



University of Azuay

Faculty of Legal Sciences

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Economic Impact Analysis of the Dual formation of companies in Cuenca :

Period 2013-2017

Thesis Submitted as a Requirement to Obtain a Degree in International Studies
and Bilingual Mention in Foreign Trade

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Dedication

I want to dedicate this dissertation to God for having guided me to this hard but wonderful way. To my parents Elsa Barrera and Arturo Acosta, whom have been my support and inspiration to follow and improve myself every day. This is the best reward I can offer for their trust and hopes placed on me. To my sibling Paulina who always is giving me happiness in the difficult times. To Boris Barreto Mendieta who is a really important person in this special stage of my life. This is just one part of the way, the conclusion of a stage and this would not have happened without your valuable and unconditional support.

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KEY WORDS

Dual Vocational Training, economic benefits, initial investments, internal trainees, external trainees, general tutors, specific tutors, collaborators, Indurama company, Graiman Industrial Group, Continental Tire Andina company.

ABSTRACT

From an economic perspective, this research analyses the enforcement of the first promotion of Dual Vocational Training in Electricity and Mechanics in the period 2013 – 2017 in industries from Cuenca. This paper includes the research of trajectory of dual training in Germany and the implementation of the mentioned model in our city. In addition, the cost — benefit economic analysis that this model represents to the training companies. This investigation will allow entrepreneurs to view dual training as a future investment to their companies and benefits that can be generated in the short and long term

INTRODUCTION

We believe that the interaction of the theoretical and practical training between the university and the company is the best method to reduce the youth unemployment level, to increase the productivity with qualified labor force in order to obtain a marked increase in the quality of goods and services of a company.

The present research work arises as a result of the importance of analyze the economic impact that the Dual Education has generated in the trainers companies in order to reflect the results of this project to motivate new entrepreneurs to develop this new learning model. "From a business standpoint the vocational training is an investment and as such it must be profitable. To involve more companies into this project, it will take much more than good intentions. Economic arguments are needed." (Wolter, 2015).

There is an analysis of the cost-benefit economic model that tries to reflect which are the components that help to establish the benefits and incomes that the trainers companies have to deal with in the case of making the decision to apply the Dual Education Program. As well as its history, its background in Germany, Latin America, and the implementation of this model in Cuenca City.

Subsequently, I will take the profiles of three selected companies to determine the costs incurred and the benefits deriving during the training of the students that replace other professionals in each one of these companies.

To conclude, I will establish the balance point that arises from the analysis of the number of productive hours performed by a trainee in each one of the companies in order to know in which time the net cost of the traineeship will become zero for the company.

The overall objective of this research work is to analyze the viability of the Dual Education in the trainers selected companies in the period of 2014 – 2017.

Chapter 1: Cost – Benefit Economic Model Theory and the global vision of the Dual Education.

The present chapter will develop the information related to the cost — benefit economic model implementation in order to establish if the Dual Education Program is profitable for the companies. Additionally, the research work will continue with the analysis of the Dual Education context in Germany and Latin America focused on the transfer of the dual system from a business vision.

Every entrepreneur seeks to maximize the company performance by generating additional incomes that should be greater than or equal to the additional costs that were invested in the company projects. The economy teaches us that everything has a cost, so it leads to making decisions and exchanges an objective for another objective. To reach an optimal combination, the companies require investment in qualified labor force in order to generate profitability in the short and long term.

In most cases, the costs decrease over time as the workers gain experience, so as to increase the level of the productivity.

Currently, the decision to invest in the Dual Education Model implies a costs and benefits analysis that could be generated through and after the training period by allowing students replace qualified workers. (Robert S. Pindyck D. L., 2005)

The estimation of fixed and variable costs is related to the type of information that the company wishes to venture into. For example, they could choose between its application in the administrative area or in the technical area; as well as the market sector that the company belongs to such as: a perfect competition market or an oligopolistic market. Within this analysis, it is important to establish the productive capacity growth that the executives look for with the increase of the amount of labor force, to avoid the triggering of an obsolete production by the excessive recruitment of trainees. (Ley de rendimientos marginales decrecientes.)

In conclusion, the costs dynamic variations in a Dual Education will depend on the learning process and the program period. (Robert S. Pindyck D. L., 2005)

As a suggestion, it is important to implement a high performance and profitability recruitment system for the companies of different sectors. The uncertainty about the benefits or about the risk that the company must assume in the case of making the decision of apply the Dual Model is the reason why there is a low participation in the mentioned model. Consequently, it will be useful to find new ways to mitigate the risk of the lack of benefits that this investment must generate.

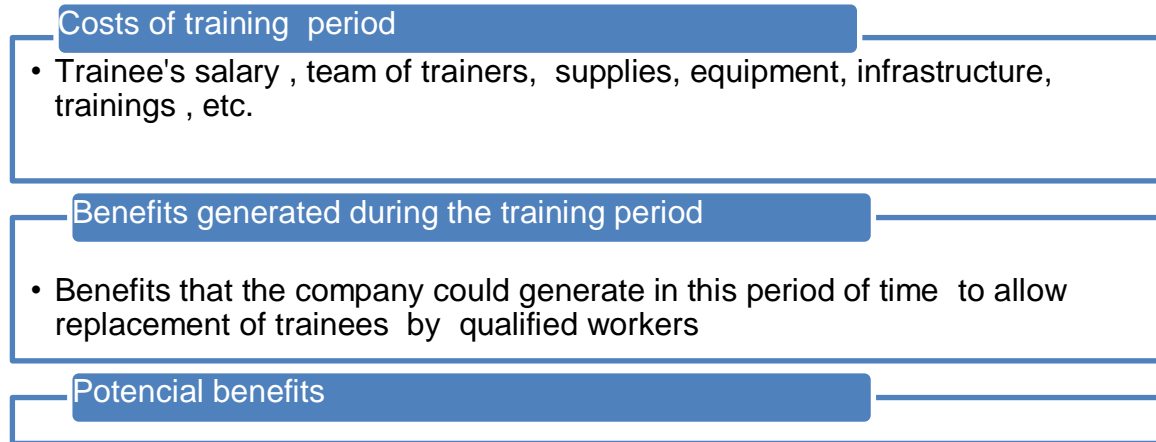
The cost-benefit model

Over the last two decades, Germany and Switzerland have applied this cost-benefit model several times, which simulates the net costs and benefits from a business standpoint. The experience of applying this model in different countries, economic sectors and professional profiles, was carried out with the objective of experiencing the identification processes of the most important parameters by simulating the net costs of a Professional Dual Education. Wolter and Mühleman in the study of cost-benefit simulation, called “Apprenticeship training in Spain – a cost — effective model for firms?” They apply this simulation from different scenarios with the net costs for a Dual Education abroad , as is the case in Spain. ¹

Those authors analyzed the main components of the profitability of applying the cost-benefit model in a trainer company. “The model has three components: the costs that arise during the training period, benefits that the company could generate in this period of time and the potential benefits” (Dr. Stefan C. Wolter, 2015, pág. 27)

¹ The model consist of three components for which it uses the most recent statistical data from Switzerland . These are complemented with Spain Data.

Illustration 1 Components of the Cost-Benefit Model

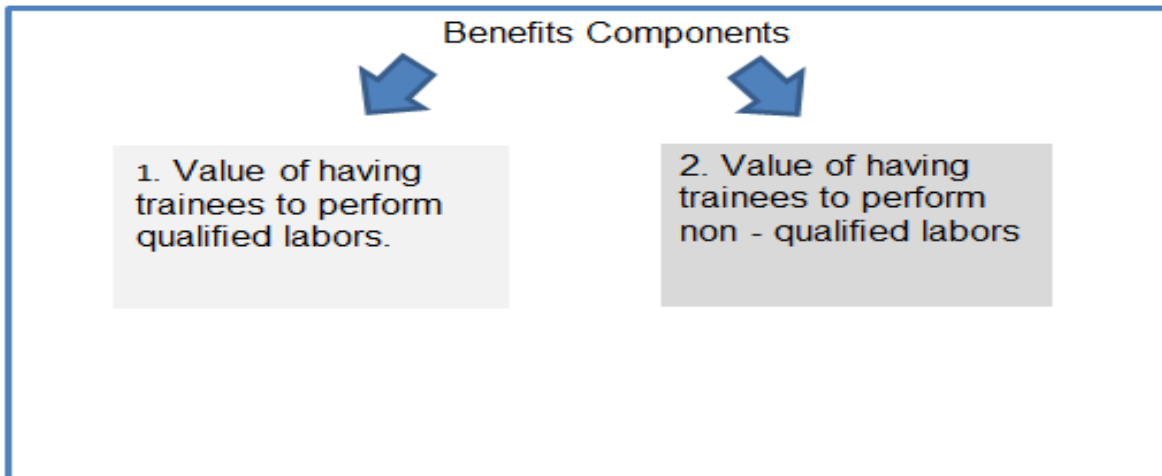


Elaborated by: Sofia Acosta

Source: “Apprenticeship training in Spain – a cost — effective model for firms?”
Wolter and Mühleman

The components of the benefits for a trainer company are as follows:

Illustration 2 Types of benefit components



Elaborated by: Sofia Acosta

Source: “Apprenticeship training in Spain – a cost — effective model for firms?”
Wolter and Mühleman

1. It is calculated by multiplying the time that trainees spend on their tasks by the salary that the company must pay to qualified workers. That result is multiplied by the trainee productivity expressed in relation with the productivity of a qualified worker.²

2. The non-qualified tasks correspond to the salary that the company would have had to pay to a non-qualified worker. It has also been found an improvement in the productivity of workers around the trainees.

Finally, the difference between the learning costs and benefits generate net benefits for the company at the end of the training period.

As mentioned earlier, the companies need to obtain short and long term benefits through and after the training period.

Experiences about the hiring

Is the key to success for the company to recruit qualified workers? Indeed, filling a vacancy implies direct costs for the company, such as: the selecting processes and the training for the new worker; but also it involves indirect costs related to the low productivity of the new staff that generates disorganisation in the productive processes of the company. The cost of selecting a new worker differs according to the knowledge level and the preparation needed to occupy the job post. There is not enough empirical evidence of staff recruitment. However, Mühleman y Strupler in their study called "Ten Facts You Need to Know about Hiring," establish specific data about the staff recruitment for intermediate specialisation works through a survey conducted in an administrative establishment in Switzerland during the years: 2000, 2004 and 2009. The main points are as follows:

1. The average cost to fill a vacancy for a semiskilled work is around 16 weeks of a basic unified salary.

² Thus, if a trainee needs twice as much time as a skilled worker to complete a given task, their relative productivity is 50 % . For the company, this means that the value of having a trainee performing a skilled job is half the salary cost that would have hired a skilled worker.

2. The most representative cost is related to the 53% of the training and its low productivity level of the trainee, the 26% is the time required by the other workers to give instructions, and the 21% for the selection process.
3. The company invests an average of 9 hours on work interviews, including the preparation time and the subsequent interview evaluation.
4. The adaptation and training average for the trainee to reach a correct productivity level is about 4 months.
5. The hiring cost increases by the skills level required and those are measured in training hours. The 1% increase in the skills required was related to the 0.8% of the hiring cost.

The results achieved let us comprehend clearly the process and cost that the hiring implies. Although the costs vary in each one of the countries, this always differs due to the skills level required. (Leiser, 2015)

“The companies can make the decision to provide training places because they await any net initial investment return in the training. (Oatey.1970; Lindley, 1975, Merriees, 1983)” (Marc Blatter S. M., 2012, pág. 2)

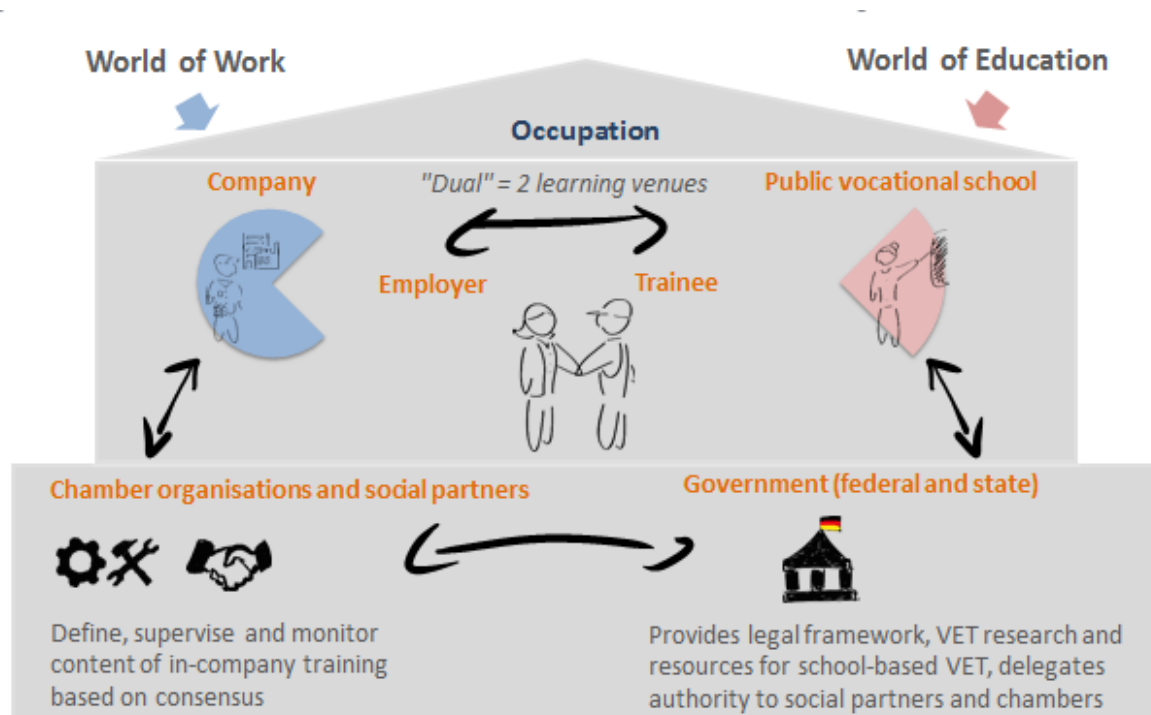
The proportion of hiring costs is essential for a company to provide an apprenticeship training. If the training costs are greater than the hiring costs, the company will probably not provide any kind of information. (Marc Blatter S. M., 2012)

The Dual Education as a starting point. Is it an export success?

The Professional Dual Education system, made in Germany, every year is being complemented by more companies around the world. Its application is valid for those companies that act globally and search qualified staff for their productivity. On the other hand, the governments from different countries have undertaken the German model waiting for the reduction of youth unemployment levels to develop a more competitive economy.

The German Chamber of Industry and Trade extends its full support to the different chambers of industry and trade to give them consultancy and coordination with the different actors to the program implementation in foreign countries in order to include new companies in this education model.

Illustration 3 Dual System Scheme in Germany



Source: German office for international cooperation in Vocational Education and training www.bibb.de/govet/en/54880.php

The Dual system is defined as “two worlds under the one roof,” because the companies are which create the careers according to their own needs, and which with the professional schools participation reach the final objective to train the student in the best way the theoretical part in the classroom and the practical part in the company during a specified period of time.

It is necessary to demonstrate that there are some economic arguments that prove: the viability of the program, the possibility of get short and long term benefits, as well as the costs that the company has to assume in the case of be transformed into a trainer company.

To continue, it is important to analyse the application process of the economic model of cost-benefit of having a qualified labor force through the implementation of a Dual Education in a foreign company based on the report done by the German Confederation of the Chamber of Industry and Commerce in 2016.³

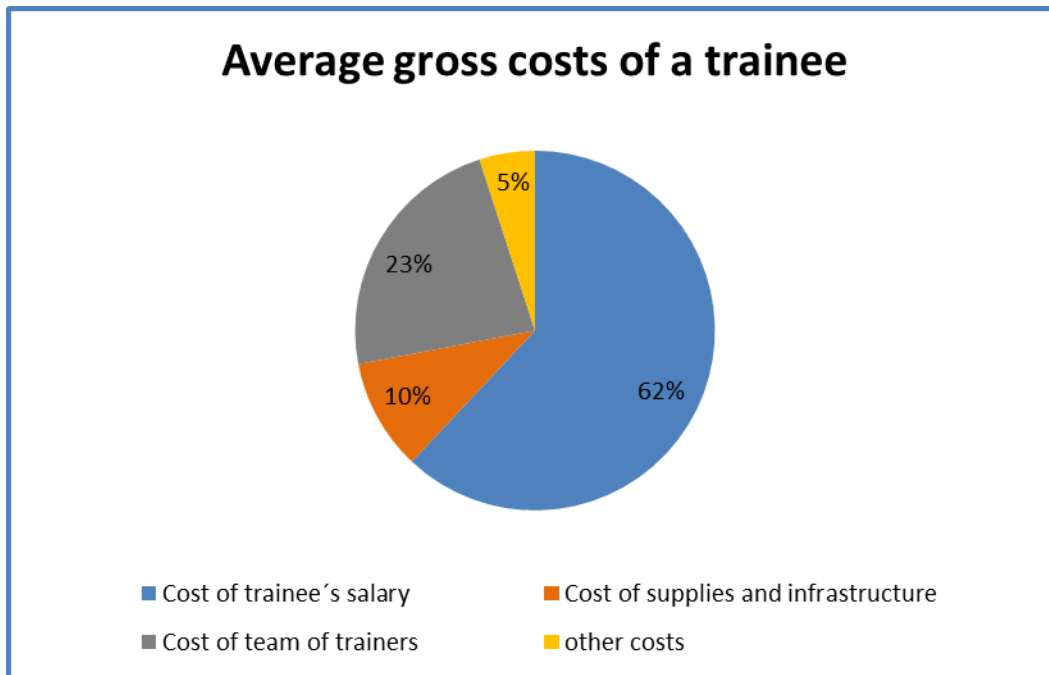
Costs analysis of the Professional Dual Education in Germany

1. Cost factors of the training

The Dual Educations costs are quantifiable and could be fixed or variable. The gross costs are remarkably quantifiable and those could vary according to the sector that the company is part of, the professional profile, the size of the company and if it has or not a teaching workshop. Illustration 4 reflects the percentage that each cost component represents in the training period of the trainee. Studies show that the main factor about costs is the remuneration of the training period, so in 2014, it was around 769,50EUR.

³ Study of the costs and benefits of training within the company . Solid reasons and arguments for the implementation of training in companies from other countries based on experiences in Germany with the dual vocational training system .

Illustration 4 DIHI representation according to the BiBB (2015)

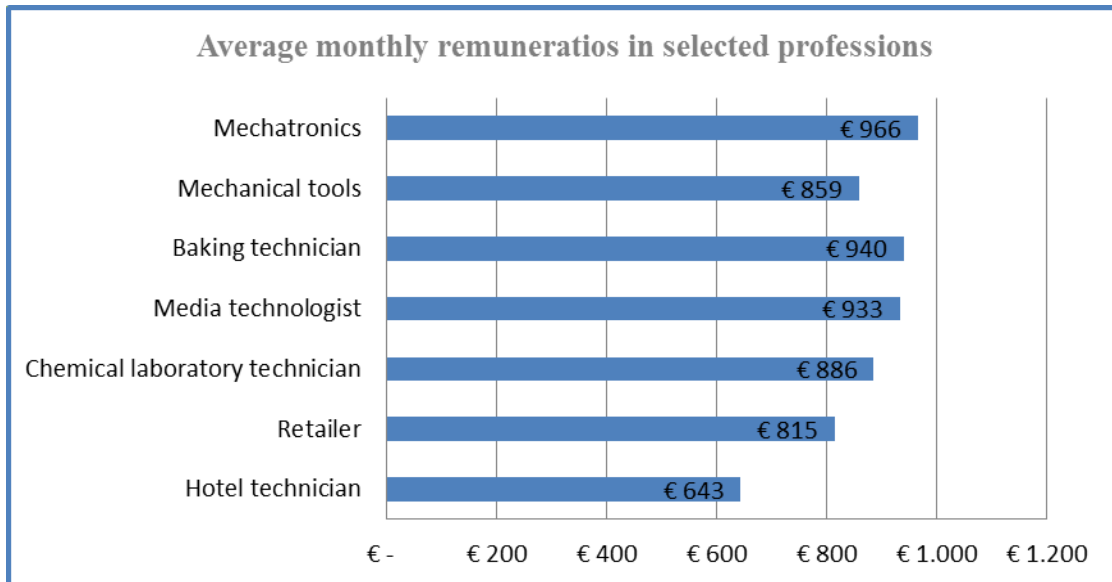


Elaborated by: Sofia Acosta

Source: Confederation of the German Chamber of Industry and Commerce

The salary that the trainee receives for his training process within the company varies according to the type of area selected. In Germany, the careers with a major remuneration are those of technical areas that imply that the costs increase as compared to other industries. Illustration 5 represents the monthly average depending on the different professions.

Illustration 5 DIHK representation according to the Federal Agency for Employment data: Beruf Aktuell 2015/2016



Elaborated by: Sofia Acosta

Source: Confederation of the German Chamber of Industry and Commerce

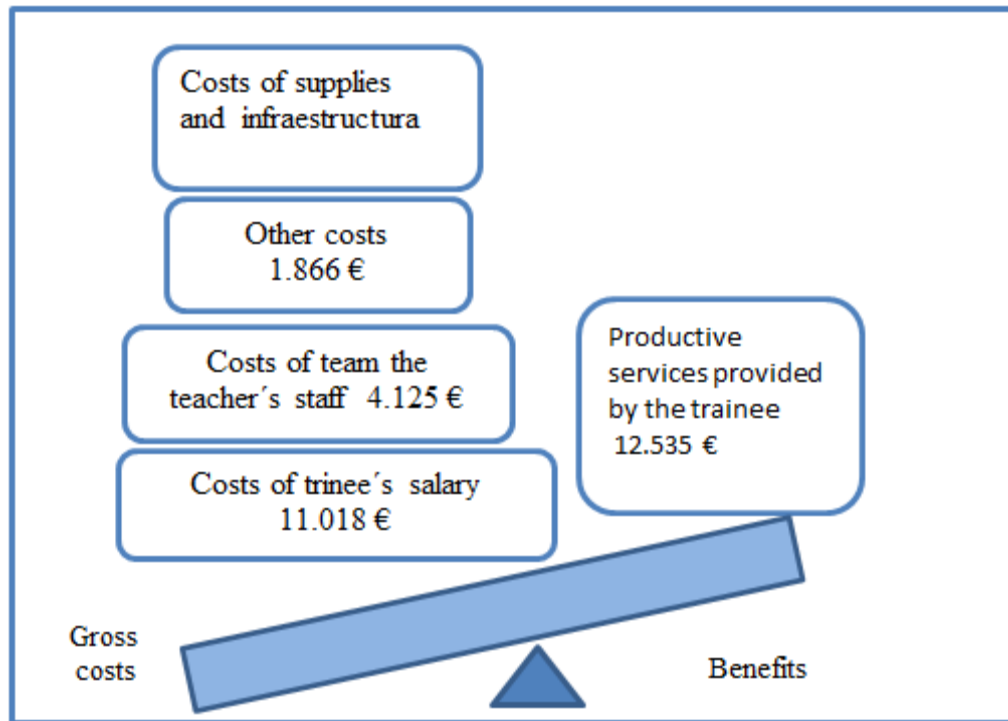
An additional factor to keep in mind is the costs and incomes structure for the trainer company, which can be fixed or variable. The variable structure of the costs depends fundamentally on the correct choice between two areas: the technical-industrial profile and the commercial profile. Illustration 6 represents which costs components related to this education model are.

The study has been set so that the technical-industrial profile costs are more representative than those of the commercial profile. The reason why is because if the investment is higher, the net incomes will be higher too. While the commercial profile indicates that 30% of its trainees do not incur in the net costs of the company but in its net incomes. Another fact to keep in mind for the costs calculation is the size of the company, the basic salary level in the country and the education program duration.

Short term benefits of the Dual Education for the company

It is necessary to demonstrate which specific benefits were generated through and after the training process. However, one very important point to notice is that when the trainees are hired, most cases often report that the companies can either recover their investment, it means at the end of the Dual Education program or must assume additional costs at the end of the model.

Illustration 6 DHK representation according to the BiBB data (2015)

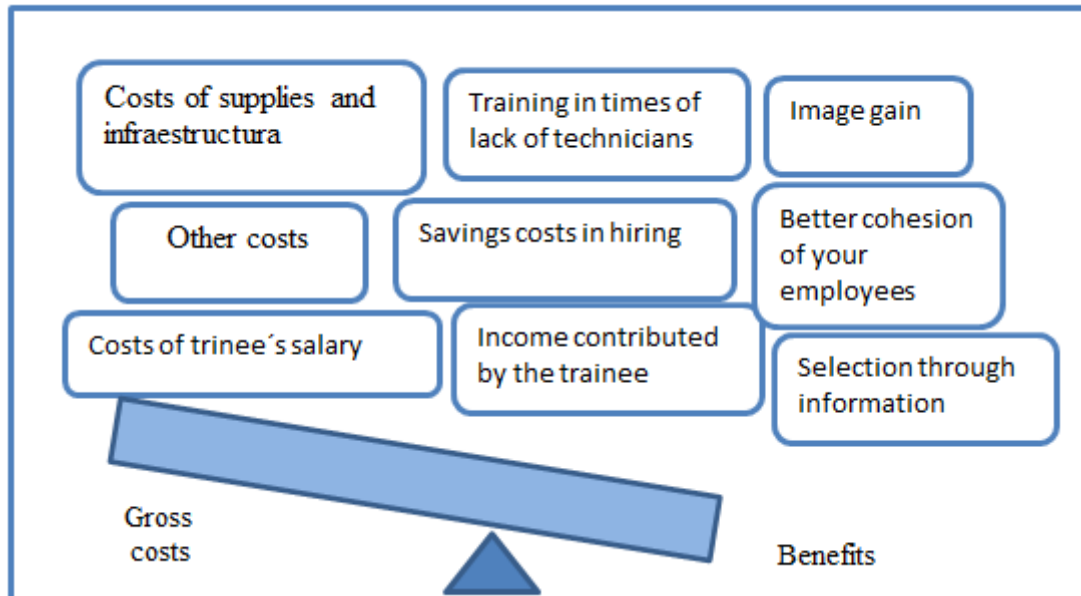


Elaborated by: Sofia Acosta

Source: Confederation of the German Chamber of Industry and Commerce

From a short term perspective, the analyses establish that the gross costs are covered partly by the trainees' services. On the other hand, in the long term the benefits exceed the costs with a qualified labor force staff as part of the company with an added value as follows:

Illustration 7 DHK representation according to the BIBB (2015)



Elaborated by: Sofia Acosta

Source: Confederation of the German Chamber of Industry and Commerce

After an admittedly successful result of the training period, the companies hire the trainees as long as the two parties agree. On average, this cover a 60%. The large companies keep their trainees as workers in an 82% approximately. While the small firms keep them in a 40% approximately. In the industrial and trade sector, on average, two out of three trainees are hired.

When a company hires technicians that were trained in its own installations, there are savings such as the following:

- A decrease in the margin of error due to the productive processes knowledge.
- A lower wear due to the correct handling of the machinery.
- An increase in the productivity due to the practical and technical knowledge.

Dual Education Opportunity Cost

A fundamental role before making the decision to implement the Dual Education is the opportunity cost. The opportunity cost of having qualified labor force through a Dual education means the decision to sacrifice the following costs:

- ✓ Recruitment costs
- ✓ Training costs for the new workplace
- ✓ Wrong designation costs
- ✓ Productivity shortfall of technicians without Dual Education.

(DHIK-Yorck Sievers, AHK – Netz, head of the Vocational Training unit of AHK. DIHK-RA Steffen G. Bayer, Head of the Vocational Training in the foreign, Vocational Training, 2016)

The Professional Dual Education is an investment with a high cost and with a large term perspective about benefits. This is an investment for the future of the company satisfying the demand of technicians in productive processes generating competitiveness in the market.

The Dual Education in Latin America

After the success of the Dual Education in Germany and different European countries, some mechanisms were implemented to transmit this learning model to Latin-American countries. In 2015, the Bolivian – German Chamber of Commerce and Industry did a comparative study of Argentina, Bolivia, Chile, Ecuador, Mexico and Peru, recollecting information about experiences, Dual System models and the most important characteristics of each of them in order to develop the Dual Program.

The results reflect that the Dual System has a significant growth for the dynamic development of the Latin-American countries. The companies search qualified

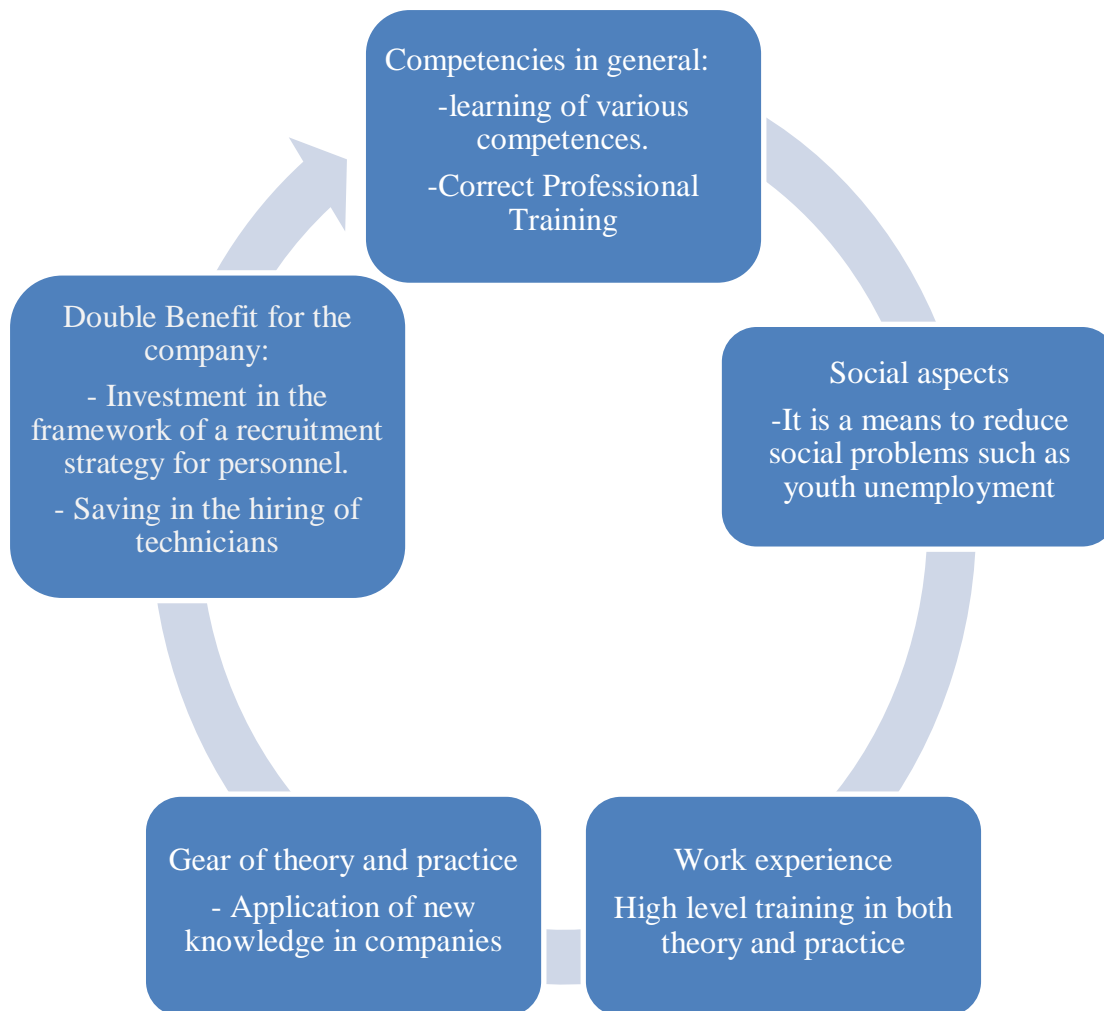
technical workers. The implementation of the Dual Education has the following process:

The interest from the side of the national government and companies bearing in mind that it must be modified according to each country is needs.

The cooperation from the side of the national government through the German Chamber of Commerce and Industry in different countries.

Currently Argentina, Mexico, Peru, Chile and Ecuador have Professional Technical Training models; while Bolivia just has Professional Commercial and Administrative Training. Experts of some German Chambers of Latin America are persuaded into the idea to implement the Dual System in their countries are the best option and the following are their main reasons:

Illustration 8 Potential benefits of the Dual Education



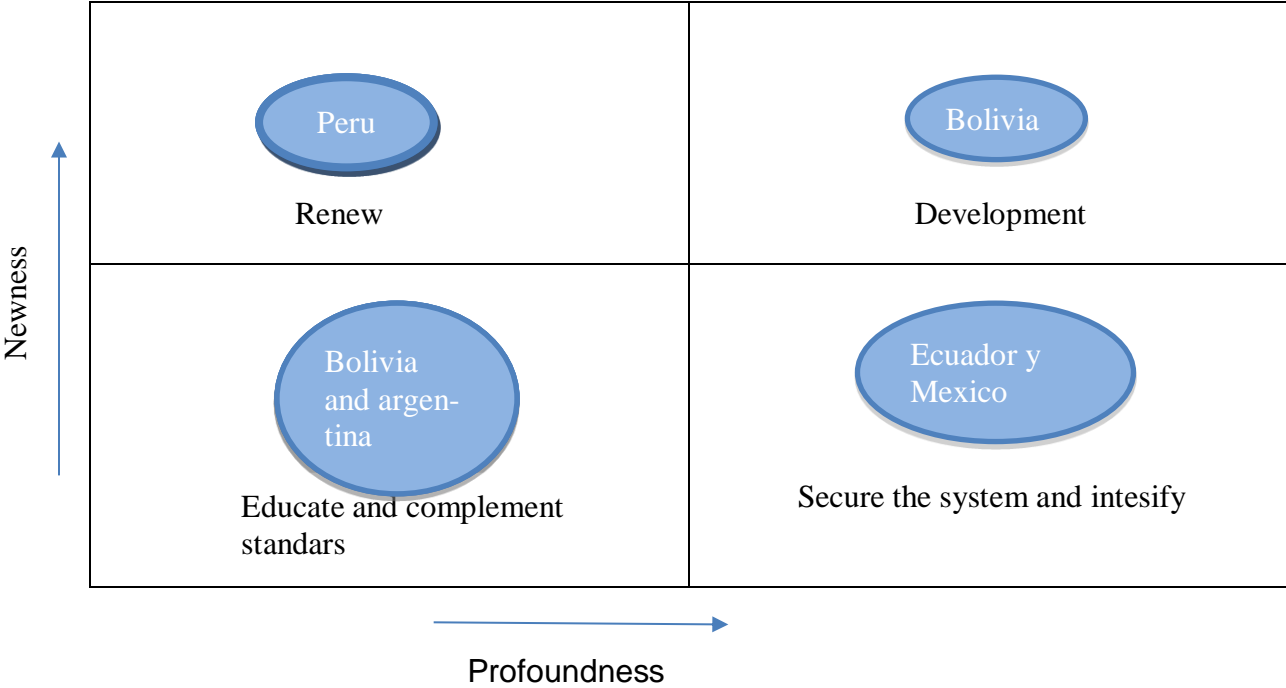
Elaborated by: Sofia Acosta

Source: Bolivian – German Chamber of Commerce and Industry

It is indispensable that each country has a Dual Education model to achieve a correct transfer of this system to Latin-American countries. This is in addition to a social acceptance of the program, the local government interest as a strategic point, the laws that allow the system transference and the accessibility to the labor market.

The study establishes which the current trends are and the solutions that could improve the Dual System.

Table 1 Current trends and solutions



Elaborated by: Sofia Acosta

Source: Bolivian – German Chamber of Commerce and Industry

Latin America and Ecuador need investigations about the Dual Education from an economic viewpoint to persuade to the entrepreneurs to invest in the Dual System in order to overcome the current barriers in the Latin-American countries. (Johanna Kupffer AHK Bolivien, 2015)

Conclusion:

This first chapter lets us comprehend the Dual Education in the companies from a business standpoint. This investment results unpredictable for the trainer companies about getting short and long term benefits, so it is important to analyse the cost — benefit model applied to European countries in order to know the program profitability in the companies that decide to be involved in this model.

From my point of view, the Dual Education insertion depends fundamentally on the entrepreneurs' vision at the moment of making the decision to invest in qualified labor force generating better opportunities for the labor insertion. This training model is an example of success that is considered important to be implemented in Ecuador and in the rest of the Latin-American countries.

Chapter 2: The Dual Vocational Training in the companies of Cuenca City and the costs analysis of the selected companies.

The current situation of the Dual Vocational Training in the companies of the Cuenca City

The Dual Vocational Training has been a recent but also intense topic in the last years. This work could be conformed due to the support of the business sector in order to promote the Dual's Program in the companies of Cuenca .

According to the last economic census in Ecuador (2011), the province of Azuay with Cuenca as its capital, has 4.886 manufacturing establishments that employ 27.572 workers. The largest manufactures of Azuay are concentrating in the white goods sector, ceramics and furniture production. In accordance with this census, Cuenca is the most per capita industrialised city in the country. The University of Cuenca determined that the commercial sector is the most important one because its generation of employment and resources.

(Cámara de Industrias y Comercio Ecuatoriana -Alemana, 2017)

Cuenca is considered as an attractive city due to its economic characteristics for possible industrial and professional training business, generating competitiveness in the companies to improve their productive development. Thanks to its great success, the Dual Vocational Training Unit was comprised by the following actors:

- Dual Vocational Training Guild
- Educational Institutions Commission
- Business Tutoring Network
- Chamber of Industry, Production and Employment (the local guild promotes the Dual Vocational Training as manager of the unit)
- Ecuadorian – German Chamber of Industry and Commerce, which possess the know-how and ensure the quality of these careers.

The Dual Vocational Training projects are currently 4 in different training fields and are as follows:

Table 1 Current programs of the Dual Vocational Training in the Cuenca City

Program	Educational Institution	Antiquity	Title granted	Duration	Current trainin companies	Promotion of graduates	Annual cost for the company per student	Annual cost for the student
Business Administration	State University of Cuenca	12 years	Ecuadorean degree in business administration. Title of the Duale Houchshule Latin America Network	4 years	20	14	\$900 dolars	0
Industrial Electricity and Industrial Mechanics	National Polytechnic University (private)	3 years	Degree in mechanics and electricity is granted by the Federation of German Chambers of Industry and Commerce	2.5 years	19	1	\$1380 dolars	\$1500 dolars
Food processing	University of Azuay (private)	2.5 years	Degree in food processing is granted by the Federation of German Chambers of Industry and Commerce	2.5 years	9	nothing	\$1380 dolars	\$1500 dolars

Elaborated by: Sofia Acosta

Source: Report of the Dual Vocational Training situation in Cuenca

On the other hand, the Lenin Moreno government politics were presented on January 2018 in order to foster the integration of young people in the labor market. These incentives subsidise the 50% of the salary and the affiliation to social security (*IESS*) and another measure is about tax factors, it means that it will search some types of incentives with an only condition: the permanent contract. However, it does not refer to the Dual Vocational Training neither as a measure to decrease the unemployment levels or as a key to improve the competitiveness of the companies. (*Diario El Comercio, 2018*)

Market research of Dual Vocational Training in Cuenca City

Ecuadorian – German Chamber of Industry and Commerce is the promoter of the Dual's Program in Ecuador and specifically in Cuenca the last two and a half years. It has the support of the Chamber of Industry, Production and Employment to promote this project generating benefits for the companies. Currently, there are 19 companies that have taken the initiative of training students in the electricity and mechanic area. However, the industrial sector involvement of Cuenca is low due to the uncertainty of the benefits generation at the short and long term for the company.

This research market tries to determine the entrepreneurs' perception and the availability to be involved in the Dual Vocational Training's project.

The Dual System proposed is the maintenance in the electricity and mechanic areas according to the size of the company and the number of trainees to get better results. To motivate new companies takes much more than good intentions. This is the reason why it is important to determine which the economic arguments the general managers and the human talent have at the moment of making the decision to be part or not of this Dual Vocational Training's Project. The companies of the productive sector that are affiliated to the Chamber of Industry, Production and Employment of Cuenca will be analysed and this investigation will be a tool for the Ecuadorian – German Chamber of Industry and Commerce in order to know its level of acceptance by the general managers and the human talent staff.

General objective:

- Know the general managers and human talent staff perceptions about the Dual's System in the electricity and mechanic areas of the industrial sector of Cuenca.

Specific objectives:

- Determine the arguments and important variables that the managers will consider to evaluate the Dual Vocational Training.
- Analyse the reasons why a company considers to be involved or not in the Dual Vocational Training.
- Establish the number of students that the managers would prepare to accept into it's companies.

Target group

- General Managers and human talent staff of the companies of the industrial sector in Cuenca affiliated to the Chamber of Industry, Production and Employment interested on be part of the Dual Vocational Training in the electricity and mechanic areas.

Design of the research

- Descriptive quantitative research due to the objective is to determine the perception of the managers about the Dual Vocational Training. The surveys shall be performed using electronic questionnaires and personal interviews.
- Description: The market research will undertake a survey to a sample of the interested companies of the industrial sector affiliated to the Chamber of Industry, Production and Employment of Cuenca.

Testing: survey simulation on staff responsible for the Dual Vocational Training in the Ecuadorian – German Chamber of Industry and Commerce of the city of Cuenca.

Analysis of the results

Question 1 - What is the productive sector that the company belongs to?

According to the surveys carried out in the companies affiliated to the Chamber of Industry, Production and Employment, the most representative result is 33.7% related to the food sector, while the 26% represents another industry branches and with the minimal representation of 6.7% the companies of the agriculture, livestock farming and fishing, beverage processing, products and textiles, metal products treatment, furniture manufacture and manufacture of parts and accessories for vehicles.

Illustration 9 Productive sector

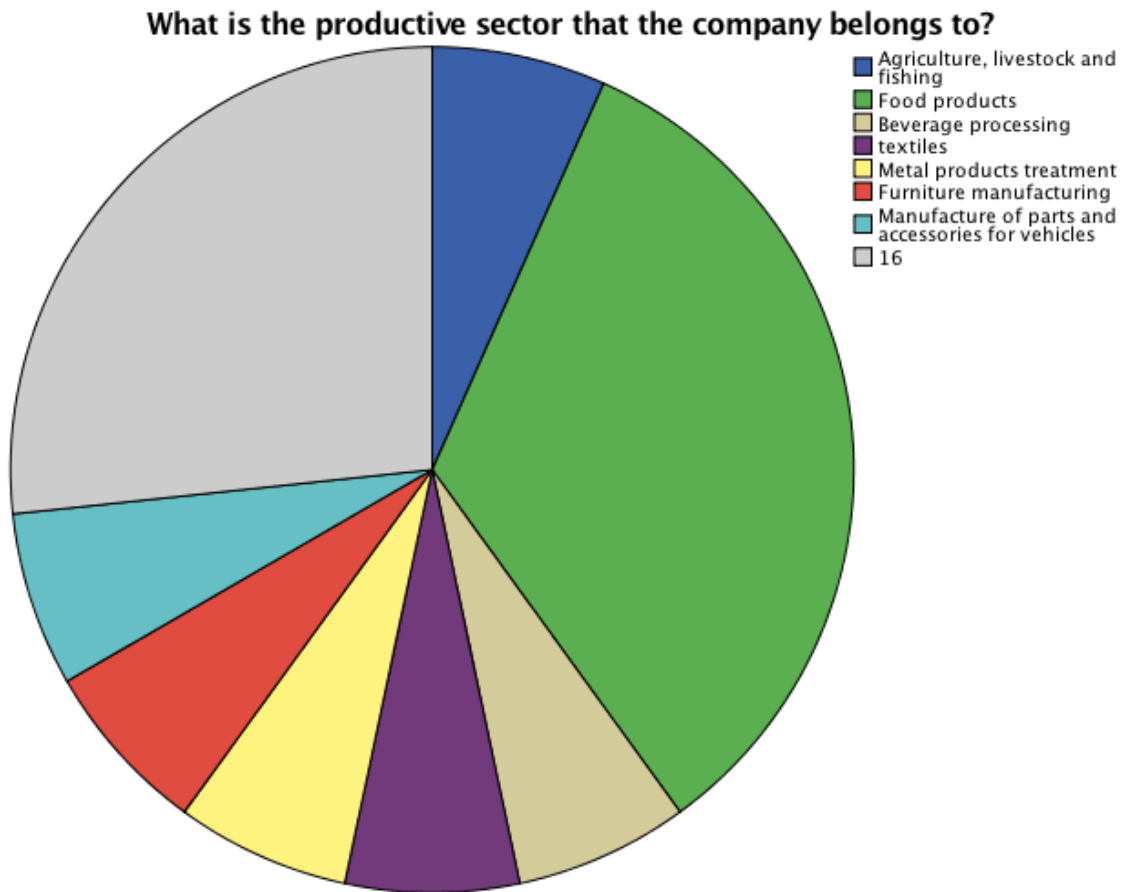
What is the productive sector that the company belongs to?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agriculture, livestock and fishing	1	6,7	6,7	6,7
	Food products	5	33,3	33,3	40,0
	Beverage processing	1	6,7	6,7	46,7
	textiles	1	6,7	6,7	53,3
	Metal products treatment	1	6,7	6,7	60,0
	Furniture manufacturing	1	6,7	6,7	66,7
	Manufacture of parts and accessories for vehicles	1	6,7	6,7	73,3
	16	4	26,7	26,7	100,0
	Total	15	100,0	100,0	

Elaborated by: Sofia Acosta

Source: Survey about the perception and acceptance of the Dual Vocational Training in Cuenca.

Illustration 10 Representation of the productive sector



Elaborated by: Sofia Acosta

Source: Survey about the perception and acceptance of the Dual Vocational Training in Cuenca.

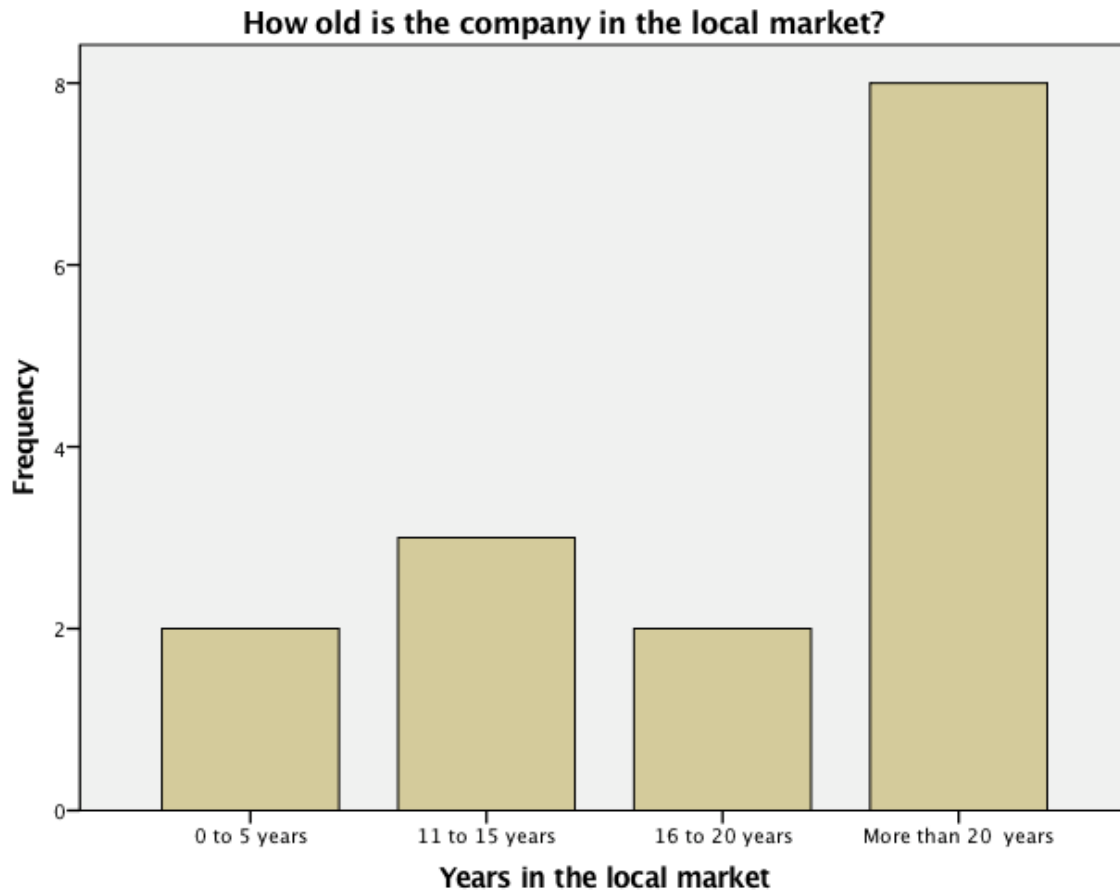
As the illustration 10 reflects, the larger number of surveyed companies was from the food sector with 33.7% which demonstrates the interest that they have to know the Dual's System keeping in mind that the Dual's career in this sector is in process of implementation since last year.

Question 2 – How old is the company in the local market?

According to the results, the 53% of the surveyed companies have more than 20 years in the local market, the second representative percentage is 20% with companies that have

from 11 to 15 years in the market and the minimal representation with 13.3% of the companies that just have from 0 to 5 and from 16 to 20 years in the local market.

Illustration 11 How old is the Company in the local market?



Elaborated by: Sofia Acosta

Source: Survey about the perception and acceptance of the Dual Vocational Training in Cuenca.

As it can be seen in the illustration 11, most of the surveyed companies, specifically 8, are more than 20 years in the local market. Three of the total of surveyed companies are from 11 to 15 years and the other 4 from 0 to 5 years and from 16 to 20 years, it means 2 in each category. However, it is necessary to emphasise that this parameter is not necessary to be part of the Dual Vocational Training because it does not matter if a company has more years in the local market than others.

Question 3 – Had you ever heard about the Dual Vocational Training?

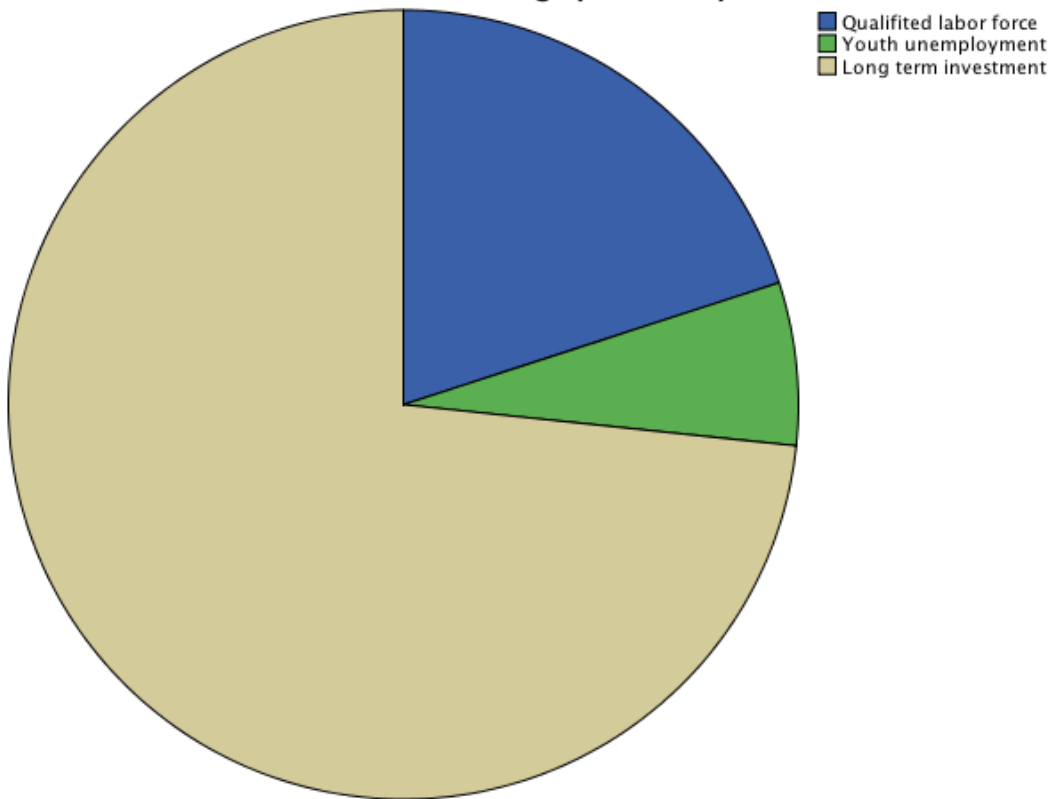
The results indicate that the 100% of the surveyed companies have certain knowledge about the Dual's System due to the great work carried out by the Ecuadorian – German Chamber of Commerce and Industry the last two and a half years in Cuenca.

Question 4 – Which of the following options are the correct interpretation of the Dual Vocational Training system for you?

According to the obtained results, the illustration 12 shows that the general managers and the human talent staff interpret the Dual Vocational Training as a theoretical — practical system seen as a long term investment in order to improve the productivity levels with a qualified labor force. The 3% consider it as an option to obtain a qualified labor force at low prices and in the short term. While the 1% corresponds to the Dual's system as a solution to decrease the youth unemployment levels.

Illustration 12 Dual Vocational Training's interpretation

¿Which of the following options are the correct interpretation of the Dual Vocational training system for you ?



Elaborated by: Sofia Acosta

Source: Survey about the perception and acceptance of the Dual Vocational Training in Cuenca.

Question 5 – Which of the following options of the Dual Vocational Training would like you to implement in your company?

Illustration 13 Areas implementation of the Dual Vocational Training

Which of the following options of the Dual Vocational Training would like you to implement in your company?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Productive area	7	46,7	46,7	46,7
	Maintenance area	8	53,3	53,3	100,0
	Total	15	100,0	100,0	

Elaborated by: Sofia Acosta

Source: Survey about the perception and acceptance of the Dual Vocational Training in Cuenca.

According to the results, the 53.3% of the companies prefer the maintenance area, the 46.7% the productive area while the marketing and sales, administrative, accounting, trade commerce and logistic areas do not have an acceptance by the interviewed companies.

Question 6 – How many students you are able to train?

The 100% of the interviewed company states that they were able to train from 1 to three students. It is important to emphasise that as well as before, the companies that have more years in the market are able to accept the same number of trainees as those companies with less years in the local market.

Question 7 – What type of personnel do you select to train?

According to the results, the 53.3% prefers to train external personnel (bachelors), the 26.7% will choose internal personnel and the 20% external personnel (tertiary degree).

Illustration 14 Type of personnel for the training



Elaborated by: Sofia Acosta

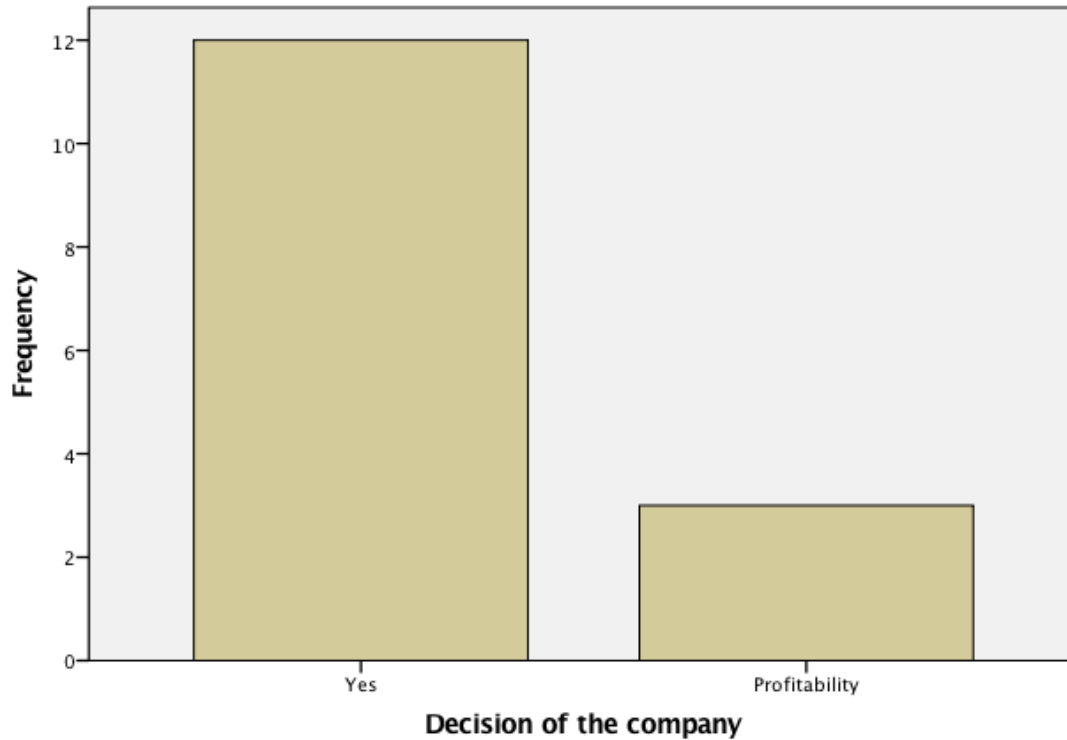
Source: Survey about the perception and acceptance of the Dual Vocational Training in Cuenca.

Question 8 – Would you be interested in being part of the Dual Vocational Training if the benefits are clearly demonstrated in the short and long term from an economic viewpoint?

As it can be seen in the illustration 15, eleven surveyed companies would be interested in be part of this model, reason that demonstrates that the companies have the objective to have a best profitability in a long term.

Illustration 15 Interest in being part of the Dual Vocational Training

Would you be interested in being part of the Dual Vocational Training if the benefits are clearly demonstrate in the short and long term from an economic viewpoint ?



Elaborated by: Sofia Acosta

Source: Survey about the perception and acceptance of the Dual Vocational Training in Cuenca.

Cross-tab analysis

Dual Vocational Training interest with regard to its interpretation.

Illustration 16 Cross-tab of the Dual Vocational Training's interest with regard to its interpretation.

		¿Would you be interested in being part of the Dual Vocational Training if the benefits are clearly demonstrate ?		Total
		Yes	Profitability	
Which of the following options are the correct interpretation of the Dual Vocational Training system for you?	Qualified labor force	2	1	3
	Youth unemployment	1	0	1
	Long term investment	9	2	11
Total		12	3	15

Elaborated by: Sofia Acosta

Source: Survey about the perception and acceptance of the Dual Vocational Training in Cuenca.

As it can be seen in the illustration 16, two people are interested on making their companies part of this Dual system considering it as an option to obtain qualified labor force at low prices. On the other hand, nine people are interested in being involved in this program from an investment viewpoint.

The kind of personnel to be trained with regard to the years that a company has in the local market.

Illustration 17 Cross-tab of the kind of personnel to be trained with regard to the years that a Company has in the local market

Count		What type of personnel do you select to train			Total
		External personnel (Bachelors)	External personnel (tertiary degree)	Internal personnel	
¿How old is the company in the local market?	0 to 5 años	2	0	0	2
	11 to 15 años	1	1	1	3
	16 to 20 años	1	0	1	2
	More than 20 years	4	2	2	8
Total		8	3	4	15

Elaborated by: Sofia Acosta

Source: Survey about the perception and acceptance of the Dual Vocational Training in Cuenca.

As the results reflect in the illustration 17, four of the surveyed companies that have more than 20 years in the market prefer to train external personnel (bachelors). Another two rather external and internal personnel in their companies. While the companies that have less years in the local market prefer to train external personnel (bachelors).

The number of students that a company is able to train with regard to the areas of Dual Vocational Training.

Illustration 18 The number of students that the company is able to train with regard to the areas of Dual Vocational Training.

Count

		¿How many students you are able to train? 1 to 3 students	Total
¿Which of the following options of the Dual Vocational Training would like you to implement in your company?	Productive area	7	7
	Maintenance area	8	8
Total		15	15

Elaborated by: Sofia Acosta

Source: Survey about the perception and acceptance of the Dual Vocational Training in Cuenca.

The two most preferred areas by the companies are: production, electricity and mechanic. Seven companies will be able to train from 1 to 3 students in the production area. In comparison with the electricity and mechanic areas, there are eight companies that will be able to train the same number of students.

Dual Vocational Training models in electricity and mechanic areas in Cuenca

The implementation of the Dual’s program in the electricity and mechanic areas is still developing in 18 companies. Twelve of this companies correspond to the first promotion of the period from 2015 to 2018 keeping the training. The last seven companies make the decision to be part of the second promotion that is developing this year.

To analyse the cost-benefit model, it is important to consider the study of the first promotion of electricity and mechanic because it will allow knowledge about the planning process keeping in mind the costs that must be assumed by the trainer company, as well as the obtained benefits trough and after of the training period.

The Dual Vocational Training model has an apprentice schedule, both in the university and in the trainer company. Each model considers two and a half years of training with the following hours distribution:

Table 1 Dual Vocational Training models in the electricity and mechanic areas.

Model 1	Model 2	Model 3
• Two and a half years of training	• Two and a half years of training	• Two and a half years of training
• 1600 hours of formal education at the university	• 1600 hours of formal education at the university	• 1600 hours of formal education at the university
• 1960 hours job training	• 1960 hours job training	• 1960 hours job training
• Trainees are internal workers of the company	• Trainees are young external bachelors	• Trainees are internal workers of the company and young external bachelors

Elaborated by: Sofia Acosta

Source : Ecuadorian – German Chamber of Industry and Commerce

From the first promotion were selected three trainers companies with three different models, analysing the following variables:

- Industrial sector that the company belongs to
- Application of training costs
- Number of selected trainees

Parameters of the Dual Vocational Training costs

Trainees' salaries

In Ecuador the companies that had implemented this education model, pays monthly salaries to their trainees during they're training period even if the time is also distributed in their university for the theoretical part. This application models have been selected both internal and external personnel. However, to make the decision, it depends on the corporate policies and the acceptance by the internal staff for being trained in new areas. Specifically, paying a trainee during the whole training period changes, radically, the relation between the company and the trainee because of the motivation and loyalty that are formed through this period of time. Consequently, the entrepreneurs ensure that the content and quality of the theoretical — practical instruction will be the one according to their expectations.

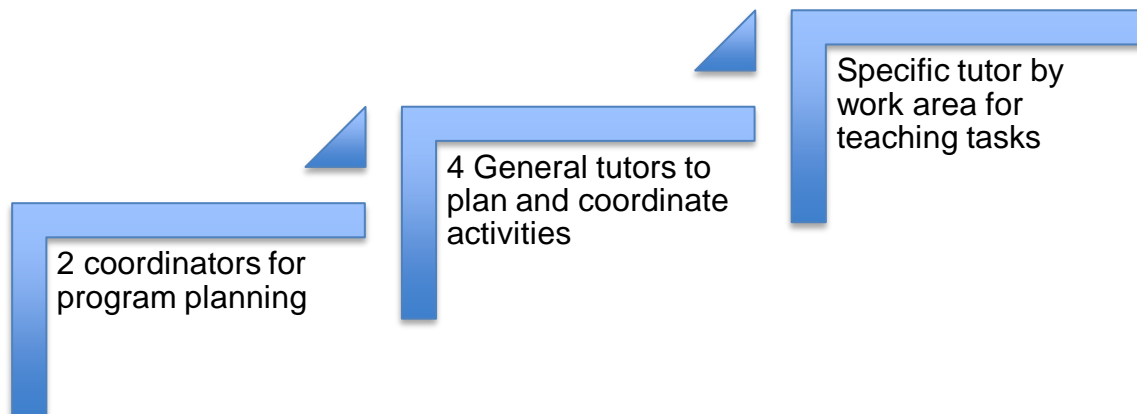
The companies that assume the responsibility of training students in order to help them to get the enough labor experience for their subsequent recruitment, have a selection process in which they prefer to train external bachelors assuming feed costs, a percentage of enrolment. Consequently, the entrepreneurs ensure that the content and the quality of the theoretical — practical instruction are according to their expectations and needs.

Results of the model 1 – Application costs

To analyse the first model according to the costs assumed by the trainer company, it was necessary to evaluate Indurama, a company that belongs to the white goods sector. In the first promotion, this company decided to train 10 internal workers and 5 external bachelors that were previously selected. To know the methodology used within Indurama, it was im-

portant to have the collaboration of Lcda. Patricia Culcay, the programmer coordinator, through a personal interview. She brought information about the components analysis that the Dual Vocational Training implies.

Illustration 19 Dual Vocational Training work team in Indurama



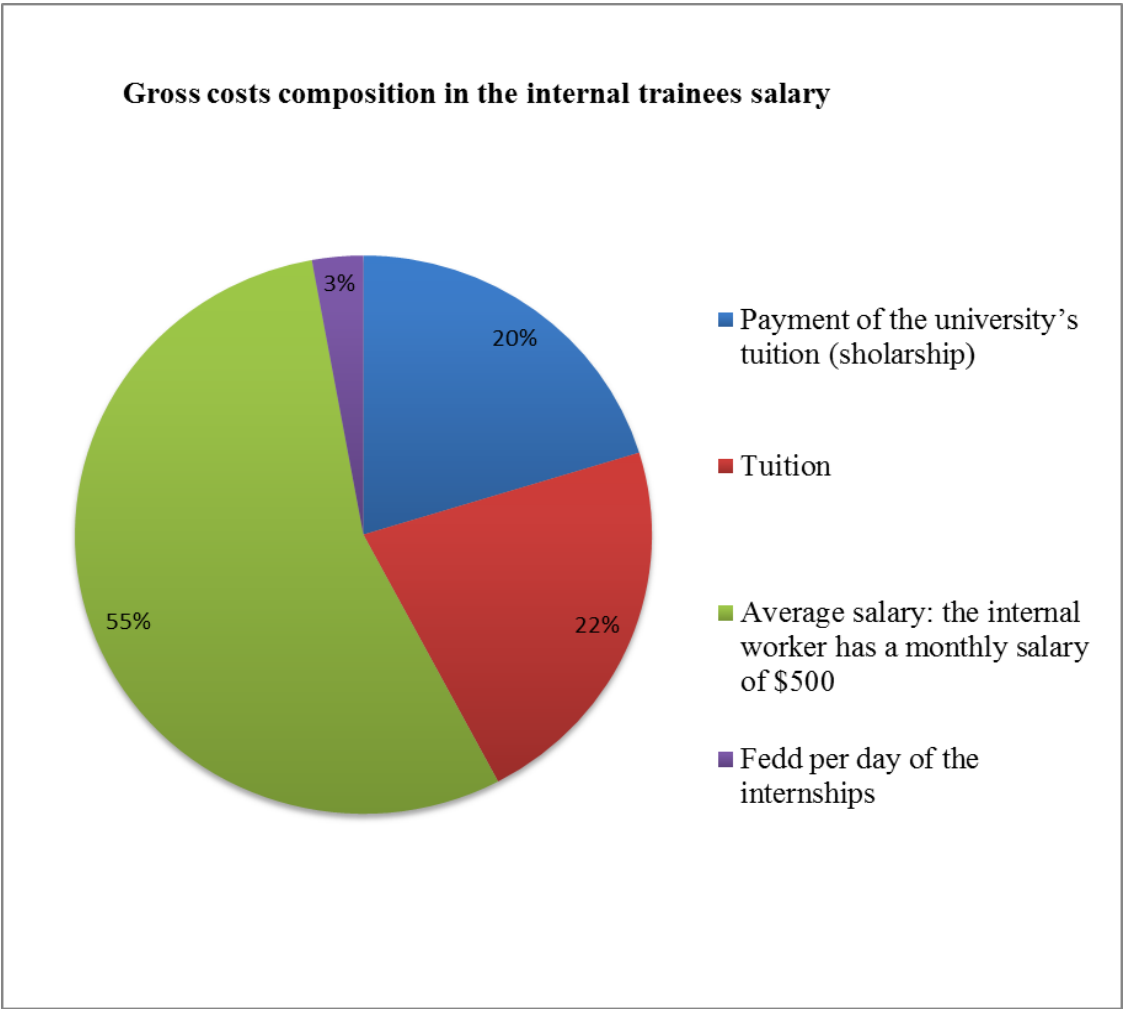
Elaborated by: Sofia Acosta

Source: Indurama Company

The gross costs that were generated during the Dual Vocational Training's model are in two subdivisions because this company had internal personnel and external personnel (bachelors).

In this way, the components of an internal worker selected to be part of the Dual Vocational Training are the following:

Illustration 20 Gross costs' composition in the internal trainees salary



Elaborated by: Sofia Acosta

Source: author's calculations of Indurama's information

Payment of tuition (scholarship): the company pays an amount of the students tuition of \$690 each semester.

Tuition: the company pays \$750 each semester and then it is discounted from the student's monthly salary.

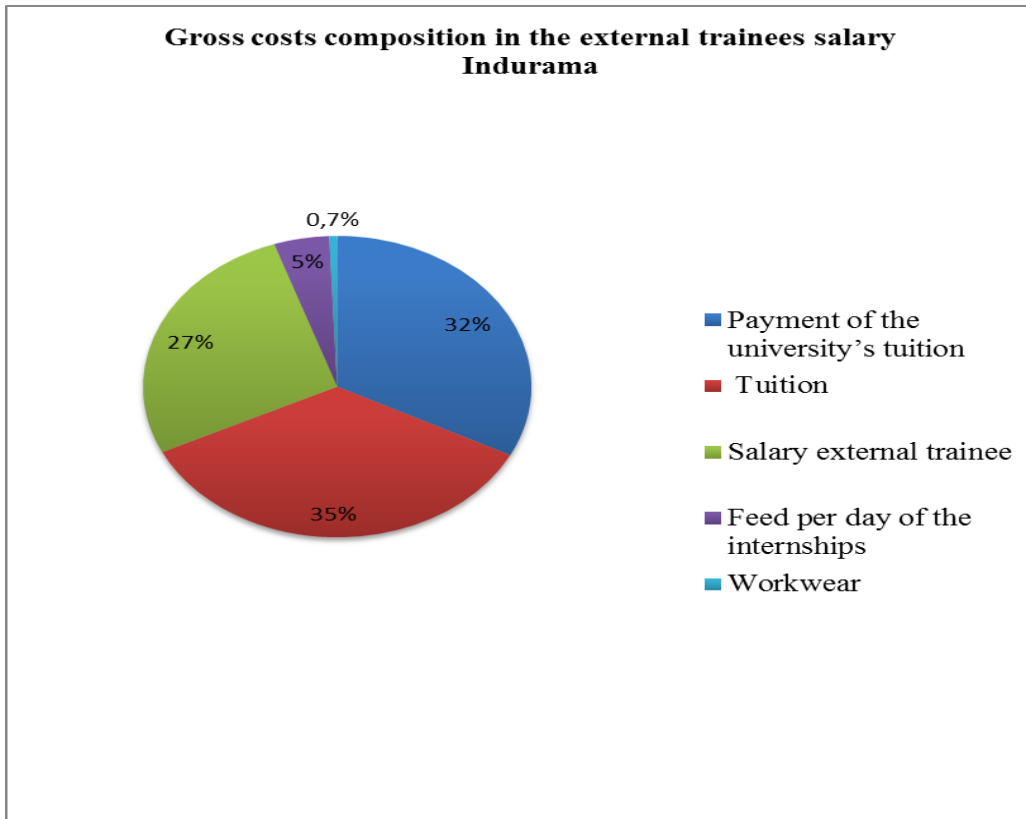
Salary: the internal worker has a monthly salary of \$500 and consequently the 9.45% is discounted for the social insurance.

Feed: the company assumes \$1.50 per day of the internships.

The illustration 20 indicates that the most representative component is the payment of salaries with the 55%. As a company's policy, the students are trained receiving a fixed salary each month without working during the theoretical training so the company hires a new person for his/her replacement in order to avoid a double workload. About the tuition payments component, it represents the 22% having as a benefit the reduction of the risk of the career's desertion with financial aid. The careers costs per semester that Indurama assumes, has a representation of 20% having as a benefit the compromise of the entrepreneur to ensure the completion of the program. The 3%, is the less representative component, is about the feed that the company provides during the practical training with a 50% of subsidy. With regard to the workwear, the company trains internal personnel so they have their own uniform generating a saving for the company.

The components of external personnel selected to be part of the Dual Vocational Training within Indurama are the following:

ilustration 21 Gross costs´ composition in the external trainees salary (bachelor)



Elaborated by: Sofia Acosta

Source: author's calculations of Indurama's information.

Payment of the university's tuition: the company pays an amount of the student's tuition of \$690 each semester that consequently is discounted from the student's monthly salary.

Tuition: the company pays \$750 each semester and then it is discounted from the student's monthly salary.

Salary: the external bachelor has a monthly salary of \$390 and consequently the 9.45% is discounted for the social insurance.

Feed: the company assumes \$1.50 per day of the internships.

Workwear: the cost of the working tools is of \$70, this value is assumed by the company.

As it can be seen in the illustration 21, the components for external personnel (bachelor) comprise costs' differences that Indurama has to assume in comparison to the internal personnel. The most representative component is the payment of the tuition with a 35%, a value that is assumed by the company to finance the training process. The second component represents the 32% corresponding to the payment of the tuition. With regard to third component about the trainees salary, it corresponds to the 27% considered as an economic motivation for the tasks to develop within the company. The fourth component with the 3% is the one that refers to the trainees feed. The less representation is about the workwear, which is given at the beginning of the Dual Vocational Training. As it can be analysed, the gross costs per external trainee that the company directly assumes are: the payment of regular salaries, the 50% of the feed costs and the workwear. As the results reflect, the company obtains savings due to the costs assumed are less than those that result from the investment on an internal trainee.

Table 2 Internal trainees salary in comparison with the real cost per hour worked

	I Semester	II Semester	III Semester	IV Semester	V Semester
Internal trainees salary	1951,5	1951,5	1824	1794	1824
Real cost per hour worked	250	250	1525	1975	1675
Hours in te company	80 hours	80 hours	488 hours	632 hours	536 hours

Elaborated by: Sofia Acosta

Source: author's calculations of Indurama's information.

The table 4 reflects the obtained calculations of the internal trainees salary per semester in comparison with the real cost bearing in mind that Indurama pays a monthly salary during the whole training process, it means two and a half years. The marginal cost is comparable for the real value and the six-monthly salary, which reflects if the additional costs are more or less than the generated benefits.

Table 3 Net flow of the Dual Vocational Training of an internal trainee within Indurama

Salary	I Semester	II Semester	III Semester	IV Semestre	V Semester	
\$500 dollars	\$-1.701,50	\$-1.701,50	\$-299,00	\$181,00	\$-149,00	Hiring costs 30 months of salary to the internal worker of the company
Hours in the Company	80 hours	80 hours	488 hours	632 hours	536 hours	Total hours in the company1816

Elaborated by: Sofia Acosta

Source: author's calculations of Indurama's information.

The table 5 shows the marginal cost in comparison with the additional benefits that Indurama witnessed. This information demonstrates that the first, second, third and fifth semester were represented by higher additional costs than the generated benefits. However, this situation was changed because the costs were decreasing. However, the fourth semester presented benefits due to the working hours within the company; factor that compensates the marginal costs obtaining a qualified labor force with a monthly salary of \$500. The working hours present an increase from the second year as the results reflect. The additional cost that the company gets in the first and second semester will be compensated by the increase in the trainees productivity, and it could present increased gains.

Table 4 Generated benefits during the Dual Vocational Training by an internal trainee within Indurama

Salary	I Semester	II Semester	III Semester	IV Semester	V Semester	
\$500 dollars	\$1.951,50	\$1.951,50	\$1.824,00	\$1.794,00	\$1.824,00	Benefits generated in the short term for 30 months by an internal worker of the company
Hours in the company	80 hours	80 hours	488 hours	632 hours	536 hours	Total hours in the company 1816

Elaborated by: Sofia Acosta

Source: author's calculations of Indurama's information.

During the training period, the company generates economic benefits per semester. As it can be seen in the table 6 the benefits increase according to the working hours in the productive area within Indurama in the short term. As a result, the additional income covers a part of the additional costs that represents the development and the application of this program.

Table 5 External trainees salary in comparison with the real cost per working hour

	I Semester	II Semester	III Semester	IV Semester	V Semester
External trainees salary	663,87	663,87	483,87	506,37	536,37
Real cost per hour worked	194,4	194,4	536,37	1535,76	1302,48
Hours in te company	80 hours	80 hours	488 hours	632 hours	536 hours

Elaborated by: Sofia Acosta

Source: author's calculations of Indurama's information.

The table 5 reflects the obtained calculations of the external trainees salary per semester in comparison with the real cost. It was calculated based on the working hours' value per semester during the training period. The marginal cost is compared between the real value and the six-monthly total salary so it lets to know if the additional costs are less or more than the generated benefits.

Table 6 Net flow of the Dual Vocational Training of an external trainee within Indurama

Salary	I Semester	II Semester	III Semester	IV Semester	V Semester	
\$390 dollars	\$-469,47	\$-469,47	\$52,50	\$1.029,39	\$766,11	Hiring costs 30 months of external apprentice salary of the company
Hours in the company	80 hours	80 hours	488 hours	632 hours	536 hours	Total hours in the company 1816

Elaborated by: Sofia Acosta

Source: author's calculations of Indurama's information.

The table 8 shows the marginal cost in comparison with the generated benefits of implementing the Dual Vocational Training with an internal trainee in a period of two and a half years. As a result, the first and second semester were represented by higher additional costs than the generated benefits per working hours, but the additional costs decrease through the training period.

However, from the third semester there were some benefits due to the working hours' number within the company because these compensate the marginal costs obtaining a best qualified labor force with a monthly salary of \$390 during the training period. The hours' number increases from the second year, so the additional cost that the company has during the first and second period is projected to be compensated by the trainees productivity in the long term even with increased gains

Table 7 Generated benefits of an external trainee during the Dual Vocational Training's period within Indurama

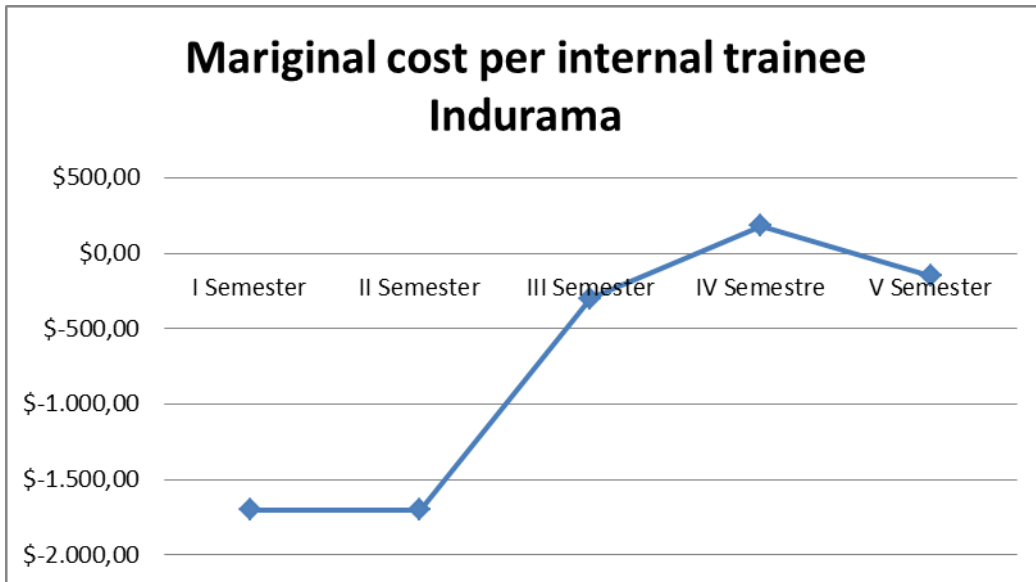
Salary	I Semester	II Semester	III Semester	IV Semester	V Semester	
\$390 dollars	\$194,40	\$194,40	\$536,37	\$1.535,76	\$1.302,48	Benefits generated in the short term for 30 months by an external worker of the company
Hours in the company	80 hours	80 hours	488 hours	632 hours	536 hours	Total hours in the company 1816

Elaborated by: Sofia Acosta

Source: author's calculations of Indurama's information

During the training period, the company has generated economic benefits per semester. The table 9 reflects the benefits increase according to the working hours in the productive area within Indurama. As a result, Indurama trains an external bachelor with the objective of training those students in order to make them have the same productive level of the internal workers. So in the case that the company decides to hire those trainees after the conclusion of the training period, the benefit and the hiring's saving could become higher.

Illustration 1 The marginal cost per internal trainee within Indurama during the Dual Vocational Training's period.

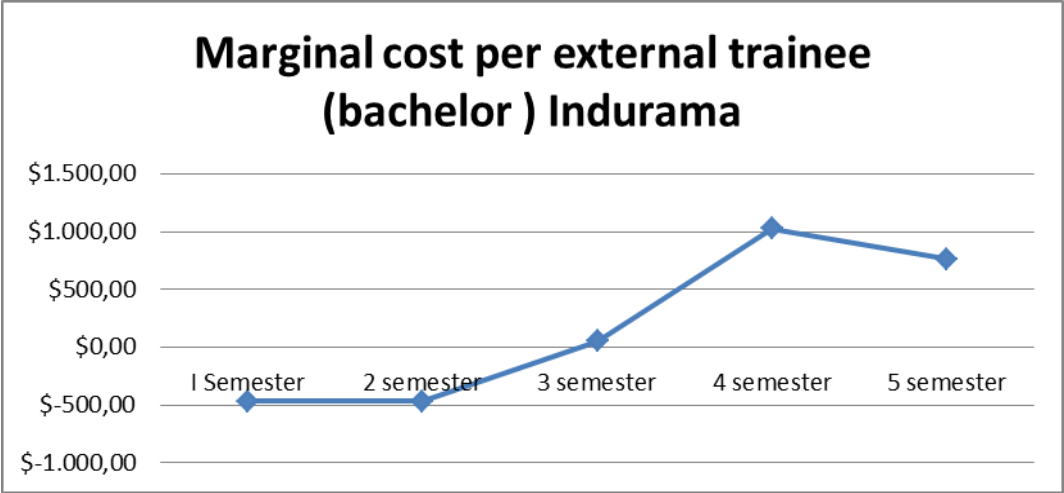


Elaborated by: Sofia Acosta

Source: author's calculations of Indurama's information

The additional cost per internal trainee within Indurama in two and a half years reflects that the costs were higher than the generated benefits in the first year considering that the marginal costs decrease according to the working hours. And it is important to consider because the trainees after concluding the program are becoming internal workers of the company, so they are allocated within Indurama as an innovated and qualified labor force.

Illustration 2 The marginal cost per external trainee (bachelor) within Indurama during the Dual Vocational Training's period.

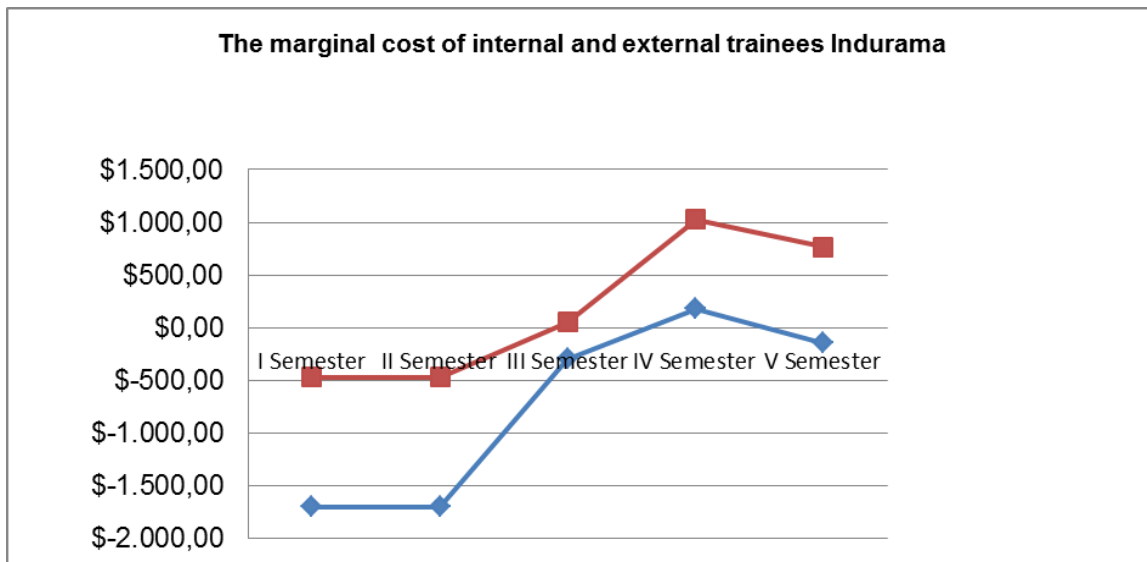


Elaborated by: Sofia Acosta

Source: authors calculations of Indurama's information.

Having an external trainee (bachelor) is more beneficial than having an internal one because the salary costs that the company assumes are less than the generated benefits in the two and a half year between this types of trainees. Indurama considers that training external trainees is viable due to the salary costs of an external trainee is less without considering the hiring costs, induction and the adaption time in the work place.

Illustration 3 The marginal cost of internal and external trainees within Indurama



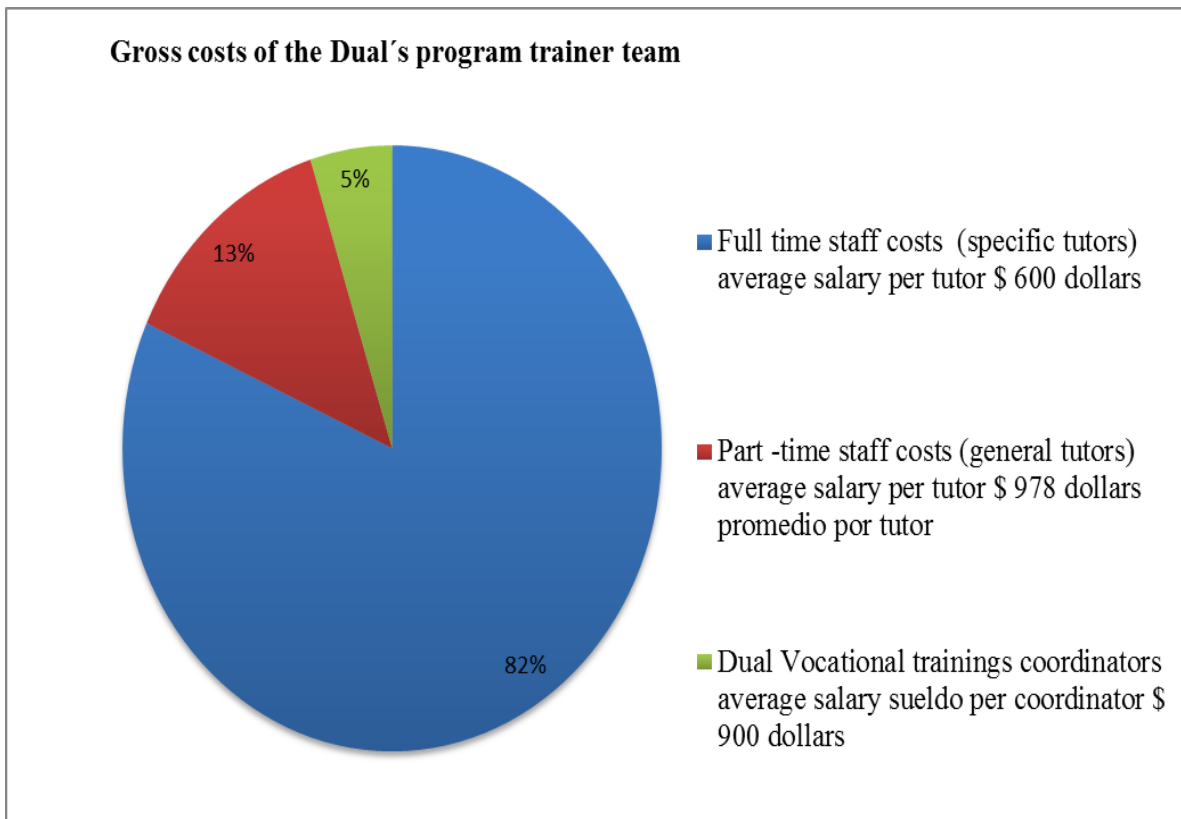
Elaborated by: Sofia Acosta

Source: author's calculations of Indurama's information.

The marginal cost of internal and external trainees keeps the same trend. However, the additional cost of the Dual Vocational Training implementation is higher with an internal trainee due to the assumption of costs are higher than the generated benefits in the short time. On the other hand, the company expects to have an improved labor force hoping to relocate its internal staff that conclude its Dual Vocational Training, improving the processes and the productive capacity of the maintenance area. As regards internal trainees, it considers the same working hours within the company, its labor is productive, its additional cost is less and the additional incomes are more from the third semester. Showing the profitability of the program within Indurama to train external personnel (bachelors) under the policies that are developing.

Component cost of the Dual's program trainer team

Illustration 4 Gross costs of the trainer team during two and a half years within Indurama.



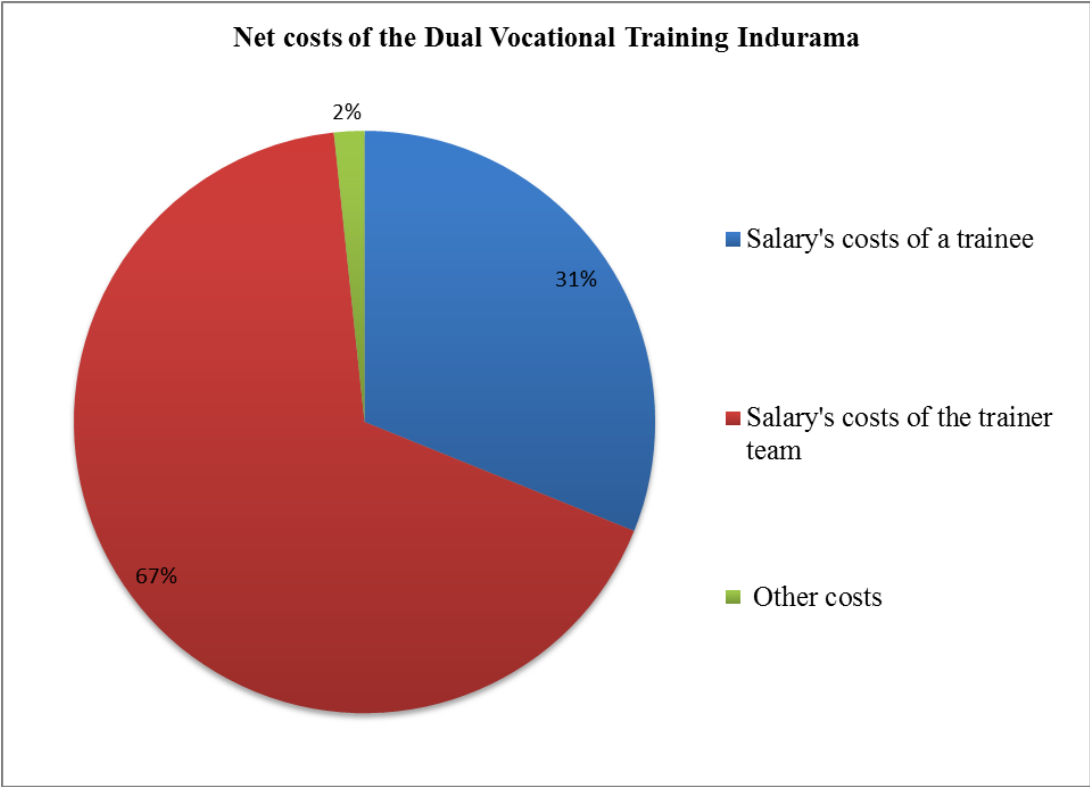
Elaborated by: Sofia Acosta

Source: author's calculations of Indurama's information.

- Full time staff costs: the specific tutors are the company's engineers who are in charge of the Dual process development by carrying out the assigned hours per semester within the company.
- Part-time staff costs: the general tutors are the engineers who are in charge of the correct planning process for practical activities in the company during the whole Dual Vocational Training's period.
- Dual Vocational Trainings coordinators: the coordinator staff is in charge of the pre-selection of the trainees and of the planning processes to implement the program.

As the illustration 4 shows, the most representative component of the gross costs of the trainer team is the tutors' salaries with an 82% due to the continuous support provided during the whole training period. The second component is the part-time staff salaries with a 13% because of the tutors dedicate from 4 to 5 hours of their weeks to the Dual Vocational Training's whole period. The 5% corresponds to the program's coordinators who dedicate 4 hours of their time to plan the Dual Vocational Training. It is important to consider that the trainer team is composed by the internal workers of Indurama who are in charge of being part of this project keeping their activities and function previously assigned.

Illustration 5 Net costs of the Dual Vocational Training during two and a half years within Indurama.



Elaborated by: Sofia Acosta

Source: author's calculations of Indurama's information.

Salary's costs of a trainee: economic contribution of the company to the Dual Vocational Training of the student, his/her feed, workwear, and regular salary.

Salary's costs of the trainer team: salary of the coordinators, specific and general tutors per working hours assigned to the Dual Vocational Training.

Other costs: trainees' induction, Dual Vocational Trainings promotion, and others.

The principal component of the net cost of the Dual Vocational Training is the trainer team cost with a 67% because having 15 trainees, the number of collaborators increases to ensure the correct training keeping in mind that there are different work areas in the maintenance plant. To fulfil the schedule, Indurama plans with its collaborators and general tutors in order to, consequently, delegate to the collaborators the mission of specific tutors in the required area. In this way, the company ensures its objective to satisfy its needs of the trainees' knowledge. It means that in the case of external trainees, the company procures that these students conclude this stage having a productive level equivalent to the productive level of a qualified worker and the internal trainees could improve its knowledge in order to be relocated in new work places within Indurama.

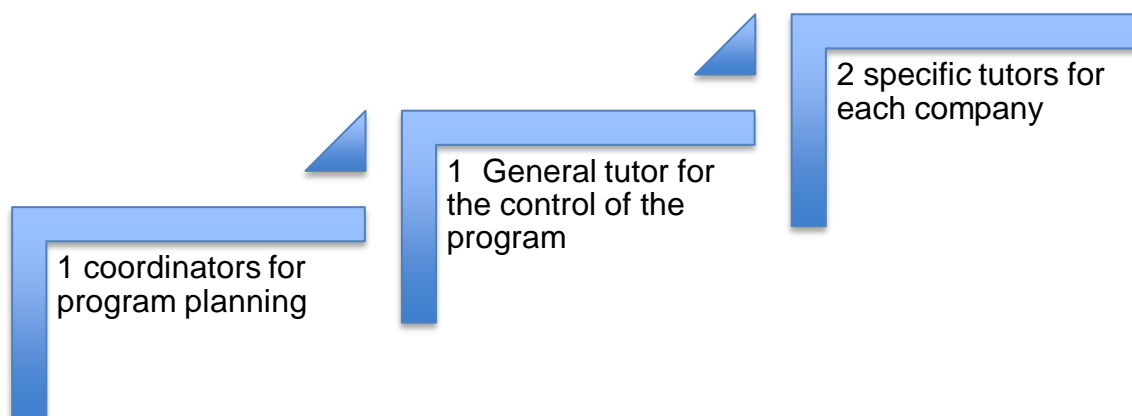
With a 31%, the second component is related to the salary's cost of an internal trainee. The company assumes an amount of the tuition for the trainees theoretical part, and the regular salary without discounting the hours that the trainees invest on the university's class. On the other hand, the company makes the external trainee part of it with a basic salary during two and a half years, feed and workwear.

Although Indurama must assume the training costs, at the same time it has the benefit of training its trainees with its own processes and technologies, facilitating their work adaptation generating savings without the hiring costs. The 2% is the less representative component that corresponds to other costs that are destined to the Dual Vocational Training promotion, training period induction, and others.

Results of the model 2 – Applications costs

To analyse the second model according to the costs assumed by the trainer company, it was necessary to evaluate Graiman Industrial Group, which decided to be part of the Dual Vocational Training with two of its companies. The first is called “Vías del Austro” in the roads construction’s service and the dual training was implemented in the maintenance area of vehicles and machinery. And the second one selected company is Graiman that belongs to the ceramic production sector and the Dual Vocational Training was implemented in the maintenance plant. In the first promotion, this Graiman Industrial Group decides to train 2 internal workers in each company, who were selected by the human resources department. To know the methodology used within Graiman Industrial Group, it was important to have the collaboration of Ing. Marta Monje, the programmer coordinator, through a personal interview. She brought information about the components analysis that the Dual Vocational Training implies within Graiman Industrial Group.

Illustration 6 Dual Vocational Training work team in Graiman Industrial Group

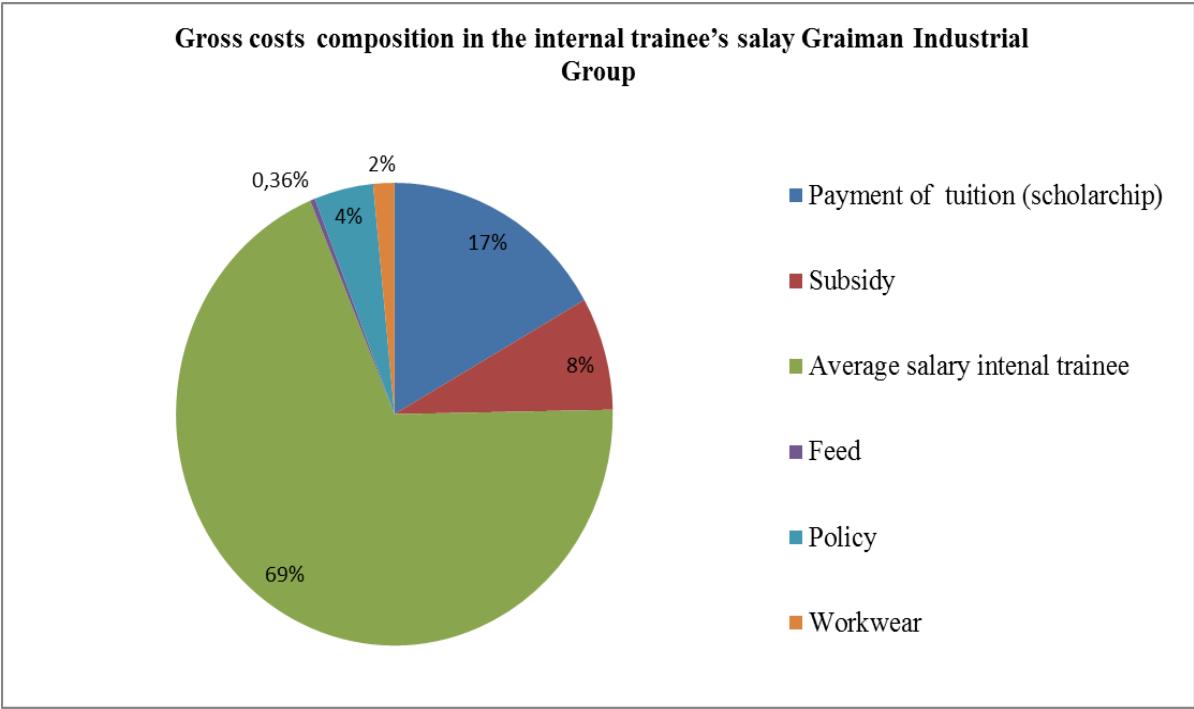


Elaborated by: Sofia Acosta

Source: Graiman Industrial Group

The costs that were generated during the Dual Vocational Training’s model of a Technical of Mechanic Industry in Graiman Industrial Group of internal trainees are the followings:

Illustration 7 Gross costs’ composition in the internal trainee’s salary within Graiman Industrial Group



Elaborated by: Sofia Acosta

Source: Graiman Industrial Group

- Payment of tuition (scholarship): the company pays an amount of the student’s tuition of \$690 each semester.
- Subsidy: Graiman subsidises the tuition with \$325 per trainee.
- Salary: the internal worker has a monthly salary of \$540.
- Feed: the company assumes \$1.50 per day of the internships.
- Work wear: the cost of the working tools is of \$160, this value is assumed by the company.

The illustration 21 indicates that the most representative component is the payment of salaries with the 69%. As a company's policy, the students are trained receiving a fixed salary each month without working during the theoretical training so the company hires a new person for his/her replacement in order to avoid a double workload. About the tuition payment's component, it represents the 17% having as a benefit the reduction of the risk of the career's

desertion with financial aid. The tuition subsidy per semester that Graiman Industrial Group assumes has a representation of 8% having as a benefit the compromise of the entrepreneur to ensure the completion of the program. The less representative components are the private insurance that Graiman Industrial Group brings to its workers because they are exposed to suffer occupational accidents, and the feed that the company provides during the practical training with a 50% of subsidy.

Table 8 Additional cost per internal trainee within Graiman Industrial Group

Salary	I Semester	II Semester	III Semester	IV Semester	V Semester	
\$540 dollars	\$1.015,00	\$1.015,00	\$1.015,00	\$1.015,00	\$1.015,00	Additional costs during the 30 months by an internal worker of the company
Hours in the company	80 hours	80 hours	488 hours	632 hours	536 hours	total hours in the company 1816

Elaborated by: Sofia Acosta

Source: author's calculations of Graiman Industrial's Group information

The table 8 reflects the marginal cost that the implementation of the Dual Vocational Training represents to Graiman Industrial Group. During these two years and a half, the additional costs were consistent because of the company assumes the educational costs and the tuition subsidies during the whole process. However, the additional costs were compensated by their own productive labor. The working hour's number increases from the third semester as the table 8 indicates, so the additional income will be reflected in the long term with the innovated productive processes with higher profits.

Tabla 9 Generated benefits during the Dual Vocational Training by an internal trainee within Graiman Industrial Group

Salario	I Semester	II Semester	III Semester	IV Semester	V Semester	
\$540 dollars	\$270,00	\$270,00	\$1.647,00	\$2.133,00	\$1.809,00	Hiring costs 30 months of internal trainee salary of the company
Hours in the company	80 hours	80 hours	488 hours	632 hours	536 hours	total hours in the company 1816

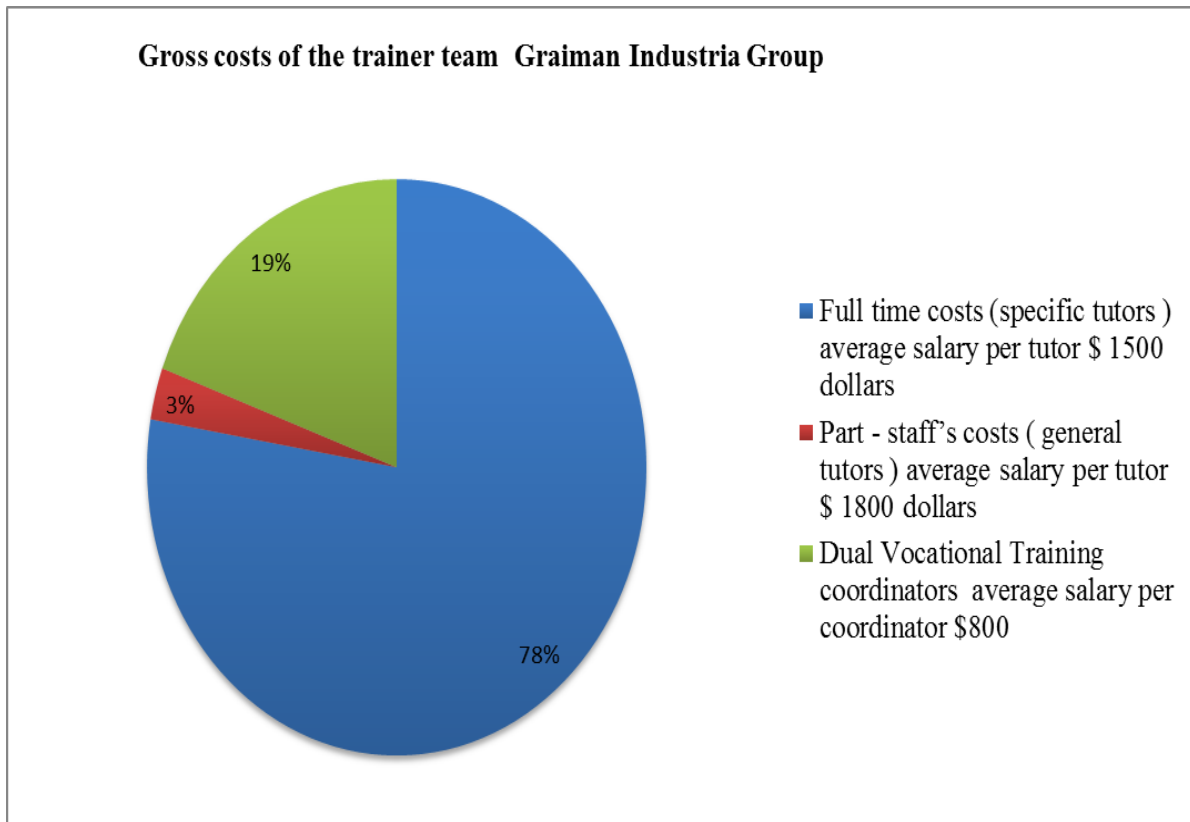
Elaborated by: Sofia Acosta

Source: author's calculations of Graiman Industrial's Group information

During the training period, the company generates economic benefits per semester. As it can be seen in the table 9 the benefits increase according to the working hours in the productive area within Graiman Industrial Group in the short term. As a result, the additional income covers a part of the additional costs that represents the development and the application of this program.

Components cost of the Dual's program trainer team

Illustration 4 Gross costs of the trainer team during two and a half years within Graiman Industrial Group



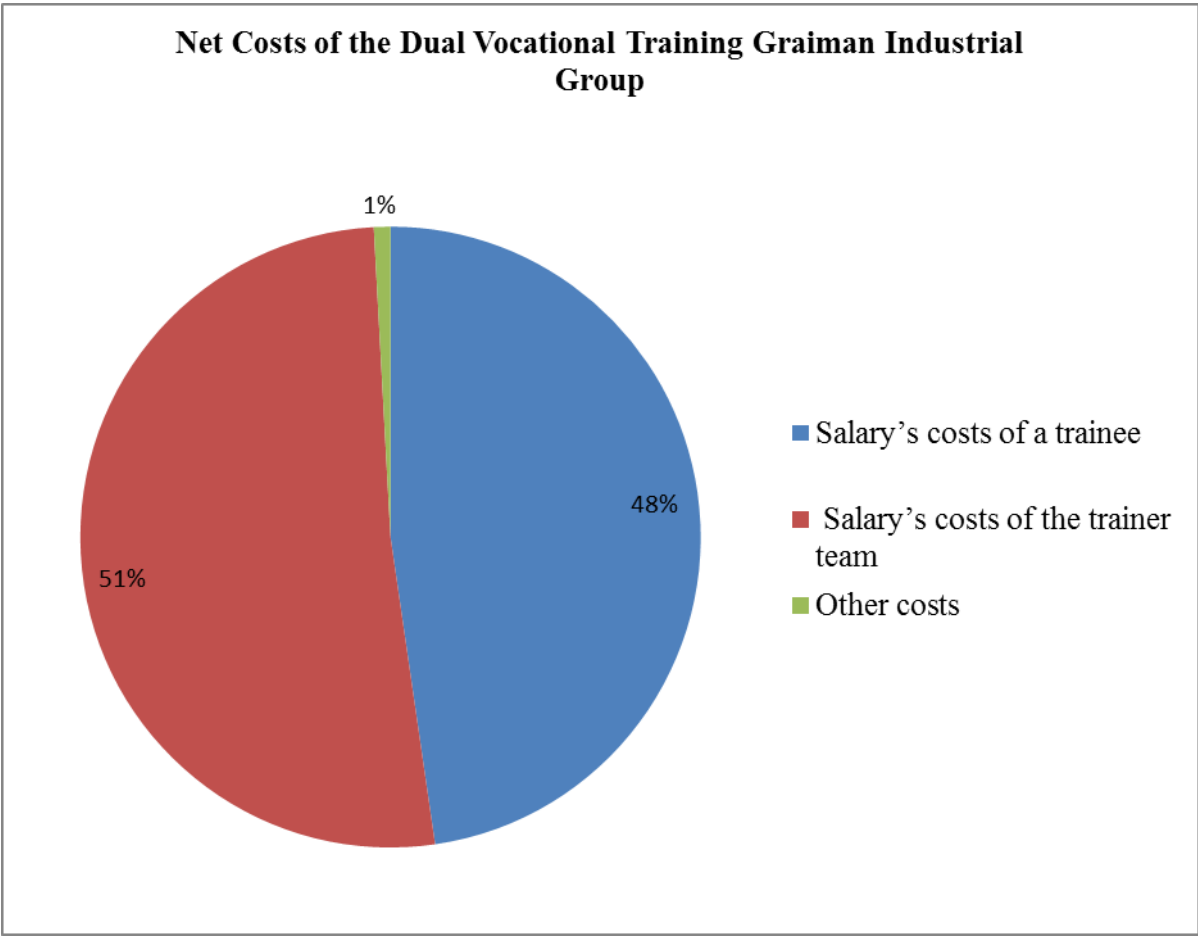
Elaborated by: Sofia Acosta

Source: author's calculations of Graiman Industrial's Group information

- Full time staff costs: the specific tutors are the company's engineers who are in charge of the Dual process's development by carrying out the assigned hours per semester within the company.
- Part-time staff's costs: the general tutors are the engineers who are in charge of the correct planning process for practical activities in the company during the whole Dual Vocational Training period.
- Dual Vocational Training coordinators: the coordinator staff is in charge of the pre-selection of the trainees and of the planning processes to implement the program.

As the illustration 4 shows, the most representative component of the gross costs of the trainer team is full time staff salary (specific tutor) with a 78% due to the permanently support provided to the students during the whole training period. The second component is the coordinators' salary with a 19% because the coordinators dedicate 4 hours per week to the Dual Vocational Training. The less representative component is the partial-time staff salary (general tutor) who dedicates 2 hours per month for monitoring the Dual Vocational Training program. It is important to consider that the trainer team is formed by internal workers of the company that are in charge of be part of the project keeping its tasks and activities previously assigned.

Illustration 9 Net costs of the Dual Vocational Training during two and a half years within Graiman Industrial Group



Elaborated by: Sofia Acosta

Source: author's calculations of Graiman Industrial's Group information

- Salary's costs of a trainee: economic contribution of the company to the Dual Vocational Training of the student, his/her feed, workwear, and regular salary.
- Salary's costs of the trainer team: salary of the coordinators, specific and general tutors per working hours assigned to the Dual Vocational Training.
- Other costs: trainees' induction, Dual Vocational Trainings promotion, and others.

The principal component of the net cost of the Dual Vocational Training is the trainer team cost with a 51% because having 2 trainees, the number of collaborators decrease to one tutor for Vias del Austro and one for Graiman to ensure the correct training keeping in mind that there are different work areas in the maintenance plant. To fulfil the schedule, Graiman Industrial Group plans with its coordinator and the tutors of each company in order to ensure a correct implementation of the program, so the internal trainees will improve their knowledge and innovation in the maintenance area. With a 48%, the second component is related to the salary's cost of an internal trainee. The company assumes an amount of the tuition for the trainee's theoretical part, and the regular salary without discounting the hours that the trainees invest on the university's classes, feed, and workwear. It means that in the case of internal trainees, the company procures that they obtain a qualified labor force avoiding new hiring costs. The 1% is the less representative component that corresponds to other costs that are destined to the Dual Vocational Training's promotion, training period's induction, and others.

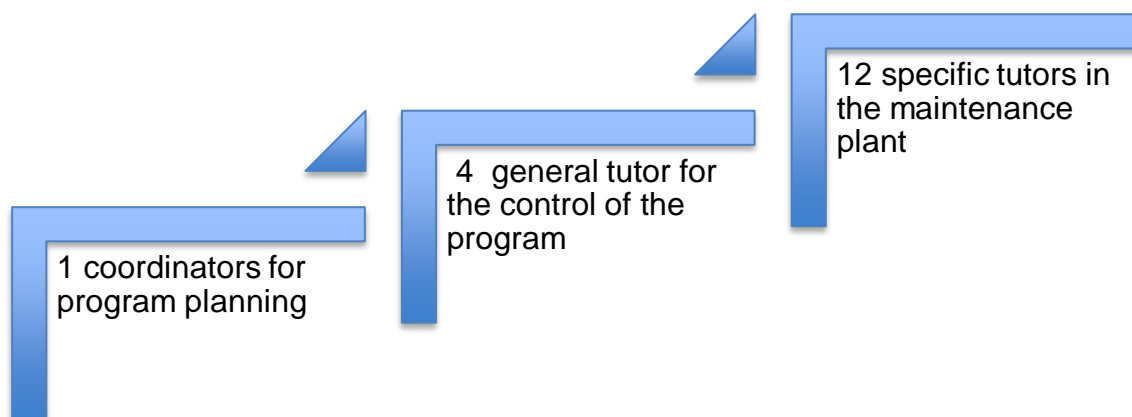
Results of the model 3 – Application’s costs

To analyse the third model according to the costs assumed by the trainer company, it was necessary to evaluate Continental Tire Andina, which decided to be part of the Dual Vocational Training in the industrial electricity and mechanic. In the first promotion, this company decides to train external bachelors previously selected. To know the methodology used within Continental Tire Andina, it was important to have the collaboration of Ing. Santiago Pesantez, the programmer coordinator, through a personal interview. He brought information about the components analysis that the Dual Vocational Training implies within Continental Tire Andina.

The trainer team is divided into three areas:

- Plant 1 concerns to the raw material with 2 general and 2 specific tutors.
- Plant 2 includes the materials’ preparation, construction, vulcanisation and the final finishing with 6 general and 6 specific tutors.
- Laboratory with one general tutor.

Illustration 31 Dual Vocational Training work in Continental Tire Andina

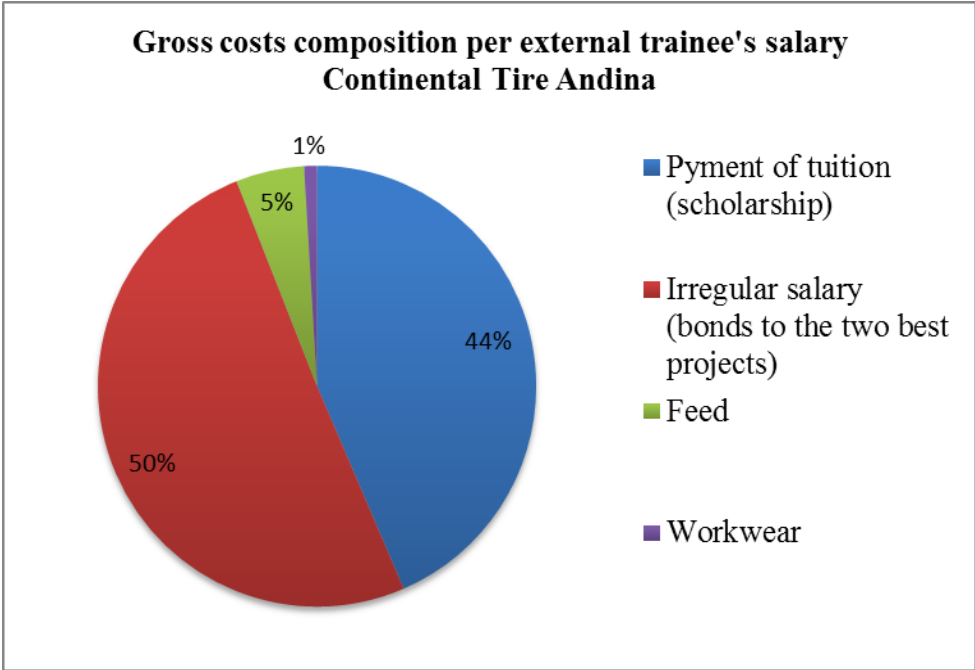


Elaborated by: Sofia Acosta

Source: Continental Tire Andina Company

The costs that were generated during the Dual Vocational Training’s model of Industrial Electricity and Mechanic in Continental Tire Andina of external trainees (bachelors) are the followings:

Illustration 32 Gross costs composition in the external trainee's salary within Continental Tire Andina



Elaborated by: Sofia Acosta

Source: author’s calculations of Continental Tire Andina Information

- Payment of tuition (scholarship): the company pays an amount of the student’s tuition of \$690 each semester.
- Irregular salary: bonds to the two best projects. Continental Tire Andina provides an economic incentive of \$2.000 each promotion.
- Feed: the company assumes \$80 per semester of the internships.
- Workwear: the cost of the working tools is of \$75, this value is assumed by the company.

The illustration 32 indicates that the most representative component is the tuition's payment with the 61%. The second component with a 35% corresponds to the economic incentive that the company provides to the best trainee because of the development of the best project at the end of the Dual Vocational Training. The third component belongs to the feed costs that represents the 3%. The less representative component is the workwear with a 1% that is provided at the beginning of the program. The gross costs of training an external bachelor

are minimal because of these trainees do not have an employment contract. In the long term it is expected that the company decides to hire them.

Table 10 External trainees salary in comparison with the real cost per working hour Continental Tire Andina

	I Semester	II Semester	III Semester	IV Semester	V Semester
External trainees salary	690	690	690	690	690
Real cost per hour worked	345	345	2104,5	2725,5	2311,5
Hours in the company	80 hours	80 hours	488 hours	632 hours	536 hours

Elaborated by: Sofia Acosta

Source: author's calculations of Continental Tire Andina Information

The table 12 shows the obtained calculations from an external trainees salary that is intended to cover the tuition costs per semester in comparison with the real cost. It was calculated based on working hours value per semester during the training period. The marginal cost is compared between the real value and the six-monthly total salary to know if the additional costs are less or more than the generated benefits.

Tabla 11 Net flow of the Dual Vocational Training of an external trainee within Continental Tire Andina

Salary	I Semester	II Semester	III Semester	IV Semester	V Semester	
\$690 dollars	\$-345,00	\$-345,00	\$1.414,50	\$2.035,50	\$1.621,50	Hiring costs 30 months of salary to the external worker of the
Hours in the company	80 hours	80 hours	488 hours	632 hours	536 hours	Total hours in the company 1816

Elaborated by: Sofia Acosta

Source: author's calculations of Continental Tire Andina Information

As the table 13 reflects, the marginal cost in comparison with the additional benefits of the Dual Vocational Trainings implementation demonstrating that in the first and second semesters, the additional costs were higher than the generated benefits per working hours. However, from the third semester there were more benefits due to the number of working hours which compensate the additional costs obtaining a qualified labor force. As a result, the salary of an external trainee is \$690 that are for the tuition's payment, so the costs are less and the benefits highest in the short term.

Table 12 Generated benefits of an external trainee during the Dual Vocational Training within Continental Tire Andina

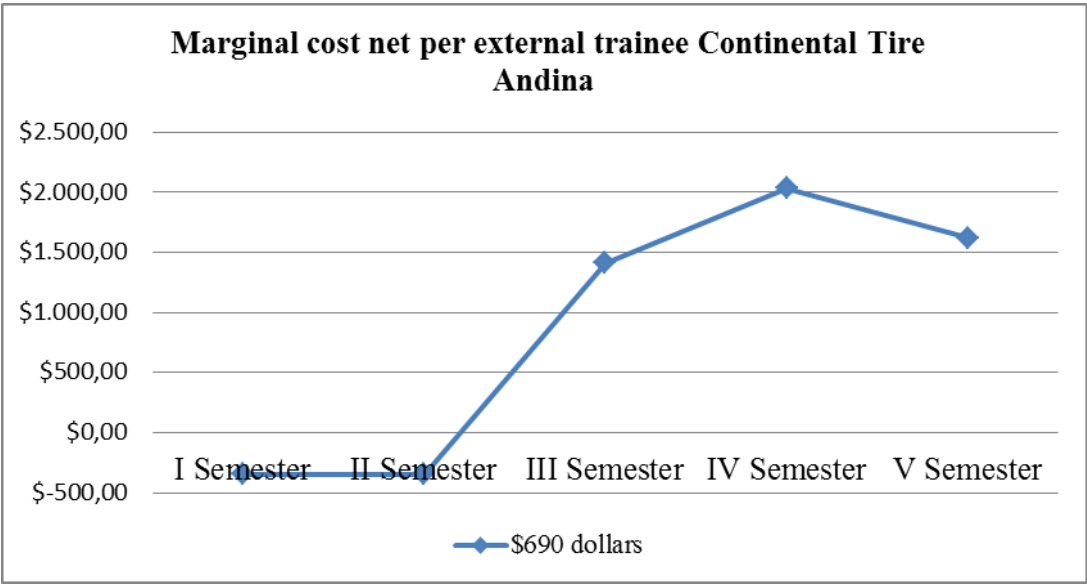
Salary	I Semester	II Semester	III Semester	IV Semester	V Semester	
\$690 dollars	\$345,00	\$345,00	\$2.104,50	\$2.725,50	\$2.311,50	Benefits generated in the short term for 30 months by an external trainee
Hours in the company	80 hours	80 hours	488 hours	632 hours	536 hours	Total hours in the company 1816

Elaborated by: Sofia Acosta

Source: author's calculations of Continental Tire Andina Information

During the training period, the company has generated economic benefits per semester. The table 14 reflects the benefit's increase according to the working hours in the productive area within Continental Tire Andina in the short term. The additional income covers a part of the additional costs that represent the development and application of this program. As a result, the company trains an external bachelor with the objective of training those students in order to make them have the same productive level of the internal workers. So in the case that Continental Tire Andina decides to hire those trainees after the conclusion of the training period, the benefit and the hiring saving could become greater.

Illustration 12 The marginal cost per external trainee within Continental Tire Andina during the Dual Vocational Training period.

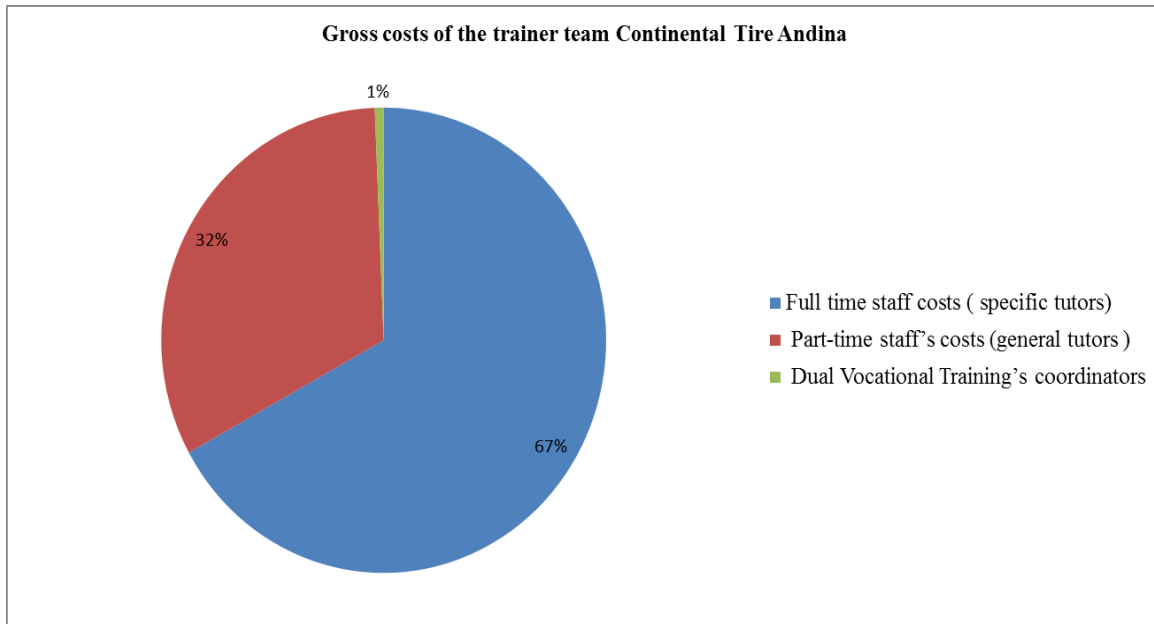


Elaborated by: Sofia Acosta Source: author's calculations of Continental Tire Andina Information

The marginal cost per external trainee within Continental Tire Andina in two and a half years reflects that the additional costs were higher than the incomes in the first year, but from the third semester the additional costs were lower than the incomes. To train external bachelors is profitable for the company because their salary is lower than a qualified worker one.

Component's cost of the Dual's program trainer team

Illustration 13 Gross costs of the trainer team during two and a half years within Continental Tire Andina



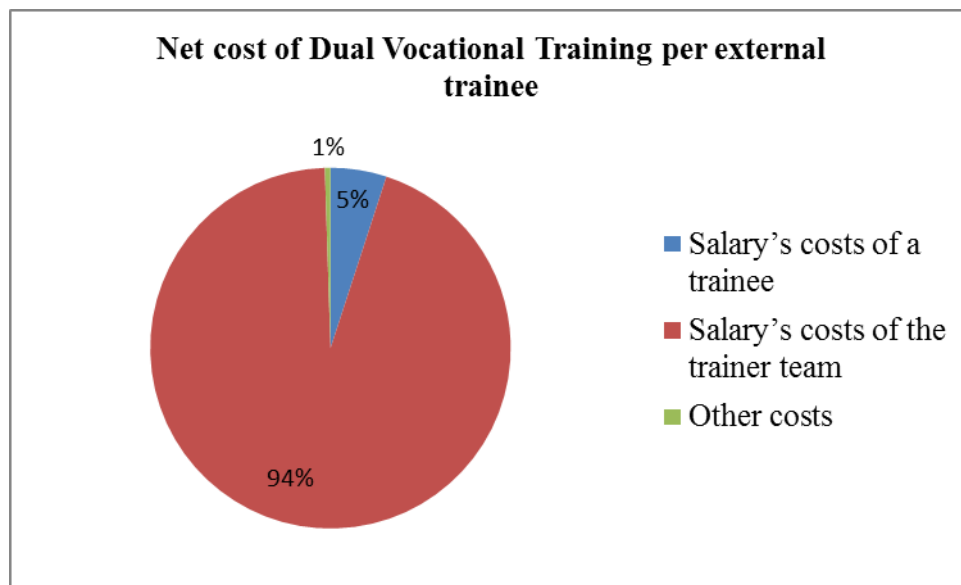
Elaborated by: Sofia Acosta Source: author's calculations of Continental Tire Andina Information

- Full time staff costs: the specific tutors are the company's engineers who are in charge of the Dual process's development by carrying out the assigned hours per semester within the company.
- Part-time staff's costs: the general tutors are the engineers who are in charge of the correct planning process for practical activities in the company during the whole Dual Vocational Training's period.
- Dual Vocational Training's coordinators: the coordinator staff is in charge of the pre-selection of the trainees and of the planning processes to implement the program.

As the illustration 34 shows, the most representative component of the gross costs of the trainer team is full time staff salary (specific tutor) with a 67% due to the permanently support provided to the students during the whole training period. The second component is the general tutors' salary with a 32% because they dedicate 2 hours per week to the Dual Voca-

tional Training. Each general tutor has his/her own planning due to this Dual's program is implemented in three different areas. The less representative component is the coordinator's salary who dedicates 2 hours per month for monitoring the Dual Vocational Training program. It is important to consider that the trainer team is formed by internal workers of the company that are in charge of being part of the project keeping its tasks and activities previously assigned.

Illustration 14 Net costs of the Dual Vocational Training during two and a half years within Continental Tire Andina



Elaborated by: Sofia Acosta

Source: author's calculations of Continental Tire Andina Information

- Salary's costs of a trainee: economic contribution of the company to the Dual Vocational Training of the student, his/her feed, workwear, and regular salary.
- Salary's costs of the trainer team: salary of the coordinators, specific and general tutors per working hours assigned to the Dual Vocational Training.
- Other costs: trainees' induction, Dual Vocational Training's promotion, and others.

The principal component of the net cost of the Dual Vocational Training is the trainer team cost with a 94% because having 7 trainees, the number of collaborators increase to ensure the correct training keeping in mind that there are different work areas in the maintenance plant. To fulfil the schedule, Continental Tire Andina plans with its general and specific tutors in order to ensure a correct implementation of the program, so the external trainees will improve their knowledge and innovation in the maintenance area. With a 5%, the second component is related to the salary's cost of an external trainee. The company assumes an amount of the tuition for the trainees theoretical part, and the regular salary without discounting the hours that the trainees invest on the university's classes, feed, and workwear. It means that in the case of external trainees, the company procures that they obtain a qualified labor force avoiding new hiring costs. The 1% is the less representative component that corresponds to other costs that are destined to the Dual Vocational Training's promotion, training period's induction, and others.

Conclusion :

After these three specific analyses of Indurama, Graiman Industrial Group and Continental Tire Andina, let me affirm the viability of the Dual Vocational Training program, even if each company implements a different Dual Training's policy and the costs vary from company to company due to the selected trainee to develop this system considering that the companies keep the same working hours in the practical part of the program.

If Indurama decides to train an internal trainee it will be more expensive than training an external one due to two main reasons:

- 1.-The cost of a monthly salary of a collaborator who stops working during the whole Dual Vocational Training's period is higher with an internal trainee than an external.
2. - The tuition's subsidy that the company assumes each semester. However ,when Indurama invests on their collaborators, it is ensuring to obtain qualified labor force and an improvement in its processes in the long term.

When Graiman Industrial Group decided to be part of the first promotion of the Dual Vocational Training, it had economic benefits during the two and a half years because of the workers fulfil their previous tasks and at the same time, were working on the practical part of the Dual Vocational Training. At the long term, the company will have qualified labor force that will improve the productivity in the maintenance areas and hence also in the production area.

The costs of the Dual Vocational Training of an external trainee within Continental Tire Andina were higher than the benefits during the first year due to the low working hours during this period of time. Nevertheless, from the third semester the incomes were higher than the costs. The costs that are assumed by the company do not include the monthly salaries, so the company recover its investment in the short term.

Chapter 3: Generated benefits during the Dual Vocational Training's period in the three analysed companies

Break-even point of the Dual Vocational Training's model per company

This is necessary for the trainer company to know at what time it will recover the investment and if it is necessary to implement more practical hours in the company to cover the generated costs during the two years and a half. To know the operational level that is needed to cover the operational costs, the companies use the analysis of the break-even point, so it is important to classify the costs of the Dual Vocational Training in fixed or variable. In this case, it is relevant to present the results of the analysis of the three trainer companies.

First model's application – Dual Vocational Training in Indurama

To establish the fixed and variable costs assumed by Indurama during the training period, it was important to analyse the components' costs without taking into consideration the costs component of the trainer team due to the coordinators, specific and general tutors that are collaborators of the company and were assigned for the program implementation keeping its current salary.

The formula applied to establish the break-even point is as follows:

Break-even Point (years) = FC ÷ (SP – VC)

In the case of Indurama, it is necessary to identify the break-point of an internal or an external trainees due to the costs that the company assumes because these are different in each situation, so the time varies considering that the whole investment had to be recovered in the short or long term.

Internal trainee:

Break-even Point (years) = \$17.032,50(FC) ÷ \$5675 (SP)-0(VC)
= 3 years

- Fixed Costs (FC): represents the tuitions subsidies, regular salaries and feed.
- Benefit: represented by the real cost per working hours in comparison with trainee monthly salary.
- Variable Costs (VC): the variable costs of an internal trainee are zero.

The break-even point of the Dual Vocational Training of an internal trainee within Indurama is of 3 years as it could be seen in the formula. The results reflect that six months after the conclusion of the training period the company recovers its investment. It demonstrates the viability of the program in the short and long term and this is the reason why it is necessary that the internal collaborator continues working for the company in order to generate potential benefits in the future.

External trainee:

$$\begin{aligned} \text{Break-even Point (years)} &= \$ 3.411,85(\text{FC}) \div 2854,35(\text{SP}) - \$1.500 (\text{VC}) \\ &= 2,5 \text{ years} \end{aligned}$$

- Fixed Costs (FC): represents the tuition's subsidies, regular salaries and feed.
- Benefit: represented by the real cost per working hours in comparison with trainee monthly salary.
- Variable Costs (VC): the variable costs of an external trainee are the economic recognition of the best projects.

The break-even point of the Dual Vocational Training of an external trainee within Indurama is of 2.5 years as it could be seen in the formula. The results reflect's that with the conclusion of the training period the company recovers its investment. It demonstrates the viability of the program in the short and long term and this is the reason why it is necessary that the external trainees continue working for the company in order to generate potential benefits in the long term.

Second model's application – Dual Vocational Training in Graiman Industrial Group

To establish the fixed and variable costs assumed by Graiman Industrial Group during the training period, it was important to analyse the components' costs without taking into consideration the cost's component of the trainer team due to the coordinators, specific and general tutors that are collaborators of the company and were assigned for the program implementation keeping its current salary.

The formula applied to establish the break-even point is as follows:

$$\text{Break-even Point (years)} = \text{FC} \div (\text{SP} - \text{VC})$$

In the case of Graiman Industrial Group, the corporate policy was to train internal personnel of the company so the result was as follow:

Internal trainee:

$$\text{Break-even Point (years)} = \$ 5.075(\text{FC}) \div \$6.129 (\text{SP}) - \$2.011 (\text{VC})$$

$$= 8 \text{ months}$$

- Fixed Costs (FC): represents the tuition's subsidies, regular salaries and feed.
- Benefit: represented by the real cost per working hours in comparison with trainee monthly salary.
- Variable Costs (VC): the variable costs of an external trainee are zero.

The break-even point of the Dual Vocational Training of an internal trainee within Graiman Industrial Group is of 8 months as it could be seen in the formula. The results shows that from the second semester, the training's cost is zero. Consequently, from the third semester,

there were generated benefits recovering the investment before the conclusion of the Dual Vocational Training period.

Third model's application – Dual Vocational Training in Continental Tire Andina

To establish the fixed and variable costs assumed by Continental Tire Andina during the training period, it was important to analyse the components' costs without taking into consideration the cost's component of the trainer team due to the coordinators, specific and general tutors that are collaborators of the company and were assigned for the program implementation keeping its current salary.

The formula applied to establish the break-even point is as follows:

$$\text{Break-even Point (years)} = \text{FC} \div (\text{SP} - \text{VC})$$

In the case of Continental Tire Andina, the corporate policy was to train external personnel of the company so the result was as follow:

External trainee:

$$\text{Break-even Point (years)} = \$3925 \text{ (FC)} \div \$7831.5 \text{ (SP)} - \$5600 \text{ (VC)}$$

$$= 1 \text{ year } 7 \text{ months}$$

- Fixed Costs (FC): represents the tuition's subsidies, regular salaries and feed.
- Benefit: represented by the real cost per working hours in comparison with trainee monthly salary.
- Variable Costs (VC): the variable costs of an external trainee are the economic recognition of the best projects.

The break-even point of the Dual Vocational Training of an external trainee within Continental Tire Andina is of 1 year 7 months as it could be seen in the formula. The results reflect's that from the third semester, the training's cost is zero. Consequently, from the

fourth semester, there were generated benefits recovering the investment with the conclusion of the Dual Vocational Training period.

Benefits of the Dual Vocational Training for the companies

The benefits of the Dual Vocational Training within the three analysed companies, being to show by around the end of the training period in the first stage. On the other hand, the benefit can be analysed from the long term perspective because when the trainees are consequently hired, the Dual Vocational Training provides a potential benefit.

Generated benefits during the Dual Vocational Training

To quantify the generated benefits during the two a half years, it was necessary to interview the coordinators, the general and specific tutors of each one of the companies in order to know their opinions and perceptions of the programs implementation. And the following were the results:

Generated benefits during the two and a half years: the 50% rates the Dual Vocational Training team as “very good” and the 41.67% as “good”.

Attitude of the trainees: the 50% rates these trainees’ attitude as “good” and the 33.3% as “very good”.

Business values’ adoption: the 50% rates it as “very good” and the 41.67% as “good”.

The process improvement during the first year: the 50% rates it as “good” while the 25% rate this improvement as “regular”.

The process improvement during the whole training: the 66.67% rates this improvement as “good” and the 25% as “very good”.

The productivity of an internal and external trainees at the end of the Dual Vocational Training: the 50% rates it as “good” and the 25% as “very good”.

The statistical analysis helped to determine the dependent and independent variable in order to know which one of the generated benefits during the Dual Vocational Training is more important and which is directly related to the perception of the trainer team of each company. As a result, the independent variable is more significant in the general grade about the generated benefits during the training period and it is related to the process improvement of the company's areas where the program was implemented.

Table 15 Regression

Regression analysis	Survey questions
Independent variable	How do you rate from 1 to 5 the improvement of processes in the areas that were subject to dual training in the maintenance plant of the companies in the two and a half years of training?
Dependent variable	How do you rate the benefits of dual training generated during the training on a scale of 1 to 5?
R	0,786
R ²	0,618

Elaborated by: Sofia Acosta

Source: Personal interviews

The independent variable established as the process improvement during the two and a half years reflects in 0.618 the dependent variable over the generated benefits during the Dual Vocational Training. About the correlation, this is direct in 0.786 between both variables reflecting the importance of improving the process regarding to the trainer team's perception about the general benefits of the dual program.

The statistical analysis done determined that for each 0.663 in the grade about the process improvement, it will increase with 1 point in the global perception of the trainer's team about the generated benefits during the Dual Vocational Training within the company.

$$\text{Equation: } Y = 1,71 + 0,663X1$$

Generated benefits after de Dual Vocational Training period

From the long term perspective, the companies ensure an own training key of professionals both internal and external trainees. Following the success completion of this program, the companies keep their trainees:

Indurama: The 15 collaborators (internal trainees) are relocated in new workplaces covering new needs and contributing with new knowledge. On the other hand, two of the five external trainees (bachelors) were hired.

Graiman Industrial Group: The 2 collaborators (internal trainees) are working on the selected area of dual training contributing with new knowledge and increasing the productivity of the company.

Continental Tire Andina: 4 of the 7 external trainees were hired. In the long term, the company plans to increase the number of bachelors under this dual model.

The opportunity cost has an important role in the dual implementation's decision due to the costs' saving of hiring technical experts and training. In the long term it represents a financial benefit for the company to having a dual program implemented. To know the perception of the trainer's team, it was necessary to interview the coordinators, general and specific tutors of each one of the companies. And the following were the results:

The 75% of the trainer's team considers that the financial benefits are highest in the long term.

The 33.3% of the trainer's team considers the hiring costs of technical experts as "very high"

The 33.3% of the trainer's team considers the costs' savings as "high" and the 8.33% as "very high".

The productive process's optimisation plans that the knowledge and preparations deficit will decrease after the end of the training process and the internal trainees will be relocated in their workstations, and the external trainees will be hired and be part of each one of the companies. As a result, the productive process optimisation in the trainer companies has the following results of the implemented projects proposed by the trainees:

Table 16 Projects implemented in the electricity area within Indurama

Project 1	Benefit	Project cost	Real cost	Estimated time	Real time
Installation ANDON System in Manufacturing Plant	Reduction of project execution time. In addition, this time has served so that tutors can perform parallel tasks	\$ 1.500,00	\$ 800,00	170 hours	120 hours
Project 2	Benefit	Project cost	Real cost	Estimated time	Real time
Armed Board and Programming of the LOGO micro PLC for the LOGAN folder	Reduction of project execution time. In addition, this time has served so that tutors can perform parallel tasks.	\$ 1.500,00	\$ 500,00	120 hours	80 hours

Elaborated by: Sofia Acosta

Source: personal interviews

The table 16 shows the application of the developed projects by the internal and external trainees in the maintenance plant of the company. The favorable results of the Dual Vocational Training's benefits can be reflected in the savings of the projects' implementation and in the time of execution. The first project represents a 47% of savings and less 50 working hours than had been allotted. The second project has a 66% of costs' saving and less 40 working hours than had been allotted.

Table 17 Projects implemented in the mechanic area within Indurama

Project 1	Benefit	Project cost	Real cost	Estimated time	Real time
Automatic Kitchen Packing System	Reduced project execution time	\$1.500,00	\$700,00	220 hours	160 hours
Project 2	Benefit	Project cost	Real Cost	Estimates	Real Time
Construction of elements for the elaboration of tools for the Refrescamiento project Kitchens	Reduced project execution time	\$900,00	\$450,00	180 hours	120 hours

Elaborated by: Sofia Acosta

Source: Indurama

The table 17 represents the application of the developed projects by the internal and internal trainees in the maintenance plant within Indurama.

The favorable results of the Dual Vocational Training's benefits can be reflected in the savings of the projects' implementation and in the time of execution. The first project represents a 53% of savings and less 60 working hours than had been allotted. The second project has a 50% of costs' saving and less 60 working hours than had been allotted.

Continental Tire Andina plans to implement the following projects that were previously selected by the general and specific tutors:

Project Implementation of blocking system for internal pressure press NRM of 40.5

Project design and implementation elevator cores in hexabead and improvement setup of Core Maker

Consequently, the processes that are efficiently executed by the qualified workers are of major importance for the trainer companies.

Strategic planning and its importance in the companies of the Dual Vocational Training

The strategic planning is the process of visualizing the future of a company exposing the goals, objectives and action plans needed in order to achieve its desired future. The main function of the strategic planning is to link the work processes with the strategic directions. So it is important to have a strategic planning to implement the Dual Vocational Training program in the companies that are currently within this model and for those that are taking the decision of be part of it.

Strategy: is a plan that is comprised by the main goals, policies and sequences of action of the company to implement the Dual Vocational Training taking in mind this model as an objective to adapt itself to the needs, processes and policies of the company. Consequently, if the company has a well-formulated strategy it will help to monitor and assign the economic and operational resources during the two and a half years of the dual training.

Main practices of a strategic planning of the Dual Vocational Training

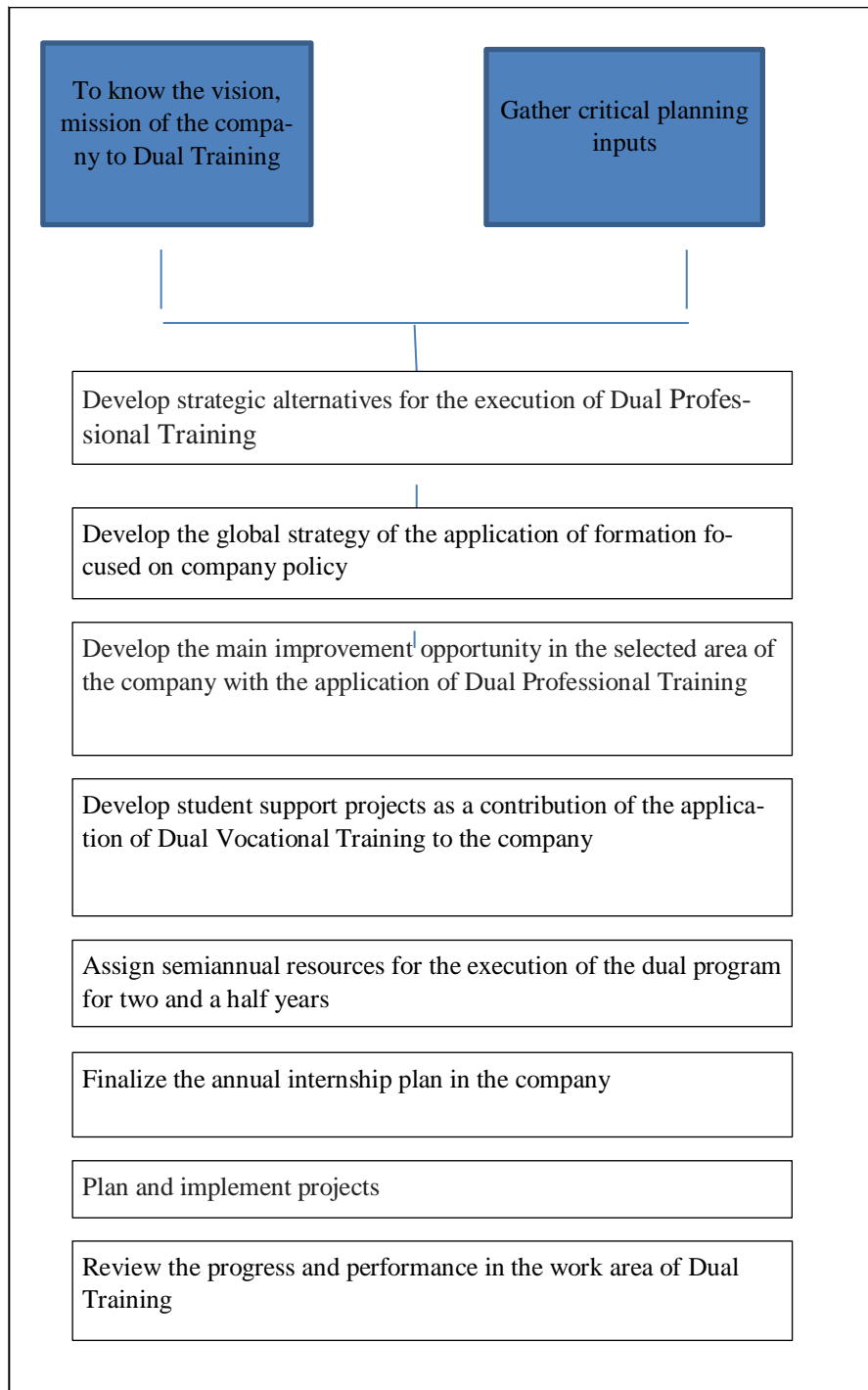
Systematic planning to create and execute the related strategies to the Dual Vocational Training.

Understand the work environment between the selected team of the Dual Vocational Training and program's trainees, the main factors that determine the success and the strategic challenges related to the organizational sustainability.

Link the action plans of the short term to achieve the practical part of the Dual Vocational Training with strategic objectives and organizational challenges of the long term of the trainer company.

Identify the key measures or indicators to follow the evolution of the action plans of the Dual Vocational Training and consequently project the performance of these key measures to identify the opportunities of the trainees in the dual program of the company.

Table 18 Strategic development of the Dual Vocational Training



Evaluate annually and improve the planning process for the following dual program promotions

Elaborated by: Sofia Acosta
Source: personal interviews

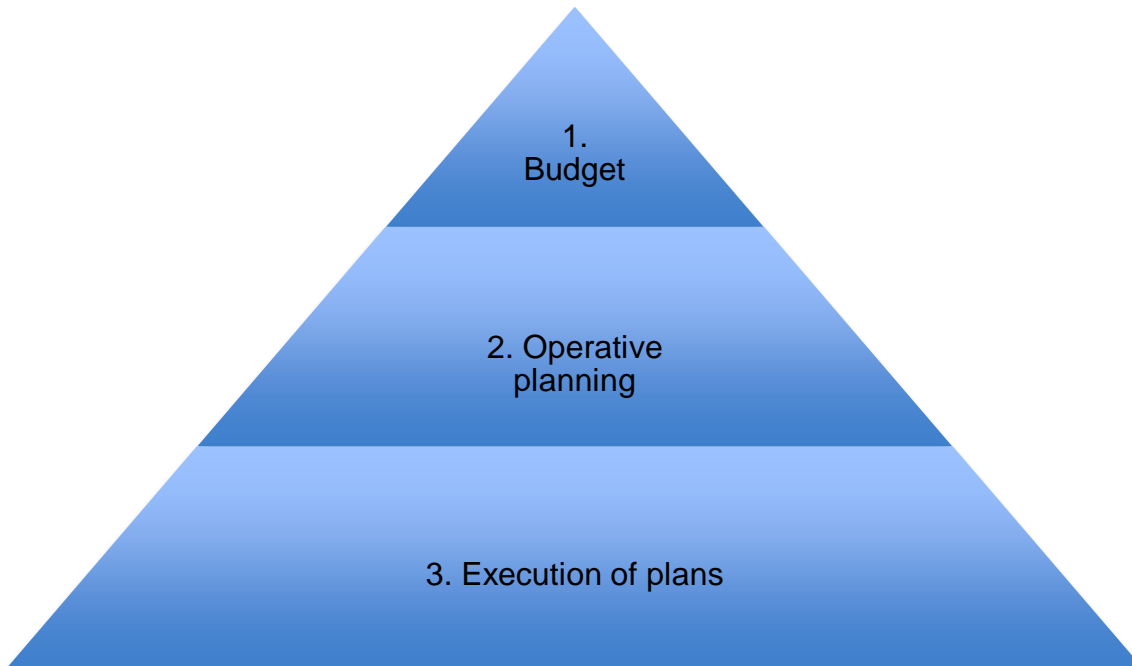
Strategic foundations of the company to apply the Dual Vocational Training

It is necessary for the trainer companies to bring a feedback in order to make internal or external trainees know the mission, vision, principles and values of the company that they will be part of through the dual program. While all this is going on, the trainees feel like members of the organizational family during two and a half years considering the possibility of being permanently recruited.

Long-term objectives: these represent the desired strategic positions when the Dual Vocational Training ends. With regard to the internal and external trainees, these objectives have to be attainable, measurable and challengers.

The planning process

It is important a change of mentality from the entrepreneurs to the work team in order to develop the planning process considering the following model:



Strategic foundation: it is considered as a basis for strategic decision making. This phase is focus on the operational principles of the company during the training period.

- Long-term plans: It is based on the analysis to know the economic and operational projections in the area where the Dual Vocational Training was implemented. These must be clearly defined in a timeline from one and a half year to two and a half years.
- Tactical plans: at this stage of the processes, it allows making the desires of the trainer company a reality. It is important to clearly define what is the desired, how, when it will be achieve, and who will be in charge of the different tasks within each area of the company. It includes goals in a timeline of one year considering the action plans.
- Operational plans: these are tasks and activities to carry out the weekly operations of the Dual Vocational Training, the operational plans must be in function of the trainer company's needs and the plans of the areas in which the information is developing.

Planning elements

➤ The approach of the key strategic areas (KSA) has an extensive reach and these are aspects that need to be planned during a long period of time in order to achieve the mission and strategy of the Dual Vocational Training within the company. To apply the dual program the area's heads must analyze which of these areas are the strategic ones to achieve the mission, vision and objectives of the company, so this is the reason why it will be planning the insertion of the dual program in the selected area.

It is important to assign roles of the Dual Vocational Training's team within the selected area in order to identify the critical issues, to design the plan to coordinate and evaluate the program.

Success key factors

The adhesion of the aspects related to the internal aspects of the company, as well as the strengths and internal limitations that will have an important effect in the development of the dual program.

Source:

✓ What opportunities or challenges are needed to be confronting by the Dual Vocational Training within the company?

✓ What operations have the possibility of having a major effect under the profitability and growth in the long term?

✓ Which are the future positions linked to the Dual Vocational Training's matters within the selected area?

Tactical plans

These are focus on the implementation, the work environment and the result of the strategic planning of the Dual Vocational Training.

Elements:

➤ 1. Specific steps or required actions

1.1 Analyze the company's area in which the Dual Vocational Training will be implemented.

➤2. Persons responsible for each step or action

2.1 Select the collaborators of the company to execute the program under the business policy of each trainer company: coordinator, specific and general tutor.

2.2 Select the external or internal trainees of the company that are part of the Dual Vocational Training.

➤3. Schedule to develop the steps and actions

3.1 Get used to the number of hours established to the practical part of the company in the curriculum of the Dual Vocational Training, which is adjusted to the yearly planning in each company, so in this way it tries to achieve the mission of this program.

3.2 Develop the link between the external trainee with the company to adopt him/her to the principles and values of the company and to make them feel as a part of the organizational family in the long term. If it is the case of an internal trainee, it searches to improve the efficiency in the workstation in order to generate credits in the long term for the company.

➤4. Required resources:

4.1 Plan the budget of two and a half years of training: trainees' salaries, amount to the trainee's tuition, the work tools, feed and extra costs.

➤5. Feedback mechanism to monitor each step:

5.1 To monitor the implementation of the Dual Vocational Training it is necessary to control each developed activity in order to have a best control of the trainees' progress.

A correct planning of the Dual Vocational Training is important to improve the execution of the dual program in each one of the companies with the objective of having best results at the end of the two and a half years.

Conclusion

The Dual Vocational Training is a long-term investment for the company in which to obtain results in the short and long term the conclusion of the program is essential regardless of it is an internal or external trainee. The period of time in which the additional costs generated by the dual program are equal to zero and the investment is recovered depending on the amount that the company assumes per trainee.

The Dual Vocational Training is a tool that helps to ensure the improvement of processes and the productivity of the workers. However, the benefits depend on the application of each trainer company to achieve the foreseen objectives of each one of the companies. The benefits after the conclusion of the program has direct relation with the way in which the

companies take advantage of the competitive advantage of having qualified labor force according to the needs and processes that the Dual Vocational Training generates within the selected areas for the program.

In the case of Indurama, the Dual Vocational Training is viable both with external trainees and internal trainees in two and a half years. However, to train external personnel are less expensive than to train an internal one. This is the reason why the investment on an external trainee is recovered during the training period while the internal trainee's investment is recovered in the long term.

Graiman Industrial Group could recover its investment of its internal collaborators during the Dual Vocational Training because of the workers that are part of the program keep their functions within the company and also execute the assigned tasks of the Dual Vocational Training.

When Continental Tire Andina trained the external bachelors, its investment were recovered during the training period because of the investment was recovered by the productive hours of the trainees.

The strategic planning is important before, during and after the conclusion of the training processes so the objectives could be measured and it could be possible to improve the program's implementation for the new generations of trainees.

To conclude, it is considered that the Dual Vocational Training in the industrial electricity-mechanic is viable from the economic viewpoint for the companies. The investment is profitable in the short and long term, which plans to obtain an increase in the quality of the products with a qualified labor force, and helps to reduce the levels of youth unemployment.

Recommendations

- The project of the Dual Vocational Training carried out by the Ecuadorian – German Chamber of Industries and Commerce´s team with the support of the Chamber of Industries, Production and Employment of Cuenca is important because it gets the involvement of 18 companies in the mechanic and electricity careers, promoting the dual program as a future investment and exposing the economic benefits in the short and long term is the key for the business change of mind.

- The three trainer companies previously analyzed in this investigation project conclude the programs with major results. It is important to keep the project in the long term and to be considered as a part of the corporate policy.
- The implementation of the Dual Vocational Training is not an easy task, the trainer companies must carry out a process to select their collaborators who will have the mission of being part of the team and monitor its performance within the company.
- It is necessary an interaction between the company and the university with the objective of the company proposes the careers according to their own needs.

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