



Community assessment in the face of climatic disasters: A Service-Learning experience

Diagnóstico comunitario ante desastres climáticos: Una experiencia de aprendizaje-servicio

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Abstract

The increase of extreme events caused by climate change has led not only to the local need to strengthen the coping and resilience capacity at a community level, but also, to rethink about the suitability of the university study programs in order to develop competent professionals in the face of these new emerging risks. In this context, the objective of this study was to assess the implementation of a community needs assessment process before a climate disaster through the methodological implementation of the Service-Learning strategy (ApS) in a course of psychology students in Chile. To do so, we selected a representative case study of community management in the face of a climate disaster in the north of Chile, using a participatory action research design (PAR). The data were produced using an inter-method triangulation of six techniques, creating a four areas scheme of the learning process results. These areas were: i) theoretical-conceptual, ii) methodological, iii) practical and iv) ethical-political. The results showed the use of ApS in the teaching-learning process of the community assessment, identifying both advantages and limitations in the development of disciplinary, transversal and professional competences, as well as those competences related to the service provided. This study concludes that it is important to integrate horizontal, participative strategies, and use them in the process of professional training and education, according to the integral type of university education required to face the complex psychosocial problem of climate change.

Keywords: Service-learning, community assessment, professional training, participatory action research, climate change, Chile.

Resumen

El incremento de eventos extremos —a causa del cambio climático— conlleva no solo a la necesidad local de fortalecer las capacidades de afrontamiento y de resiliencia a nivel comunitario, sino también, al replanteo sobre la idoneidad de los planes formativos universitarios en el desarrollo de profesionales competentes ante estos nuevos riesgos emergentes. Bajo este contexto, el presente trabajo tuvo como objetivo valorar la implementación de un proceso de diagnóstico de necesidades comunitarias ante un desastre climático, esto mediante la aplicación metodológica de la estrategia de aprendizaje-servicio (ApS) en un curso de estudiantes de psicología en Chile. Para esto seleccionamos un estudio de caso representativo de gestión comunitaria ante un desastre climático en el norte de Chile, esto bajo un diseño de investigación acción-participativa (IAP). Los datos son producidos mediante la triangulación intermétodo de seis técnicas, esquematizando los resultados del proceso de aprendizaje en cuatro áreas: i) teórico-conceptual, ii) metodológica, iii) práctica y iv) ético-política. Los resultados relevan el uso de ApS en el proceso de enseñanza-aprendizaje del diagnóstico comunitario, identificando tanto ventajas como limitaciones en el desarrollo de competencias disciplinares, transversales profesionales y del servicio entregado. Se concluye con la importancia de integrar estrategias horizontales, participativas y situadas en los procesos de enseñanza profesional, esto acorde al tipo de formación universitaria integral que requiere la problemática psicosocial compleja del cambio climático.

Descriptores: Aprendizaje-servicio, diagnóstico comunitario, formación profesional, investigación acción participativa, cambio climático, Chile.

1. Climate Change and the University Training Role

Adaptation to climate change is one of the main objectives for sustainable development on a global scale (Intergovernmental Panel on Climate Change [IPCC], 2014). In Latin America, global environmental change has not only led to the emergence of new natural risks, such as (i) biodiversity loss, (ii) sea level rise, (iii) heat waves and (iv) increased hydrometeorological hazards, droughts and floods; but, in turn, it has amplified and intensified the social vulnerability of the territories (Griselda-Günther & Gutiérrez, 2017; Sánchez & Reyes, 2015).

In terms of impact, considering the year 2018, hydrometeorological events affected 57.3 million of people, being floods the main event with an average of 35.4 million affected (UN Office for Disaster Risk Reduction [UNDRR], 2019).

These untimely events have led to the reconfiguration of government disaster risk reduction strategies (DRRS), which have shifted the focus from the institutional response to local capacity strengthening and community resilience (Gaillard et al., 2019; Sandoval-Díaz, 2020).

In this regard, article six of the United Nations Framework Convention on Climate Change (UNFCCC) relieves the role of education, training and awareness of this risk, requiring not only curriculum integration, but rethinking the role of education in the face of “climate literacy” (IPCC, 2014). Accordingly, several countries have gradually incorporated curriculum content, both in formal elementary and/or high school (United Nations Educational, Scientific, and Cultural Organization [UNESCO], 2015). Meanwhile, although this problem is expanding at the university level, especially in disciplines and postgraduate studies linked to environmental sciences, it is in the professional field of social sciences that committed collaborators are required to strengthen adaptive capacities of

community resilience (García-Lirios et al., 2014; Ricardo et al., 2019).

In this connection, Article six of the United Nations Framework Convention on Climate Change (UNFCCC) relieves the role of education, training and awareness of this risk, requiring not only curriculum integration, but rethinking the role of education in the face of “climate literacy” (IPCC, 2014). Accordingly, several countries have gradually incorporated curriculum content, both in formal primary and/or secondary education (United Nations Educational, Scientific, and Cultural Organization [UNESCO], 2015). Meanwhile, although at university level this problem is expanding, predominantly in disciplines and postgraduate studies linked to environmental sciences,

Therefore, it is important to rethink the educational role of universities in the face of these emerging issues, with the aim that they not only address their basic research development, but also in facilitating applied training spaces that contribute to the development of professionals who are competent in the diagnosis and intervention of these problems (De Castro & Domínguez, 2018).

In the case of vocational training in Chile, being competent at an institutional level is defined as:

An individual's ability to mobilize both internal resources (knowledge, skills and attitudes) and external resources available in the environment of his or her performance area to solve complex problems arising in the development of his or her profession or activity (National Accreditation Commission of Chile [CNA], 2015 p. 4)

In the field of university education and in the human sciences in particular, a recurrent problem is the difficulties of students in transferring, generalizing and applying the theoretical contents learned inside the classrooms, toward real practical situations (Barrón-Tirado, 2009; Cuadra et al., 2018), leading not only to difficul-



ties in how to proceed operationally in differentiated contexts, but also to the promotion of active involvement and participation by the communities (Stringer, 2008).

In turn, this difficulty in transfer is not only referred to subjects that contribute to the fields of potential professional performance — but also — in those formative subjects linked to reflexivity and research-scientific methodologies (Bassi, 2015; Orellana-Fonseca et al., 2019). From the university imaginary, those subjects with a research nature only acquire “meaning” in the face of the potential conduction of the thesis or when writing “papers” (If students are interested in the academic-university field), ignoring many times (like their professors), the potential advantages that this form of scientific rationality provides in situations of concrete professional performance, such as the processes of diagnosis and social intervention (Muñoz-Arce et al., 2017).

These processes of diagnosis and social intervention, from a transdisciplinary perspective, have as objective not only (i) to delimit and evaluate psychosocial needs in the face of a particular problem, and subsequently (ii) to deploy informed actions to solve that problem, but also (iii) to enable inclusive and collaborative spaces with and from the communities involved, with the aim of mediating the reflective acquisition of transforming capacities of the violated contexts (Freire, 2012; Ortega, 2015).

In this regard, we maintain that the formation of competences in the face of the diagnosis of social problems must overcome the know-how binarism of conventional disciplinary-professional training (Matus, 2002), integrating strategies and inquiry procedures, which consider not only technical competences but also the reflexive and logical subjectivity underlying the investigative task as transdisciplinary transformative practice (Cuadra-Martínez et al., 2018; Muñoz-Arce et al. 2017; Ortega, 2015), according to an integral university formation of professional and existential competences in the face of the current emergence of complex prob-

lems on a global scale (Morin, 2016). Based on this, we relieve the practical and heuristic role of the research process applied to the professional field, understood as a potential tool for reflective substantiating diagnostic decisions and social intervention (Bassi, 2015; Orellana-Fonseca et al. 2019), more so in cases where data collection and analysis of complex problems, such as climate change, are necessary (García-Lirios et al., 2014; Ricardo et al., 2019).

In summary, this formative development of research competences applied to the professional field leads us to rethink the conventional forms of teaching-learning, moving us to the incorporation of participatory and implicative-active methodologies, which not only contribute to the good “theoretical declarative” performance, but also to their potential reflexive application in problematic contexts (López-Noguero, 2017). According to this, a potential formative strategy for this task is service learning (LS).

1.2. Learning-service

Vocational training requires educational spaces that can transfer knowledge from the classroom to concrete reality, under the acquisition and development of cross-cutting² and disciplinary competences (Wendler, 2012; Cuadra-Martínez et al., 2018). However, under this new uncertainty context, the necessary implementation of experiential-active methodologies is supported, requiring a combination of learning reflection by making constant (Dewey, 1985), and active social commitment to the vital needs of the most deprived communities (Freire, 2012).

Thus, the SL methodology would allow to develop competences, transfer knowledge to communities, educate in values, develop a better self-knowledge, a strong sense of social responsibility and citizen commitment (Rodríguez, 2014), under the current context that increasingly challenges professionals (Pizarro & Hasbún, 2019). In turn, this proposal articulates simultaneously socio-educational responsibility, peda-



gological innovation and active student prominence, both in the territory to be involved and in the teaching-learning processes (Mayor, 2019). At present, there are more than 147 SL notions, which materialize in (i) varied sociocultural contexts, (ii) institutions with different administrative dependence, (iii) intersectorality in the type of service, (iv) varied curricular implementation, (v) different disciplines, (vi) multiple levels and ages of the participants (Mayor, 2019).

For Furco (2011), one of the most recognized authors of the area, SL is “a teaching pedagogy whereby students acquire a better understanding of academic content, applying skills and knowledge for the benefit of society” (p. 23). On the other hand, in applied terms, the Chilean National Service-Learning Network (REASE), created in 2011, refers to it as:

A pedagogical teaching-learning approach applied in courses, practices and theses, used for the resolution of real social problems, through a quality service in which in an integrated and collaborative way the three central actors of the process (teachers, students and community partners) relate and work together. (Claire et al., 2019 p. 38)

While there are difficulties in homogenizing this educational practice under one expression, there is consensus on three fundamental criteria: (i) Community service with the objective of responding to social problems, (ii) active pedagogy that requires the leading role of the student and academic body, and (iii) integrated planning of curricular contents with community service activities that enable the acquisition of competences (Montes, Tapia & Yaber, 2011). With regard to the pedagogical construction of SL, five main dimensions have been identified: (i) learning, (ii) service, (iii) participation, (iv) activity of social utility and (v) reflection, which, although not expressed in the same way and emphasis, manifest a desirable end state (Mayor, 2009).

According to this background, the general objective of this paper is to evaluate the imple-

mentation of a diagnosis process that identifies the community needs in the face of a climate disaster, by using the SL methodological application in university psychology students in Chile. As specific learning objectives we seek to: i) identify the learning benefits in the theoretical-conceptual, methodological, practical and ethical-policy areas of community needs under SL, ii) identify learning limitations in the four areas mentioned above; for the service area it is sought (iii) to generate a participatory diagnosis of psychosocial needs in the face of the disaster.

1.3. Characteristics of the case study

The career of psychology at the University of Atacama (UDA) arises with the objective of initiating the regional training of professionals whose scientific and practical competences are the diagnosis, evaluation and intervention in processes involving people, groups and organizations, with the capacity of ethical discernment and respect for human nature in the practice of the profession (Departamento de Psicología UDA, 2015).

In regard to the constructivist university educational model, and in line with the proposal 2008-2011 for the approval of curricular competences of psychologists by the network of state universities of Chile,³ this career emphasizes the formation of transversal and specific competences in ten semesters (Juliá, 2013).

This is how this competency-based training incorporates four practical-professional integration workshop subjects throughout its curriculum: i) career field approach (second semester); ii) areas of development and professional insertion (fourth semester); iii) psychosocial diagnosis (sixth semester) and iv) psychosocial intervention (eighth semester), as prior inductions to final professional practice (Departamento de Psicología UDA, n.d.). Under this training framework, it is decided to incorporate SL into the subject Integration Workshop III (psychosocial diagnosis), based on the concern of a group



of academics, who, following a climate disaster that occurred in 2015 (see section 1.4), seek not only to respond to a request to support an affected community, but also to strengthen the applied understanding of some methodological research tools previously taught theoretically.

Based on the above, prior to the beginning of the second half of 2016, the incorporation of the SL strategy into the integration workshop III is designed and planned; then, the search for territorial collaborators started, identifying the neighborhood N°36 of the town of Paipote, who were in full design of the post-disaster housing reconstruction plan. Accordingly, a series of meetings were held between professors and community leaders to bring together reciprocal and plausible objectives to develop, where it was agreed to develop a diagnosis of community needs.

In the present paper we understand the diagnosis of needs as the elaboration process and systematization of information that allows to know the problems and psychosocial requirements in a context, allowing to rank needs, and potential intervention strategies seeking to give a solution for its implementation (Aguilar-Idañez & Ander-Egg, 2001). The requirements that this type of diagnosis must meet is that it must be broad (for this reason different qualitative and quantitative research strategies are incorporated), with a simple, precise and timely language for the post-disaster potential housing reconstruction.

1.4. The climate disaster in Atacama

On March 25, 2015 (25M), an extreme hydro-meteorological event caused significant rains in 17 streams in Atacama, Chile. In Copiapó, the regional capital, the rains carried a large amount of water, burying the city under a sediment layer of 31 cm thick, leaving more than 50% of the houses without a sewerage system. In terms of the

affectation, 22 people died, 28 000 were homeless, 2000 homes were destroyed and 5000 with major damage, with an economic impact of more than USD 46 million (Izquierdo et al., 2018).

In terms of psychosocial impact, the exposed-susceptible groups with significant subjective severity were the elderly, people with a disability or a chronic disease, women, people with a low-income, and without higher education studies, plus those in the condition of partial-total damage of their home and who did not receive support for housing reconstruction (Sandoval-Díaz & Cuadra-Martínez, 2020).

In physical-material terms, the mean height of affectation was 45 cm, identifying four sectors of the city in which the flood exceeded the water sheet meter, one of them being the locality of Paipote, zone zero of the disaster. According to Izquierdo et al. (2018), floods caused by mudslides represent a global risk, especially in areas of high levels and arid climate, such as Paipote (see Figure 1). This residential town of 20,000 inhabitants, founded in 1913, is located between the communes of Tierra Amarilla and Copiapó, 8 kilometers of distance from each other.

At the end of 2016, neighborhood leaders of Paipote N°36 are trying to organize themselves to accelerate the slow reconstruction of their neighborhoods and homes devastated by the disaster (more than a year and a half ago), as well as to seek support from both governmental and civil society actors, as was the case with the Department of Psychology of UDA. In this regard, a group of professors designed a training program in the diagnosis of psychosocial needs at the community level. The implementation of this program was carried out in order to respond to two objectives: raise a diagnosis in conjunction with the neighborhood board, and strengthen professional training tools for eighth semester students.



Figure 1. Aerial diagram of the case study



Source: Astudillo-Pizarro and Sandoval-Díaz (2019, p. 315).

2. Methodology

A case⁴ study of community management in the face of a climate disaster was used; for this purpose, the locality of Paipote de Atacama was selected as a representative case (Gerring, 2007). A Participatory Action Research Design [PAR] was implemented with the aim of emphasizing the participation and action of the affected community (Stringer, 2008). The phase of awareness raising, involvement and production of information, linked to the direct participatory experience of the professors responsible for the course throughout the disaster cycle, were essential to the PAR, alternating collaboration with the community through participation in intersectoral assemblies linked to housing reconstruction and the organization of recreational activities as a

whole. Finally, in order for students to apply investigative techniques taught in previous subjects, “triangulation of methods”⁵ was incorporated as a cross-validation criterion (Flick, 2014), with the objective of using both quantitative and qualitative (QUAN-QUAL) strategies for the production of oral, written and visual data, which will be described in the technique section (see picture 1).

With regard to collaborating partners, intentional sampling was used at the neighborhood level, proceeding “according to the relevance of the cases, rather than by their quantitative representativity” (Flick, 2007, p. 80). Based on the presentation, work was carried out in the neighborhood N°36 of Paipote, located in the zone zero of the disaster, which had 174 families with different degrees of housing involvement.



Figure 2. Application of the drifting technique in Paipote



Photo: José Sandoval-Díaz.

2.1. Procedures

The implementation of SL took place from mid-July to end-December 2016. Integration Workshop III had 34 students enrolled in the eighth semester of psychology. At the service level, two coordination meetings were held with neighborhood leaders prior to the beginning of the subject with the objective of agreeing on the products, periodicity and procedures of the diagnosis, and knowing the local history and experience related to the climate disaster, enabling a first territorial approach to the context and the problems to be addressed. Following this coordination, contact was made with some families affected along with the key informant (neighbor-

hood leader), with the aim of disseminating the potential work to be done.

At the learning level, weekly theoretical-practical sessions were initially established with a duration of approximately one hour and a half (duration of the course), which were extended to three hours if performed on the field. For the development of the subject, the students self-grouped by personal affinities, (in a maximum of four people), with the objective of prioritizing a team work based on previous knowledge. A total of 13 sessions were implemented (plus two recreational sessions with the community), which were held both in the field and in the university classrooms. The sessions are briefly described in the following table.



Table 1. Activity sessions implemented in integration workshop III

Date	Activity	Type of Activity	Brief description
15/07 24/07	Pre-coordination meetings with the community.	Ground practice	Academic body meetings with neighborhood leaders for setting objectives and procedures.
06/08	PAR design.	Theoretical	Classroom presentation of the design, synthesizing its theoretical, practical and procedural components.
30/08	First induction to the field.	Field Practice	A walking tour of the locality was conducted at the group level, using a field diary to record first impressions.
13/09	Guided observation: Drift.	Field practice	Application of a participating observation technique guided by neighborhood leaders.
30/09	First day, risk management of local disaster UDA.	Seminar-discussion	With local experts on disaster risk management, involving both neighborhood leaders and students.
04/10	Diagnosis of observed needs: static and dynamic.	Theoretical	Classroom presentation of the diagnosis of psychosocial needs, synthesizing its theoretical-practical components.
11/10	Design of a quantitative scale.	Theoretical-applied	Students designed closed selection questions in the classroom i) dichotomic, ii) polynomic and iii) Likert scale, according to qualitative impressions collected in the field.
25/10	Application of quantitative scales.	Field practice	Field application of psychometric scales and closed questions (consensual and selected in the previous class), by probabilistic sampling of homes.
08/11	Participatory strategies: Ecomap and social mapping.	Theoretical	Introductory presentation of participatory techniques synthesizing their theoretical-practical advantages and limitations.
29/11	Need Diagnostic Systematization Matrix.	Theoretical-applied	Theoretical presentation of the Community Capabilities and Vulnerabilities Matrix (CVM).
06/12	Presentation of group advances (matrices).	Theoretical-Expositive	Group presentation of CVM matrix advancement, with a feedback done by professors and students.
13/12	Delivery of final synthesis report.	Theoretical	With the feedback, the working groups were required to produce a final report.
10/08 21/12	Recreational activities: (i) celebration of the Child Day and (ii) support for Christmas celebration in the community.	Recreational Activities	Performing and supporting two recreational activities with the professors, students, and the community.

Source: own elaboration

2.2. Data Production Techniques

With the objectives of a) strengthening research applied learning, as well as b) increasing the validity of the need diagnosis process, the Quan-Qual triangulation methods was used (Flick, 2014). These techniques were first taught in class sessions (see Table 1), and subsequently applied in field work. The teaching of these techniques

was carried out flexibly, according to the times and characteristics of the respective sessions, considering for this: a) topics addressed and emerging in the field, b) willingness of students, c) characteristics of the classroom and the resources to be used, to mention a few aspects. Table 2 describes the techniques used with their respective purpose, justification and stage of use.



Table 2. Description of the techniques taught and applied by students for the diagnosis

Use context	Technique	Objective	Justification
Field	Narrative interview (Flick, 2007).	Know local history, such as the background and characteristics of the disaster.	First face-to-face approach to the community from a perspective.
Field	Drift (Pellicer et al., 2013).	Explore the spatial meanings and senses of the disaster.	Guided observation technique that territorialized the emerging narratives of the interview through a tour in the risk exposure area.
Practical application in the classroom	Participatory social mapping (Vélez et al., 2012)	Produce a map, on an area scale, of potential threats, vulnerabilities and security spaces for climatic hazards.	Dialogical technique that graphs spatial use and appropriation, in which exposed-susceptible and risk-safe locations are drawn.
Practical application in the classroom	Ecomap (Fernández et al., 2011).	Produce a relational map of social actors identifying the degree of perceived closeness or distance.	Ecological technique that graphs proximity, distance or absence relationships between community and public/private institutions throughout the disaster cycle.
Field	Sampling and application of psychosocial impact scales (Sandoval-Díaz & Cuadra-Martínez, 2020).	Apply quantitative sampling and data collection competences	Students applied a booklet of psychosocial scales prior to training. Later, they analyzed the results in a general way using descriptive statistics.
Classroom systematization	Capability and vulnerability matrix (Anderson & Woodrow, 1989).	Systematize the information collected, using a CVM matrix	At the group level, students had to systematize the information collected to develop a community diagnosis for a) physical-material, b) organizational and c) motivational areas.

Source: adapted from Sandoval et al. (2018).

3. Results

The results are presented in Tables 3 and 4, according to the specific objectives of the study,

identifying both learning advantages and limitations in the areas i) theoretical-conceptual, ii) methodological, iii) practices and iv) ethical-policy of the diagnosis of community needs under SL.



Table 3. Advantages in the teaching-learning of psychosocial diagnosis under PHC

Theoretical conceptual	Methodological	Practical	Ethical-political
Application to a real situation of QUAN-QUAL data collection strategies reviewed only theoretically in previous subjects.	Awareness of the importance of the flexible design of the PAR (in terms of anticipation of unanticipated emerging situations), which should not be confused with "spontaneous" or "voluntary" decisions.	Strengthening cross-cutting social skills, such as: A) teamwork, b) active listening, c) synthesis capacity, d) assertive communication, e) empathy and f) negotiation.	Awareness of the negative experience of the affected community, which goes beyond the contingency of the event.
Conceptual-empirical problematization in the face of the concrete problem addressed (rupture with the empiricism [affected as mere victims] or the imperialism of the theory [communities resilient to disaster]).	Development and procedural application of QUAN-QUAL strategies that are according to a problem of social relevance. The importance of the horizontal PAR for developing collaborative solutions.	Application of disciplinary knowledge through field work guided by a real problem.	Development of an investigative-reflective and implicative citizen positioning in the face of the problem.
Incorporation of group self-reflection processes which made possible not only the incorporation of student narratives but also the collective signaling of prejudices or obstacles to the process.	Strengthening methodological criticality, for example: (A) adequacy of the technique according to the characteristics of the target population; (b) relevance of the type of technique according to the nature of the data; b) Limitations of the design and/or format of instruments according to the context (problems in understanding the Likert scale in older adults and/or limited use of self-application scales in people who do not know how to read).	Continuous community feedback to incorporate strategies/procedures according to emerging needs.	Continuity with post-subject community work (some students are still linked with the community).

Source: Own elaboration



Table 4. Limitations on teaching-learning psychosocial diagnosis under SL

Theoretical conceptual	Methodological	Practical	Ethical-political
Brief approach on the interventional component of community disaster management, due to the limited times of the subject.	Lack of systematization and in-depth analysis of the data collected (both in statistical terms and in qualitative content), due to the limited times of the subject, and the previous methodological gaps (lack of knowledge to use the software).	Time limitation, in terms of six-monthly duration (only 13 sessions) as for the number of hours allocated (approx. two hours).	In some cases, there was low willingness and motivation on the part of the student, due to interest in other professional areas (e.g. clinical, work, educational).
Incompatibility between the professional competences taught and the competences deployed for the specific psychosocial problem, due to the characteristics of each context	Lack of incorporation of rigor and quality criteria of the techniques used.	Limitation of economic resources (transportation and technological materials for data collection) as well as human resources (both professors and the community). Part of the community is suspicious of the work of external organizations.	In some cases, incompatibility between the perceived needs of the community (who were mostly interested in housing reconstruction) and the needs to be met in the subject (psychosocial diagnosis).

Source: Own elaboration.

4. Discussion and conclusions

First, we positively value the use of SL in the teaching-learning process of community diagnosis in the face of disaster risk, identifying both advantages and limitations in the acquisition and development (i) theoretical-conceptual, (ii) methodological, (iii) practical and (iv) ethical-political skills of disciplinary and cross-cutting competencies at the professional level in social sciences.

In the teaching-learning process, these advantages are understood not only in the practical strengthening of skills, knowledge and attitudes, in terms of professional skills (CNA, 2015; Departamento de psicología, 2015; Juliá, 2013), but also in the heuristic replacement of different investigative techniques used for the diagnosis. In this regard, we stress the importance of expanding the practical horizons of conventional methodological teaching in university formative contexts, which only have meaning at the time of the thesis, without including disciplinary technical competences necessary for the development of

psychosocial diagnoses and interventions (Bassi, 2015; López-Noguero, 2017; Orellana-Fonseca et al., 2019). For this reason, with the SL methodology certain conceptual-abstract and investigative knowledge taught in the classroom are translated and transferred to a specific problematic situation, enabling not only the procedural management of the different techniques used [skill], but also a critical reflective self-analysis regarding its use [attitude] (Cuadra-Martínez et al., 2018).

Another important element to emphasize is the complement between active teaching strategies and applied and horizontal learning of the research process. Thus, SL allowed the student not only to have an approximation of the professional knowledge, but also to know the importance of the participatory horizontal characteristic of the PAR so as to enable real knowledge dialogues between experts and communities, as for ii) position the latter as a leading actor in self-managed and sustainable change processes over time (Stringer, 2008). In this way, students were able not only to contextually integrate the



theory and the practice—but also—to develop professional competences in the face of emerging society problems; the support provided was useful to the community, being a key factor in the processes of intersubjective change (Sandoval-Díaz et al., 2020). This complementarity could strengthen the SL methodology, reducing the limitations that occur when communities and interveners start from immeasurable assumptions about potential service.

With regard to the objective of the service for/with the community, a virtuous circle between pedagogical and social intentionality was achieved (Furco, 2011; Pizarro & Hasbún, 2019), enabling a continuous negotiation between the perceived community needs and the expected learning objectives, having as a clear viable goal the social diagnosis. However, although this pedagogical objective was achieved in the expected times, many of the emerging social needs of the developed service could not be addressed, given that some corresponded to the physical-material dimension of the reconstruction of housing and public space, as well as institutional decisions emanating from local governments (risk mitigation strategies (Anderson & Woodrow, 1989). Another outstanding aspect was the incorporation of interventional strategies for the reduction of territorial social vulnerability (Freire, 2012), as well as the empowerment and strengthening of resilient capacities (Sandoval et al., 2018).

In terms of limitations, according to the SL quadrants of Stanford University's Service-learning Center, our pedagogical experience was closer to a mix of field work and community service, due to the absence of the feedback component from the community due to the factors of (i) limited temporality of the intervention, (ii) incipient but non-systematic articulation between interveners and collaborating partners, (ii) low territorial implication and empowerment and (iii) high distrust of external actors. In addition to these constraints are the lack of adequate material and human assets for medium-scale intervention, as well as the absence

of government actors, which were key to decisions and times for post-disaster reconstruction (Mayor, 2019). Therefore, future work should incorporate the proposal stated in the Sendai Framework for Action (2015), under which:

Community-based organizations should participate, in collaboration with public institutions, *inter alia*, to provide specific knowledge and pragmatic guidance in the context of developing and implementing standards policy frameworks and plans for DRRS. (UNDRR, 2015, p. 23)

Therefore, improving capacities requires a transfer of power to the benefit of the local population by recognizing them as informed, skilled and ingenious actors (Gaillard et al., 2019). However, despite this limitation, from a professional training point of view, this exploratory pedagogical experience made it possible to go beyond conventional disaster-centered approaches, enabling us to enter into local anticipation, response and recovery in the face of climate risks, under the pragmatic articulation of different investigative-interventional strategies (Anderson & Woodrow, 1989; Sandoval et al., 2018). In summary, we affirm the use of SL as a participatory methodology for the strengthening not only of professional-disciplinary competences, but also of transversal competences, such as critical thinking, teamwork and citizen sensitivity (Muñoz-Arce et al., 2017; Ortega, 2015), according to the type of integral university formation required by emerging complex psychosocial problems (Morin, 2016).

Notes

- 1 Chile considers cross-cutting competences the oral and written communication skills, problem solving, teamwork, ethical commitment, creativity, leadership, among others (CNA, 2015 p. 5)
- 2 MECESUP ULS 0601 Project "Improving the general and specific training of professional psychologists of the universities of the state (CUECH) by designing and implementing a competency-based curriculum framework".
3. Project MECESUP ULS 0601 "Improvement of training general and specific of the professional psychologists of the consortium



of the state universities (CUECH) through the design and implementation of a competency-based curriculum framework ”.

4. A case is a spatially delimited phenomenon (or unit), observed at a single point in time or over a certain period of time (Gerring, 2007 p.19).
5. Use of different techniques that are framed in methods of different research, and are combined to analyze the same object of study with the aim of increasing research quality.

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