COLLABORATIVE LIAISON TOOL AIMED AT SMALL AND MEDIUM-SIZED COMPANIES IN PERIPHERAL REGIONS. VALIDATION AND ADJUSTMENT THROUGH ACTION- RESEARCH

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ABSTRACT

This article focuses on the processes of testing a collaborative linkage tool, which is oriented toward strengthening the performance of small and medium-sized companies (SMEs) in peripheral regions. For this purpose, the action–research methodology is used. This method allows for verifying the feasibility of applying the developed tool. Simultaneously, its design and improvement could corroborate different moments, stages, and steps of the tool, as well as supporting procedures in different situations. It also analyzes the coexistence of this liaison methodology with pre-existing models and the possibilities of enhancing said models and enriching the change agents involved. Besides, the experiences carried out made it possible to verify the flexibility of the tool and its support procedures. It can be tested also the possibility of application and its relationships with each of the different development agents in peripheral regions. During the action–research, some improvements were made to the instruments developed. These adjustments made it possible to reduce the risks inherent in liaison actions and to favor synergies to strengthen the business fabric.

KEY WORDS: Action–research; Liaison tool; Collaborative linkage; Smes; Peripheral regions.

INTRODUCTION

For each type of research, the most appropriate methodology must be selected, taking into account, mainly, the nature of the phenomenon to be analyzed. In those cases in which the information to be collected includes qualitative and quantitative variables, it is convenient to opt for a mixed, qualitative-quantitative study (Casas et al., 2017; Hernández Sampieri, 2018). Within the great variety of systems with mixed variables, there are those that cannot be

56

isolated for study, and must be investigated in their real environment, where researchers are involved and thus acquire an internal view of the event. For these cases, the research methodology to be selected must provide a systemic perspective and collect qualitative and quantitative information on the phenomenon under analysis. This particular type of research does not pretend to generalize the results achieved in each experience but, on the contrary, it studies the singularities of each one of them.

In particular, the study of real cases and the action–research methodology (Blaxter et al., 2001; Coughlan and Coghlan, 2002; Eikeland, 2007; Lewin, 1992; Villarreal Larrinaga and Landeta Rodríguez, 2010) are adequate to verify and improve liaison models[1], production and economic systems, although in both cases its origin comes from the social sciences (Aguiar Fuentes et al., 2020; Lewin, 1992; Rete and Pinto, 2020). It is important to highlight that, in the field of action–research, the context of practice is privileged over analytical theory. It involves the compilation of qualitative and quantitative information that describes the experiences and then allows their exhaustive analysis. Action–research begins with the use of the inductive-deductive method, exploring the phenomenon, so that after being applied, it allows to analyze, review, refine and design the tool to be validated while it is being executed.

As an example of the use of these methodologies, we can cite the research carried out by Michalus (2011) to corroborate an alternative model of flexible cooperation of small and medium-sized enterprises (hereinafter, SMEs) oriented to local development through the methodology of the study of cases. Also in the business area, the work of Villarreal Larrinaga and Landeta Rodríguez (2010) analyzes management and economics aspects within the internationalization processes developed by Basque multinational companies. The objective of his research was to compare the behavior of these companies with the theoretical models proposed for the phenomenon of internationalization. Vivares Vergara (2017), for its part, uses action–research in seven companies to test its maturity model for production systems. In the case of Paravie et al. (2020), developed through this methodology, a dashboard for a metalworking SME in the province of Buenos Aires was taken into account. The case study technique was also used in the province of La Rioja, Argentina, in the process of technological linkage with the National University of La Rioja, to raise the common problems of five

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[1] Liaison: the term refers to "the search for answers to problems that create the challenge of conceiving innovative products or services made 'to measure' for their counterparts" (Battista et al., 2014). In Argentina, the liaison model was created in the 1990s, with the launch of the first National Technological Liaison Program (CIN; Villanueva et al., 2019). The discussion continued with the addition of the linking function to the universities, including technical assistance, training, technology transfer, and project formulation activities, among the salient activities. After the first decade, the promotion of entrepreneurship was added as a special form of transfer (Battista et al., 2019; Carro and Britto, 2021; Dini et al., 2018; UN, 2018; Polaino and Romillo, 2017).

productive sectors of the region, in order to detect the main limitations of the sector and analyze the organizational learning process, approached from the University (Starobinsky et al., 2020). In these cases, the aim is not to generalize the results, but to evaluate the ability of the model to adapt to the particular situation in which it is applied, with an open mind and the necessary dynamism to move from inductive to deductive thinking during the same action–research experience.

This work presents a study based on action–research, which allowed to validate a collaborative linkage tool[2], aimed at strengthening the fabric of SMEs in peripheral regions. Likewise, the adequacy of its support procedures designed to facilitate its practical and expeditious application to SMEs was evaluated.

The importance of this research lies in the use of action–research in the field of Industrial Engineering, allowing the validation and improvement of a liaison tool, developed by the team of researchers, applied to specific cases, which allowed to verify the feasibility and robustness of the methodology developed.

The central points that were investigated are: a) the feasibility of applying the TELAR tool, its stages and support procedures, b) the possibility of coexistence and synergy of this liaison methodology with existing linkage and improvement models, c) the enrichment of the agents of change involved through this liaison tool, and d) application to companies of various sizes and geographic locations, in cooperation with various organizations in the environment (belonging to the quadruple helix: Academia, State, Company and local Organizations).

The TELAR Tool

The liaison tool that is analyzed in this research, called TELAR as an acronym (in Spanish) for "Weaving Regional Liaisons", was designed with the aim of contributing to comprehensive and sustainable systemic development, which includes economic development, but also human or social development of peripheral regions.

It is based on the comprehensive analysis of the value chain in which SMEs from peripheral regions are inserted and their local impact (Kaplinsky and Morris, 2000; Pérez Lara et al., 2016; Yacuzzi, 2012; Zuntini, 2015). This approach allows the company to be analyzed in its context, with analysis procedures that consider both its external relationships and its internal particularities.

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[2] Collaborative liaison: the term collaborative is added in the sense that this search for answers is carried out among all the linked agents. It is not about one-way relationships, but rather each party contributes and receives skills and competencies in this connection (Casas et al., 2017; Co-Efficient, 2015; Santisteban and Icart, 2011).

TELAR takes into account the networks and systemic interactions between companies and their environment: infrastructure, government institutions, universities, technology centers, chambers of commerce, legislation, culture and the very society in which it is inserted, for the development of a region (Arciénaga Morales, 2006; Delgado, 2010; Duque, 2016; Michalus and Hernández Pérez, 2016; Tassara, 2014). Configure the linkage under the Quadruple Helix format (Arnkil et al., 2010; Bernal Pérez et al., 2014; Carayannis and Rakhmatullin, 2014).

With this tool, it is intended to contribute from the instrumental point of view to understand the keys to comprehensive systemic development, starting from the prominence of companies, and at the same time, considering all the facets and variables involved in inclusive development processes (Sepúlveda and Edwards, nineteen ninety six). Taking into account that it is also innovated by interaction (Kline and Rosenberg, 1986), the tool considers the socioeconomic context and the nature of personal interaction, learning and bonding processes, in the space where they are developed (Kirat and Lung, 1999; Lawson and Lorenz, 1999).

The model created by the research team was developed within the framework of the philosophy of continuous improvement (Formento, 2015; Formento et al., 2013; Gadea, 2005), contemplating the steps of Plan, Do, Check and Act (PDCA). It, in turn, presents three moments: Bonding, Intervention and Analysis. For its implementation, it has been conceived in six successive and interrelated phases.

The aforementioned liaison tool is briefly described below, which is made up of the following phases:

1. Strategic management of the project: this first phase involves three central actions: substantiate the liaison, define its focus and scope, and select the agents involved. As a result, information is obtained in relation to the study of the context, the leadership structure, the mapping of regional value chains, and the analysis of risks. Finally, the form of administration of the information collected is determined. For this stage, the Geolocation Mapping, the PESTEL tool, the analysis of Porter's five forces, the SIPOC analysis, the audit of resources and competencies, the application of the SWOT Matrix, the Mapping of value chains, failure mode analysis and its effects (FMEA) and stakeholder mapping (regional development agents), all this under the modality of a collaborative work team.

2. Action planning: in this second phase, the work team is formed, objectives are set and monitoring indicators are established. With this information, actions are planned and the necessary resources are assigned to carry them out. In turn, the mode of administration and monitoring of the plan is designed. The information connected to this stage corresponds to the development of competencies, the intervention actions proposed, the indicators of the degree of progress of the plan, and the study of contingencies. The support procedures that

are presented to execute the planning are: project planning, planning methodology by Hoshin Kanri[3], the agreed definition of indicators and the agents' own development processes.

3.   Development of the actions proposed as projects by objectives: this phase is properly the application of what is planned. The characteristic actions of the same and the associated information are related to the transfer of necessary competences, the application of the designed actions, the execution of progress meetings and the analysis and resolution of the contingencies inherent to the implementation of a plan. The main adequate support procedures for this stage are: Project Management and Objective Management, the design and use of check lists and the development of participatory activities.

4.   Measurement of results: this phase is deployed in actions such as data collection and analysis, comparison with intervention objectives, study of intervention results, contingency analysis. The work in this phase is collaborative, which involves feedback, corrective actions and attention to significant deviations from the designed plan. All this information is loaded into an information system of the data cube type.

5.   Standardization of actions: the fifth phase of the TELAR model refers to standardizing, improving and evaluating the impact of the intervention. Standards are proposed for learning actions, the intervened processes, the results are disseminated within the chains of the territory and alternatives are sought for the effective communication of information between the agents involved. The communicational results plan and the creation of tacit and explicit knowledge through processes such as socialization, externalization, internalization and a combination of them are proposed as a support procedure for this stage (Gao et al., 2008; Ponzi, 2002).

6.   Information analysis: the closing phase of the TELAR tool consists of the study of collected data, the comparison with the objectives of engagement and intervention, the communication of the results achieved and the presentation of new proposals for future improvement. The most suitable tools for this stage are dashboards, cubic pivot tables, and collaborative multidimensional databases.

Table 1 summarizes the structure of the developed tool and the support procedures proposed for each stage.

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[3] Hoshin Kanri is a strategic planning methodology that seeks to align all the efforts of an organization towards its strategic objectives (Arciénaga Morales et al., 2021).

Table 1 General structure, moments, phases and stages of the TELAR tool

Moment	PDCA	Phase	Steps / actions	Information	Support procedures
BONDING	Plan	1 Strategic management of the project	Substantiate the liaison → Define its focus and scope	Study of the context Mapping of regional value chains Analysis of risks	Geolocation Mapping / PESTEL / Porter's five forces / SIPOC / Audit of resources and competencies / SWOT Matrix / Mapping of value chains / FMEA
			Select the agents involved	Leadership structure	Stakeholder mapping (regional development agents) Collaborative work team
INTERVENTION		2 Action planning	Action planning	Work team Objective Monitoring indicators Plan	Project planning / Hoshin Kanri / Agreed definition of indicators
			Resources assigment	Resources and timelines	Agents' own development
	Do	3 Development of the actions proposed	Development of the actions	Development of competencies, Intervention actions Degree of progress Contingencies impact	Project Management and Objective Management / Check List / Participatory activities
	Check	4 Measurement of results	Measurement of results	Data collection analysis Performance Study of results Contingency analysis	Measurement of Management Indicators -KPI- Measurement of goals and objectives- Dashboards
	Act	5 Standardization of actions	Standardizing, improving and evaluating the impact of the intervention	Learning actions Intervened processes Results dissemination Effective communication	Communicational results plan
ANALYSIS		6 Information analysis		Study of collected data Performance of engagement Communication of the results New proposals	Dashboards / Cubic pivot tables / Collaborative multidimensional databases

Source: own elaboration.

The liaison tool designed in this way is suitable for application in municipal linkage units, chambers of industry or any liaison and assistance project to SMEs of government offices, NGOs, or CSR departments of companies, university centers of SME liaison, among other institutions that have an interest in the sustainable development of a peripheral region. Its application does not cancel the own intervention processes in SMEs that the different organizations already have in execution, but it enhances each of the tools and procedures, with an interlacing and synergy of applications.

The main objective of applying this liaison tool is to strengthen the SME fabric of peripheral regions. In addition, some secondary benefits of the application are:

1.   Encourage the synergy of teamwork of the agents involved, enhancing the work by coordinating efforts.

2.   Set up a node for the dissemination of available offers (training, programs, financing) to strengthen the value chains of peripheral regions.

3.   Adding value to each agent's own liaison processes, in order to allow the flow of information and effective communication.

DEVELOPMENT

Materials and Methods

The liaison of agents with SMEs in their real environment was investigated, based on the personal involvement of the researchers, which allowed them to acquire an internal view of the event under study. In this way, it was sought to provide a systemic perspective and collect qualitative and quantitative information about the experiment. It was not intended to generalize each experience but, on the contrary, to study the particularities of each one of them, and to analyze the capacity of the designed tool to adapt in each case.

The action–research allowed testing and adjusting the methodology proposed in TELAR, following the principle of induction: exploring, describing, and including improvements in the design, and then applying deductive thinking.

The experiences were designed for the partial or total validation of the generated methodological tool. In this work, five action-research cases that were carried out in recent years are presented, adapting the use of the tool according to each particular case. Each of them was totally different from one another, four were developed in the province of Salta and one in Buenos Aires. They worked as a team with other researchers, human resources in training, or agents of change interested in the results obtained, getting directly involved with the process.

A data collection worksheet was designed, as a log, to record the experiences. The main items included were:

1. Application of transversal axes: a) Continuous improvement cycle (plan, do, verify act; b) Problem solving process; c) Effective communication; d) Structural analysis of the information.
2. Main results achieved and impact on the TELAR tool.
3. Main difficulties observed during the application of the tool.

4. Publication- results. Reports.
5. Support procedures tested in each experience, presented as a percentage of the total of the proposals in the tool.
6. Number of agents involved.
7. Time and scope of application.

The information collected was processed by the work team, obtaining procedural improvements for the TELAR tool. These improvements resulted in new versions of the model, as the investigation progressed. In the same way, information was shared with the agents who participated in each case. The corresponding reports and some of the works were published in scientific events (Arciénaga Morales et al., 2021; Villanueva, et al., 2019; Villanueva et al., 2015; Villanueva et al., 2020; Villanueva et al., 2019).

Results and discussion

The characteristics of each of the action-research experiences carried out are presented below. They were arranged in chronological order.

Action-research 1: both the sequence of the TELAR methodological tool and some of its support procedures were applied, as a basis for the elaboration and improvement of the instruments used for the Study of Cases in chairs of Industrial Engineering, of the Faculty of Engineering , from the National University of Salta (UNSa.) and in its relationship with the Professional Assistance for Entrepreneurship Salteños (APPES) program, within the framework of a program financed by the Federal Investment Council (CFI). In this stage of application of the TELAR tool in the cases of chairs and in the connection with the APPES program, 85% of the support procedures included could be tested. We worked with the participation of the four groups of development agents (State, Academy, Company, Society). Work under this format was continuous throughout the duration of the APPES program (seven years in total). In this experience, this analysis methodology and proposals for improvement could be applied in 96 companies-enterprises, most of them in the city of Salta, but also some in the interior of the province. The work team was made up of teachers-researchers and students from the National University of Salta, the Catholic University of Salta, professionals and government agents of the APPES program, staff and managers of the SME observatory, a leading professional in Salta of the CFI, active partners of the Argentine Society for Continuous Improvement (SAMECO).

The action-research carried out through the real cases of analytical and the University-APPES Program liaisons, allowed to verify and enrich mainly tools for context analysis,

stakeholder mapping and risk study. Its application in a variety of companies in different fields allowed evaluating its flexibility in different contexts. Continuous improvement and troubleshooting tools were also tested. The work with several agents gave rise to the practice of teamwork, the processes and times of the University-State link were reviewed and alternatives for effective communication were incorporated. Elements were designed for data collection adjusted to the reality of each case. The tools proposed for setting objectives and indicators were also checked. The experience made it possible to verify the objective of the TELAR tool to develop competencies both in the agents involved and in the companies intervened. The adaptability of planning tools for intervention actions was verified. The main result of this action-research stage was to refine the methodology and diagnostic tools, as well as to verify the formal requirements for liaison.

Action-research 2: in this case, the tool was verified regarding its function of obtaining information and mapping companies in the province of Salta. We worked on linking the University with the UIS, the Salta SME Observatory and the APPES program. The experience with the Industrial Union and the APPES program was focused on strengthening the procedures related to the geolocation and characterization of SMEs in Salta. In this way, several alternatives could be tested to carry out the geolocation mapping, and the data management of companies and enterprises, which represented 30% of the proposed support procedures. In this experience, the linking of three development agents (State, Academy, and Society) was achieved. The investigation lasted four months. It was possible to geo-locate and characterize 717 companies. The agents involved were teachers-researchers and students from the National University of Salta, agents from APPES, heads of small and medium-sized companies from the UIS and professionals from the SME Observatory of the city of Salta (Argentina).

The research-action stage carried out in conjunction with the University-UIS and APPES allowed us to verify the importance of applying mapping tools of companies in the region as a source of information for decision-making. Particularly in this experience, the UIS and its Observatory SMEs were able to make use of the georeferential map to establish a list with the main value chains of the province and generate specific actions to strengthen them, according to their needs. Similarly, the dynamic tables generated were adjusted and allowed to analyze items, departmental distribution, number of companies, importance of industrial parks. Teamwork techniques were reinforced, with work distribution and coordination of actions. Other elements were incorporated to document the University-Company-State link. The adaptability of the elements designed for data collection and subsequent analysis was verified. It was possible to apply the proposed tools to develop competencies among the agents

involved, in particular, the availability of standardized information and the use of the associated dynamic tables. The main contribution of this action–research to the TELAR model was the proof of the capacity and importance of geo-referential mapping, based on dynamic information, and the capacities of teamwork and linkage with other agents.

Research-action 3: a methodological proposal was proposed for the generation of technological improvement projects for companies and citizens of the city of Salta. A collaborative work was carried out with the Municipality of the City of Salta, materialized in a project to participate in the 2020 Local Innovators Contest, called "Protagonist Cities", an event carried out annually by the non-governmental organization Local Innovation Network (RIL), where the different municipalities that wish to participate present a project idea for evaluation and selection. The experience of liaison with the Municipality of the city of Salta allowed to test and validate 80% of the support procedures of the TELAR tool. During five months, a link was carried out that promoted the participation of the Municipality in this contest, along with another 100 selected challenges, corresponding to five different countries. In this experience, the four development agents were linked (State, Academy, Company, and Society). This activity allowed to verify the sequence of the TELAR stages in comparison with those proposed by RIL: a) empathize, b) define, c) devise, d) prototype, e) evaluate and define, and f) present. It was found that applying the TELAR linkage tool does not presuppose canceling other methodologies, but rather that they complement and enhance each other. The agents involved were teachers-researchers and students from the National University of Salta, executives from the Municipality of the City of Salta, members of RIL and contestants from other regions.

It was possible to check, compare and improve the tools proposed by TELAR for context analysis, risk mapping and analysis, leadership, planning and validation, in contrast to those required for participation in the contest. Competency development tools were proposed, both to be applied to local agents (neighbors), as well as to the other intervening parties, in this case the Municipality of Salta and the National University of Salta. The contingency planning and treatment tools were verified and enriched. For the learning processes, standardization, dissemination of intervention results and communication, the TELAR tools were transferred. The procedures proposed for the study of data, and the degree of fulfillment of the linking objectives were applied. At this stage of the action-research, the highlight was the sharing of different methodologies with other municipalities in the country and in Latin America, enriching the point of view of the TELAR tool, with different realities, thus validating the robustness of the designed tool.

Research-action 4: it consisted of the diagnostic intervention and improvement proposals in a metalworking SME company in the Buenos Aires suburbs. The action was carried out

under the quadruple helix format, in which the following participated: the metalworking company, members of the National Institute of Industrial Technology (INTI), the "Sociedad Argentina Pro Mejoramiento Continuo (Argentine Society for Continuous Improvement)" (SAMECO) and teaching-researchers from the universities: Universidad Nacional de Salta (UNSa), National University of Mar del Plata (UNMDP), and National University of Comahue (UNCo). This activity was carried out within the framework of the Management Technology Advisors training program dictated by SAMECO, in agreement with the General Sarmiento University (UNGS) and the INTI. This experience, although it was carried out occasionally in a single company, was adequate to verify 80% of the support procedures and each of the stages of the tool. The duration of the process was two months.

The tools related to context analysis, stakeholder mapping and risk study were tested. Continuous improvement and troubleshooting tools were also tested. Techniques for teamwork, linking with companies and also for effective communication were reinforced. The planning tools were applied and monitoring indicators were established, appropriate to the objectives set, according to the methodology proposed by TELAR, which reinforced the form proposed in this case of intervention. Likewise, the data collection methods were tested for their analysis, facilitating the information processing. In the same way, the tools proposed for the establishment of objectives and indicators, and for the development of competencies of the intervened company, were also checked. In this particular case, the company was able to detect its strengths and weaknesses, adopt a problem-solving methodology, find agile and effective solutions for a chronic problem, and establish contact with change agents for further improvements. The adaptability of planning tools for intervention actions was verified. Competences could be transferred from the TELAR tool to the other participating development agents. As an example, improvements were incorporated in the INTI diagnostic instrument, from the perspective of the support procedures included in TELAR, changing the perspective towards strategic units, instead of a general look at the company. The main result of this action–research stage was the verification that the tool is flexible and can be applied in different contexts.

Action-research 5: consisted of the design and presentation of a project for the University-SME link, carried out through the Competitiveness Program of Regional Economies-of the Ministry of Productive Development of the Nation (PROCER). During the formulation of the project for the creation of a Center for University SME linking, it was possible to incorporate 95% of the procedures developed into the design. The project adopted the TELAR philosophy, configuring the participation of the four groups of development agents (State, Academy, Company, and Society). The proposal was prepared in a period of three

months and was approved (June 2021). Currently, it is in the process of being realized. The project was planned to analyze at least 12 value chains in the province of Salta. The agents involved in the project were professor-researchers from the National University of Salta, representing each of the faculties, that is, all the knowledge imparted at the University. In the same way, the relationship with agents of the Ministry of Development of the Nation, SMEs of the province of Salta, local development agents, such as municipalities and social groups, companies that provide consulting and training services, companies interested non-profit and INTI agents.

This intervention allowed a full trial of the methodology proposed by the linkage tool. Support procedures created for context analysis, mapping, risk management and leadership consolidation were incorporated into the design. A planning of intervention actions in the territory was defined, taking into account the composition of the work team, the definition of objectives and indicators, the tools for assigning the necessary resources and deadlines. Tools were applied for the development of competencies of the value chains of the peripheral regions, but also of each one of the agents, as a way of developing suppliers. The intervention actions were proposed, including progress meetings, data collection, comparison with intervention objectives, analysis of intervention results, contingency analysis, learning and standardization. TELAR's proposals for the dissemination of intervention results and for the generation of effective communication were included. The study of data, and the comparison with linkage objectives were established through structural analysis and logical framework. The main result of this experience was that the TELAR tool contributed to the design of a project for the creation of the University-SME Link Center and, in turn, such design facilitated its approval compared to other competing projects.

Improvements included in the Tools

From the concretion of the five experiences described, a series of common difficulties were detected, of which improvements were incorporated to the tool, granting it greater flexibility; they are described below:

- Delays in the formalization of the relationship: given the time required for signing agreements and other formal documents, more agile alternatives were incorporated into the TELAR tool. One of them was the signing of letters of commitment, until the corresponding agreements were validated.

- Discontinuity of programs or participation of agents: faced with the discontinuity of programs for political reasons or for the participation of an agent, for reasons external to the linking tool, the decision to think of linking as Projects, with dates and Pre-

established completion deadlines, in order to conclude them independently of the uncontrollable factors of the environment and of the other agents involved.

- Difficulties in accessing information: the action-research experiences carried out allowed us to detect three difficulties related to information: a) it was dispersed among the agents of change, b) its format was not uniform or compatible, c) presented discontinuity in time. As a consequence of this difficulty, the TELAR tool incorporated instruments for the collection and transformation of information into a standardized format, the treatment of multivariate and multidimensional information, under the conformation of collaborative databases and the dynamic updating of the information.

- Low active participation of companies: a low participation of SMEs was detected compared to the proposals of the other agents of change. For this reason, participatory activities were investigated and incorporated as motivational and dissemination tools for existing programs and projects.

- Lack of flexibility and adaptation of the instruments to the reality of SMEs in peripheral regions: it was possible to detect that, in those cases in which standardized instruments were used, they were not always adjusted to the reality of the region. This difficulty made it possible to perfect the instruments developed from TELAR, so that they are more flexible. In turn, this situation made it possible to collaborate with other development agents involved, contributing from the University, improvements to their respective tools. Hence, TELAR not only contributes to SMEs, but also has an impact on the development of the other agents involved.

CONCLUSIONS

The validation study, carried out through action–research, made it possible to improve the tool as it was applied, and to adapt it to each particular situation. In addition, a protocol was generated to collect the information during these experiences, which made it possible to compare, without generalizing, analyzing the singularities of each one of them, to enrich the adaptability of the linking tool.

The phases of the tool respect the logical sequence of the improvement and transfer processes, and incorporate the instance of linking the strategic actors and analyzing the results in a collaborative way. The support procedures are simple to apply, they are complemented and enhanced with other methodologies already used in each experience.

The methodological proposal -which seeks to access SMEs through links with chambers, intermediary organizations and consortia- offers the alternative of increasing the scope of the actions developed.

The work between several agents allows reaching synergistic solutions to the problem of SMEs in peripheral regions, since they contribute the different perspectives of those who participate.

From the action–research, the main aspects that were improved in the tool were those related to communication, the flow of information and monitoring indicators, and the collaborative aspects between the agents.

The research carried out allowed us to verify that the proposed linkage model is adaptive, flexible and focused on solving contextualized problems.

REFERENCES

Please refer to articles in Spanish Bibliography.

BIBLIOGRAPHICAL ABSTRACT

Please refer to articles Spanish Biographical abstract.

69