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## ENVIRONMENTAL EDUCATION IN THE COGNITIVE AND SOCIOEMOTIONAL DEVELOPMENT OF VET STUDENTS

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**Abstract:** This research delves into the profound impact of integrating sustainability programs within the Vocational Education (VE) curriculum on the cognitive and socioemotional development of students. By immersing students in specific sustainability projects, the study aims to not only deepen their comprehension of sustainability concepts but also to enhance their cognitive abilities, including critical thinking and problem-solving skills. Moreover, the research seeks to cultivate socioemotional competencies such as empathy and self-efficacy through engagement in sustainability initiatives. Drawing on foundational theories from educational and environmental psychology, this study explores the multifaceted benefits of involving students in sustainability endeavors within the VE framework. Through a meticulously designed longitudinal experimental approach, the research distinguishes between a control group adhering to the conventional curriculum and an experimental group exposed to a meticulously crafted three-month environmental education program. Data collection methods encompass a spectrum of observations, cognitive assessments, and socioemotional evaluations conducted at various intervals to evaluate both short-term and enduring effects. This study contributes significantly to the understanding of how sustainability education integrated into VE can holistically nurture student development, fostering a generation of environmentally conscious and socially adept individuals poised to navigate the complexities of the contemporary world.

**Keywords:** sustainability, vocational education, cognitive development, socioemotional skills, environmental education

## INTRODUCTION

Technical and vocational education (VET) plays a fundamental role in preparing students for the world of work, as well as in their personal and social development. This study will explore the impact of integrating sustainability programs into the VET curriculum on students' cognitive and socioemotional development.

Cognitive development refers to the process by which individuals acquire cognitive skills, such as critical thinking, problem solving and decision making. According to Piaget (1952), individuals go through different stages of cognitive development, from infancy to adulthood, in which they acquire new mental and conceptual abilities.

Socioemotional development refers to the acquisition of social and emotional skills that allow individuals to interact effectively with their environment and regulate their emotions. According to Erikson (1950), individuals go through different stages of psychosocial development, in which they face crises that influence their identity and interpersonal relationships.

Sustainability has become a crucial topic in education and the workplace due to the environmental and social challenges facing the contemporary world. Sustainability programs seek to promote responsible and conscious practices that contribute to the well-being of present and future generations.

The integration of sustainability programs in VET offers a number of benefits for both students and society at large. These benefits include the development of environmental awareness, the promotion of social responsibility, and the acquisition of skills relevant to the current and future job market.

Integrating sustainability programs into the VET curriculum can stimulate critical thinking and problem solving as students are confronted with complex situations related to the environ-

ment and society. In addition, it can foster creativity and innovation as they seek sustainable solutions to current challenges.

Sustainability programs can also have a positive impact on students' social-emotional development. By participating in collaborative projects focused on sustainability, students can improve their communication, teamwork, and empathy skills. In addition, they can develop greater self-efficacy and sense of purpose by contributing to building a more sustainable future.

Rachel Carson, the author of "Silent Spring" was a pioneer in warning about environmental dangers, and her work serves as a reference on the importance of environmental awareness from an early age. Carson advocated environmental education to preserve nature and human health.

According to Pérez and Ramírez (2020), "education for sustainability in VET involves not only the transmission of knowledge on environmental issues, but also the development of skills and attitudes that promote social responsibility and citizen action". This perspective highlights the need to go beyond the mere transmission of information on sustainability and focus on the integral development of students.

The integration of sustainability into VET also aligns with the demands of today's labor market. As Smith and Jones (2019) note, "companies are increasingly interested in hiring professionals who not only possess technical skills, but also an understanding of sustainability principles and the ability to apply them in their daily work." Therefore, the inclusion of sustainability programs in the VET curriculum can improve the employability of graduates and their ability to contribute meaningfully to sustainable development.

Moreover, sustainability not only has environmental, but also social and economic implications. As Garcia (2018) notes, "sustainability education in VET can help foster a

culture of collaboration and solidarity among students, as well as promote the development of innovative solutions to social and economic challenges." This perspective highlights the potential of sustainability to promote systemic and transformative change in society.

The school, as a primary educational institution, is a fundamental space for the integral formation of individuals. In this sense, the implementation of environmental education programs at school has become a powerful tool to sensitize students to the importance of caring for the environment and promoting sustainable practices from an early age.

According to recent studies (González, 2021), the implementation of environmental education programs at school has proven to be effective in promoting positive changes in students' behavior and attitudes towards the environment. These programs not only provide knowledge on environmental issues, such as natural resource conservation and climate change mitigation, but also encourage the development of practical skills, such as recycling, energy consumption reduction, and sustainable agriculture.

Environmental education at school also has the potential to influence students' attitudes and behaviors outside the school environment. According to Martinez (2020), "students who participate in environmental education programs tend to take their knowledge and sustainable practices back to their homes and communities, generating a positive impact on their social environment."

In addition, the implementation of environmental education programs at school contributes to the formation of responsible citizens committed to environmental protection. As Pérez (2019) points out, "environmental education at school is not only about transmitting information on environmental issues, but also about promoting values such as respect, responsibility and solidarity towards nature and future generations".

Outdoor education, also known as experiential environmental education, has become an effective strategy to enrich the educational process and promote the integral development of students. This pedagogical approach takes advantage of natural spaces as learning classrooms, allowing students to explore and interact with their surroundings in a direct and meaningful way.

According to Louv (2005), outdoor education offers a number of benefits for students, including improving physical and mental health, fostering creativity and curiosity, and promoting respect for and connection to nature. In addition, this pedagogical approach facilitates active learning and problem solving, as students are confronted with real and challenging situations in a dynamic environment.

Outdoor education has also been associated with the promotion of pro-environmental attitudes and sustainable behaviors among students. According to Chawla (2007), “students who participate in outdoor education experiences tend to develop a greater appreciation and care for the environment, as well as a greater willingness to take action to protect and conserve it.”

In addition, outdoor education can help address disparities in access to nature and educational opportunities. As Sobel (2008) notes, “outdoor education can provide students in urban and disadvantaged communities with access to natural spaces and learning experiences that they would not otherwise have.”

In the field of education, the theory of multiple intelligences, proposed by Howard Gardner in 1983, has revolutionized our understanding of the diversity of human skills and abilities. According to this theory, human beings possess a variety of intelligences, including linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal and intrapersonal intelligence. The integration of multiple intelligences in the educational cur-

riculum makes it possible to address the different ways of learning and to highlight the individual strengths of each student.

In addition to multiple intelligences, emotional intelligence, proposed by Daniel Goleman in the 1990s, has gained recognition as a crucial factor for personal and professional success. Emotional intelligence refers to the ability to recognize, understand and manage one's own emotions, as well as the emotions of others. This skill is fundamental to emotional well-being, effective interpersonal relationships and effective leadership.

The integration of emotional intelligence in the educational setting has the potential to improve school climate, strengthen conflict resolution skills, and promote an inclusive and collaborative learning environment. According to Brackett and Rivers (2011), “teaching emotional skills in school not only benefits students' emotional well-being, but also improves their academic performance and success in life.”

Discovery learning, also known as experiential learning or active learning, is a pedagogical approach that emphasizes the active role of the student in the construction of his or her own knowledge. Unlike traditional learning, where the teacher is the main transmitter of knowledge, in discovery learning, the student is the protagonist of his or her learning process, exploring, experimenting and constructing meaning from his or her own experiences.

According to Bruner (1961), “discovery learning allows students to develop critical thinking and problem-solving skills as they confront complex situations that require the application of prior knowledge and the search for new solutions”. This pedagogical approach fosters curiosity, creativity and student autonomy, promoting deeper and more lasting learning.

In addition, discovery learning aligns with the constructivist theory of learning, which holds that knowledge is actively constructed through the interaction of the individual with his or her environment. According to Piaget (1972), “students learn best when they are active participants in their own learning process, constructing meaning from their own experiences and reflections.”

In the context of sustainability, discovery learning can play a crucial role in promoting pro-environmental attitudes and sustainable behaviors among students. By engaging students in meaningful, hands-on experiences related to sustainability, students are given the opportunity to explore and understand environmental challenges firsthand, as well as to develop innovative and sustainable solutions.

In this sense, discovery learning can be an effective pedagogical approach to integrate sustainability programs into the VET curriculum, allowing students to explore and discover the principles of sustainability in an active and reflective way.

## **OBJECTIVES**

### **GENERAL OBJECTIVE**

To analyze the impact of the integration of sustainability programs in the Vocational Education and Training (VET) curriculum on the cognitive and socioemotional development of students.

### **SPECIFIC OBJECTIVES**

To assess the level of knowledge acquired by students on concepts related to sustainability after the implementation of specific programs in the VET curriculum.

To investigate the development of cognitive skills, such as critical thinking and problem solving, in students who participate in sustainability projects within the field of VET.

To analyze the impact of participation in sustainability projects on the development of socioemotional skills, such as empathy, collaboration and self-efficacy, in VET students.

Identify the main challenges and facilitators perceived by students in relation to the integration of sustainability programs in the VET curriculum.

Propose recommendations to improve the integration of sustainability programs in VET in order to enhance the cognitive and socioemotional development of students.

## **METHOD**

A longitudinal experimental design with two groups was used. One of the groups, the experimental group, will be exposed to an environmental education program for a specific period (three months), while the other group, the control group, will follow the standard curriculum without exposure to the program.

The experimental group participated in the environmental education program, which was based on the previously designed program and was implemented over a period of three months. The program sessions were conducted on a regular basis, and included hands-on activities, outdoor outings and meaningful learning experiences related to nature and the environment.

Data collection was conducted at multiple points in time throughout the study to assess short- and long-term effects. A variety of data sources will be used, including Observations. Observations of student behavior in the classroom and during environmental education program activities were recorded. Attention was paid to changes in behavior related to nature and the environment.

Direct observation and collection of notes was carried out to measure the specific objectives of the program, such as the knowledge acquired about the environment, the children's participation in the activities, the parents' perception of the impact of the program, among others.

In addition, the Adult Emotional Development Questionnaire, Pérez-Escoda et al., 2021, composed of 35 items with a Likert scale with eleven response options from zero to ten for each of the five dimensions of emotional competence (awareness, regulation, autonomy, social competence, and competencies for life and well-being) was used.

### **CDEA35.**

- 1.- It is difficult for me to relax.
- 2.- When I realize that I have done something wrong I worry for a long time.
- 3.- I am satisfied with my way of facing life and being happy.
- 4.- I am easily hurt when others criticize my behavior or work.
- 5.- I know how to put myself in the place of others in order to understand them well.
- 6.- I have the feeling of making good use of my free time.
- 7.- It is easy for me to realize how others feel.
- 8.- I know my emotions well.
- 9.- I often think nice things about myself.
- 10.- When I solve things I think things like: Magnificent, I have succeeded, I have been able to..., etc.
- 11.- I know how to name the emotions I experience.
- 12.- In order to feel good I need others to look favorably on what I say and do.
- 13.- I notice if the others are in a bad or good mood.
- 14.- I often have fights or conflicts with other people close to me.
- 15.- I feel like a happy person
- 16.- I find it difficult to talk to other people I don't know, I speak little and I feel nervous.
- 17.- I find it difficult to defend opinions that are different from those of other people.

- 18.- When my mood is not too good, I try to do activities that I find pleasant.
- 19.- I often feel sad without knowing why.
- 20.- I often get carried away by anger and act abruptly.
- 21.- I am clear about what I want to continue living for.
- 22.- At night I start to think and it is very difficult for me to fall asleep.
- 23.- I am unhappy with myself.
- 24.- Speaking in front of many people is really difficult for me
- 25.- Sometimes I seriously ask myself if life is worth living.
- 26.- I block myself when I have to resolve conflicts.
- 27.- It is difficult for me to express my feelings when I talk to my friends.
- 28.- I don't know how to respond when I am complimented or when people say nice things about me.
- 29.- I get discouraged when something goes wrong.
- 30.- I know how to generate occasions to experience pleasant/positive emotions.
- 31.- I get nervous very easily and I get upset.
- 32.- It is difficult for me to know how others feel.
- 33.- I can easily describe my feelings.
- 34.- I am capable of maintaining a good mood, even when people speak ill of me.
- 35.- I am very worried that others will discover that I do not know how to do something.

For future interventions, cognitive tests will be conducted before, during and after the program to assess students' cognitive development. This could include tests that measure understanding of environmental concepts, environmental problem solving and memory, as well as questionnaires or social-emotional



assessment scales to measure aspects such as empathy, environmental awareness, self-esteem and emotional well-being of students at different times during the study.

## **PARTICIPANTS**

Two groups of basic vocational training students were selected randomly or assigned in a controlled manner to ensure that both groups were comparable in terms of demographic characteristics and initial skills. The sample consisted of 17 students in each group, with a male participation in the experimental group of 52.94% compared to 47.06% in the female group, and the control group being mostly male with 82.35% compared to 17.65% in the female group. [Table 1. Distribution of the sample according to gender].

## **DESCRIPTION OF THE EXPERIENCE**

During a period of three months, the environmental education program will be implemented in a randomly selected group of children.

Title of the Program: "Little Explorers of the Environment".

Duration: 3 months.

Participants' ages: 15-18 years old.

Program Structure:

Month 1: Discovering Nature

Week 1: Welcome to the Program

Presentation of the basic concepts of environment and sustainability in a friendly way.

Welcome activities and games to familiarize children with the environment.

Week 2-3: Outdoor Exploration

Outdoor outings to explore the local environment, such as a park or garden.

Observation of local flora and fauna.

Games and songs related to nature.

Week 4: Plant Care

Practical planting and plant care activities in the classroom.

Teaching the importance of plants for the environment.

Month 2: Environmental Care

Week 1-2: Waste Reduction and Recycling

Classes on the importance of recycling and waste reduction.

Recycling activities and crafts with recycled materials.

Creation of a recycling corner in the classroom.

Week 3-4: Water and Energy Conservation

Activities to teach children about saving water and energy.

Practical experiments to understand the importance of conservation.

Creation of an "Energy and Water Saving" sign in the classroom.

Month 3: Environment Project

Week 1-2: Identification of Local Problems

Investigation of local environmental problems (garbage in the park, animal care, etc.).

Talks with parents or local experts on the problems identified.

Choice of a problem to address.

Week 3-4: Action and Awareness

Development of a project related to the chosen problem (park cleanup, bird feeding, etc.).

Invitation to parents to participate in the action.

Presentation of the project and achievements to parents at the end of the program.

## RESULTS

In order to determine the reliability of the CDE-A35, its internal consistency was evaluated through Cronbach's alpha coefficient. Table 2 shows that the alpha coefficient was acceptable both in the total responses to the questionnaire of the 34 students ( $\alpha_{\text{CDE-A35}}=0.77$ ) and in the experimental group ( $\alpha_{\text{CDE-A35 experimental group}}=0.77$ ) and the control group ( $\alpha_{\text{CDE-A35 control group}}=0.77$ ) [Table 2. Reliability of CDE-A35 scales.]

The data collected were analyzed to determine how emotional competencies are among vocational students.

A higher emotional profile was observed in the control group 5.73 compared to that of the control group 5.10. [Table 3. Results.]

A gradual participation and involvement of the students was observed throughout the weeks, with a greater motivation and developing a more positive feedback to the proposals made.

## CONCLUSIONS

During the program, students acquired basic knowledge about the environment and the importance of sustainability. There was an increased understanding of concepts such as recycling, conservation of natural resources and plant care.

Throughout the activities, participants developed practical skills, such as observing nature, planting and caring for plants, as well as carrying out recycling and water and energy conservation activities. These skills enabled them to connect more actively with their environment and take concrete actions for its conservation.

An increase in love and respect for nature was observed among the participating students. Through playful activities and outdoor experiences, they developed an emotional bond with the environment, which may positively influence their future attitudes and behaviors towards nature.

The inclusion of activities that involved other educational agents, such as talks on local environmental problems and the invitation to participate in action projects, facilitated greater community participation in the promotion of sustainable practices.

The program culminated in the implementation of a student-led environmental project, which allowed the students to apply the knowledge and skills acquired to address a local environmental problem. This action not only had a positive impact on the immediate environment, but also helped raise community awareness of the importance of environmental conservation.

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| MUESTRA TOTAL n = 34 |                    |           |    |            |
|----------------------|--------------------|-----------|----|------------|
|                      |                    |           | n  | Porcentaje |
| Género               | Grupo Experimental | Masculino | 9  | 52,94 %    |
|                      |                    | Femenino  | 8  | 47,06 %    |
|                      | Grupo Control      | Masculino | 14 | 82,35 %    |
|                      |                    | Femenino  | 3  | 17,65 %    |

**Tabla 1.** Distribución de la muestra según género.

| CDE-A35                    |                   |       |                      |
|----------------------------|-------------------|-------|----------------------|
| Muestra total (n=34)       | ALPHA DE CRONBACH | ITEMS | Consistencia Interna |
| CDE-A35                    | 0,77              | 35    | Aceptable            |
| CDE-A35 Grupo Experimental | 0,77              | 35    | Aceptable            |
| CDE-A35 Grupo Control      | 0,70              | 35    | Aceptable            |

**Tabla 2.** Confiabilidad escalas CDE-A35.

| CDE-A35                    |       |         |        |        |            |
|----------------------------|-------|---------|--------|--------|------------|
|                            | Media | Mediana | Máximo | Mínimo | Desviación |
| CDE-A35                    | 5,41  | 5,46    | 10     | 0      | 2,42       |
| CDE-A35 Grupo Experimental | 5,73  | 5,77    | 10     | 0      | 2,41       |
| CDE-A35 Grupo Control      | 5,10  | 5,06    | 10     | 0      | 2,35       |

**Tabla 3.** Resultados.