Engineering-Based Educational Model to Promote Equality of Rights, Opportunities, and Spaces for Adolescents from Within the School

Abstract– Education and innovation are key drivers of development, requiring a systematic and iterative approach to solving problems and creating functional products or solutions. This process combines scientific, technical, and creative knowledge to transform needs into concrete solutions. Such an approach is applied at Santa Magdalena Sofía Educational Institution, where the reality reflects poverty, family unemployment, violence, and other social factors. This context raises the question: *How does the application of the engineering-based model develop the competency to manage economic and social entrepreneurship projects?* The proposal seeks to promote **equality of rights, opportunities, and spaces for female students within the school**. The objective of this research was to implement an intervention plan using a quasi-experimental design with fourth-grade secondary students from sections L, M, and N, specializing in administrative management. The students developed a business idea through an engineering-based process that included market analysis, production planning, financial evaluation, formalization, human resource management, and marketing strategies—integrating the Happiness Management Model. In doing so, the initiative promotes equality of rights, opportunities, and spaces for female students by enabling them to generate employment or self-employment, access sources of wealth, and meet their basic needs. The model significantly improved the students' entrepreneurial competencies and contributed to narrowing the gap in Sustainable Development Goals 2 (Zero Hunger), 4 (Quality Education), and 8 (Decent Work and Economic Growth).

Keywords: Innovative entrepreneurship, educational competencies, engineering process, Economic growth, Sustainable development goal.

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I. INTRODUCTION

[1] Reports a population of 1,338,994 inhabitants in the Lambayeque Region as of 2022 (Statistical Compendium of Peru), with a migration growth rate of 0.9%. The informal employment rate for men is 72.7% and 80.6% for women. Authorizations for work for minors to 2021 in men were 2 and women 2 which does not imply that students do not work, Lambayeque would have regressed 5 years in poverty 14.6% in 2019 to 19.5% in 2020 representing 247,000 (19%) of the population. [2] Meanwhile the Portal SISEVE 2022 (Portal of school violence of the Ministry of Education) notes that in Chiclayo there is a high rate of cyberbullying, bullying, inappropriate touching, school violence reported 1474 cases of school violence between year 2020 to April 2021: 54% of cases correspond to violence between schoolchildren using technological means, and 46% to cases of violence produced by a staff of the educational institution. that subordinate the participation of women in social dynamics. At the secondary level - school sexual violence July - September 2022, 87 cases, according to SÍSEVE. In relation to the results of the sample evaluation of the year 2022 show the scale of learning achievements in 4 levels being: prior to the beginning, in the beginning, in process and satisfactory in 2nd grade of secondary school in reading we have that 19.1% is located at a satisfactory level, 31. In Science and Technology, 12% are at the satisfactory level, 32.6% in process, 42.6% in process, 42.6% in process, 12.9% prior to the beginning, in mathematics 12.7% at the satisfactory level, 21.1% in process, 36.8% in process, 36.8% in process, 36.8% in process and 30.3% prior to the beginning. Likewise, the results of the 2022 sample evaluation [3] Socio-Emotional and Educational Context of Santa Magdalena Sofía School
Santa Magdalena Sofía is a public educational institution founded in 1957, specializing in technical areas such as Administration, Accounting, and Secretarial studies. The student population faces significant social vulnerability—characterized by a high prevalence of incomplete families, exposure to abuse, unwanted pregnancies, cyber harassment, and socio-economic instability. Many students take on adult responsibilities within their homes, leading to accelerated socio-emotional maturity and a lack of prioritized attention to their own emotional needs.

In terms of socio-affective competencies: Only 18.1% feel capable of managing their learning environment, 19.9% believe they can confront unpleasant situations, 9.1% feel confident in relating to peers and handling social challenges, 37% say they can regulate their behavior to achieve goals amid change, 49% report autonomous behavior guided by personal principles, 65% enjoy positive relationships with close individuals,46.1% can understand peers and their broader environment. 64.1% are willing to support others in difficulty. 57.7% accept responsibility for their actions and outcomes, 53.2% report using structured procedures for decision-making, The school includes students from intercultural bilingual backgrounds and from judicially protected shelters. In 2019, students developed their first business plan with a market analysis, addressing local needs. In 2020, during the COVID-19 pandemic, dropouts increased—especially in rural areas lacking electricity and internet. In response, students began building business plans using virtual environments and ICT tools. By 2021, efforts

continued to sustain learning and entrepreneurial development amid adversity, still in the virtual scenario, the students consolidated their economic and social entrepreneurship projects using the SYSA [4] entrepreneurship model, constituting a learning opportunity that gave rise to family business entrepreneurship. In the year 2022 they also worked successfully on their entrepreneurship projects.

We know that every citizen inevitably ends up in the labor market, for this reason it is essential to develop the competence to manage projects of economic and social entrepreneurship, which allows applying their skills to meet the needs of their community giving rise to a company either services or relevant products. Information was collected through a survey to learn more about the reality of the students, we share the findings.

In relation to weekly family income, 75% receive an income of less than S/1,000, 12% from S/1001 to S/.2,000 and 13% from S/2,500 soles or more, with regard to family organization, 38.4% are complete families, 58% are incomplete and 4% come from homes and shelters, with regard to unwanted pregnancies, 5% have unwanted pregnancies, 95% do not. In relation to the type of work contract of the person who supports the home, 15% have a work contract and 85% are informal; in addition, only 23% of the people who support the home receive income and 77% do not receive income when they are absent from work; in relation to whether the families initiated processes of production of goods or services, 31% answered no and 69% answered yes; in relation to whether they were able to conduct a market study for their business, 0% answered yes and 100% answered no, In relation to whether those responsible for the family economy usually plan their budget in their own business, 28% answered yes and 72% answered no, in relation to whether they have ever registered their business with the National Superintendence of Tax Administration, 2% said yes and 98% said no, in relation to whether the family had a business idea, 63% had not started a business idea and 37% had tried. The research aimed to assess how the intervention plan *"Fighting Poverty from the Administration Classrooms"* mobilizes competencies for managing economic and social entrepreneurship projects among fourth-grade students (sections L, M, N) at I.E. Santa Magdalena Sofía. To achieve this, the team diagnosed students' initial competency levels, designed a training itinerary based on the *Innovative Entrepreneurship Model*, and implemented it to develop skills holistically and interdisciplinarily. The intervention proved impactful, significantly enhancing students' entrepreneurial competencies.

ENTREPRENEURSHIP A VIEW FROM THE EDUCATIONAL PRACTICE

National statistics show the need to strengthen the technical labor market due to the lack of skilled labor (PEN, 2036) [5]; this scenario gives birth to opportunities based on the development of entrepreneurial skills that motivate employment, self-employment and formalization. The I.E. Santa Magdalena Sofia provides high school with technical training developing 8 pedagogical hours per week in the sections in the area of Education for Work where they develop economic and social entrepreneurship projects according to the needs of their community. In this way the students of 4 L, M, N are enabled to develop in the global labor market through the use of virtual environments generated by Tics, involving cognitive skills, motor skills and attitudes embodied in business plans designed with high potential for transformation, ethical - cultural frameworks, identifying environmental impacts, managing negative impacts and responsibly using inputs or resources. The OECD/Eurostat [6] defines entrepreneurship as "the ability to activate our capacities and ideas to take advantage of opportunities generating diverse value to improve the quality of life of people, it becomes an opportunity to improve reality; however, we start from the experience that to undertake successfully and raise our quality of life, we base our confidence in the development of competencies that allow us to manage economic and social entrepreneurship projects. [7] Aimed to examine the impact of learning plans on entrepreneurial will and disposition in a sample of 713 students from 30 universities that were part of Project GUESS 2021, and found that the will is persuaded by entrepreneurial self-efficacy, while the locus of control or the way of visualizing their life outcomes negatively define entrepreneurial will. As we see entrepreneurship seems very exciting and gives us a touch of adventure; however, it requires certain habits such as discipline, constant learning based on experience, innovation, resilience, social skills, organization that can strategically and prospectively plan the business idea in mind. [8] Investigated longitudinally in a sample of 120 entrepreneurs on the recurrence of stress in women and men coming to show that women during training decrease stress and men increase it, therefore they suggest that the socialization among them would reduce stress especially in those starting out; however, the research was sustainable for up to 6 months.

[9] In research aimed at transforming an idea into a practical application that solves a real problem and then could turn it into a business idea with design thinking, there were 31 students with whom plenary sessions were developed with the support of facilitators in 10 days. As the plan was developed, which was flexible both in time and content, it allowed the depth of learning, and it was noted that perceptions in relation to entrepreneurship were improving empathically. [10] investigates in 291 entrepreneurs in Sweden on the learning processes to implement companies where the discoverer thoughts are the most apt to generate new business ideas; however, those dedicated to industry increasingly strengthen their learning and, in that area, and lower their expectations in relation to the generation of new business ideas, making better use of people's talent.

[11] states that Entrepreneurial propensity is a term of exclusive use, but it has various contexts, which can change its meaning. Therefore, we gave the framework, and we are

abiding by the understanding, which says that it is a desire to be entrepreneurial. [12] She shows us that the willingness to be entrepreneurial in young people is defined by circumstances of the political and economic environment; school an economy with exacting demands for entrepreneurship puts more barriers and therefore blocks more the willingness to be entrepreneurial. [13] Also examine the mediating role of dynamic capabilities that are developed through entrepreneurial networks and entrepreneurial orientation. They suggest that dynamic capabilities are of key importance in competitive environments. Strong networks and strategic alliances among SMEs are the platforms for these capabilities. [14] Examined entrepreneurial innovativeness, entrepreneurial intention and entrepreneurial process in their studies. They also analyzed the Big Five personality trait. They concluded that the interaction of institutional elements, individual personality traits and opportunity assessment play an important role before entrepreneurial decisions are made.

[15] The Entrepreneurial Learning Model = ELM suggests that learning is constructive when it generates entrepreneurial competence where the student is the protagonist of their learning as decision making is ongoing and substance conservation to finish pending agendas and they are accompanied throughout the process. How do young people see the future of business creation in their own environment? Several educators have already applied constructivist learning such as project-based learning = PBL [16] meanwhile, [17] Manifests that many people are already entangled in entrepreneurship ideas that have a clear prospect of improving their entrepreneurial trajectory. According to researchers [18] three basic types of measuring people's interests are desire, foresight and behavioral intention. [19] Applied an integrated model, combining the Entrepreneurial Performance Education Model (E/P Model). Their model consists of motivation, entrepreneurial skills and entrepreneurial skills components with the Entrepreneurship Education Model (E/E Model), which comprises topics of entrepreneurial success, entrepreneurial knowledge and skills, business plan utilization, learning approaches, the facilitator and the program context. This combined model is not yet constructive and is continuous as a process. [20] stated that a blended learning approach that integrates theory and practice through a simulation aligns well with the needs of entrepreneurial learners. It is different from the blended entrepreneurial learning that has been proposed. This may be a future study to look for differences and the meeting point of these two. Entrepreneurship is a process of introducing, creating ideas and assembling new resources [21]. Creating something new, whether it is a product, a market, a method, raw materials, an organization, or a technology, cannot be done instantly. the Entrepreneurial Learning Model (ELM). Entrepreneurship learning changes mindset, alters entrepreneurial experience, enables making a business plan and facilitates communication consists of three main elements, which are personal and social emergence, contextual learning and negotiated enterprise [22]. Entrepreneurship education contains group skills (self-initiative skills: knowing how and where to look for opportunities; social skills: understanding human nature in an organizational setting; marketing skills: learning how to attract customers and sell themselves; money skills: managing the assets of the business or organization; and leadership skills: making sound decisions in a timely manner under constraints. [23] There is a significant and good-sized correlation between high entrepreneurship efficiencies that developed students' interest in starting an entrepreneurial project within the destination.

FAMILY SUPPORT AND ENTREPRENEURIAL INTENTION

Entrepreneurial intention recognizes that the family role is crucial in attracting their child to start the business. Specifically, it emphasized that parents play a vibrant role in the belief that the desirability and feasibility of entrepreneurship are addressed [24]. As it can be understood family support is a constant source of motivation for entrepreneurial attitude and entrepreneurial motivation, strengthening the relationship between professional versatility. Children of entrepreneurs are familiar with the unique tasks performed by a leader in their family business [25].

Family plays a key role as they are a source of new ideas in an environment of emotional control brought about by financial and competitive commitments, provokes far-reaching organizational commitments, broad social networks of trust and comes with financial backing suitable for future ventures. Family individuals are directly involved in the apprehension of business possibilities and opportunities that affect their financial decision to improve planning [26]. Family monetary and social capital can be used for entrepreneurial projects by providing resources and facilitating transactions [27]

PATH WE FOLLOWED

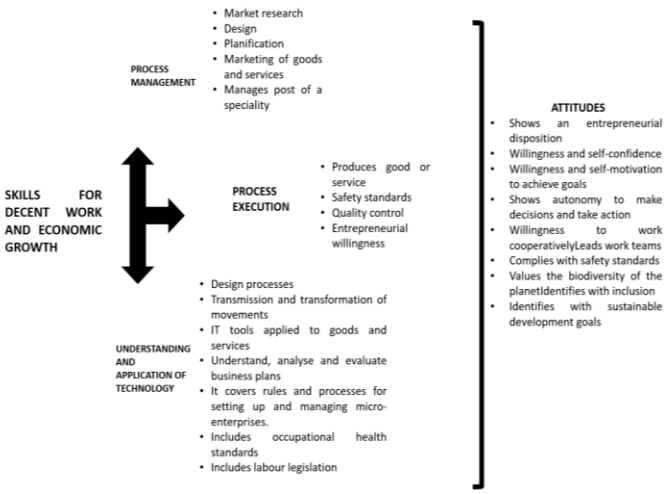
This research adopted a pragmatic paradigm using action research to address poverty by empowering students to develop their own entrepreneurial ventures. A quasi-experimental quantitative approach was applied, with a census sample of 69 fourth-grade students enrolled in the Administration specialty across three sections: L (25 students), M (23), and N (21).

Pre- and post-tests were used to assess improvements in competencies related to managing economic and social entrepreneurship projects. Inclusion criteria focused on students regularly attending 4th-grade Administration classes; other specialties were excluded. Data was collected using a structured evaluation rubric aligned with the intervention plan *"Fighting Poverty from the Classrooms of Administration"*. Reliability of the assessment instrument was confirmed with a Cronbach's alpha of 0.90496, indicating high internal consistency.

PROMOTING EQUAL RIGHTS, OPPORTUNITIES, AND SPACES FOR FEMALE STUDENTS

Institutional support plays a critical role in shaping college students' entrepreneurial ambitions, fostering not only goal-setting but also the self-confidence required to undertake new ventures. Motivational dynamics within student communities further strengthen this foundation. The initiative *"Fighting Poverty from the Management Classrooms"* is structured in three stages: **Family Business Plans** – using the SYSA strategic planning model, **Marketing Strategy** – based on consumer preferences and purchasing capacity, **Human Resources Planning** – implemented in real-world settings, emphasizing soft skills and the happiness management approach.Competency mobilization in economic and social entrepreneurship focuses on three core dimensions: **Process Management, Process Execution, Technology Application and Attitudinal Development**

Figure 1: Competency Design Manage economic and social entrepreneurship projects



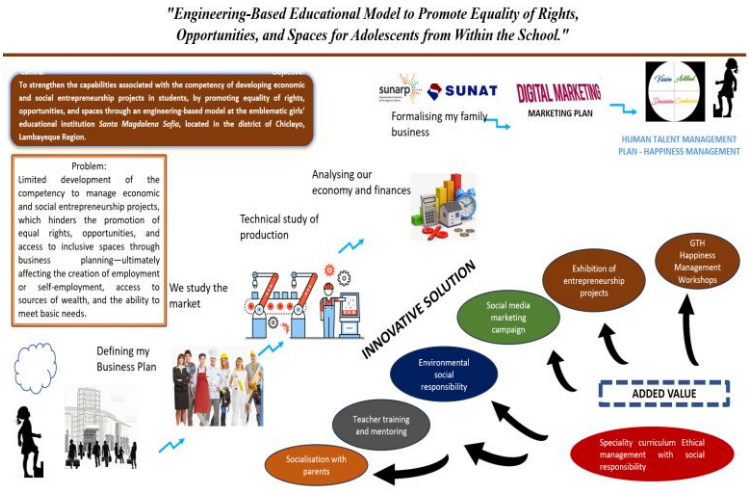
Note: Compilation based on the National Curricular Design of Regular Basic Education Approved by Ministerial Resolution NO 0440-2008-ED.

ENGINEERING-BASED EDUCATIONAL MODEL TO PROMOTE EQUALITY OF RIGHTS,

OPPORTUNITIES, AND SPACES FOR ADOLESCENTS FROM WITHIN THE SCHOOL.

The engineering process is a systematic and iterative approach used to solve problems and develop functional products or solutions. This process combines scientific, technical, and creative knowledge to transform needs into concrete solutions. Its stages include: Problem definition, background research, Requirement's specification, Idea generation, Selection of the best solution, Prototype development, Testing and redesign, Prototype evaluation, Communication of results, documentation and presentation of the final solution, this process is highly iterative, meaning participants often revisit and improve the design.

Figure 2: ***Engineering-Based Educational Model to Promote Equality of Rights, Opportunities, and Spaces for Adolescents from Within the School***.



Note: Authors' elaboration

To achieve this, we designed a holistic interdisciplinary training itinerary leading to the formulation of family business plans in 10 months.

Table 1: Training Itinerary based on the Innovative Entrepreneurship Educational Model to mobilize the competence to manage economic and social entrepreneurship projects.

Module	engineering process	Performance to be developed	Collaborative areas
rganizational Management	**DEFINING THE BUSINESS**	Business Name	Education for work (EFW)
		Description of the product or service	EFW
		Visión – Misión-	EFW, Personal development
		Strategic objectives	EFW, Personal development
		Organizational structure	EFW, Social Sciences

	MARKET RESEARCH	Analysis of the physical-economic-financial-financial-technological environment - Analysis of the social-political-legislative environment	EFW, Social Sciences, Science and technology
		Customers - substitute products - suppliers - employees	EFW, Religion, Mathematics
		Potential market - market estimation - target audience	EFW, Religion, Mathematics
		Competitive advantage, competition	EFW Communication
		Distributor markets, external market	EFW Communication
		Market strategies, supplier market	EFW, English, Art and culture, Physical E.
	TECHNICAL STUDY OF PRODUCTION	Product design - Prototype	EFW, Art and culture, Physical E, Science and technology
		Production process - Work areas	EFW, Art and culture, Science and technology
	ECONOMIC AND FINANCIAL ANALYSIS	Investments, costing, unit cost	EFW, Mathematics
		Working capital, selling price, break-even point	EFW, Mathematics
		Sales projection, economic cash flow	EFW, Mathematics
		Financial Plan Cash flow net financing	EFW, Mathematics
		Profitability indicators, sensitivity analysis	EFW, Mathematics
	REGISTRATIONS AND	SUNAT - Taxpayer Registration No. SUNARP, sanitary permits and others	EFW

Table 2: Project scheduling Second stage

Training Module	board	Performance to be developed	Collaborative areas
Organization of youth group associations and/or school cooperatives	**MARKETING PLAN**	Structure of the marketing plan	EFW, Communication
		Introduction	EFW, Communication
		Description of the service, vision, mission, objectives.	EFW, Communication
		Segmentation strategies: geographic, demographic, professional, etc.	EFW
		Segmentation strategies by nationality, psychorganic, behavioral, etc.	EFW, Mathematics
		Positioning strategies: plan of action: product	EFW, Science and technology
		Positioning strategies: action plan: sales	EFW, Personal development
		Positioning strategies: action plan: promotion	EFW, English
		Positioning strategies: action plan: distribution	EFW, Physical education
		Final action plan	EFW, Physical educaon
	PLAN DE RECURSOS HUMANOS	What are human resources? Legal labor framework in Peru	EFW, Social Sciences
		Job profile: knowledge, skills, attitudes, type of company servers Economic information. What is People Strategic Plan - People Engineering Model	EFW, Religion
		Control 1	EFW
		What do they need to know? Professional training according to the function	EFW, Social Sciences
		To know vision, mission, others. To know the areas of work under his/her responsibility- To know the environment of his/her institution.	EFW, Social Sciences
		Control 2	
		What do they have to do? Establish organizational objectives in their area of responsibility. position. Structuring and shaping your area with the application of appropriate HR management techniques.	EFW, Personal development, Social Sciences
		Know how to listen (empathy) Communicate effectively -	EFW, Personal

		Know how to motivate the staff and take advantage of the potential and capabilities of their collaborators	development, religion
		Know how to solve interpersonal problems - Knowing how to make assertive decisions Knowing how to manage time, Knowing how to efficiently conduct work meetings, Knowing how to promote teamwork - Knowing how to delegate	EFW, Personal development, Physical education, religion
		Control 3	
		What do they have to want? Be flexible and permeable to change - Focus their efforts on achieving results Provide integration of work teams	EFW
		To act with honesty, fairness and responsibility. To be coherent between what one thinks, says and does.	EFW, Religion, Personal development
		Concern for the development and progress Of the staff and be sensitive to the feelings of others, be identified with the reality and therefore with its users.	EFW

The methodological processes followed in the area of education for work are active, through interactive learning, permanent communication between teacher and student, between peers, parents, the environment and teachers from other areas, based on project-based learning and the mentoring strategy, which allowed working based on their own needs and according to their field of interest, i.e. in accordance with the National Curriculum of basic education CNEB, National Catalog of Training Offers, Curriculum approved by the educational institution for technical specialties.

Decision-making is permanent, both for the teacher in the didactic processes given the nature of the project method, as well as for the students, since when designing and positioning the organizational management plans in real scenarios, they must manage in uncertainty and prospective. In order to develop competencies, learning to undertake is promoted, that is, building didactic spaces for personal exploration in relation to their potential in challenging scenarios in their community, generating innovative ideas to solve an economic or social problem and evaluating the positive impacts.

Competence, capacities and learning standards of Education for Work

According to the Basic Curricular Design (2021) [29], in the area of Education for Work the competence that is mobilized is to manage social economic entrepreneurship projects aligned with the National Catalog of Training Offers of the Ministry of Education in the specialty of Administration (Cod.82), economic activity: Administrative and office support activities and other business support activities, productive family: services rendered to companies, economic sector: professional, scientific and technical activities. The competency is accompanied by its learning standards that are the referents for the formative evaluation of competencies, because they describe levels of development of each competency from the beginning to the end of schooling, students effectively and efficiently manage resources, materials and inputs for the development of economic or social entrepreneurship projects from an environmental and sustainable approach. The learning standards constitute precise and common criteria to report not only whether the standard has been achieved, but also to indicate how far or close each student is to achieving it.

The performances achieved are Investigates as a team a need or problem in their environment that they are interested in improving or solving, recognizes patterns among the factors that originate the identified need or problem, integrating information gathered in group interviews and statistical and theoretical sources; from this structures a group of users that is affected by it using stratified sampling. Designs creative and innovative solution alternatives, represents them through prototypes and redefines them by integrating comments from potential users and optimizing the investment-benefit ratio and maximizing social and environmental results; considering ethical and social aspects Administers the inputs and materials required to develop the value proposition and schedules the activities to be executed to develop the proposal. integrating alternative solutions to complex scenarios or unforeseen situations. Combines the most relevant technical skills to produce a good or provide services being responsible with the environment and applying safety standards at work. Coordinates the activities of his team, getting people to agree on their priorities and objectives; accompanies and enhances the performance of his colleagues, assuming with responsibility different roles within the team and proposes alternative solutions to unexpected conflicts. Establishes indicators and develops information gathering instruments that allow him/her to evaluate the processes and results of his/her project; systematizes the information gathered and analyzes the balance between investment and benefit, user satisfaction, and the social and environmental benefits generated and incorporates improvements to increase the sustainability of his/her project over time.

Linking the competencies of the area and those of other areas.

The technical specialty of Administration involves various specialties, but they maintain the pedagogical practice by entrepreneurship projects where students are protagonists of their training, develop competencies to solve problems and conflicts, promote intercultural tolerance, action-oriented. This methodology is interdisciplinary, it develops

metacognition, putting high collective participation, involving areas such as: Mathematics in planning, execution, quantities in production processes, control, search for balance in income - expenditure and evaluation of processes: fixed and variable costs, cash flow, break-even point, etc. The competency creates projects from the languages of art, the competency designs and builds technological solutions, the competency solves problems of data management and uncertainty, competencies responsibly manage economic resources and responsibly manage space and the environment, mobilizes is solves problems of quantity and solves problems of data management and uncertainty, reads various texts related to management and writes various types of advertising texts, builds historical interpretations. They build their identity, which strengthens the development of intrapersonal and interpersonal socioemotional skills, and manage economic resources responsibly. In Communication, students improve the writing of commercial and advertising documents that are a source of official information of their intercultural entrepreneurship.

In Social Sciences, it helps to develop historical identity and democratic construction as a way of life in the social conscience of the students, being that through this project they got closer to the ancestral culture through the experiences of people from previous generations who made them the depositaries of their knowledge regarding health care. Foreign languages allowed us to create advertising through the use of the English language and disseminate it through social networks and video repositories such as YouTube, Facebook, tik tok, etc., Art Education developed skills of expression, diction in front of cameras, image building to make the elevator pitch advertising. As we can see, the collegial work was fundamental to develop competencies and turn education into a meaningful experience. The student culminated her formative process with the support of the formative module in the specialty. They have a terminal character, are certifiable and make up the curriculum, leading to obtaining a modular certification according to the National Catalogue of Training Offers [30]. From there they can take with greater ease and vision the strategies to use to position themselves in the

market, making objective studies use the applied scientific methodology, through the application of surveys and qualitative and quantitative processing.

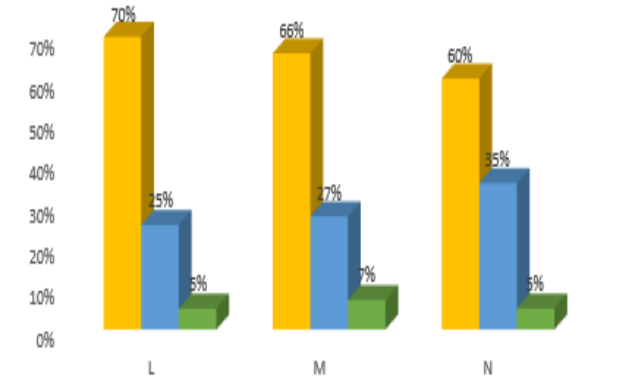
Table 3: Competency assessment rubric manages economic and social entrepreneurship project.

Nro.	INDICATHOR	AD (4 points) Demonstrates learning beyond that expected for grade or age.	A (3 points) Demonstrates the expected level, i.e., completes the assigned tasks within the established deadline.	B (2 points) is close to the expected level, therefore, requires academic support to reach it.	C (1) demonstrates minimal progress in terms of expected level, needs coaching and advice from the teacher
01	DEFINING THE INVESTMENT PLAN	Clearly state: Name of the investment plan Describe the product or service Vision, mission, objectives of the investment plan, Organizational structure			
02	MARKET RESEARCH	Defines the environment, potential market, market estimation, target audience, competitive advantage, competition, strategy, supplier market, distributor market. Develops marketing surveys reaching conclusions that favor its positioning in the market.			
03	STUDY OF PRODUCTION	Establishes the production process, production process (process flowchart), work area charting			

04	PERFORMS FINANCIAL	Performs economic estimates with short-, medium- and long-term revenue projections.			
05	HUMAN TALENT MANAGEMENT	Establishes employee roles and implements a selection process to attract new employees. talents to your company			

RESULTS

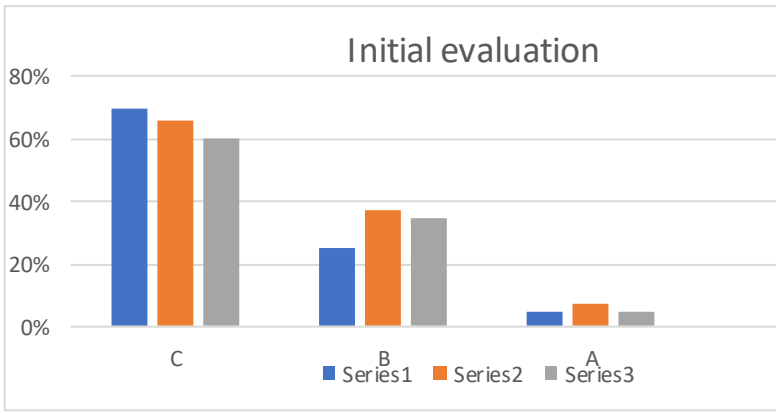
Figure 3: Students enrolled, evaluated and not evaluated.



Source: Diagnostic evaluation

As can be seen in the graph, the 4thL classroom has 70% of students enrolled, 25% of students evaluated and 5% of students not evaluated. Classroom 4M has 66% of students enrolled, 27% of students evaluated and 7% of students not evaluated. Classroom 4N has 60% of students enrolled, 35% of students evaluated and 5% of students not evaluated. In relation to the diagnosis, the following results were determined:

Figure 4: Initial evaluation of competency manages economic and social entrepreneurship projects Results of the first evaluation of learning achievements.



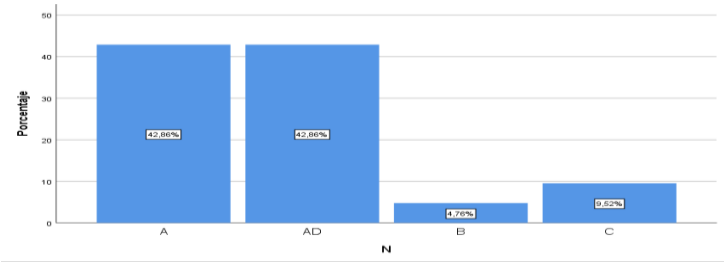
Legend: 4L blue, 4M orange, 4N gray

As we can see in the initial evaluation, the 4L classroom presents 70% in a condition of minimum progress in terms of the expected level, 25% of students are close to the expected level, but require academic support to achieve it, 5% demonstrate the expected level by completing the assignments in the expected time, and 0% demonstrate learning beyond what is expected for their age. Classroom 4M: 66% in minimum progress condition in terms of the expected level, 27% of students are close to the expected level, require academic support to achieve it, 7% demonstrate the expected level by completing the assignments in the expected time, and 0% demonstrate broad learning at the expected level for their age. In the 4th grade, 60% of students are in a condition of minimum progress in terms of the expected level, 35% of students are close to the expected level, require academic support to achieve it, 5% demonstrate the expected level by completing the assignments in the expected time, and 0% demonstrate broad learning at the level expected for their age.

In relation to the post-test

Figure 5: Results of the post-test of competency: manages economic and social entrepreneurship projects Results of the first evaluation of learning achievements in the classroom

CLASSROOM N



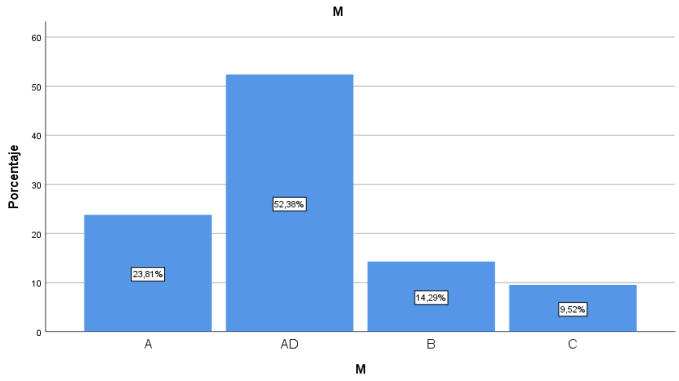
Note: Own elaboration

In classroom 4°N, a total of 21 students were observed. Most of them, 42.9%, obtained the grade "A", demonstrating the expected level, that is, they fulfill the tasks assigned within the

established term; while another equally significant group also achieved a grade of 42.9%, but in the "AD" category, demonstrating learning beyond what is expected for their grade or age. Only one student, corresponding to 4.8%, received a grade of "B", which is close to the expected level and therefore requires academic support to achieve it. Two students, totaling 9.5%, obtained a "C" grade, demonstrating minimal progress in terms of the expected level, and therefore, they need support and advice from the teacher. In cumulative terms, 42.9% of the students achieved an "A" grade and another 42.9% obtained an "AD" grade, representing 85.7% of the total. The "B" and "C" grades contribute 4.8% and 9.5%, respectively, thus completing 100% of the grades in the "4°N" classroom.

Figure 6: Post-test result of competency manages economic and social entrepreneurship projects Results of first evaluation of learning achievements classroom 4M.

CLASSROOM M

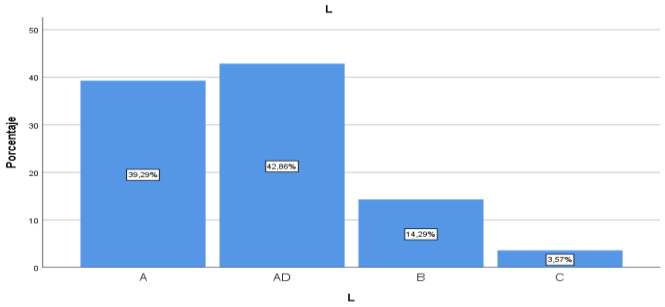


Note: Own elaboration

In the "4°M" classroom, there is a total of 21 students. Of these, 23.8% achieved the grade "A", demonstrating the expected level, i.e., they fulfill the assigned tasks within the established time frame. While a remarkable 52.4% obtained the grade "AD", demonstrating learning beyond what is expected for their grade or age. Three students, equivalent to 14.3%, received the grade "B", being close to the expected level, thus requiring academic support to achieve it. Two students, representing 9.5%, obtained a "C" grade, demonstrating minimal progress in terms of the expected level, so they need accompaniment and advice from the teacher. Cumulatively, 76.2% of the students obtained "A" or "AD" grades, while 90.5% achieved "A", "AD" or "B" grades. The totality of grades in the "4°M" classroom is completed with 100%, reflecting the distribution of grades of female students in this specific context.

Figure 7: Post-test result of competency manages economic and social entrepreneurship projects Results of the first learning achievement assessment in classroom 4L.

CLASSROOM L



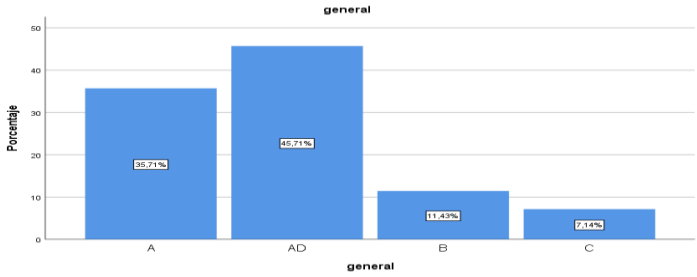
Note: Own elaboration

A total of 28 students participate in the "4°L" classroom. Of these, 39.3% achieved an "A" grade, demonstrating the expected level, i.e., they completed the assigned tasks within the established time frame. While 42.9% obtained an "AD" grade, demonstrating learning beyond what is expected for their grade or age. Four students, equivalent to 14.3%, received the grade "B", being close to the expected level, thus requiring academic support to achieve it. Finally, one student, representing 3.6%, obtained a "C" grade, demonstrating minimal progress in terms of the expected level, and therefore, she needs support and advice from the teacher. In cumulative terms, 82.1% of the female students obtained "A" or "AD" grades, while 96.4% achieved "A", "AD" or "B" grades. The distribution of grades in the "4°L" classroom reflects a significant variability, highlighting the presence of female students in the different grade categories.

CUMULATIVE RESULT OF THREE CLASSROOMS

Figure 8: Post-test result of the competency "Manages economic and social entrepreneurship projects" Results of the first evaluation of learning achievements in classroom 4L.

CLASSROOM L



Note: Own elaboration

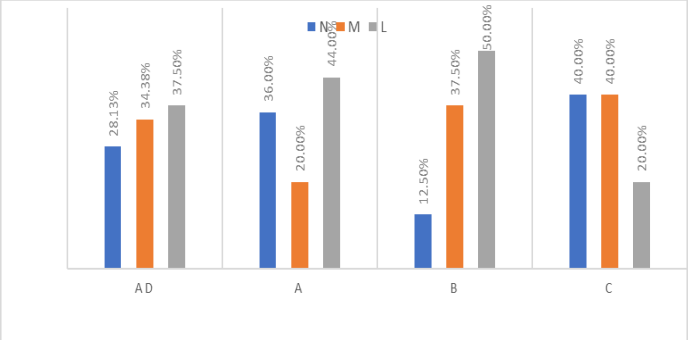
In the overview of the three combined classrooms, with a total of 70 female students, a diverse distribution of grades can be observed. 35.7% of the students obtained an "A" grade, demonstrating the expected level, i.e., they completed the assigned tasks within the established deadline. While 45.7% achieved the grade "AD", demonstrating learning beyond what is expected for their grade or age. 11.4% of the students

received the grade "B", being close to the expected level, therefore, they require academic support to reach it. In addition, 7.1% obtained a "C" grade, demonstrating minimal progress in terms of the expected level, and therefore, they need accompaniment and advice from the teacher. In cumulative terms, 81.4% of the students obtained "A" or "AD" grades, and 92.9% achieved "A", "AD" or "B" grades. The distribution of grades on the development of the competency "manages economic and social entrepreneurship projects" in the overview reflects the variability existing in the three classrooms considered together.

GENERAL DETAIL BY CLASSROOM

Figure 9: Post-test results of the competency "manages economic and social entrepreneurship projects" Results of the first evaluation of learning achievements in classroom 4L.

CLASSROOM L



Note: Own elaboration

In the detailed breakdown of overall performance by classroom, differences in the distribution of grades are evident. In the "4°N" classroom, 28.13% of the students obtained the grade "AD", demonstrating learning beyond that expected for their grade or age. While in the "4°M" classroom this percentage was 34.38% and in the "4°L" classroom it was 37.50%. As for the "A" grade, demonstrating the expected level, the "4°N" classroom leads with 36.00%, followed by the "4°M" classroom with 20.00%, and finally, the "4°L" classroom with 44.00%. In the "B" grade, being close to the expected level, therefore, requires academic support to reach it, the "4°N" classroom has 12.50%, "4°M" has 37.50%, and "4°L" has 50.00%. As for the "C" grade, demonstrating minimal progress in terms of the level expected, so it needs accompaniment and advice from the teacher, the "4°N" classroom presents 40.00%, "4°M" 40.00%, and "4°L" 20.00%. In general terms, this breakdown highlights the variations in the performance of the students in each specific classroom with respect to the development of the competency "manages economic and social entrepreneurship projects".

DISCUSSION OF RESULTS

The implementation of the *Innovative Entrepreneurship Educational Model* significantly mobilized students' entrepreneurial competencies, aligning with the National Educational Project to 2036, which emphasizes the need for a qualified technical workforce capable of integrating into the global labor market with autonomy and digital fluency.

Students demonstrated practical and creative entrepreneurial behaviors, generating **40 business ideas** (25 in teams, 15 individually), consistent with the development of entrepreneurial propensity noted by **Palalić et al. (2017)** and **Volkmann et al. (2021)**. These ideas were not spontaneous—they were shaped by socio-economic conditions that fostered motivation and a drive for change, thereby challenging the view of **Czakó (2023)**, who asserts limited entrepreneurial engagement in adverse conditions.

Family involvement emerged as a key enabling factor, forming an **entrepreneurial network** that contributed resources and logistical support, confirming the idea of **Abu-Rumman et al. (2021)** regarding the strategic capitalization of social networks.

Student agency was evident in every phase—ideation, planning, execution, and revision—with **entrepreneurial intention, personality traits, and opportunity evaluation** playing critical roles (**Borsi & Dőry, 2020**). These elements were sustained by **constructive learning** through real-world project development, as highlighted by **Santoso (2023)**.

Assessment results affirmed high competency levels: **35.7%** of students received grade “A” (expected level), **45.7%** exceeded expectations with grade “AD”. **11.4%** received “B” (near expected level, requiring support), **7.1%** received “C” (minimal progress, requiring targeted intervention).

These outcomes endorse **Project-Based Learning (PBL)** as a powerful method for entrepreneurial development, supporting models proposed by **Kean & Kwe (2014)**, **Filho et al. (2016)**, and **Chang et al. (2021)**. PBL enabled the formulation of business plans through strategic planning, market research, financial analysis, and human resource management—fostering holistic competency development.

The **Local Educational Management Unit** played a key role in amplifying student achievements by promoting their ventures publicly, thus enhancing their **identity, self-confidence, and entrepreneurial intention** (**Shahzad et al., 2021; Field et al., 2014**).

CONCLUSIONS

Regarding the diagnosis of the status of the competency "manages economic and social entrepreneurship projects" in female students, it was concluded that the levels of learning achievement at the beginning of the research were minimal, as most students were in an early progress condition—a trend that

prevailed across the three classrooms and in the overall data.A training itinerary was designed based on the *Engineering-Based Educational Model to Promote Equality of Rights, Opportunities, and Spaces for Adolescents from Within the School*, with the purpose of significantly mobilizing the competency of managing economic and social entrepreneurship projects in a holistic and interdisciplinary manner. The impact of the implementation of this training itinerary was substantial, as it successfully mobilized the competency among fourth-grade secondary students (sections L, M, and N) of the Santa Magdalena Sofía School. By the end of the program, 92.9% received grades of "A" and "AD," demonstrating learning outcomes that exceeded expectations. In doing so, the initiative promotes equality of rights, opportunities, and spaces for female students by enabling them to generate employment or self-employment, access sources of wealth, and meet their basic needs.

REFERENCES

[1] Instituto Nacional de Estadística e Informática Lambayeque Compendio Estadístico 2022 PERÚ Instituto Nacional de Estadística e Informática (inei.gob.pe).

[2] Ministerio de Educación, Portal SISEVE contra la Violencia Escolar SíseVe (siseve.pe)

[3] Ministerio de Educación, Unidad de Medición de la Calidad educativa Resultados de la Evaluación Muestral de Estudiantes 2022 | UMC | Oficina de Medición de la Calidad de los Aprendizajes (minedu.gob.pe)

[4] SYSA Cultura emprendedora Sysa | Inicio (culturaemprendedora.com)

[5] Ministerio de Educación, Proyecto Educativo Nacional al 2036, El reto de la Ciudadanía Plena Proyecto Educativo Nacional al 2036. El reto de la ciudadanía plena - Informes y publicaciones - Consejo Nacional de Educación - Plataforma del Estado Peruano (www.gob.pe)

[6] Lunati, M. (2010). El Programa de Indicadores de Emprendimiento de la OCDE y Eurostat. En una reunión multianual de expertos sobre políticas de desarrollo empresarial y creación de capacidad en ciencia, tecnología e innovación (CTI), Ginebra.

[7] Sekerbayeva, A., Tamenova, S., Tarman, B., Demir, S., Baizyldayeva, U., & Yussupova, S. (2023). The Moderating Role of Entrepreneurial Self-Efficacy and Locus of Control on the Effect of the University Environment and Program on Entrepreneurial Intention and Attitudes. European Journal of Educational Research, 12(3). DOI: 10.12973/eu-jer.12.3.1539

[8] St-Jean, E., Tremblay, M., Barès, F., & Simionato, M. (2023). Effect of training nascent entrepreneurs on their stress: the role of gender and participant interaction. New England Journal of Entrepreneurship, 26(1), 20-39. DOI: https://doi.org/10.1108/NEJE-10-2021-0064

[9] Sorici, C. O., Sălceanu, C., Matei, R. S., Sburlan, D. F., Țiței, A., & Gîrțu, M. A. (2023). An extracurricular project-based training course in innovation and entrepreneurship taught to a transdisciplinary group of students from engineering, social sciences, arts and medicine. Educational Sciences, 13(10), 967. DOI: https://doi.org/10.3390/educsci13100967

[10] Politis, D. The Entrepreneurial Learning Process: A Conceptual Framework. Entrep. Practical Theory. 2008, 29, 44–71. [Google Académico] [CrossRef]

[11] Palalić, R., Ramadani, V., Đilović, A., Dizdarević, A., & Ratten, V. (2017). Entrepreneurial intentions of college students: a case-based study. Journal of Entrepreneurial Communities: People and Places in the Global Economy., 11(03), 393-413. DOI: https://doi.org/10.1108/JEC-12-2016-0046

[12] Czakó, K., Polster, C., Setyaningsih, S., & Vasic, T. (2023). The role of the environment in entrepreneurial propensity of youngsters' business ideas. Journal of Innovation and Entrepreneurship, 12(1), 7. DOI: https://doi.org/10.1186/s13731-023-00275-2

[13] Abu-Rumman, A., Al Shraah, A., Al-Madi, F., & Alfalah, T. (2021). Entrepreneurial networks, entrepreneurial orientation and performance of small and medium-sized enterprises: ¿are dynamic capabilities the missing link? Journal of Innovation and Entrepreneurship, 10(1), 1-16 DOI: https://doi.org/10.1186/s13731-021-00170-8

[14] Borsi, B., & Dőry, T. (2020). Perception of multilevel factors for entrepreneurial innovation success: A survey of university students. Acta Oeconomica, 70(4), 615-632 DOI: https://doi.org/10.1556/032.2020.00039

[15]Santoso, R. T. P. B., Priyanto, S. H., Junaedi, I. W. R., Santoso, D. S. S., & Sunaryanto, L. T. (2023). Project-based entrepreneurial learning (PBEL): a blended model for startup creation in higher education institutions. Journal of Innovation and Entrepreneurship, 12(1), 18. DOIhttps://doi.org/10.1186/s13731-023-00276-1

[16] Kean, A. C., & Kwe, N. M. (2014). Meaningful learning in the teaching of culture: The project-based learning approach. Journal of Education and Training Studies, 2(2), 189-197.

[17] De Oliveira, F. V., Freitas Filho, F. L., & Lanzer, E. A. Coworking spaces as promoters of the entrepreneurial ecosystem: the Brazilian case of CUBO Coworking spaces as promoters of the entrepreneurial ecosystem: the Brazilian case of CUBO.DOI: https://doi.org/10.56238/homeebookorg01-019

[18] Amirkhanpour, M., Vrontis, D., & Thrassou, A. (2014). Mobile marketing: a contemporary strategic perspective. International Journal of Technology Marketing 5, 9(3), 252-269. DOI: https://doi.org/10.1504/IJTMKT.2014.063855

[19] Cedeño, S. D. M. R., & Dueñas, A. E. P. (2020). El emprendimiento en América Latina: Un análisis de su etimología, tipología y proceso. ECA Sinergia, 11(2), 47-58.

[20] Dickfos, J., Cameron, C., & Hodgson, C. (2014). Blended learning: impacting assessment and self-reflection in accounting education. Education+ Training, 56(2/3), 190-207. DOI: https://doi.org/10.1108/ET-09-2012-0087

[21] Volkmann, C., Fichter, K., Klofsten, M., & Audretsch, D. B. (2021). Sustainable entrepreneurial ecosystems: An emerging field of research. Small Business Economics,56(3), 1047-1055. DOI: https://doi.org/10.1007/s11187-019-00253-7

[22] Chang Fun, L., & Gisbert Ríos, R. (2005). En línea con el espíritu emprendedor. Cátedra Virtual de Innovación y Creación de Empresas en Colombia. Serie Capacidad Emprendedora, Caracas: CAF. Retrieved from https://scioteca.caf.com/handle/123456789/451

[23] Alonso, A., & Marqués, J. M. (2019). Innovación financiera para una economía sostenible (Financial Innovation for a Sustainable Economy). Banco de España Occasional Paper, (1916).

[24] Farrukh, M., Khan, A. A., Shahid Khan, M., Ravan Ramzani, S., & Soladoye, B. S. A. (2017). Entrepreneurial intentions: the role of family factors, personality traits and self-efficacy. World Journal of Entrepreneurship, Management and Sustainable Development., 13(4), 303-317 DOI https://doi.org/10.1108/WJEMSD-03-2017-0018

[25] Macho, A. Y., Carabaza, C. R. P., González, Á. J., Valverde, E. M. P., Ordaz, R. G., & Iglesias, J. L. P. (2020). Personalidad emprendedora y género. Cuadernos de relaciones laborales, 38(1), 85. DOI: https://dx.doi.org/10.5209/crla.68869

[26] Klyver, K., & Terjesen, S. (2007). Entrepreneurial network composition: An analysis across venture development stage and gender. Women in Management Review, 22(8), 682-688. DOI: https://doi.org/10.1108/09649420710836344

[27] Brush, C., Edelman, L. F., Manolova, T., & Welter, F. (2019). Una mirada de género a los ecosistemas de emprendimiento. Economía de la Pequeña Empresa, 53, 393-408.[27]

[28] Fayolle, A., & Liñán, F. (2014). The future of research on entrepreneurial intentions. Journal of entrepreneurial research, 67(5), 663-666. DOI: https://doi.org/10.1016/j.jbusres.2013.11.024

[29] Ministerio de Educación, Diseño Curricular Nacional 2022. CNEB [Google Académico]

[30] Ministerio de Educación, Catálogo Nacional de ofertas formativas, 2015