such as Musschenbroek (Leiden Jar), Lichtenberg (Lichtenberg's camera), and Coulomb (Torsion balance and Proof plane), who evidenced these instruments were concentrated in the Electrostatics area of knowledge.

The quantitative experiments performed with Electricity and its effects on bodies electrically charged allowed the scientists to establish Electrostatics units of measurements. For instance, it was established the unit of electrical charge measurement and it was called Coulomb some time later.

Electrical measurement instruments designed and built in XIX-th Century by scientists such as Poggendorf and Schweigger (galvanometer multiplier), Thompson and Harris (Quadrant Electrometer), D' Arsonval and Depress (moving coil galvanometer), Ohm (electrical resistance coil), Wheatstone and Thompson (bridge of resistances) and Ampère (differential galvanometer) gave their contributions on Electrodynamics measurement area or Electrical Current [7], [10].

The amount of Electricity (common used word at that time) that flew through an electrical conductor was measured. Based on experiments and this kind of measurement it was possible to establish a scale of intensities for a meter of Electricity flow by unit of time. The amount of

Electricity flow by unit of time was established and it was called Ampere some time later It was possible to establish the difficulty an electrical conductor offered to Electricity flow, that was called electrical resistance, as well as it was possible to establish electrical unit of measurement for this parameter. For instance, the electrical resistance unit was established and called Ohm some time later.

The Alternating Current was discovered at the end of XIX-th. Century as well as scientists and inventors' attention were concentrated on electrical meters design development and building, concerning this new type of electrical current. Some outstanding scientists and inventors of alternating current meters are: Oliver Shallenberger (voltmeter), Maxwell and Wien (Impedance Bridge with resistance, inductance and capacitance), Galileo Ferraris (Electrical energy meter). Wattmeters and frequency meters were invented in this period of time also. These meters were introduced in Standard Laboratories and Electrical Industry at XIX-th Century end [11].

In the beginning of XX-th Century some components of electrical meters were replaced by electronic circuits with vacuum valves. Thereafter, several components of electrical meters were replaced by electronic devices gradually and these instruments' accomplishment and accuracy were improved.

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Electronic methods of measurements were implemented and have shown they were more accurate, fast and flexible in measuring on experiments than those measuring obtained by electromechanical meters before.

In 1971, semiconductor components were invented and new technologies were included in the electrical measurement instruments especially on the sensors that detect the signal to be measured.

We have noticed scientists concern of electrical measurement meters accuracy that was used during their experiments, because scientists were searching for a real measuring of the parameter under observation.

The improvements made on the meters, the Establishment of standards of measurements, the design and build of calibration instruments and the creation of the International System of Units – SI – they were very important results and they were very important answers to that search for accuracy in measurements.

When solid state technology was invented and it was added to circuits of electrical meters some decades ago, a high improvement of performance was reached concerning detection and processing of electrical signals, and cost reduction as well.

There are several applications on which electrical meters are used and they are connected to transducers. In this way, any physical parameter can be measured. However, there are natural phenomena not measurable yet, due to the lack of appropriated electrical meters. Therefore, the electrical measurement area requires research and development.

The subjects covered in this section and other meters used in Electrical Engineering are illustrated in Fig.8.

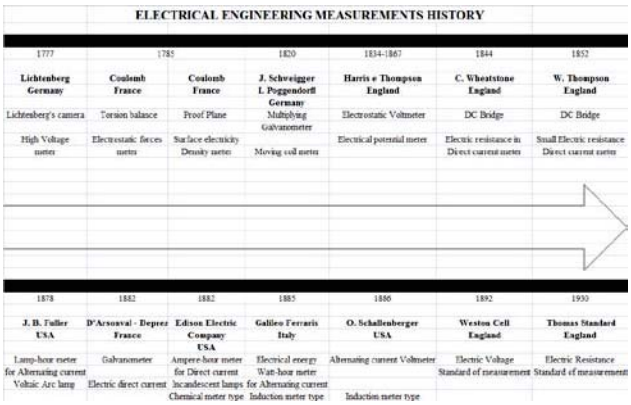

Figure 8 : Electrical Engineering Measurements History 1745 - 1930

V. Electrical Energy Generation, Transmission and Distribution History

The first electrical power systems in Europe were installed in the XIX-th Century. The first electrical generators were galvanic cells which generated electrical voltage and current with direct current shape. Physicists and Chemists who lived in the first part of that Century, they worked with galvanic batteries and built devices and electrical measurement instruments that were fed by these batteries. They were also intended to design and build an electrical direct current generator with more power.

The best result with electrical D.C. generation and transmission was attained through the Thury system in 1889: 4.65 megawatt was generated and transmitted at 57.6 kilovolt line from Moutier to Lyon, France. The distance between these cities was 180 kilometers. [12]

In Brazil the first D.C. system with generation, transmission and distribution of electrical energy was installed in Diamantina, Minas Gerais State, in 1883 [13]. In 1887, in the United States of America, Nikolas Tesla established a contract with George Westinghouse. Tesla had shown to American government the advantages to implement an alternating current system as well as suggested this system to be adopted as a standard for generation, transmission and distribution of electrical energy. Thomas Alva Edison was against Tesla's proposal, because Edison had supported a direct current standard for electrical systems. Tesla was a former Edison's employee in France and he was transferred to Edison's Company in the USA. In Europe Tesla worked with several scientists and inventors; among them are Galileo Ferraris in Italy,

Who was developing a theory for biphasic electrical motor and Mikhail Dolivo-Dobrovolskii in Russia, who was developing a theory for induction polyphase electrical motor [6]? The alternating current induction motor is the electrical machine most used in the world. In 1888, Tesla received the patents of a polyphase electrical system with generators, transformers, transmission line and alternating current motors. George Westinghouse bought the patents from Tesla and became the first innovator to introduce the first alternating current system in the United States. The first electrical power station with alternating current, in the United States, was built in Great Barrington, Massachusetts. A large hydro-electric power station was built in Niagara Falls, New York, and it was an extraordinary result at the end of XIX-th Century, in 1898 [14].

In Europe, in 1891, a triphase transmission line was built with alternating current for the International Electrical Engineering Fair in Frankfurt, Germany. The power station had an electrical generator built by Braun. The voltage generated was elevated by an electrical transformer at 15 kV and the energy was transmitted through a line of 170 km long up to the Fair; another electrical transformer lowered the voltage at 113 volt and fed an induction alternating current motor of 75 kW; this motor was connected to a water-pump [12].

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These electrical systems cited were the first steps for the development of a large power stations, transmission lines and distribution circuits, such as the ones we have today.

The subjects about generation, transmission and distribution covered by this section and other key information of this matter in XX-th Century are illustrated in Fig. 9.

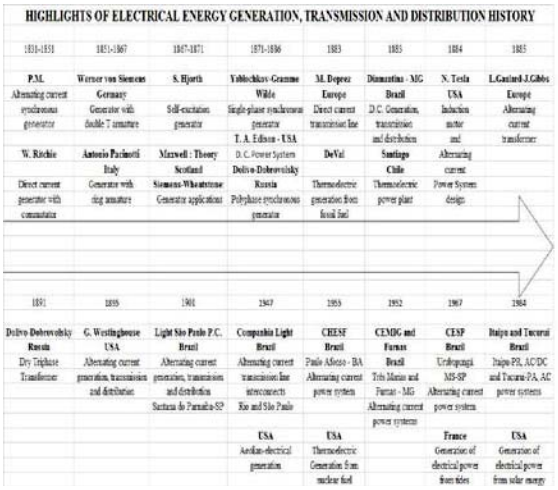

Figure 9 : Generation, Transmission and Distribution of Electrical Energy – 1831 - 1984

VI. Electrical Engineering Education History

At the XVI-the Century disciplines like physics, chemicals, mechanics, mathematics, arts, law, medicine, etc were offered in universities like Genoa, Toulouse, Colonia and Oxford. Scientists and inventors were Academy of Sciences' members in their Countries. Some became visiting-members in Academies in other Countries [6].

In the Industrial Revolution of XIX-th Century, Electricity applications were electrical installations and equipments, and they required specific designs to be manufactured; they also required to be tested, installed and have some maintenance. These requirements determined the beginning of Electrical Engineering formal education that occurred in parallel with manufacturing electrical industry of wires, lamps, telephones, telegraph, motors, trains, etc. This industry required well-trained personnel on specific skills and activities. The origins of the formal education in Electrical Engineering are based on disciplines called optional or autonomous offered by Schools and Universities. They were related to "Electricity applications" and were inserted in curriculum offered by Physics Departments and Engineering Departments.

In order to fulfill the market needs the Cole Poly technique de Paris in France started offering these disciplines in 1797. The Massachusetts Institute of Technology in the United States started disciplines at Physics Department in 1882. In 1901 the Escola Politécnica da Universidade de São Paulo in Brazil created a discipline called Electrotechnic, and the University of Xi'an Jiao tong started an Electrical Engineering in China, in 1908 [13], [15], [16], [17].

Since that time universities were created all over the five continents. They have offered a fundamental curriculum of Electrical Engineering and disciplines related to specific areas of this knowledge also. These specific disciplines depend on local context where universities are located.

The teaching techniques have been improved within Electrical Engineering courses, and have progressed so forth the education learning level of students in graduation courses. This improvement has also motivated students to go ahead and enroll in post-graduation programs and to aim an academic profession for their lives.

The topics mentioned in this section and other key information about Electrical Engineering education in the world is illustrated in Fig. 10.

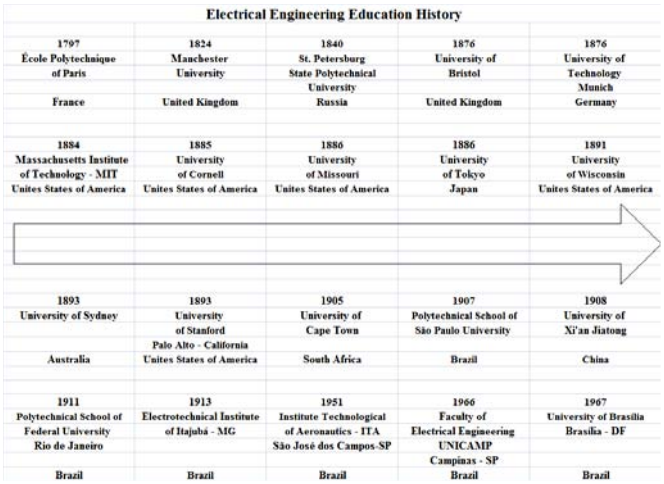

Figure 10 : Electrical Engineering Education History – 1797 - 1967

VII. Conclusions

Based on the sections presented in this paper we believe that an improvement of Electrical Engineering teaching at graduation level can occur, concerning the formulation and implementation of these two proposals [18], [19]:

1. Creation of a discipline called "History of Electrical Engineering".
2. The purpose is to create a discipline at each Electrical Engineering College in the five continents in order to motivate students to fond this Engineering graduation studies.
3. This discipline may have a program to increase graduation students' comprehension about historical process of Electrical Engineering such as presented in this paper.

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4. Creation of an "Electrical Engineering Museum".
5. The purpose is to create a museum at each Electrical Engineering College in the five continents in order to motivate students and local community to fond this Engineering history.

The creation of a special place to preserve, study and show to students as well as to local academic community a collection of scientific works, cultural assets and technological developments such as we can see in some cities in the world.

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The Formation of the Pedagogue and Environmental Education

By Theóffillo Da Silva Lopes & Francisco José Pegado Abílio
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Abstract - It's the Greek scene is born early indications of Education through Plato, considered the first teacher for believing in the formation of wise guys, always instigating the unrest of knowing and valuing the human. We realized how old is thinking about education and pedagogy won numerous contributions to the present day. New concepts were incorporated into the ways of teaching. The ways to achieve the human faculties are studied to this day.

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The Formation of the Pedagogue and Environmental Education

Theóffillo Da Silva Lopes [α] & Francisco José Pegado Abílio [σ]

I. Introduction

It's the Greek scene is born early indications of Education through Plato, considered the first teacher for believing in the formation of wise guys, always instigating the unrest of knowing and valuing the human. We realized how old is thinking about education and pedagogy won numerous contributions to the present day. New concepts were incorporated into the ways of teaching. The ways to achieve the human faculties are studied to this day.

In a wider context of political and social aim Frere (2005), which advocates a liberating pedagogy that combines the teaching of the student relations with the world, with its cultural context, so that the individual is perceived as part of the change process both its reality as the reality of society, since they are placed in the context of a particular culture.

Pedagogy began to develop in the nineteenth century and has, according Lebanon (1998), as the science that has the social practice of education as their object of research and professional practice, namely, that aims to investigate the educational process that may be present - provided it is intended - everywhere, whether at home, at school, in an organization, the company, in other environments.

Also according Lebanon (1998), the formation of the educator in Brazil got its start around 1939, when the first class was regulated course of pedagogy. Such training provided for the Bachelor of Education at that time known as "technical education / educational issues."

With the laws that came to support this professional. Until modern times, since the time of the creation of the course, were granted three versions of the Law of Guidelines and Bases of National Education. In 1961, when it appeared the Law 4024/61, which allowed access to the upper level for the current high school graduates, in 1971, when it appeared the Law 5692/71, with the task of updating the old standards, in 1996, was enacted Law 9394/96, which sought to modify the Brazilian educational system in order to regulate the profession both in the training of teachers, the school management and the areas of curriculum.

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a) *We also found in Article 62 of the Law of Guidelines and Bases of National Education*

The training of teachers for working in basic education will make will be at a higher level in the undergraduate course, full degree, at universities and institutes of Higher education, admitted as minimum

Qualification for the practice of teaching in early childhood education and the first four grades of elementary school, offered in the middle, in normal mode.

This article of the Law of Guidelines and Bases of National Education shows clearly and coherently, which are the fundamental requirements to work in basic education, curbing any pedagogical practice either as a teacher or educator to those who have no training in pedagogy.

Beyond the Law of Guidelines and Bases of National Education, on May 15, 2006 the National Education Council - Full Council, awarded the CNE / CP No. 1, establishing the National Curriculum Guidelines (DCN) for Undergraduate Education defining principles and conditions for teaching and learning procedures to be followed in planning and assessment bodies of educational systems and institutions of higher education in the country.

We can therefore understand in general education as science education, i.e., education level both in its theoretical and practical, and also as a prerogative, improving the learning process of individuals, through reflective practice, the systematization and knowledge production.

b) *We understand for pedagogue second Lebanon 2009*

I therefore consider that the formation of this teacher to perform activities of educational research, this pedagogue who may act toward school, coordination, planning and educational evaluation, educational computing, communication and media production, instructional materials, management of special education, business pedagogy, cultural events, educational psychology, etc.., I mean, that characterizes the educator strictly speaking, the expert must be formed in a specific course, and by the end qualifications.

Thus according to their education, educator, teacher can act since the first grades of elementary school I and II, with his license, but also can guide,

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encourage, research, coordinate, plan, teach, manage, share, methodologies focused on environmental issues. Since being inserted into this professional current cultural context, be it working in the school, company, or other institution does not cease to be faced with environmental problems characteristic of modern societies in whatever area.

Pedagogy has been presented before as a social science connected with various aspects of society and the educational standards of the country, whose purpose would be to solve by means of studies and teaching practices, issues related to teaching and learning process.

c) *In other words, it comes from the aspect of majoring in Pedagogy, Article 3 of Resolution CNE / CP No. 1, says*

The student pedagogy work with a repertoire of skills and information comprising plurality of theoretical and practical knowledge, which will be proportionate consolidation in the profession, basing on the principles of interdisciplinary, contextualization, democratization, relevance and social relevance, ethics and sensitivity affective and aesthetic.

The above passage clearly talks about the aspects which pertain to student pedagogy, making clear the need for plurality of knowledge, and, in addition, be based on interdisciplinary principles and social relevance.

The professional pedagogy is enabled to meet the demand of socio-character non-formal and informal, can thus act in schools, social movements, business, education of youth and adults in educational psychology services in non-governmental organizations, projects, among other functions.

According Lebanon (1998), Pedagogy of the student knows the next scientific and philosophical education, and acquire theoretical and practical knowledge of its performance, so in correspondence, the course is divided into three areas: scientific knowledge and philosophical education; Knowledge specific activity, and technical and professional knowledge.

Related to the real functions in which should be able to graduate in pedagogy, we have provided the CNE / CP No. 1 of 15 May 2006, Article 5:

II - to understand, care for and educate children from zero to five years, in order to contribute to its development in the dimensions, among others, physical, psychological, intellectual, social;

IV - to work, in school and non school in promoting the learning of subjects in different stages of human development at different levels and modalities of the educational process;

XIII-managed institutions participate in planning, executing, monitoring and evaluating projects and educational programs, in school and non-school settings.

These aspects of the formation of the pedagogue already reveals a profile of a professional that has at its core characteristics solicitous to the real meaning and education, which are either embedded and contextualized with the environmental dimension and the socio environment in which it operates.

II. The Importance of Environmental Education in Training Pedagogue

"The intention of qualifying to differentiate the proposed environmental education in society is to unveil the ideological appropriation to them by dominant groups. This so you can to align them, in fact, with the completion of environmental education practices in the critical action on the social process enables the formation of citizens committed to the issue of environmental quality. "(Guimarães, 2000, p. 67)

Lay argues (2006) states that environmental education first of all, is education, and that this is an unquestioned assumption. Based on this assumption and the need to differentiate qualify for the proposed Environmental Education, and then comes the figure of environmental educators. For Carvalho (2002), it overlaps in the midst of a historical movement that has highlighted the environmental issue as a field of political-pedagogical action.

This perspective of pedagogical action and reflection on practice is an activity that sees education as critical, that is caring for autonomous development and emancipation of all those involved in the process (ZAKRZEVSKI & SATO, 2001).

a) *About this flagship training teachers in affirms Paranoid*

'The craft teacher may only have access to the reflective paradigm to follow the same itinerary critical, as never passed on a large scale, by the ghost of a practice "scientific".' (Paranoid, 2002, p. 15)

We can thus understand the difficulty of the many professionals who are cast in professional practice in each period. Paranoid continues to emphasize that the reflective practice is complex and at the same time it is:

To broaden the scientific practice, where they exist, and fight ignorance still very wide of the humanities, psychology and, above all, the social sciences;

Not to mystify and to develop training courses that articulate scientific rationality and reflective practice, not as sister's enemy, but as two sides of the same coin. (Paranoid, 2002, p. 16)

With in this context we understand that the absence of reflective practice on teacher education brings remnants of its roots in an academic understatement experienced in society in general.

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It is currently consensus that diverse knowledge is not sufficient to address the complex world and the diversity of situations in our daily work. We seek to reflect on the new forms of exercise of our profession. With this real situation, it is necessary to train a professional reflective practice, which extracts knowledge through experience imposed on him every day, i.e. the reflection in action and on action.

In this sense says Frere (1996), the teaching practice critical thinking tease the right, involves dynamic movement, dialectical, between doing and thinking about doing. Therefore, we understand the importance of reflective practice linked to teaching practice.

Even on this knowledge necessary to face the complex world, in which we live, Morin (2001), presents seven indispensable knowledge for future education. Which cites: introduce and develop education in the study of mental traits, cultural, psychological and human knowledge; develop the natural ability to locate all the information in a context; highlight the indissoluble link between unity and diversity of all that is human , knowing the planetary destiny of mankind; teach principles of strategy for overcoming unforeseen; demonstrate understanding as long, middle and end of human communication, and contribute not only to the awareness of our Earth-country, but also allow this awareness will translate into willingness to perform the earthly citizenship.

Morin evidence thus an intrinsic relationship between education and intimate, and the awareness that this same translates into recognition of our role in the effects of the Earth. Among such knowledge is notorious relationship with the environment in such terms as: identity and citizenship earthly planetary destiny. With this it is hard not to say that an education of the future will not permeate the environmental dimension in the training of individuals.

This knowledge, this reflective practice, understanding of environmental inserted directly in education, cannot be detached from the training of teachers, which in turn, will be the educators who will form multipliers of this planetary consciousness.

Thus, the vision of a good environmental educator anchors itself in the formation of this professional. That, unlike monitors and environmental activists, lacks independence and critical independence, while education policy, formed, forming and shaping as the educator himself (CASCINO, 1999).

This process, this autonomy and independence, not to make different teachers as educators and teachers who are too. In previous work we can observe the realization of the need for environmental education in teacher education (ROSA, 2003), or within strategies for Environmental Education, is the awareness and training of teachers, which in turn transmit the same to the learners (SILVA, 2000).

We can also observe in other works is a perception of the need for various aspects that are intrinsically linked to the school, where it overlaps the pedagogical practice and professional development of educators, Environmental Education for good (PEQUENO, 2001).

Clearly, the importance of proper training of professionals, as agents capable of intervening effectively and consciously placed on the environmental dimension in education. For this, one cannot forget the medium to which everything happens, the university, which is formed and is formed.

According to Santos (2005), university knowledge should be presented in a trans disciplinary way that, by its context, requires a dialogue or confrontation with the various types of knowledge.

Returning the basis of this research, we observed that the formation of the educator has an intrinsic relationship with the whole process of university knowledge and reflective practice.

The research described here aims to contribute to a better understanding of how the university is actually contributing to the formation of the pedagogue, associated with the environmental dimension.

What we can see the extent of the inclusion of environmental education is that it would be necessary to reflect on the role of the university as an institution, should take place where an inclusion of the environmental dimension in the curriculum, which comes to involve the practices of social agents: both teachers, the students, the community, etc.. It is also relevant to examine the philosophical and epistemological principles that underlie these proposals.

The design of the environmental dimension in education can only be understood and worked interdisciplinary is almost a consensus, but it is still somewhat experienced in educational practice.

Morin (2001), complexity is a term that means a web of elements that come together and form a whole. We can translate this concept to education, and to understand that everything should be inserted: the subject, the context, history, consciousness and so on.

If everything is a huge complex system, we note that environmental education is also part of this, and should be addressed in various fields of vocational training company. As ratified in paragraph 1, section VI of the National Plan for Environmental Education, which states: *"To promote environmental education at all levels of education and public awareness for the preservation of the environment."*

The training of the various sectors of society brings in its scope; the difficult task of becoming consistent with the practice exercised and be relevant to the post - modern world. The formation of the educator is not excluded that universe, and makes a thoughtful educational context necessary to society, in general, significant.

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Thus, environmental education in teacher training should present itself as a permanent educational process, continuous, comprehensive, and socializing and generator of internal transformations of man in its multifaceted interrelationships with the environment.

As already mentioned, the National Curriculum approach to environmental education as a cross-cutting theme and indispensable role in the transformation of environmental awareness. For this purpose, it is necessary a change of mentality, aware of the need to adopt new habits.

Thus, it must be designed, an education committed to environmental issues, which favors not only the human species but the planet as a whole, realizing that the man only exists if the planet itself exist. In this respect, only exist full conditions of life for present and future if each individual has a responsibility to human, social and environmental.

In light of these reflections, the university should prove attentive, since the individual is not only endowed with technical knowledge for a profession, but also get sufficient training for socio-environmental fair and equitable. Thus, it is essential to consider the undergraduate space for this new thinking of educational action, as well as of their own curricula.

According to Serpentine (1997), there is an indelible importance of the university as a mediator in the training of professionals and citizens, to act within a proposal to improve the quality of life, and protection and improvement of environmental conditions, capable of stimulating educational processes related to environmental issues at all levels of education and learning.

We also note in Silviers (1997) there are several reasons to emphasize the role of the university in the development of environmental education, confirming among them, the fact that the same accumulate functions of teaching, research, extension and consultancy, for the university to be a forum dialogue with the school and society in general, for being a center of research and therefore understand science as a factor of both progress and quality of life, the disaster, and forever accept inter-and trans disciplinary curriculum alternatives.

We see that *"The university (...) has to be sensitive to the preparation of teachers to act under the aegis of environmental education in regular courses at the undergraduate and multidisciplinary still" (Marajo, 2004, p. 73-74).*

In the case of the undergraduate course in pedagogy, as a trainer of teachers of basic education, this should not be present in a silent and distant the new educational paradigm.

We know that entering the environmental dimension in teaching practices, permeates social pressure and institutional precisely why the same, are being formed for the most part, from a conservative point of view and a classical education system, i.e. based on an understanding of the world adapted by hegemonic rationality to which practices generate unable to do other than "single path" prescribed by that rationale, effecting up hegemony "(Guimarães, 2004, p. 124).

In Brazil, several researchers in their fields come bothering with the procedure and discussion of training in environmental education or educators (the) environment.

War and Lima (2004) consider the integration of the environmental dimension in the initial and continuing training of teachers in undergraduate programs, a challenge to the educational process, and analyze that environmental education should be included in the curriculum in an interdisciplinary and cross.

We note that it is imminent, the need to include environmental education in higher education degree, so she really exert their transversely in schools, from the formation of the new generation of educators who comes to educational institutions.

Therefore, it is necessary to recognize the environmental dimension within academic backgrounds, so that they will prioritize the adoption of the local environment, to promote the role of the community in identifying problems, and their solutions.

With all the educational activities relating to environmental education, feel the need to get a college teachers committed to the ability to exercise their citizenship responsibly, to be created and expanded participation in decision-making responsibility at respect to the environmental context.

The support in the Constitution is already present inherent Environmental Education, simply a greater commitment and consideration focused on educational activities of teachers in order to better meet the needs of the current social system which we find ourselves.

In particular, the pedagogy course examined in this study is in a different level, since that shape future education professionals. Accordingly, we aim to establish a culture upbringing that provides the educator, support for understanding this area as appropriate.

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Insights from using the Approaches to Studying as an Evaluation Tool for Educational Resource Development

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Abstract - Over the past 12 years, an awareness of student characteristics has informed the design and interpretation of a series of research and evaluation studies in the Student Approaches to Learning (SAL) tradition. Instructors and developers of on-line learning objects have used the results to encourage active learning and implement better strategies. Addition of content learning items to the survey questions (along with evaluation questions and the 18-item ASSIST short form) made the questionnaire long enough to discourage completion. On some studies, two items ask about students' conceptions of- and motivations for learning have served as proxies for Approach scores, because they can be interpreted in the context of previous research. Non-conventional ways of analyzing the data have evolved because approaches are not evenly distributed. Significance tests based on assumptions of treatment groups, each randomly sampled from a population, are not always appropriate in real course settings.

Keywords : *assist, approaches to studying, student learning, distance education, resident education, life science teaching, higher education, classroom assessment, authentic assessment, metacognition.*

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Insights from using the Approaches to Studying as an Evaluation Tool for Educational Resource Development

Carol A. Speth [α] & Donald J. Lee [σ]

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Keywords : assist, approaches to studying, student learning, distance education, resident education, life science teaching, higher education, classroom assessment, authentic assessment, metacognition.

I. Introduction

A series of educational research and evaluation studies were conducted in Genetics, Plant Sciences and Soil Sciences classes in a College of Agriculture and Natural Resources at a Land Grant University during the last twelve years. These studies were implemented to guide the courses toward student-centered teaching and active learning strategies that were appropriate for the student population. Gradually, instructors have learned how to help students make optimal use of online materials and how these materials can be incorporated into both resident and distance classes.

Teaching strategy and on-line resource development interact with student learning styles to culminate in the final learning impact. Consequently, these studies have been inspired by an international body of scholarship in what Biggs (1993) called the Student Approaches to Learning (SAL) tradition. This article describes how the Approaches and Study Skills Inventory for Students (ASSIST) helps teachers understand student characteristics and how data collected with it can be used to guide course and educational resource development. This article will also describe how SAL analyses can be streamlined and focused in educational research. When necessary, a two-item proxy measure focusing on conceptions of learning and motivations was substituted for the ASSIST to capture its essence without making the total number of questions enough to discourage students from participating or completing. Finally, the next phase of the research program, planned for next year, will be described.

During the late 1990's, a series of scientific breakthroughs in the areas of genetics and crop technology, including genetic modification of major crops, and cloning of livestock animals (the most famous being Dolly the sheep) created a demand for publicly available information and online teaching materials that, unlike textbooks, could keep up with the rapid changes. This led to development of the Library of Crop Technology, later called the Plant and Soil Sciences library (http://passel.unl.edu). These online lessons were developed with learning objectives, images, animations, and quizzes. Teachers and self-directed learners from dozens of countries were finding and using these resources (Byrne, Namath, Harrington, Ward, Lee and Hain (2002). But when students in a junior-level genetics course were asked to use and evaluate lessons on crop genetic engineering, the results were baffling (Hain, 1999). A subset of students used all the features of the on-line environment, quizzes, hyperlinks and animations and reported a preference for their integration into their own learning. Most students in this genetics class did not use them or put minimal time and effort into it. This uneven use of on-line resources contrasted with national and international interest in use of these resources via their distribution on the Internet.

The developers had evidence from Byrne et al. (2002) that the animations and on-line learning environment would help students understand the concepts better and wondered how to make the online lessons more inviting and/or motivate students to view them, both by persuasion and reward. The developers and teachers decided they needed more insights on their students' approaches to learning, which set the stage for several studies including a measure of individual differences.

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II. Previous Literature

Biggs (1993) reviewed the development of what he calls the Student Approaches to Learning (SAL) tradition of research and how it compares to the Information Processing (IP) tradition. The ASSIST came out of a long research program on post-secondary student learning by Noel Entwistle and others, mainly at the University of Lancaster and University of Edinburgh, always benefitting from insights of similar research programs by John Biggs at the University of Newcastle in Australia and the University of Hong Kong. After years of testing with thousands of students in Great Britain and several other countries, the Approaches to Studying Inventory developed at the University of Lancaster in England (Ramsden and Entwistle, 1983) evolved into the ASSIST at the University of Edinburgh (Tait, Entwistle, and McCune, 1998).

Each approach includes (1) A type of motivation, which might be interest, achievement as measured by grades, or trying not to fail; (2) an intention to either understand the material or just memorize it for the test; (3) Either organized or disorganized study methods. Students' approaches can be influenced by kinds of instruction they receive and the kinds of assessment they expect.

Students whose ASSIST responses suggested they are using a Surface Approach have the following characteristics: An intention to cope, not reflecting on purpose or strategy, treating the course as unrelated bits of knowledge and having trouble making sense of new ideas. Students in this group often find tests very threatening, lack self-confidence and feel anxious. By definition, the intention of students with a Strategic Approach is to excel on their graded work. They gear their work to instructors' preferences, manage their time and effort and put consistent effort into studying. But if they focus on the grade rather than the content, they may miss deeper meanings and connections, unless they are rewarded for looking for them. Students using a Deep Approach intend to understand and are motivated by interest in the content. They may tend to focus more on the bigger picture and relationships among ideas or on the components or logical structure. They can get into trouble if they don't find the content interesting or meaningful or if they do not focus enough on what the *instructor* values. Many students manage to fuse Deep and Strategic Approaches and do quite well. Other students aspire to understanding but do not know how to go about reaching it. Their survey responses often indicate that they *intend* to understand, but their learning processes make that unlikely and their anxiety about assessment is a distraction rather than a motivation.

In several of the classes studied, at least half the students were in the Surface Approach Group for that subject. This might be because the course is not in their major. The same students might respond like a Deep Approach learner in their own fields of study.

Using the Revised Approaches to Studying Inventory (RASI) an intermediate version between the ASI and the ASSIST), Entwistle, Tait and Speth (1996) developed software and manuals to administer the questionnaire, use the scores to diagnose student characteristics and provide personalized advice on learning and studying for students with different patterns of responses. Another part of that same British Higher Education Funding Council project developed software to help instructors (even with no training in educational measurement or research) to analyze course level data from the questionnaire and visualize the data in two- or three-dimensional space.

The idea of looking at the *relationships among the three approach scale scores* can be operationalized in different ways. For example, there have been studies in the U.S. using first the Approaches to Studying Inventory later called the ASSIST (with a small change in wording to make it more appropriate for U.S. context) to evaluate how students with different characteristics react to different kinds of teaching and assessment. Speth and Brown (1990) used cluster analysis to assign students to groups with a similar pattern of Approaches to Studying Inventory (ASI) scale scores and then compare these groups on their answers to questions about how they would prepare for two different kinds of exam: essay or multiple-choice.

a) First Generation of Studies

Another way of grouping the students before analyzing their evaluation results was used in a study published in 2006. All students in a junior-level college genetics course were asked to use relevant lessons in the Library of Crop Technology (an earlier version of what became the Plant and Soil Sciences library). They answered ASSIST questions about their learning in general and questions about their use of these online lessons. On-line resources were assigned as homework and grading was based on the scores from a pool of questions based on the content of each lesson. In effect, students choose their own levels of treatment.One purpose of this study were to understand what kinds of students were most likely to use the online resources and how much they believed they benefitted. To analyze the results, Speth, Lee and Hain (2006) assigned students to groups based on their highest of three Z scores on the three ASSIST scales: Deep, Strategic, and Surface, in order to compare the three groups' responses to new online lessons in genetics and crop technology. This study included a question on what percent of their total learning they attributed to the online lessons, as compared to lectures, labs or recitations.

Why sort students into groups after they all receive the same instructional "treatment" to compare their responses? It has been extremely useful to

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instructors and developers of online learning resources to draw some generalizations about how future students will react, based on how current students with similar characteristics respond. Why use Z scores? It is common for students to have equal total raw scores on two scales, so sorting them into groups simply by their highest scale score can lead to all sorts of confusing combinations. But if one looks at the *distributions* of those scale scores, a total of 20 (out of 30 maximum possible points) on the Strategic Scale might be more or less extreme than the same score on the Deep Scale, or vice versa. Z scores take account of how far an individual score is from the mean, whether plus or minus.

In the study published in 2006, while most students had used the online lessons and thought they were useful, the 54 students whose highest Z score was on the Surface Approach Scale were more likely to say they learned a great deal from the Internet lessons and they helped them a lot in the course. They attributed significantly more of their learning to the online lessons (21%) than the 30 students whose highest Z score was on the Deep Approach Scale (15% of their learning) or the 32 students whose highest Z score was on the Strategic Scale (14% of their learning). It was encouraging to lesson developers to find their work benefitted students who most needed help, while apparently causing no harm to more confident students who could learn from other sources.

Adding the ASSIST to the evaluation of the online lessons, animations and quizzes helped developers understand that students struggling to learn these difficult scientific concepts were finding them helpful and then prioritize changes for that large group (often half the class). The developers had always included practice quiz questions to help motivate students to use the lessons, but now they realized that many students valued those questions as a learning tool, or as a way to determine how much time and effort they needed to invest. The developers worked to write more and better graded quiz items, ever more closely tied to the objectives, so students would get a sample of items from a pool that tested their knowledge or application ability for a specific concept.

Open-ended responses as well as the item responses showed students whose highest Z score was on the Strategic Approach Scale were particularly conscious of how much time the lessons took. The animations were made much quicker to access, in the learning environment and the images were integrated into the text without additional clicking.

Speth, Namath and Lee (2007) reported on an evaluation of lessons from the Library of Crop Technology by a sample of students taking courses in colleges of agriculture at several universities and in several states (n=446). This larger, more diverse sample permitted factor analysis of the 18 items and determination of the internal consistency of the three scales. To continue using the ASSIST as part of the ongoing research program related to the developing Plant and Soil Sciences library, it was essential to verify that the three approach scale scores for individual students do convey meaningful information even though the decisions being made were about the lessons and features rather than about individual students. In this study, Cronbach's alphas for the three scales were 0.65 for the Deep, 0.75 for the Strategic, and 0.70 for the Surface. The Strategic items measure organization and achievement motivation. There are two different ways to be Deep, one more holistic with an emphasis on understanding relationships among ideas and one more process-oriented or analytic. Ideally, a student could do either or both, but not many do. This duality often holds down the reliability of the Deep Scale.

The student sample from Speth et al, (2007) included nine first year, 105 second year, 146 third year, 158 fourth year and 28 graduate students. Their major fields of study included 61 Agronomy, 88 Animal Science, 82 Biology and/or Chemistry, 62 Diversified Agriculture or Mechanized Systems, 20 Range Science and 68 Veterinary Science majors. The specific objectives of this study were to find out if the items emerge on factors as expected and if the reliability coefficients for the scales were high enough to support using scale scores to identify groups of students with similar characteristics. Based on their highest z score, of the 446 students, 133 were assigned to the Deep, 125 to the Strategic, and 188 to the Surface group. These proportions have been fairly consistent across several semesters of data collected in one Genetics course at one university. Finally, as a test of the validity of the scales and scoring procedure, student comments were sorted into the three groups to see if they made more sense than the list of unsorted comments.

b) Second Generation Studies

Application Lessons and Conceptions of Learning

The on-line environment offered the potential to customize instruction to students based on their interests. Four new "application" lessons were developed and added to the PASSEL to demonstrate to students how the concepts being taught are used in occupations, and make them more aware of these occupations. These lessons consist of text, photos and practice quiz questions. One of these lessons, called "Greening up the Greens: Transpiration Application Scenario,"http://passel.unl.edu/pages/informationmodule.php?idinformationmodule=1126892811 was the focus of another inquiry.

The teachers and developers wanted to learn how much students were learning and whether their levels of use could be related to levels of content learning. They wanted some measure of student approach, but 18 ASSIST items, plus evaluation items to

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assess intensity of use, plus the content items would make the survey rather long, perhaps discouraging student participation or completion.

The longer version of the ASSIST (Centre for Research on Learning and Instruction, 1997) includes two questions that provide additional insight about individual students' experience of learning in higher education. Rather than using all 18 ASSIST questions, the Learning and Motivation questions were used as a proxy for the ASSIST short form for this study. The first of these two questions was, "When you define learning, what does it mean to you?" Students could choose one of five definitions or write their own. The percentages of students who chose each definition of learning were as follows:

1. Building up knowledge by acquiring facts and information, 23.5% of the students in this sample.
2. Being able to apply the information you learn, 38.3%
3. Understanding new material for yourself, 21.5%
4. Seeing things in a different and more meaningful way, 5.4%
5. Making sure you remember facts well, 7%
6. Own definition, 10.7% of the students in this sample.

Tables 1-4 show how students were unevenly distributed into groups based on their answers to the learning or motivation questions. Table 1 shows students' responses to the Conceptions of Learning question cross-tabulated with the question on the value of the application lesson coupled with the more conventional lesson on the principles of transpiration. The application lesson was valued by all kinds of students. No one said the application lessons made the topic less interesting than the principles lesson alone.

The Conception of Learning question included a space for an open-ended comment. One student wrote: "All of the above in concert, in my view, provide the spectrum of results essential to learning." Several wrote some version of the following idea: "Learning is acquiring knowledge, facts, and experience to understand material or a concept,[and] then being able to apply the information/skills." One wrote: "For me to learn something, it sometimes needs to be explained in a simpler term since I have a learning disability." Sad to say, this particular student gave a rather tepid rating of the value of the application lesson, which relies a lot on the written word. Later additions to the library, such as the video-based resources evaluated in the Gene Segregation resources study mentioned below, might have had more appeal to this particular student.

A second question from the ASSIST long form that was included in this data gathering was: "What motivates you to learn?"

1. I just don't want to fail or do badly, chosen by 14.8% of the students in this sample
2. I am always striving to compete and be successful in all my courses, chosen by 23.5%
3. I am interested in this subject and want to learn as much as I can about it, 16.8%
4. This course will help me get a degree and qualifications so I can get a good job, 15.4%
5. I need to understand this subject to be good at the kind of work I hope to do, 24.8%
6. I want to live up to the expectations of others, such as my family or teachers, 4.7% of the students in this sample.

Table 2 shows how students with different motivations for learning answered the question about whether the application lesson made the topic more interesting. In retrospect, it was unfortunate that questions did not measure how much interest students had in the topic *before* they consumed the application lesson. If their interest was fairly high beforehand, and remained about the same, that is not bad news.

Both the Conception and Motivation for Learning Variables were also cross-tabulated with an item on intensity of student use of the lessons. Table 3 shows how intensively students who chose different conceptions of learning used the practice question feature, and it suggest almost half the students who chose being able to apply what they had learned made optimal use of these questions by taking time to check if they got them right or not. Table 4 does the same for students who chose different motivations for learning. One generalization from Table 4 is that a fairly large proportion of each motivation group used the most intensive strategy of answering the questions and checking their answers. Sadly, in this study, students just trying not to fail didn't always use this easy strategy to increase their learning.

Analyses of this data set gave teachers evidence to assure such students that higher levels of interaction with the lessons did indeed pay off in how many practice questions they would get right, especially on the more difficult items, and since the exam questions would be similar, these practice questions were indeed good preparation for the exam. A manuscript on analyses of the "Greening up the Greens" Application Lesson research data has been submitted to another journal. That manuscript highlights the content learning items of varying difficulty and how intensively students used the lesson. Those who used the most intensive strategy were rewarded for their efforts, especially on the more difficult items. But the analyses submitted to that other journal will not include the conceptions of learning or motivation variables discussed in this article.

c) *Third Generation Studies: Metacognition or Learning Strategies Training*

It has long been known that if they have sufficient skills, some students can adapt their approaches to the subject and, most importantly, their

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perception of assessment demands. A project was undertaken to offer students course-specific training and practice in thinking about their own thinking, integrated with courses rather than in a stand-alone workshop. In Soil Sciences and Plant Sciences classes taught at the freshman level in a College of Agriculture and Natural Resources, students are given assignments to practice thinking about their learning and studying processes, in other words, "metacognition."

Data was collected at mid-semester by administering the ASSIST short form plus the learning and motivation questions mentioned above. The ASSIST results yielded information about the nature of the student samples in each course. The Plant Sciences course has a higher proportion of first-year students and a smaller proportion of sophomores, juniors and seniors than Soil Sciences. Some of the students are taking both Plant Sciences and Soil Sciences while others are taking one or the other. As shown in Table 1, the proportions of students whose highest Z scores was on either the Deep, Strategic or Surface Approach were remarkably similar in the two courses in spite of demographic differences in terms of students' year in school and the academic majors. There is a tendency for students to become more Strategic as they go through their college years, which might account for the higher proportion of Strategic (and lower proportion of Deep) in the Soil Science 153 course. Keep in mind that this way of categorizing students forces a choice between Deep and Strategic. The best students tend to be high on both of those scales.

A second data collection in the same classes at the end of the semesters did not include the ASSIST or the Conception of Learning variable and the data from the two questionnaires could not be linked. The researchers had thought that students who already have a Deep or Strategic Approach might find the emphasis on learning strategies was not necessary. But the percentage of all students who said the emphasis on learning strategies was useful was so high it must have included most students in all three Approach groups. In the spring 2012 Plant Science, 81.1% said they were useful, 7.4% said they were not useful, and 11.6% were unsure. In fall 2012 Plant Science, 60.8% said they were useful, 20.3% said no, and 18.9% were unsure. In the Soil Science course in fall 2011, 69.5% said the emphasis on strategies was useful, 18.9% said they were not, 11.6% were unsure. Obviously, not being able to link the two data sets was a design flaw, as that information would have been very useful.

d) Next Generation Study: Multi-Institutional Evaluation of Resources to Teach Gene Segregation and Make Students Aware of Plant Breeding

A current project will impact genetics and plant science teaching locally and test a strategy for impacting life sciences learning and professionalism. Education and extension resources are being developed to teach key concepts and create an awareness of plant breeding as a career. The seven educational resources students will be asked to evaluate include:

1. Genetic Variation and the Story of Stem Rust (video).
2. Plant Breeder's Mission (video).
3. Segregation of Genes: Wheat Stripe Rust Inheritance Quiz Activity.
4. Segregation of Genes: Reading on Wheat Breeders' Work with Herbicide Resistance.
5. Segregation of Genes: Reading on Mendel's Experiments with Peas.
6. Segregation of Genes: Short Instructional Videos.
7. Segregation of Genes: Steps in Wheat Breeding Activity.

Courses that serve a variety of student audiences from multiple institutions will take part in this study. The content of the educational resources is relevant to both introductory biology courses and genetics courses. By using on-line resources and answering questions in the course management system used at their university, they can receive extra credit points, which increase students' motivation to participate and show them how much the instructor's value participation. Students access the resources by links in their course management systems to the Plant and Soil Sciences library (PASSEL). Individual students can choose which and how many resources to use, and how intensely to go about their use. Survey questions will reveal differences among classes that serve different student populations in the mean number of resources used and self-rated growth in awareness, knowledge, interest in plant breeding as a career for themselves, and willingness to invest time and effort in using the resources.

Cross-tabulations of usage data with the Conceptions and Motivations for Learning questions will indicate if there are differences between students who choose different conceptions of learning in the number of resources used, whether they think the resources would help them in their career or help them in the course they are taking at the time.

Results will help us accept or reject the hypothesis that learning genetics concepts in a plant breeding context can elevate the mastery of concept application and help students explore potential career interests. This is of particular importance in STEM fields such as Plant Breeding that are under-subscribed by students.

III. Conclusions

Gradually, we are designing research strategies to collect worthwhile data while following U.S. federal guidelines for protecting students' confidentiality and freedom from coercion.

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We have also sought to make these studies authentic and realistic for classroom conditions. Traditional research methods emphasize random samples from large diverse populations, significance testing and treatment effects. These emphases have little to do with improving teaching of specific students in specific courses, each bringing his or her needs, abilities, motivations and beliefs about learning. Significance testing is not always appropriate when non-normally distributed populations of students assemble into courses. Significance differences can be reported, but SPSS always warns that your data contains unequal cell sizes and suggests your results are suspect. Teachers must teach students as they are, not pretend they are random samples from a general population.

The demand for high scale reliability as measured by Cronbach's alpha favors large samples from diverse populations, not classrooms where students have similar culture and experience. One way of testing the validity of categorizations based on the ASSIST is to sort their open-ended comments into groups. With a few exceptions, individual's comments show the categorization was accurate.

The three-part nature of each approach tends to muddy the waters in terms of scale reliability, though with enough students and a diverse enough sample, Cronbach's alphas can be coaxed higher. But many instructors do not deal with large or pluralistic groups of students. For them, the advantage of SAL is for describing and understanding the real students they are dealing with in classes.

While all these studies had flaws, understanding students' approaches has been extremely useful in helping developing better ways to teach them.

Beginning with the first generation of local studies, instructors realized how much students can learn from well-written quiz questions closely tied to the objectives if there is timely feedback, and if they take advantage of that feedback (by checking their answers). This helped inspire a teaching strategy of having students answer quiz questions after almost every lecture. They do not have to leave class wondering if they learned anything that day. A quick evaluation (rather than a research study) in the genetics course, helped instructors realize how much students valued being able to work with classmates on those quizzes, and that helped motivate them to attend class, even on a Friday afternoon. Students even said they felt like active learners rather than passive recipients of the lecture content. As indicated above, a large proportion of students in each class find big exams threatening, lack confidence and feel anxious, but the frequent quizzes can build up confidence and give guided practice at answering questions. It also gives students an incentive to prepare for each class, because they know they will be tested right afterward. These small, quick assessments that go directly to the university's course management system have reduced the load of hand-grading.

As mentioned earlier in this article, students whose highest Z score was on the Surface Approach may also have fairly high scores on Deep Approach, which only makes sense if you realize that seeking understanding and actually finding it are two different things. If their learning and studying processes are deficient and they are distracted by their anxieties they are not likely to find the understanding they seek. Adding an emphasis on Meta cognition to the Plant and Soil Sciences classes guided the at-risk group whose highest Z score was on the Surface Approach toward higher order thinking and learning activities that the Strategic or Deep Approach groups might be using already. There were only two students in the Soils class who said they didn't need this, they already knew how to study, but a high percentage of students were grateful for the help.

The best evidence of SAL analysis impact on teachers in the Genetics, Plant Science and Soil Science courses has been their response to student learning revelations. Genetics and Plant Science courses have implemented more intensified structure to their course with authentic on-line assessment and on-line resource use that is integrated into lecture learning strategies. Realization that the student populations in these courses consist of a high proportion of surface learners and relatively low frequencies of deep learners motivates and justifies this teaching strategy. The benefits of instructional intensification for students from low income demographics in large enrollment life science courses with a history of low performance and retention levels has been documented (Hauk, Halle Rips Limbers, Pitter, and Freeman, 2011) SAL analysis refines our understanding of students and on-line resource development and integration further advances our capacity to improve life science learning success in higher education.

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Table 1 : Second Generation of Studies: Level of Interest by Conception of Learning

Concept of Learning	A lot more	Somewhat more	Same interest
Acquire facts (n=33)	12.1%	48.5%	39.4%
Apply (n=57)	17.5%	35.1%	47.4%
Understand (n=30)	26.7%	43.3%	30.0%
Meaning (n=8)	50.0%	12.5%	37.5%
Remember (n=1)	100%	0.0%	0.0%
Own definition (n=16)	6.3%	62.5%	31.3%

Table 2 : Second Generation of Studies: Level of Interest by Motive

Motive	A lot more	Somewhat more	Same interest
Not fail (n=22)	9.1%	40.9%	50.0%
Striving (n=34)	23.5%	38.2%	38.2%
Interest (n=25)	35.0%	44.0%	20.0%
Qualifications (n=22)	13.6%	36.4%	50.0%
Be good at job (n=35)	11.4%	45.7%	49.2%
Live up to expectations (n=7)	28.6%	42.9%	28.6%

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Table 3 : Second Generation of Studies: Intensity of Use of the Practice Questions By Conception of Learning

Concept of Learning	Answer checkers	Answer but not check	Scan but not answer
Acquire facts (n=33)	29.0%	35.5%	35.5%
Apply (n=57)	49.1%	24.5%	26.5%
Understand (n=30)	36.7%	56.7%	6.7%
Meaning (n=8)	37.5%	37.5%	25.0%
Remember (n=1)	100%	0%	0%
Own definition (n=16)	81.3%	0.0%	18.8%

Table 4 : Second Generation of Studies: Intensity of Use of the Practice Questions by Motive

Motive	Answer checkers	Answer but not check	Scan but not answer
Not fail (n=22)	38.1%	38.1%	23.8%
Striving (n=34)	46.9%	31.3%	21.9%
Interest (n=25)	48.9%	36.0%	16.0%
Qualifications (n=22)	40.0%	25.0%	35.0%
Be good at job (n=35)	50.0%	32.4%	17.6%
Live up to expectations (n=7)	42.9%	14.3%	42.9%

Table 5 : Meta-Cognition Study Distribution of Approaches to Studying among Students Taking Plant Science, Soil Science, or Both

Approach	In 131 Only	In 153 Only	In Both
Surface	38.4%	39.0%	35.5%
Strategic	27.4%	33.9%	35.5%
Deep	34.2%	27.1%	29.0%

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The Impacts of Aligned Teaching on Students' Perceived Engagement in Independent Learning and Satisfaction: An Empirical Investigation in Hong Kong

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Abstract - In response to the move towards Outcomes-based Education in Hong Kong, our paper aims at investigating the impacts of the Outcomes-based Teaching and Learning approach (OBTL) on students' satisfaction and perceived engagement in independent learning in the context of higher education. Building upon the principle of "constructive alignment", we propose a theoretical model to examine the impacts of constructively aligned teaching and learning that is conceptualized as the constructive alignment Index in our paper. An empirical study of undergraduate students (n=253) found that the constructive alignment index (CAI) positively predicted students' satisfaction and their perceived engagement in independent learning. Implications for research and practice are discussed.

Keywords : *outcomes-based teaching and learning, OBTL, outcomes-based education, OBE, constructive alignment, satisfaction, independent learning.*

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The Impacts of Aligned Teaching on Students' Perceived Engagement in Independent Learning and Satisfaction: An Empirical Investigation in Hong Kong

Dimple R. Thadani [α], Theresa Kwong [σ], King Chong [ρ] & Eva Wong [ω]

Abstract - In response to the move towards Outcomes-based Education in Hong Kong, our paper aims at investigating the impacts of the Outcomes-based Teaching and Learning approach (OBTL) on students' satisfaction and perceived engagement in independent learning in the context of higher education. Building upon the principle of "constructive alignment", we propose a theoretical model to examine the impacts of constructively aligned teaching and learning that is conceptualized as the constructive alignment Index in our paper. An empirical study of undergraduate students (n=253) found that the constructive alignment index (CAI) positively predicted students' satisfaction and their perceived engagement in independent learning. Implications for research and practice are discussed.

Keywords : outcomes-based teaching and learning, OBTL, outcomes-based education, OBE, constructive alignment, satisfaction, independent learning.

I. Introduction

The adoption of outcomes-based education (OBE) (Spady, 1994) has become a global trend to enhance teaching and learning (Botha, 2002; Killen, 2004; Ross & Davies, 1999). With the use of OBE, an approach in which the design of the curriculum is driven by the learning outcomes that students should display at the end of the courses and programmes (Davis et al., 2007; Harden, Crosby, & Davis, 1999), quality of teaching and learning could be assured by the continuous assessment of learning outcomes achieved by students (Hill, 2007). As a result, quality assurance agencies have utilized the framework for programme outcomes assessment in the higher education in different Asia-pacific and western countries, including Australia (Barrie, Ginns, & M, 2005; Treleaven & Voola, 2008), the USA (Borrego & Cutler, 2010), the UK (Rust, 2002), Vietnam (Tran, Nguyen, & Nguyen, 2010), and Singapore (Davis et al., 2007). As a world city aiming to develop itself into a regional education hub, Hong Kong cannot be immune from such worldwide movement. Indeed, Hong Kong's higher education sector can be regarded as an interesting context for inquiry, reflected by its changing landscape, growing international recognition and blend of Asian and Western cultures in affecting teaching and learning (Ho, 2005). Since 2012, Hong Kong has been preparing for an education reform with a prominent feature to embrace Outcomes-based Teaching and Learning (OBTL), a form of OBE framework building upon the concept of constructive alignment (Biggs & Tang, 2003, 2007, 2011), in the higher education curricula.

Constructive alignment (CA) is indeed a pedagogical approach that is embedded in the constructivist theory (Biggs & Tang, 2003, 2007, 2011), emphasizing the alignment between the intended learning outcomes (ILOs), teaching and learning activities (TLAs) and assessment tasks [ATs]. It is believed that courses designed upon CA will enhance student-centered learning by encouraging students to take an active and independent role in constructing their own knowledge (Tran et al., 2010; Wang et al., 2011). Thus, independent learning is an essential outcome element in OBTL as students, with the help of effective teaching and learning activities, are encouraged to explore the intended outcomes beyond information, conception and understanding (Biggs & Tang, 2007).

In particular, Biggs and Tang (2007) stated that instructors adopting the CA approach should [1] clearly describe the ILOs in class, [2] create a learning environment and TLAs conducive to the ILOs which allow students to construct their knowledge to achieves the outcomes, and [3] establish assessment on how well students' could achieve the corresponding ILOs. These three components of constructively aligned teaching constitute important pillars in OBTL.

However, whether courses with constructively aligned ILOs, TLAs, and ATs would encourage students to take an independent and active role in learning in

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Hong Kong remains a question rarely answered. Recognizing that one of the main objective for OBTL is to enhance student-centered learning through constructive alignment with which students are expected to be more self-directed and confident in learning independently (Tran et al., 2010; Wang et al., 2011), the evaluation of whether and how CA could promote independent learning in the local Chinese context is hence imperative. The purpose of this study is to explore the relationship between the adoption of CA and students' perceived engagement in independent learning. The impact on students' satisfaction with courses will also be investigated.

This empirical study is expected to make contributions to both education researchers and practitioners. On the research side, we propose a theoretical model to enhance our understanding of constructive alignment, an underpinning concept of OBTL, and its impacts in the context of higher education in Hong Kong. On the practical side, the result of this study informs and reinforces educators of the benefits of implementing OBTL.

The rest of the paper is structured as follows. First, we outline the contextual and theoretical background, and propose a theoretical model. Then, we describe our research methodology including the survey and data collection procedures. Next, we present and discuss the findings of our empirical study. Finally, we conclude the paper by discussing the implications for both research and practice, and suggestions for future research.

II. Constructive Alignment and Perceived Engagement in Independent Learning

There is general consensus in the education literature that the goal of education is to enable students to learn independently (Gow & Kember, 1990). Although independent learning is not a new concept, there seems to lack a universal understanding towards its meaning (Broad, 2006). However, in looking at the literature on independent learning (Broad, 2006; Hanks, 1986; Lewis, 1978; Souto & Turner, 2000; Williamson, 1995), it becomes apparent that alternative terms are used to describe the same idea - empowerment of students in their learning not only in a specific context but beyond. In other words, students are able to learn for themselves not only in a course but in a broader context. Williamson (1995) stated that this could be achieved by encouraging acceptance of responsibility and involvement of students in their studies. Perceived engagement in independent learning by students is measured in this study as a proxy.

Aforementioned, OBTL is an education approach in which student-centered learning is emphasized (Tran et al., 2010; Wang et al., 2011). Instructors who adopted the CA approach actively involve students in learning and it is found to be effective in promoting learning, particularly in achieving higher order outcomes (Hoddinott, 2000; McMahon & Thakore, 2006; Morris, 2008; Taylor & Canfield, 2007). Within an aligned system, students would therefore be able to see that the teaching/learning environment and assessment tasks are closely related to what they are supposed to be learning. As a result, interpretation and reasoning would be made easier. Comprehension of prior learning and the associations amongst learning tasks would be made more systematically which favor constructivism to be taken place. It is believed that students are more willing to take the responsibility and be active in the learning process. So the higher the alignment between ILOs, TLA, and TAs, the higher the engagement in independent learning will be perceived by students. Thus, in this study, we propose that:

H1: Constructive alignment Index is positively associated with perceived engagement in independent learning

III. Constructive Alignment and Students' Satisfaction

The enhancement of students' satisfaction through improvements in aspects of teaching and learning have been well documented (Anderson, Banks, & Leary, 2002; Helms, Alvis, & Willis, 2005; Yazici, 2004). Student satisfaction is typically based on *"a cognitive process in which students compare their prior expectations of their educational experience to those actually experienced from attending a university or a course"* (Elliott & Shin, 1999). Student satisfaction results when actual performance meets or exceeds their expectations (Elliott & Shin, 1999; Zeithmal, Berry, & Parasuraman, 1993). Forrester and Parkinson (2004)'s study found that the gap existed between students' expectation and actual needs may influence their satisfaction on a distant learning course. Thus, we believe that under a constructively aligned teaching and learning environment, students [1] should be very clear as to what they have to learn, [2] should see the teaching actively engages them in learning that is appropriate to achieving what they are supposed to learn, and [3] should see assessment as addressing what they are supposed to have learned. More importantly, students receive formative feedback which allows them to evaluate their own performance in a continuous timeframe. As a result, we believe that within a constructively aligned teaching and learning environment, the gap between students' expectation and actual performance would be narrowed. Students' level of satisfaction is likely to be higher. In addition, constructively aligned courses/programme curricula are designed to include materials, strategies, and approaches which are interesting, motivating and

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requiring students to actively engage. In such a highly interactive environment, students would enjoy their learning, and be more motivated to achieve the intended learning outcomes. It is very likely that students' satisfaction towards their learning in the course. The more aligned the system is, the higher the students satisfaction would be. Thus, we propose that:

H2: Constructive Alignment Index is positively associated with students' satisfaction.

IV. The Proposed Research Model

Figure 1 depicts our research model. In this study, we aim at exploring the role of a constructive alignment index in impacting students' satisfaction and perceived engagement in independent learning in the higher education context.

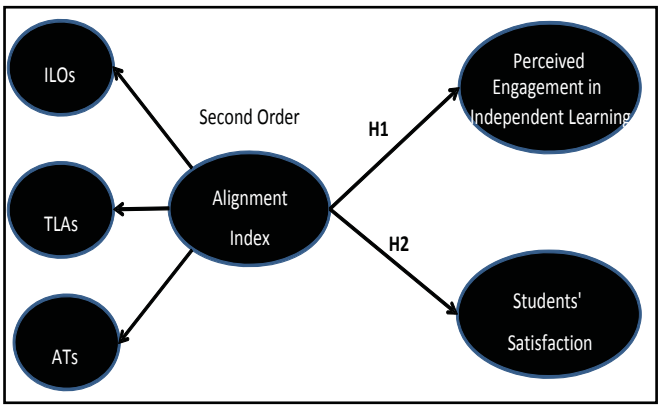

Figure 1 : Research Model

V. Methodology

This section provides the details of data collection procedures, measurement, common method bias test and data analysis.

a) Data Collection Procedures

A course alignment questionnaire, adapted from the working paper of Biggs, Tang and Wong (2013), was administrated in class to undergraduate students in 4 courses offered by the same faculty in a Hong Kong university with a overall response rate of 60.9%. A total of 253 usable questionnaires were collected at the end of the first semester of academic year 2010-2011. Among the respondents, 53.2% are female. Details of courses and response rate are shown in Table 1.

Courses	Instructors	No. of valid responses	% of Valid Responses
Course A	Instructor A	32	52.5%
Course B	Instructor B	55	40.7%
Course C	Instructor C	117	73.2%
Course D	Instructor D	48	81.3%
		253	**60.9%**

Table 1 : Details of participating courses and response rates

b) Measurement

Measurement in this study was based on a validated five-point scale. All first-order constructs: [1] Intended Learning Outcomes (ILOs); [2] Teaching and Learning Activities (TLAs); [3] Assessment Tasks [ATs] ; (4) Students' Satisfaction; (5) Perceived Engagement in Independent Learning were assessed by adapting the course alignment questionnaire (Biggs et al., 2013), which was designed upon the OBTL framework (Biggs & Tang, 2007, 2011). The second-order construct, the Constructive Alignment index, was reflectively measured by the three first-order constructs: ILOs, TLAs, and ATs. Sample questions for ILOs, TLAs, and ATs include: *"I had a clear idea of what I was to learn in this course"; "The teaching and learning activities helped me learn what I was supposed to learn in this course"; "I have achieved what I was supposed to learn in this course". Sample questions for satisfaction and perceived engagement in independent learning include: "I really enjoyed this course" and "I am now able to work out my own ways to continue to learn and evaluate myself".*

c) Common Method Variance

Due to the fact that the data was collected from a single source (i.e. Self-report questionnaire), there is a potential for the occurrence of common method bias (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). A Harman's one-factor test (Harman, 1967; Podsakoff & Organ, 1986) was performed with SPSS 16 to determine the extent to the method variance in the current data. All 20 variables in the inventory were subjected to an exploratory factor analysis (principle components factor analysis with no rotation). According to this test, if a single factor emerges from the factor analysis which accounts for most of the variance (>50%), common method variance is deemed present. Results suggested that no single factor explained more than 50% of the variance, indicating the common method bias were not likely to be presented in the current study.

d) Data Analysis

Data analysis was performed in a holistic manner using partial least square (PLS) path modeling. PLS is a component-based structural equation modeling technique that is commonly used in behavioral research. SmartPLS version 2.0.M.3 was used in the current study. PLS technique was chosen because of its high ability in modeling latent constructs under conditions of non-normality and in small to medium sized samples well (Chin, 1998; Chin & Gopal, 1995; Ringle & Wende, 2005). Specifying of relationships among the conceptual factors of interest and the measures underlying each constructs were allowed in PLS to enable the simultaneous analysis of the measurement model and structural model respectively. The technique is appropriate for testing theories that are in an early stage

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of their development. In our analysis, the path weighing scheme was used. Tests of significant of all paths were performed using the bootstrap resampling procedures with 500 iterations.

VI. Results

Following the two-stage analytical approach, we first examined the measurement model and then assessed the structural model.

a) Measurement Model

To access the internal consistency, convergent validity and discriminant validity of the measurements, the constructs' composite reliability [CR] and the average variance extracted [AVE] were calculated using PLS.

b) Convergent Validity

Convergent validity is an approach to evaluate a measure based upon how well the measure conforms with theoretical expectation (De Vaus, 1996). Table 2a shows that all coefficients of the constructive alignment index (CAI) are significant at 0.001 level, which means that ILOs, TLAs, and ATs are good representatives of CAI. Table 2b presents information about the loadings of the measures of our research model. All items have significant path loadings ($p < 0.001$) at 0.700 or above on their respective constructs in the model.

Table 2a and 2b also demonstrate that all our constructs fulfill the recommended levels concerning composite reliability [CR] and average variance extracted [AVE]. As shown in Table 2a and 1b, all items are higher than the cut-off of 0.50 for AVE as recommended by (Fornell & Larcker, 1981), ranging from 0.517 to 0.661. Similarly, the values for CR are very good, ranging from 0.857 to 0.923, well above the reliability value of 0.70, which is the suggested benchmark for acceptable reliability (Chin, 1998). These results indicate that the instrument has displayed both item internal consistency reliability and item convergent validity.

Second-Order Factor	First-Order Factor	Weights	St. Error	t-value
Constructive Alignment Index (CAI)	Intended Learning Outcomes (ILOs)	0.907	0.004	69.893
	Teaching and Learning Activities (TLAs)	0.933	0.004	113.86
	Assessment Tasks [ATs]	0.913	0.004	81.104
(CR=0.923; AVE =0.517)				

Table 2a : Psychometric Table of Measure - 2nd Order Construct

c) Discriminant Validity

Discriminant validity involves demonstrating a lack or very low correlation among different constructs (Kinnear & Taylor, 1996). Discriminant validity was confirmed with the squared root of the average variance extracted (AVE) for each construct higher than the correlations between it and all other constructs (Fornell & Larcker, 1981). Table 3 shows that each construct shares greater variance with its own block of measures than with the other constructs representing a different block of measure. In addition, as we can find that no pair of measures have correlations exceeding the criterion of 0.9 as suggested by (Hair, Anderson, Tatham, & Black, 1998), which implies that no multicollinearity existed among these constructs.

	CAI	SS	PEIL
Constructive Alignment Index (CAI)	0.719		
Students' Satisfaction (SS)	0.611	0.783	
Perceived Engagement in Independent Learning (PEIL)	0.607	0.629	0.814

Table 3 : Corrections between Constructs with Reflective Measures (Diagonal Elements are Square Roots of the Average Variance Extracted)

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Construct	Item	Loading	St. Error	t-value
Constructive Alignment Index				
Intended Learning Outcomes (ILOs)				
CR=0.861	ILO1	0.799	0.013	24.786
AVE=0.607	ILO2	0.777	0.015	21.309
	ILO3	0.763	0.014	21.564
	ILO4	0.776	0.018	19.247
Teaching and Learning Activities (TLAs)				
CR=0.876	TLA1	0.802	0.013	25.039
AVE =0.639	TLA2	0.808	0.010	28.238
	TLA3	0.791	0.011	29.472
	TLA4	0.852	0.012	24.008
Assessment Tasks [ATs]				
CR=0.857	AT1	0.797	0.015	23.995
AVE=0.600	AT2	0.752	0.015	20.562
	AT3	0.742	0.014	22.527
	AT4	0.804	0.014	23.240
Satisfaction (SS)				
CR=0.863	SS1	0.794	0.014	23.275
AVE=0.613	SS2	0.758	0.015	18.273
	SS3	0.725	0.017	20.150
	SS4	0.849	0.018	19.896
Perceived Engagement in Independent Learning (PEIL)				
CR=0.886	PEIL1	0.802	0.013	21.717
AVE=0.662	PEIL 2	0.808	0.016	18.236
	PEIL 3	0.791	0.016	19.115
	PEIL 4	0.852	0.017	20.714

Table 2b : Psychometric Table of Measure - 1st Order Constructs

d) Structural Model

Using SmartPLS (Version 2.0 M3), the structural model and hypotheses were assessed by examining path coefficients and their significance levels (Chin, 1998). The proposed model conceptualized three first-order constructs (ILOs, TLAs, and ATs) modeled as reflective indicators of the second-order construct – constructive alignment index. Because SmartPLS does not directly permit the representation of second-order latent constructs, it was necessary to separately test the first order-constructs that formed the second-order constructs. We then used the computed first-order factor scores obtained from the test as manifest indicators of the second-order construct.

This model (please refer to Fig 1.) accounts for 58.9 percent in perceived engagement in independent learning and 71.6 percent of variance in students' satisfaction. All hypothesized paths (H1 and H2) in the research model were found statistically significant. As such, the findings support the proposed research model, and demonstrate how the CAI plays a role in impacting students' satisfaction and perceived engagement in independent learning.

Figure 2 summarizes the model-testing results with overall explanatory powers, and estimated path coefficients (all significant paths are indicated with asterisks). Supporting hypothesis 1 and 2, the second-order factor, constructive alignment index, had significant positive direct effect on perceived engagement in independent learning (β=0.767, t=24.503) as well as students' satisfaction (β=0.846, t=48.674).

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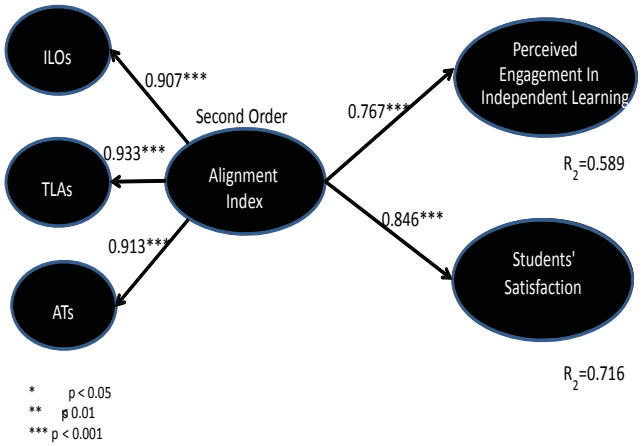

Figure 2 : Standardize Path Coefficient for the Structural Model

VII. Conclusion and Discussion

This study has its genesis from exploring the role of constructive alignment in impacting students' satisfaction and perceived engagement in independent learning. Constructive alignment is conceptualized as the alignment between ILOs, TLAs, and ATs through which students are able to construct knowledge on their own. The research model is developed based on extant literature. Constructive alignment index is explained in terms of three elements – ILOs, TLAs and ATs. The measurement model is confirmed with adequate convergent and discriminant validity of all measures, and the structural model explains 58.9 percent in perceived engagement in independent learning and 71.6 percent of variance in students' satisfaction. All path coefficients are found statistically significant in the research model. The results show that the OBTL approach positively increases students' satisfaction and perceived engagement in independent learning, illustrating the benefits of the implementation of the OBTL pedagogy.

VIII. Contributions

While the urge to implement Outcomes-based Education is apparent, there is relatively little empirical research available in the educational literature to address the process of alignment and its impacts in the Asian Chinese context. Although there are some investigations on the impacts of adoption of CA in the educational literature (Souto and Turner 2000; William 1995; Hanks 1996; Lewis 1987; Broad 2006), there is a significant gap in highlighting how student's perceived engagement of independent learning is impacted through constructive alignment and the role of constructive alignment in the process. This study offers empirical evidence to help scholars understand the constructive alignment process and its impacts on students' satisfaction and engagement in independent learning.

Apart from theoretical contributions, the results of this study also provide some insights for education practitioners. In particular, a lot of front line teachers, who have been teaching for years, are very used to the traditional teacher-centred teaching method. They might not be very confident or convinced with the new alignment pedagogy. The results of our study not only enhance their understanding on the constructive alignment concept but also inform and reinforce teachers of the possible benefits of adopting CA and implementing OBTL.

IX. Limitations and Future Research

In interpreting the results of this study, one must pay attention to a few limitations. First, to keep the model parsimonious, the proposed model only focuses on the impacts of CA adoption on two outcomes– student's satisfaction and perceived engagement in independent learning. Future studies should continue to enrich the existing model by adding more learning outcomes (e.g. teamwork, creativity, etc...). Second, because of the cross-sectional nature of the study, spurious case-effect inferences may be presented. A longitudinal design is needed in future to avoid the problem and to validate the inferences. Particularly, it would be interesting to examine the change of engagement level of independent learning across semesters. Third, the measure of engagement in independent learning was by students' perception. Objective data could be collected to increase the robustness of the study. Fourth, the study represents mostly students in higher education context which only includes one Faculty at a local university that offer degree courses. In future studies, researchers could extend the sample by including students who take sub-degree or higher diploma courses.

Considering that this study has raised some interesting questions, it is believed that the current study triggers additional theorizing and empirical investigation aiming at a better understanding on the concept of constructive alignment in the higher education context. Future research should continue along this line by investigating the underlying social and psychological process embedded within the model.

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Reasons for Enrollment in Open Elementary School and Students' Views on Open Elementary School Practices

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Abstract - In today's world where the information changes and improves at a great speed, societies need individuals who can access more information, adapt themselves with this new kind of information and keep up with the pace of changing world. In a sense, individuals need to renew themselves and have lifelong learning skills beyond basic skills. In line with technological developments, what the limits of formal education institutions are and whether they meet the needs of the society have been examined. The discussions about individuals' reflecting their education and learning processes into every aspect of their lives, acquiring basic skills regardless of age range and then providing education opportunities at advanced levels have brought forward the practices of open and distance education. Open and distance education opportunities enable the individuals to improve their information, abilities and qualifications and to provide them with new opportunities within the frame of life-long learning process through learning activities at every moment of life and prepare them for new experiences. One of the opportunities of open education is "Open Elementary School", which aims to develop and strengthen the society by providing the elementary education to the individuals who are over compulsory education age and have not completed their primary education yet. This can be done through advanced communication tools and technologies in line with the general purpose and basic principles of Turkish National Education by Ministry of Education. Open Elementary School also aims to provide opportunities to the students who could not have enough education opportunities to eliminate their deficiencies, to create opportunities to prepare them for the next stage and make them to be able to develop behaviors that will guide them to a profession through contemporary information technologies. In this study, the reasons of their enrollment in Open Elementary School and the views of the students on Open Elementary School Practices have been analyzed descriptively. The data of the study was collected from 207 voluntary students who enrolled in Open Elementary School in Ankara. In the study, "Open Elementary School New registry/Re-registration Evaluation Form developed by the researchers was used. Face-to-face interviews with the students enrolled were conducted and the forms were completed during those interviews.

Keywords : *adult basic education, distance learning, open elementary school, open primary school.*

GJHSS-G Classification : *FOR Code: 930501*

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Abstract - In today's world where the information changes and improves at a great speed, societies need individuals who can access more information, adapt themselves with this new kind of information and keep up with the pace of changing world. In a sense, individuals need to renew themselves and have life-long learning skills beyond basic skills. In line with technological developments, what the limits of formal education institutions are and whether they meet the needs of the society have been examined. The discussions about individuals' reflecting their education and learning processes into every aspect of their lives, acquiring basic skills regardless of age range and then providing education opportunities at advanced levels have brought forward the practices of open and distance education. Open and distance education opportunities enable the individuals to improve their information, abilities and qualifications and to provide them with new opportunities within the frame of life-long learning process through learning activities at every moment of life and prepare them for new experiences. One of the opportunities of open education is "Open Elementary School", which aims to develop and strengthen the society by providing the elementary education to the individuals who are over compulsory education age and have not completed their primary education yet. This can be done through advanced communication tools and technologies in line with the general purpose and basic principles of Turkish National Education by Ministry of Education. Open Elementary School also aims to provide opportunities to the students who could not have enough education opportunities to eliminate their deficiencies, to create opportunities to prepare them for the next stage and make them to be able to develop behaviors that will guide them to a profession through contemporary information technologies. In this study, the reasons of their enrollment in Open Elementary School and the views of the students on Open Elementary School Practices have been analyzed descriptively. The data of the study was collected from 207 voluntary students who enrolled in Open Elementary School in Ankara. In the study, "Open Elementary School New registry/Re-registration Evaluation Form developed by the researchers was used. Face-to-face interviews with the students enrolled were conducted and the forms were completed during those interviews.

As a result, students' enrollment behaviors (requirement, decision, and enrollment) and their views on open elementary education were presented descriptively.

Keywords : adult basic education, distance learning, open elementary school, open primary school.

I. Introduction

Distance learning was described by Moore and Kearsley (1996) as an education form in which planned learning requires specific communication forms through special course design techniques, special teaching methods, electronics and other technologies as well as being organizational and administrational arrangements, which take place in a an environment that is different from the place where the education provided. On the other hand, Demiray (1999) described distance learning as an education system that provides opportunities to people who cannot have the education opportunity in mainstream schools and the ones who lost this opportunity because of various reasons such as age, disease, distance, family issues, time and financial difficulties by using printed, audio-visual (guidance and academic counseling) and electronic materials. Generally, when the descriptions of distance learning were examined, five characteristics of distance learning came out (Keegan, 1996): a) during the learning process, teacher and students are in different places. b) The influence of education institution in providing student support facilities, planning and preparing learning materials. c) The use of technical environments like printed materials, audio, video and computer to deliver/transfer the course content and provide interaction between the teacher and the learners. d) Enabling the students to start the dialogue and make use of it by providing two-way communication. e) Since there is not a learner group during the learning process, students carry on education individually.

Distance learning has emerged depending on the reasons below. (a)The cases in which remoteness could be an obstacle for having education, for example, people who live in rural areas and geographically remote residential areas lack sufficient number of teachers and resources. (b) Educational requirements of people who are home-bound because of physical disabilities and diseases and (c) educational needs of

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young people who cannot have the opportunity to continue formal education and adults who want to improve themselves (Newby, Lehman and Russell, 2006).

Because they wanted to benefit from the opportunities of distance learning, National Education Ministry intended to solve the resource problem by educating a great number of people who could not have the opportunity of university education. Education started with the establishment of open high school in 1992 and continued with the establishment of open elementary school (OES) in 1997 (Düzgün and Yıldız, 2009). OES initiated following the enactment of Ministry of National Education law numbered 1651 on 15.09.1997. It aimed to give the opportunity to young people who are over 14, primary school graduates, the ones who drop out of elementary school, the ones who want to complete their education and get a diploma and lastly people who want to get their education abroad accredited in their home country (Birinci, 2010). OES has been serving to its students at home (81 cities) and abroad (Western Europe, Mecca, Medina and Riyadh in Saudi Arabia, Tripoli in Libya) by using distance learning methods since 1998-1999 education years. With the enactment of new Elementary Education law by 11.05.2012, the name of "Open Primary School" was changed to "Open Elementary School" on condition that their functions would stay the same.

OES aims to give the education opportunity to people who could not complete their primary education for various reasons and are over the age limit of compulsory education through the principles and the techniques of distance learning anywhere on every condition with the purpose of increasing the society's level of culture and education. It also aims to pave the way for the citizens to acquire a profession, make them contribute to economic growth and prepare them for higher education (Özgür, 2005).

Education system of OES has the same syllabus, which is conducted in formal education schools but it has been introduced to the students through the techniques and methods of distance learning. In OES, an education year is formed with three terms and at the end of each term, a "final exam" is given. All courses' final exam scores determine year-end achievement score. If the score is 45 and over, it shows that the course has been achieved. A student who has already started sixth grade sits exams at least in three terms and if the student fulfill the criteria of passing the course and the class in these three terms (the length of three terms is at least one year), he/she can graduate from OES.

The Ministry of Education introduced the following conditions to determine who can enroll in OES: Accordingly, among the people who are over age limit of compulsory education;

a) People who documented that they have completed fifth Grade;
b) Adults who have second stage achievement certificate,
c) Adults who have complementary basic education-B course certificate;
d) People who left from sixth, seventh and eighth grades of primary education;
e) People who have education abroad and get accreditation to either one of the conditions in (a) and (d) can enroll in OES.

Demiray and Sağlık (2003) conducted studies that used open education practices as their research subject until 2003 in Turkey by applying content analysis method. They reported in their studies that the subjects are generally educational environments like system operation-practices, learning environments-materials (printed materials, radio, television, video, internet, computer-based education, teleconference and face-to-face educational and counseling facilities/services), the profile, attitude and behaviors of student-graduate, offices, centers as support services and communication like historical and theoretical researches in the field. Open Education Faculty and Open High School are the open education practices that were mentioned in their research. It was said that from the year 2003, no research on the practice of Open Primary School, which was still new was found in the body of literature. Hence/Therefore, we can mention a deficit on the practices of OES. Askon, Johnston, Petty and Young stated that there is limited number of studies on distance learning of adult education in their study that they carried out in 2003. However, it should be stated that both studies belonged to the year 2003 and since that date some studies (Bal, 2001, Ozen, 2002; Ağın-Kurt, 2008; Yenilmez, 2008; Düzgün, 2010) have been conducted on OES although they are in limited number. One of these studies was done with the aim of developing a face-to-face education model for OES (Bal, 2001). According to this study, it will be beneficial to add a face-to-face education format to the practice of OES. In another study conducted by Ağın-Kurt (2008), the views of adults enrolled in OES on the system were examined. According to the results of this study, two of the main problems that adults face are lack of printed materials and communication. Ozen (2002) and Yenilmez (2008) studies are more micro studies about the subject fields which existed in OES system. Ozen examined the subject "Turkish" and Yenilmez studied the subject "Mathematics".

In the general sense, basic education is the foundation of life-long learning and human development. Individuals who have gone through an efficient basic education process can volunteer to learn about the requirements/needs in the other areas of their lives. Therefore, continuous learning opportunities need

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to be provided to the people who lacked of educational opportunities as well as the people who benefited from formal education. It is particularly significant to enable the individuals who are described as disadvantaged people like (unqualified young people, older people, the unemployed, the disabled …etc) to access to the learning/education.

OES, which was established in accordance with the reasons mentioned above, provide a significant opportunity to the adults who could not have the opportunity to benefit from formal education. In other words, OES aims to give the education opportunity to people who could not complete their primary education for various reasons and are over the age limit of compulsory education through the principles and the techniques of distance learning anywhere on every condition with the purpose of increasing the society's level of culture and education. It also aims to pave the way for the citizens to acquire a profession, make them contribute to economic growth and prepare them for higher education. In the education years 2004-2005, total 308.158 students had education (Özgür, 2005). In the education years of 2008-2009, OES, which has total 206.063 students, of whom 125.540 are male and 80.523 are female register its studies within the Republic of Turkey Ministry of National Education General Directorate of Education Technologies, Measurement and Evaluation and Open Education Institutions Department. According to the data of the year 2009 that was obtained from T.R M.N.E General Directorate of Educational Technologies Open Elementary School Department, in the education years of 2008-2009, the students enrolled in OES lived in 81 cities in Turkey; their range according to gender and grade level is given in Table 1.

Table 1 : 2008-2009 Education years range of continuing students in OES according to their gender and level of grade

Gender	Level of Grade			Total
	6. Grade	7.Grade	8.Grade	
Male	21.191	19.832	20.788	61.811
Female	33.318	22.994	22.289	78.601
Total	54.509	42.826	43.077	140.412

When Table 1 is examined, it is seen that there are total 140.412 continuing students in OES in Turkey; 61.811 of these students are male and 78.601 are female. Nearly 54.509 of these students study in sixth grade, 42.826 of them are in seventh grade and 43.077 students study in eighth grade. According to a research conducted by Düzgün (2010), OES has 207.852 students actively enrolled, 255.030 students who suspended study and 233.608 graduate students.

To sum up, OES is a significant effort to improve the work force potential of the country by providing minimum education opportunities offered by this century to the individuals who could not find and lacked the opportunity for formal education. Likewise, the number of people who have the possibility of benefiting from this facility/service is quite high because of the schooling problems, which has been experienced throughout this century. (According to the data from TSI (Turkish Statistics Institute), about 25 million people could not complete their primary education). In this context, developing OES practice has a great importance. *Because of all these reasons, in this study, it was intended to determine socio-demographic attributes of the students continuing to OES, their reasons of enrolling in OES and their views on OES practices and services. It was also aimed to contribute to enhancing the quality and functionality of future OES practices.*

II. Methodology

This study is in screening model in which enrollment reasons of continuing students in OES and the problems faced regarding open elementary education were examined.

a) Partipicants

Study group is formed with 207 people who are still registered to OES and participated in the exams in Ankara during the education years of 2010-2011. The data was collected from 207 participants who sit exams in the exam centers in Çankaya District and volunteered for the study. Nearly 155 (74.9 %) of the participants were females; 52 (25.1 %) of them were male participants. The age range of participants was given in Table 2.

Table 2 : Age range of participants

Age	f	%
15–20	8	3.86
21–25	18	8.70
26–30	53	25.60
31–35	49	23.67
36–40	52	25.12
41 and over	27	13.04
Total	207	100.00

When the Table 2 is examined, it can be seen that nearly half of the participants are between the age ranges of 26-30 and 36-40. It is also seen that the range of marital status of the participants is in parallel with their ages. Out of 207 participants, 153 (73.9 %) of them are married and 54 people (26.1 %) are single.110 (53.1 %) of the participants are in sixth grade, 53 of them (25.6 %) are in seventh grade and 44 (21.3 %) people are in eighth grade.

b) Collection of Data

In the study, a data collection tool consisting 20 questions was formed by the researchers with the purpose of collecting the information because they wanted to identify personal characteristics of the people

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enrolled in OES, their reasons of enrollment and the problems they face. In the tool, questions in Likert-scale format regarding OES practices and different question formats like those that open ended questions were used in order to introduce the problems that people face. In the spring term of education years 2010-2011, the data was collected through face-to-face interviews with the students in various exam centers in Çankaya District of Ankara.

III. Findings

In the study, primarily personal information of the participants was examined. The information about the participants' employment status, the use of internet and computer were studied descriptively. Nearly 115 (55.6 %) participants work while continuing their education but 92 of them (44.4 %) do not have any jobs. When it is considered that 90 % of the participants are over 25 years old, it can be said that working life is not an obstacle for the enrollment in OES. In respect of their places of residence, participants usually come from the city center and nearby towns/districts. Nearly 121 (58.5 %) participants out of 207 students reside in the city and 78 (37.7 %) of them reside in nearby districts. Only 8 (3.8 %) of them reside in towns and villages. Because the study was conducted in Ankara city, the fact that the large majority of the participants reside in the city center and nearby districts is significant. Whether participants have a computer or they use computer in any environment were examined and the findings obtained were given in Table 3.

Table 3 : The state of having a computer and using a computer

	f	%
Having a computer		
Yes	123	59.42
No	84	40.58
Using a computer		
Yes	176	85.02
No	31	14.98
Total	**207**	**100.00**

When the Table 3 was examined, it was seen that 59.4 % of the participants (123 students) have computer but 40.6 % of them do not own a computer. Even though the rate of having a computer was not so high, the state of using a computer is better. The number of the participants who use computer at work, school, internet café and similar places is 176 (85 %) and the number of people who do not use a computer is 31 (15 %). Those who have a shared computer at home can answer this question as not owning a computer.

The findings about whether the participants have internet connection and in what environments they can access to the internet were given in Table 4.

Table 4 : Range of using internet

Is there internet connection?	f	%
Yes	163	78.74
No	44	21.26
The place where they are connected to the internet		
Home	134	64.73
Work/Office	32	15.46
Internet Cafe	19	9.18
School	8	3.86
Telephone	1	0.48
None	26	12.56
Total	**207**	**100.00**

Nearly 163 (78.74 %) of the participants have internet connection and only 44 (21.26 %) of them do not have internet connection. As it was seen in Table 4, the participants mostly are connected to the internet at home, and then following each other work and internet café come. It was seen that only one participant (0.48 %) benefited growing mobile internet facility.

Within the frame of the group studied, it was searched that whether the people enrolled in OES had any formal education and it was found out that 173 (83.57 %) participants out of 207 students quit after they had started primary school; 26 (12.56 %) participants had never started school. The reasons why 26 people had not started school were given in Table 5.

Table 5 : Range of the participants who never had any formal education according to their reasons

Reason	f	%
I had to work.	6	23.08
My family did not allow me	4	15.38
I did not want to	2	7.69
Other	2	7.69
My age was over the age limit for primary education	0	0.00
Not mentioned	12	46.16
Total	**26**	**100.00**

When the Table 5 was examined, it was seen that the participants could not take permission from their families, had to work or they did not want to as the reasons of why they did not have a formal education. The reasons of why 173 participants who started formal education quit after a while were studied and the findings were given in Table 6.

Table 6 : Range of the participants who left formal education according to their reasons for leaving

Reason	f	%
My family did not allow	52	30.06
I wanted to leave on my own will	49	28.32
I had to work	32	18.50
I failed	6	3.47
There was no school	3	1.73
It was not compulsory	3	1.73

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It was not a boarding school	1	0.58
Health condition	1	0.58
Family issues/problems	1	0.58
Not mentioned	25	14.45
Total	**173**	**100.00**

When Table 6 was examined, it can be seen that the most obvious reasons for leaving formal education were the necessity of working and family permission. It was understood that these reasons emerge from this specific culture when we consider geographical, economic and sociological structure of Turkey. Nearly 30 % of the participants left school arbitrarily/on their own will. The reasons for enrollment in OES were examined and the findings were given in Table 7.

Table 7 : The reasons for enrollment in OES

Reason	f	%
To continue education	133	64.25
Pay gap/ seniority	33	15.94
Have a driving license	27	13.04
Exclusion or not being accepted by the society (social status)	4	1.93
Not mentioned	10	4.83
Total	**207**	**100.00**

It was seen that the highest rate among the reasons for enrollment in OES belonged to the item "To continue education". 64.3 % (133 participants) of the group stated that they enrolled in OES to be able to continue their education (Table 7). Despite being low, 1.9 % of them enrolled in OES because they thought they were not accepted by their own children.

Whether the participants collected OES books was examined and it was found out that 183 (88.4 %) students out of 207 participants had their books but 24 (11.6 %) of them did not collect them. The reasons why they did not take the books were given in Table 8.

Table 8 : Range of reasons of not collecting books

Reason	f	%
It is boring to read the books	8	33.33
Books are not relevant to the exams	5	20.83
It is easier to follow on the internet	3	12.50
School did not provide them	2	8.34
Time	1	4.17
Not mentioned	5	20.83
Total	**24**	**100.00**

It was found out that nearly 33 % of the participants found reading the books boring and nearly 20 % of them thought that the books are not relevant to the exams.

Whether the people continuing OES received support from any other people (family members/relatives…etc) during the decision period of enrollment was examined and it was stated that 123 (59.4 %) of them received support during the enrollment but 84 (40.6 %) of them did not take any support.

After OES, whether participants want to continue high school were examined and 194 (93.7 %) participants stated that they wanted to continue to high school but only 13 (6.3 %) of them stated that they did not want to continue open education.

Whether participants see a difference between formal education and open elementary education was examined and it was seen that 172 (83.1 %) of them claimed that there was a difference but 17 (13 %) of them said that they could not see a difference. 8 participants did not state any opinions on this subject. The range of the reasons of the differences that 172 participants claimed was given in Table 9.

Table 9 : The reasons of the differences between two educations

	f	%
Open education is more inadequate	49	28.49
Open education is easier	20	11.63
Open education is more difficult	15	8.72
There is face-to-face education in formal education	13	7.56
It is difficult to study at home using personal resources	10	5.81
Subjects/syllabus is different	5	2.91
Open education is inadequate in practice	4	2.33
Without learning or revising the subject, you have to take the exams	3	1.74
Time is limited	3	1.74
It is better in terms of knowledge/information	2	1.16
Study conditions are more comfortable	1	0.58
Facilities are more sufficient	1	0.58
No counseling facility/service	1	0.58
Not mentioned	45	26.16
Total	**172**	**100.00**

When Table 9 is examined, according to the participants, the most important reason for the differences between formal education and open education is that open education is inadequate. Nearly 49 (28.5 %) people said that open education is more inadequate than formal education. 20 (11.6 %) people said that education and the exam questions were easier in open education whereas 15 (8.7 %) people said that open education is more difficult.

The views of the participants on OES services/facilities were taken and it was seen that they found these services adequate (Table 10). Nearly 50 % of the participants who gave their opinions on the relevancy of books with the context/content found the book-content relevancy adequate, but 39.27 % of them said it was inadequate. 34.71 % of those who gave their opinions on courses, which were given by public education center found the courses adequate. Nearly 34

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% of those who gave their opinions on audio books and video courses, which can be accessed via internet, found the services adequate. Nearly 70 % of those who gave their opinions on the registration and the courses on the web page found given services adequate. Nearly 50 % of those who shared their opinions found academic counseling service in registration offices adequate. Face-to-face education practices were usually found inadequate (48.49 %).

Table 10 : Views on OES practices

	Highly adequate		Adequate		Indecisive		Inadequate		Highly inadequate	
	f	%	f	%	f	%	f	%	f	%
The relevancy of the book content with the exams	24	12,57	**68**	**35,60**	24	12,57	53	27,75	22	11,52
The courses given by Public Education Center	10	8,26	32	26,45	**33**	**27,27**	29	23,97	17	14,05
Audio-books accessed online	12	10,26	28	23,93	**43**	**36,75**	23	19,66	11	9,40
Video conferences accessed online	11	8,87	31	25,00	**40**	**32,26**	28	22,58	14	11,29
Reaching/accessing everything needed for registration on the web page	40	24,54	**73**	**44,79**	5	3,07	28	17,18	17	10,43
Accessing to everything needed for the courses on the web page	33	22,60	**63**	**43,15**	14	9,59	23	15,75	13	8,90
Academic counseling services in the registration offices	**47**	**27,01**	39	22,41	22	12,64	45	25,86	21	12,07
Face-to-face education practices	8	6,06	24	18,18	36	27,27	17	12,88	**47**	**35,61**

The problems/issues faced/experienced by those continuing to OES were examined and the findings were given in Table 11.

Table 11 : The reasons of the problems about OES

	f	%
Registration office	65	31.40
Books	51	24.64
Difficulty of the exams	6	2.90
Different education practice from formal education	6	2.90
Distance of the schools	3	1.45
Inadequate information services	2	0.97
The difference between books and exam questions	2	0.97
No study environment	2	0.97
Exam security	1	0.48
Not mentioned	69	33.33
Total	**207**	**100.00**

When Table 11 was examined, it can be seen that participants mostly faced problems about the registration office. Nearly 65 (31.4 %) participants stated they had experienced problems about the registration office. It was seen that 51 (24.6 %) participants had problems about the books. The reasons of the problems faced come with little rate differences in the order of difficulty of the exams, not having a parallel education with the formal education, distance of the schools, inadequate information services, content of the books not covering exam questions, not having a study environment and exam security.

IV. Discussion, Conclusion and Suggestions

Especially, since the internet and multi-media technologies started to be used in education curriculum/programs, more effective end extensive usage of distance education can be mentioned. Distance education program is a system that delivers learning by making connection between student and educational resources. The fact that distance education programs provide education opportunity to anybody who is not registered in any formal education institution proves that educational opportunities for students are increasing recently. Students make use of available resources effectively and have to follow developing technology closely through/by means of distance education programs. Within the scope of this study, students' reasons for enrollment in OES, which is a part of distance education program and some common problems that students faced were described. Within the scope of the study, it was observed that a great majority of the participants examined were female. When we consider that girls are deprived of education by families as an extension of old male-dominated structure in Turkish culture, we can say that mostly girls are still deprived of basic education rights in every segment of the society. If you take into consideration the campaigns and projects that are conducted to enable girls to continue their basic education now, it is certain that they need education more in their adult lives. Yet it was seen that a great majority of people enrolled in OES are married. This finding shows in a sense that marriage cannot be an obstacle against education or it shows that the need for education cannot be denied even for

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the individuals who settled down. Another remarkable conclusion in the study is that nearly 90 % of the people continuing OES was over 25 years old. Although a great majority was over 25 years old, slightly higher than the half of the participants work while continuing their education. Despite the rapid improvement in technology, there are problems about having a computer, using a computer and internet access. Within the limits of the study, when we consider that data was collected only in the capital Ankara, it is obvious that the situation could be far worse in other cities in Anatolia. Within the scope of the study, a great majority of the students enrolled in OES started formal education but they did not continue. As the reasons for dropping school, mainly not getting family's permission, the necessity of working and arbitrariness were given. When three reasons that cover 86 % of reasons for dropping were examined, it can be seen that some serious problems on basic education have been experienced until the very recent time. Interrupting formal education due to the necessity of working and lack of family permission needed to be dealt with and discussed not only in terms of education but also in terms of economic and political aspects. Interrupting formal education or never starting evidently emerge as a lack of basic education in the future and create problems both in their work lives and in family lives. It can be seen clearly that individuals who have not completed their basic education experience difficulties both in services like childcare, communication with their children, salary/wages, driving license and situations like seniority. Therefore, they try to make use of open education alternatives when needed. The fact that almost all participants want to continue to high school supports this finding/data. Despite high demand, the study has shown that most of the participants (83.1 %) think that there is difference between formal education and OES. As a reason for the difference, they claimed that OES is more inadequate and easier than formal education. This conclusion can be interpreted that OES is not fully understood by people and generally there are prejudgments/prejudice about growing open education programs in Turkey. Having been used to traditional form of education and practice difference in open education can cause various mistaken judgments on different forms of the education. However, participants mostly have difficulties in registration offices and books. On one hand, these findings reveal the views of the participants on OES and the difficulties they had experienced, on the other hand, they will light the way for the researches that will enhance and improve open education program.

In a century when the statements of information society and information literacy have gained such importance, it is seen that there is an urgent need to describe the attempts to solve basic education problems of adults in our country and to define necessary substructure facilities for open education system. When we look over the views on open education practices in Table 10, it is seen that more enriched learning environments need to be shared with these students. Enrolled students can be monitored through a learning management system. Courses, e-books and counseling services can be given through this system. More visual environments relevant to courses can be shared with students by means of specific features of e- learning. When suitable conditions and facilities are provided, we can anticipate that students will be able to use advanced skills and there will be rapid advancements in educating them. Therefore, we need data to determine and generalize the existing state. It is only possible to determine adults' need for basic education, to specify operating problems of the system and to make suggestions in the light of the conclusions that this kind of studies can provide.

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4. Manuscript's Category,

5. Structure and Format of Manuscript,

6. After Acceptance.

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A purpose of organizing a research paper is to let people to interpret your effort selectively. The journal requires the following sections, submitted in the order listed, each section to start on a new page.

The introduction will be compiled from reference matter and will reflect the design processes or outline of basis that direct you to make study. As you will carry out the process of study, the method and process section will be constructed as like that. The result segment will show related statistics in nearly sequential order and will direct the reviewers next to the similar intellectual paths throughout the data that you took to carry out your study. The discussion section will provide understanding of the data and projections as to the implication of the results. The use of good quality references all through the paper will give the effort trustworthiness by representing an alertness of prior workings.

Writing a research paper is not an easy job no matter how trouble-free the actual research or concept. Practice, excellent preparation, and controlled record keeping are the only means to make straightforward the progression.

General style:

Specific editorial column necessities for compliance of a manuscript will always take over from directions in these general guidelines.

To make a paper clear

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Mistakes to evade

- Insertion a title at the foot of a page with the subsequent text on the next page
- Separating a table/chart or figure - impound each figure/table to a single page
- Submitting a manuscript with pages out of sequence

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· Use standard writing style including articles ("a", "the," etc.)

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· Align the primary line of each section

· Present your points in sound order

· Use present tense to report well accepted

· Use past tense to describe specific results

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An abstract is a brief distinct paragraph summary of finished work or work in development. In a minute or less a reviewer can be taught the foundation behind the study, common approach to the problem, relevant results, and significant conclusions or new questions.

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- Reason of the study - theory, overall issue, purpose
- Fundamental goal
- To the point depiction of the research
- Consequences, including definite statistics - if the consequences are quantitative in nature, account quantitative data; results of any numerical analysis should be reported
- Significant conclusions or questions that track from the research(es)

Approach:

- Single section, and succinct
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- Center on shortening results - bound background information to a verdict or two, if completely necessary
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The **Introduction** should "introduce" the manuscript. The reviewer should be presented with sufficient background information to be capable to comprehend and calculate the purpose of your study without having to submit to other works. The basis for the study should be offered. Give most important references but shun difficult to make a comprehensive appraisal of the topic. In the introduction, describe the problem visibly. If the problem is not acknowledged in a logical, reasonable way, the reviewer will have no attention in your result. Speak in common terms about techniques used to explain the problem, if needed, but do not present any particulars about the protocols here. Following approach can create a valuable beginning:

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- Present a justification. Status your particular theory (es) or aim(s), and describe the logic that led you to choose them.
- Very for a short time explain the tentative propose and how it skilled the declared objectives.

Approach:

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Approach:

- It is embarrassed or not possible to use vigorous voice when documenting methods with no using first person, which would focus the reviewer's interest on the researcher rather than the job. As a result when script up the methods most authors use third person passive voice.
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What to keep away from

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The principle of a results segment is to present and demonstrate your conclusion. Create this part a entirely objective details of the outcome, and save all understanding for the discussion.

The page length of this segment is set by the sum and types of data to be reported. Carry on to be to the point, by means of statistics and tables, if suitable, to present consequences most efficiently.You must obviously differentiate material that would usually be incorporated in a study editorial from any unprocessed data or additional appendix matter that would not be available. In fact, such matter should not be submitted at all except requested by the instructor.



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Content

- Sum up your conclusion in text and demonstrate them, if suitable, with figures and tables.
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- Present a background, such as by describing the question that was addressed by creation an exacting study.
- Explain results of control experiments and comprise remarks that are not accessible in a prescribed figure or table, if appropriate.
- Examine your data, then prepare the analyzed (transformed) data in the form of a figure (graph), table, or in manuscript form.

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- Do not present the similar data more than once.
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- Never confuse figures with tables - there is a difference.

Approach

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- Put figures and tables, appropriately numbered, in order at the end of the report
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- If you put figures and tables at the end of the details, make certain that they are visibly distinguished from any attach appendix materials, such as raw facts
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- Give details all of your remarks as much as possible, focus on mechanisms.
- Make a decision if the tentative design sufficiently addressed the theory, and whether or not it was correctly restricted.
- Try to present substitute explanations if sensible alternatives be present.
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- Recommendations for detailed papers will offer supplementary suggestions.

Approach:

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	A-B	**C-D**	**E-F**
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Introduction	Containing all background details with clear goal and appropriate details, flow specification, no grammar and spelling mistake, well organized sentence and paragraph, reference cited	Unclear and confusing data, appropriate format, grammar and spelling errors with unorganized matter	Out of place depth and content, hazy format
Methods and Procedures	Clear and to the point with well arranged paragraph, precision and accuracy of facts and figures, well organized subheads	Difficult to comprehend with embarrassed text, too much explanation but completed	Incorrect and unorganized structure with hazy meaning
Result	Well organized, Clear and specific, Correct units with precision, correct data, well structuring of paragraph, no grammar and spelling mistake	Complete and embarrassed text, difficult to comprehend	Irregular format with wrong facts and figures
Discussion	Well organized, meaningful specification, sound conclusion, logical and concise explanation, highly structured paragraph reference cited	Wordy, unclear conclusion, spurious	Conclusion is not cited, unorganized, difficult to comprehend
References	Complete and correct format, well organized	Beside the point, Incomplete	Wrong format and structuring

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