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**Tecnosinos Talents Program: qualifying and connecting young students with
technology-based companies at Tecnosinos Tech Park**

*Plenary session 3:
Cities, STPs and other AOIs: attracting talent*

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Tecnosinos Talents Program: qualifying and connecting young students with technology-based companies at Tecnosinos Tech Park

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1. Introduction

The Science, Technology and Research Parks (STPs), inserted in the areas of innovation, focus on companies, research institutions and people. In these environments it is facilitated the creation of new businesses through mechanisms of incubation and spin-off, as well as acceleration of growth of small and medium enterprises. Therefore, they work in a global network that brings together thousands of innovative institutions around the world, facilitating the internationalization of their resident companies.

With the advent of globalization, it is possible to realize that one of the key factors for a country's development and growth is innovation, that is, technological development becomes a great instrument for enriching the national economy.

According to Artz (2015), innovation may be the way for developed economies to maintain a competitive advantage. Many countries have tried to meet this challenge by focusing on the development of a creative economy, since definitions of innovation share the common process of applying creativity. Focusing on intellectual capital is at the heart of any innovation system, even if it is a challenge to get the new creative ideas to be applied to the market. The environments and structures are not always ready for innovation. "The dichotomy between creativity and its application raises questions about the institutions and communities from which innovation can come"³.

Besides that, even though technology is one of the means to achieve greater development in a region, and hosting companies with a strong presence in the IT market, there is lack of qualified human resources - such as speakers of other languages and more specific knowledge within this field. For this, it is necessary to invest in the improvement of education and professional qualification.

Capturing and retaining talented human resources is a challenge for businesses globally. Skilled workers play a central and starring role in today's knowledge economy. Talented individuals usually make direct contributions, including innovation and scientific discoveries, and coordinate and guide the actions of many others, propelling the knowledge frontier and spurring economic growth⁴.

Taking into account that this is an extremely dynamic market, constantly evolving and with an increasingly active presence in the demands of society, human resources end up being the main capital and engine of development for the Information and Communication Technology sector. In addition, the frequent innovations and the possibility of exchange with other areas offers multiple professional opportunities in the labor market, in areas such as software, hardware or service. According to the Guide to Functions of Information and Communication Technology in Brazil, organized by the Brazilian Association of Information and Communication Technology Companies⁵,

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³ Artz, G. (2015). Innovation systems symbiosis: The impact of virtual entrepreneurial teams on integrated innovation and regional innovation systems. In Roos G. & O'Connor A. (Eds.), Integrating Innovation: South Australian Entrepreneurship Systems and Strategies (p. 94). South Australia: University of Adelaide Press. Available on: <http://www.jstor.org/stable/10.20851/j.ctt1sq5xd5.9>

⁴ Kerr, S., Kerr, W., Özden, Ç., & Parsons, C. (2016). Global Talent Flows. The Journal of Economic Perspectives, 30(4), 83-106. Available on: <http://www.jstor.org/stable/44028259>

⁵ BRASSCOM, Guia de Funções de Tecnologia da Informação e Comunicação no Brasil - 2ª EDIÇÃO, 2017 (p.05). Available on: https://brasscom.org.br/wp-content/uploads/2017/08/brasscom-guia_de_funcoes_de_tic_2a_edicao-2017.pdf

to meet the growing demands of the industry and to have a successful career, the ICT professional must be qualified and technologically updated. Issues like Internet of Things (IoT), Big Data, Blockchain, Cloud Computing, digital security and mobility are among the opportunities placed at the forefront of this thriving market. Knowing these options and what is expected from this professional becomes essential for students, educational institutions, public sector and companies.

In the same way, IT companies need to improve their ability to attract, retain and develop professionals with in-depth knowledge not only on up-to-date technology, but also on its practical applications, such as the use of information system⁶.

Looking at the Brazilian scenario, the research made by BRASSCOM (2017)⁷ pointed out that the national market already employed in 2015 840,886 IT workers. Even so, according to another study conducted by the Association for the Promotion of Brazilian Software Excellence (SOFTEX, 2013)⁸, the Brazilian Information Technology Market will have a deficit of 400,000 professionals by 2022. In addition, the study shows that the repercussion of the impact of the labor shortage in IT may even lead to a revenue loss of R\$ 140 billion by 2022 in the segment throughout the country.

However, based on the current educational framework, would be trained only 33.000 people in this area, which shows that the scarcity of human resources within this sector tends to be aggravated. This implies urgent actions to mitigate this obstacle to the growth of the Brazilian IT software and services industry.

Faced with these challenges for technology companies located or not in technology parks, the Tecnosinos Tech Park, an innovation ecosystem located in the south of Brazil, in a municipality of 220 thousand inhabitants, called São Leopoldo, put itself in the task of looking for an alternative to bring young people closer to the companies of the Park. With the understanding that attracting talents and maintaining them is fundamental to the current knowledge economy as well as being essential for the growth of Tecnosinos Tech Park.

Tecnosinos represents one of the most important technology parks in Brazil. Currently around 100 companies from Brazil and from other countries compose the Park, which can be incubated or established companies based on technology, and in the following areas: Information Technology; Automation and Semiconductors; Communication and Digital Convergence; Health Technologies, and Socio-environmental Technologies. Founded in 1999, the Park has grown substantially in recent years. In comparison to 2008, for example, the number of companies installed in the Park has doubled and in 2017 the Park reached about 5,500 direct jobs.

In 2012 a qualitative and quantitative survey was carried out with companies installed in the Park to identify the profile of the human resources demanded by the companies. At the time, were identified more than 200 open jobs in seven companies of the Park. As a challenge to fill these vacancies were pointed out the lack of qualification of professionals, incomplete and / or outdated training and little knowledge in Portuguese and foreign languages. In this context, based on the demand for human resources and lined up with the expansion plan of the park, the Tecnosinos Talents Program was strategically designed.

Therefore, this article aims to present the Tecnosinos Talents Program, training and qualifying human resources, encouraging and fostering the knowledge and development of students to work along with the Park's companies.

In the short and medium term, the Program intent to provide a technical training for a sufficient number of workers, meeting a set of demands for professional qualification already requested by Tecnosinos Tech Park companies. In addition to promoting the convergence between the demand for workers and the potential talents from schools, the program also gives students the possibility of a new look under their technological career opportunities.

⁶ Dorgan, S. J., & Dowdy, J. J. When IT lifts productivity. The McKinsey Quarterly. 4. 2004. Available on: <http://www.philadelphia.edu.jo/academics/netarchive/uploads/IT%20and%20Productivity.pdf>

⁷ BRASSCOM, O TRABALHADOR DA ERA DO CONHECIMENTO, 2016. Available on: <https://www.slideshare.net/Brasscom/o-trabalhador-da-era-do-conhecimento-regulamentao-das-profisses-de-tic>

⁸ OBSERVATÓRIO SOFTEX. MERCADO DE TRABALHO E FORMAÇÃO DE MÃO DE OBRA EM TI. Campinas, 2009. Available on: file:///K:/Area6/unitec/UNITEC%202012/COMUNICA%C3%87%C3%83O/CASES/IASP%202018/ABSTRACTS/Talentos/cadernos_tematico_mercado_de_trabalho.pdf

Programs like this and the constant expansion of the possibilities offered to companies, professionals and students, added to other factors, resulted in awards and recognitions for the Tecnosinos Tech Park and its incubator called Unitec. In 2010 and 2014, Tecnosinos Tech Park was chosen as the Best Scientific and Technology Park in Brazil by the National Association of Entities Promoting Innovative Enterprises (Anprotec). Also in 2014, the Unisinos Innovation and Technology Unit (Unitec) received the First Place in Sustainability and the highest honor: the Technopolity Network's Best Incubator Global Award, competing with incubators from 27 countries. This environment of constant innovation and new business development is what is presented to the students during Tecnosinos Talents Program visits.

2. How the Tecnosinos Talents Program Works

Created in 2011, the Tecnosinos Talents Program gives potential talents a distinct immersion with experiences generated at Unitec Incubator and in the Park. The purpose is to reveal the student's career opportunities related to the technology field, entrepreneurship and innovation environment, associated to their will to know the day-to-day business, opportunities and employability requirements, in order to support the difficult decision of choosing their professional path. That is why the Program intends to demonstrate to students that geographical boundaries are no longer the limits of a career's development. The dynamics of mobility and sharing of experiences among the most diverse actors make the Program an opportunity for talent to connect directly with the world.

In addition to the presentation of the park and its activities, the Program offers practical workshops that are directly conducted by companies installed in the park. Hand-to-hand activities aim to offer the student an idea of the skills needed and the possibilities that open up when working with technology.

The program is offered to students of high school, fundamental and technical of public and private schools of the region where Tecnosinos is installed. The Program has also vacancies for university students from the University of Vale do Rio dos Sinos (Unisinos). Unisinos is the entity in charge of managing the Tecnosinos Tech Park and has around 22 thousand students.

Tecnosinos Talents Program has no costs for the participants, and the local schools and professors interested in bringing their students only need to formalize the interest at the Tecnosinos Tech Park administration and work together for the schedule.

The training lasts an average of 4 hours and is divided into the following activities:

- a) A general presentation of how the demand for a technology park in São Leopoldo arose, what specifically is a park (the development that its implementation impacted and continues to impact the community and the educational ecosystem to which it is inserted);
- b) The opportunities offered for those who want to work in any company of the Park;
- c) Notions of entrepreneurship - for students who think about undertaking; and what needs to be incubated and maintain a company in the Park;
- d) Visits to the consolidated companies and startups of the Park with the objective of verifying in practice the subjects addressed in the previous activity and talking with the businesspersons and employees of the companies;
- e) Activities hands on in areas such as robotics, electronics, mechanics, internet, etc.

An average of four bimonthly meetings are held to elementary school students and three bimonthly meetings for high school and technical school. Totaling about seven annual meetings, each with an average of 150 students, from one or more schools in the region, that go to Tecnosinos to attend the Program. The meetings with university students usually take place at the beginning of each semester, with an average of 20 meetings a year, totaling around 700 students.

Elementary school students receive, in a playful way, notions for the awakening of their continuing education and entrepreneurship. On the other hand, it is given to high school, technicians and university students a deeper understanding of how to undertake and innovate within an innovative environment.

In the face of urban and social challenges in the region, such as the lack of skilled labor to operate in the park companies, for example, the Program works directly and jointly for the community of the Vale do Rio dos Sinos region. Encouraging and fostering the engaging students in future solutions to the needs of the community, promoting social innovation - which benefits not only students but also the Park's companies and the region as a whole.

Interactions between university-industry-government tend to work in a collaborative and valuable way, aiming development. Through a dialogue between the academic and business sectors, and through the search for a professional qualification of human resources, the Program promotes jobs and scientific research, develops incentives through scientific fairs, and encourages entrepreneurship.

Tecnosinos Talents Program with the purpose of attracting these talents and, after managing their development, in the areas in which the companies of the Park meet, makes it possible to retain the student in the Tecnosinos Tech Park ecosystem. By promoting the qualification of the local labor, this contributes to the development of the city and the surrounding area, and makes the region more attractive, avoiding students' migration, as well as workers to other regions.

3. Outcomes from the Program

Since its creation in 2011, more than 8,000 students have been received for regular visits to companies, laboratories and institutes, exposed to information on opportunities in the labor market and university education (Chart 1).

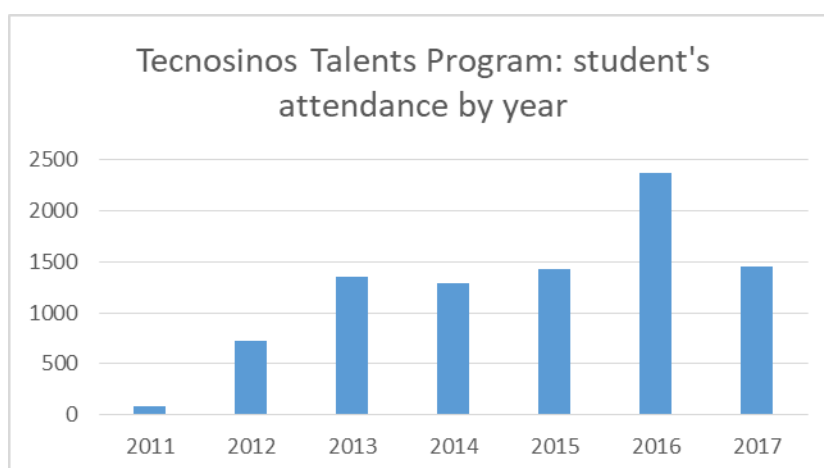


Chart 1: number of students who participate in the Program

There were 4,144 students from 144 schools and 4,566 students from the Unisinos University. Only in 2017 were 461 students from 15 schools in the region and 988 students from the University.

Another important point is the conception of work opportunity and empowerment resulting from participation in the Program. As a way of expressing these categories, we use a method of content analysis in several interviews and public manifestations of program participants. Data collection and interviews were conducted during 2017/2018 with the objective of analyzing the perception of the program among the participants and managers of the companies installed in the Park.

For the coordinator of the Talents Program, Delmara Bohrer, the project allows the awakening of a new generation of entrepreneurs, showing that continuous training is very important and that it is possible to change one's reality. For her, it makes students realize they can have a career in a technological environment, whether by creating their own startups or working for consolidated companies installed in the Park.

Experiencing Tecnosinos [Talents Program] arouses the students' entrepreneurial spirit, individually and collectively. When they listen to the young entrepreneurs in the Park, they realize they can make their own dreams come true and feel empowered and hopeful. (Program Coordinator)⁹

The data collected shows that many of those people who got involved in the qualification ended up working in companies of the Park. The following is an example of a youth from the municipality of São Leopoldo who, after participating in the Program, started working in a company specialized in Electronic Data Interchange (EDI) at Tecnosinos Tech Park.

I was part of the Talentos Unisinos program at 2013, a program that more than opened up opportunities, directed me to the job market, focused on the area where I am working as a professional. The program is really a door to opportunities for us students. (Employee in a Park's company)¹⁰

In the same way, a private technical school student, after going through the Program in 2015, started his professional life a year later in a Park company in the fashion innovation segment. Currently he works at another Park company in the software area:

I participated in the program in my second year of IT Technician in 2015, and what caught my attention was the number of companies present at the Park and the variety of them, working both with fashion, software and medicine, in addition incubated. Before I even visited the park, I was thinking of working, yes, in polo companies, like SAP, for example, because I already knew that I wanted to continue in the IT field in my life and also because of the proximity of the Tech Park with Unisinos and with my home. I am currently working at CWI Software for almost 1 year (which will be completed in April), but in 2016 I worked on UseFashion for nine months. The importance of the project is that it brought a "taste" of what it was like to work in the Park and also to confirm that I wanted to continue working in the IT field. (Employee in a Park's company)¹¹

As the Program coordinator pointed out, the scope of planted seed goes beyond the boundaries of the Park to really promote the culture of entrepreneurship. For Bruno Leuck, a 21-year-old entrepreneur, who went through the program in 2012, when he was only 15, the experience has enhanced the desire to have his own business, as he realized that most of the companies in the Park were led by young people.

I met Tecnosinos Tech Park through the Talents Program. For me, everything was new! Something Awesome! I remember that I found it incredible that most of the companies were founded by young people! And not adults as I imagined. The Talents Program allowed me to see that yes, it is possible to be an entrepreneur! We need to dedicate ourselves, but it's up to you. I think [the Program] is important, the Program put me close to the companies and aroused my interest in the professional market, at the time I was a teenager and had plans only to work in the future when I was a little older. And today I know that an internship as a teenager prepares us a lot for the job market and for life, we matured and developed a lot. (Local entrepreneur)¹²

It is noticed that for the companies of the Park the approach with the students of the region made possible reflections on the company-school relation and even the creation of specific programs for young people in the beginning of their career.

We were facing a serious problem of skilled workforce in the area of [IT] development, and attached to the Talents Program, Sawluz opened its

⁹ BOHRER, D. 2013. Available on: <http://assespro.org.br/biblioteca/inscritos-premiacoes-encerradas/2013-iniciativa-para-geracao-de-empregos-no-setor-e-ou-inclusao-digital-tecnosinos/>

¹⁰ HAESBAERT, E. Interview by the author, 2018.

¹¹ MÜLLER, L. S. Interview by the author, 2018.

¹² LEUCK, B. Interview by the author, 2018.

Trainee program, where the student, in addition to the salary and all the benefits, has 100% of his professional qualification funded by Sawluz. Since the first edition, the Program has already been a success! Through the Talents Program, the young people make contact with the companies of the park and the opportunities of work existing here, which makes possible to obtain the necessary workers for the existing demand. Today, Sawluz has a team of qualified and continuously qualified trainees. (Local manager from national company)¹³

We participate in the Tecnosinos Talents Program because it is an innovative strategy in the development of future professionals who will work in the field of Information Technology. In this sense, partnerships involving educational institutions and companies are fundamental. (Local manager from national company)¹⁴

4. Conclusion

Summarizing the findings, it is noted that the participants and managers' perceptions point to a gap between employment opportunities in technology companies in the region and the availability of skilled labor. This is due, in part, to the lack of knowledge of these career opportunities for young people who do not know the Tecnosinos Tech Park or the companies installed in the park and, so, do not seek qualification in these areas. It was also apparent that the professional who wants to work in the areas of technology needs to invest in qualification and updating to keep up with the constant changes in an innovation market.

The Tecnosinos Talents Program, therefore, shows itself as a strategy to bring young people closer to these opportunities, in the sense that they not only take notice of them but also participate in workshops and training which is important to their professional qualification, regardless of their immediate professional interest.

Moreover, the Tecnosinos Talents Program plays an important role in building the institutional image of the Incubator and the Park as an agent for the promotion of regional economic and social development. The program has significantly expanded the number of young visitors to Tecnosinos, receiving, since the year of 2011, about 8.000 students, strengthening strong ties with educational institutions in the region, thus bringing potential employees closer to the companies' human resources needs.

This interaction promoted by Tecnosinos Talents Program advances the convergence between the companies' demand, training capacity of the technical and high schools of the region, which has been reflected in the increase of the supply of skilled labor available to work in Tecnosinos companies, or undertake their ideas and business in the incubator. Thus, the promotion of innovative entrepreneurship promoted by the program expands the potential of creating innovative companies combined with the segments of the Tech Park, and projects aimed at continuing education enable the formation of more qualified professionals, increasing the success rate and growth of their companies.

The innovative entrepreneurship promoted by the Program expands the potential for creating innovative companies aligned to segments of the Tech Park. The projects aimed at continuing education enable the formation of more qualified professionals, thus increasing the rate of success and growth of their companies. The Tecnosinos Talents Program also represents an important action of social inclusion in that it brings young people of low income in the training phase of the employability available in the Tecnosinos Tech Park, presented to these young careers with high added value.

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