SERVICE LEARNING: A BRIDGE BETWEEN ACADEMIC KNOWLEDGE AND SOCIAL ENGAGEMENT

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ABSTRACT. This paper presents a study focused on the analysis of two questionnaires ("Survivors" and "Questionnaire for people affected by haematological diseases") developed by the Spanish Association of Entities against Leukemia and Blood Diseases (AELCLÉS), within the framework of the GIRLS Service-Learning (SL) project. These instruments are conceived not only as tools for data collection, but also as pedagogical resources designed to enhance students' comprehensive education. From a methodological perspective, the Service-Learning approach offers a particularly valuable framework, as it explicitly integrates academic learning with meaningful community engagement, thus reinforcing the reciprocal relationship between knowledge acquisition and social contribution, as highlighted in seminal works on SL. The implementation of the questionnaires provides students with an opportunity to mobilize theoretical knowledge in an authentic social context, thereby strengthening the experiential dimension of learning and fostering a sense of civic responsibility. In doing so, students not only consolidate curricular content but also engage with pressing social issues—specifically, hematological diseases—thus contributing to public awareness and supporting the work of civil society organizations. This dual focus reflects the core principles of Service-Learning, where academic rigor and social utility converge to create transformative educational experiences. Consequently, the questionnaires analyzed in this study should be understood not merely as evaluative and didactic instruments, but as catalysts for social responsibility and civic engagement, situating students as agents of change within their communities. By fostering both individual growth and collective benefit, they exemplify how Service-Learning initiatives can bridge the gap between higher education and social impact, producing outcomes of relevance both for learners and for society at large.

1. INTRODUCTION

Service-Learning projects represent a unique opportunity for students to see, in a practical way, the relevance of their active involvement in society. Beyond academic content, this educational approach connects learning with civic commitment, favouring a comprehensive education that includes values such as solidarity, empathy and social responsibility [4, 9].

Participating in initiatives of this kind transforms the educational experience: students not only acquire technical knowledge, but also discover the power they have to generate a positive impact on their environment. Whether collaborating with associations, analysing real problems or designing concrete solutions, each action allows them to realise that their time, effort and skills can contribute to the common good [8].

These projects are particularly valuable because they demonstrate that training does not end in the classroom: it is projected out into the community, nourished by reality and, at the same time, transforms it. For this reason, promoting Service-Learning means investing in an active, critical and committed citizenship, capable of building a fairer and more humane future [3, 10, 11].

In this work, the development of a SL project performed as part of the GIRLS project is presented, as well as two activities carried out in collaboration with CSIC. The SL project consisted on the generation of two questionnaires and the statistical analysis of their results and the activities with CSIC consisted in two workshops about recreational physics and cybersecurity risks and best practices, respectively, in the framework of the European Erasmus+ GIRLS project, has made it possible to develop a real, interdisciplinary and transformative project that demonstrates how education can become a tool for social change. It is important for them to see that the knowledge they acquire can help many people and that it is not only useful for passing subjects. It is possible to collaborate with a non-profit association with one's time and knowledge; it is not always necessary to give money in order to have an effective and valuable collaboration. Our students have learnt this during the last three years that the GIRLS project has been running [1, 5].

This paper is organized as follows: After Section 2 devoted to present AELCLÉS association, Section 3 presents the two questionnaires with their respective results and their presentation to the AELCLÉS members. Section 4 provides information about the activities in collaboration with the Spanish National Research Council (CSIC), and finally, a section with the conclusions extracted from those results is presented.

2. AELCLÉS: A GROUP OF ASSOCIATIONS

AELCLÉS is the Spanish Network of Entities Against Leukemia and Blood Diseases. It was founded in 2009 and is currently made up of 15 associations spread throughout Spain, as shown in Figure 1.

Among the objectives of the group of associations are:

- To promote comprehensive and multidisciplinary care for haematological patients and support for their families.
- To promote and support research in the field of haematological diseases.
- To disseminate the clinical and therapeutic characteristics of these diseases.
- To inform and raise awareness among politicians, the media, health and education professionals and society in general about the problems of patients with haematological diseases and their families.
- To defend and promote the rights of haematological patients and their families.
- To favour the quality of care and the improvement of care structures.
- To promote the improvement of the quality of life of those affected and their families.
- To work for the defence and improvement of the living conditions of people with physical and organic disabilities caused as a consequence of suffering or having suffered from a haematological disease.

23

FIGURE 1. Map of the member associations of the network AELCLÉS.

3. QUESTIONAIRES AS SERVICE-LEARNING PROJECT

Two questionnaires were generated to carry out a SL project which can help to develop AELCLÉS objectives, "Survivors" and "Questionnaire for people affected by haematological diseases" (Figure 2).

FIGURE 2. Questionnaires by AELCLÉS.

One of the most enriching and significant learning experiences for the students was discovering that their knowledge not only has academic value, but also social value and that it can have a real and positive impact on other people's lives. They have discovered that collaborating with a non-profit association does not necessarily require a financial contribution: time, commitment and the application of knowledge are equally valuable ways to contribute to the common good.

This spirit has been clearly evident in the GIRLS project , developed over the last few years. For our group, this project has been a significant step forward. As already mentioned, we had two questionnaires previously developed, but no rigorous scientific study had been carried out on them.

3.1. **Surviving Questionnaire.** The main objective of this questionnaire is to obtain an accurate understanding of the real situation of individuals diagnosed with a hematological disease in Spain. To this end, the instrument has been designed to comprehensively address different dimensions of the patient's experience, including psychological, social, economic, and occupational aspects. In addition, the questionnaire seeks to identify potential territorial disparities by examining whether hematology patients across Spanish autonomous communities have access to the same resources and support systems to cope with the disease.

There were 237 responses to this questionnaire. Its analysis was carried out by mixed groups of students from different degrees: second year of labour relations, first year of statistics and industrial engineering and fourth year of statistics. This allows enriching the analysis from multiple perspectives [1].

During the presentation of the project, the faculty explained in detail the objectives, phases and tasks that the students would have to carry out, highlighting that most of them were unaware of the existence of these associations. Figure 3 shows the presentation, with some of the students attending in person and others connected online.

FIGURE 3. Presentation of the Service-Learning project to students.

As mentioned above, the groups were made up of a mixture of students from different specialities in order to provide a more general view. Six groups were made by students, resulting in six projects (Figure 4). Each group focused on a different section of the questionnaire , addressing specific aspects or conceptual dimensions. This allowed the students to become actively involved in the analysis of oncohaematological diseases and to reflect on the needs of people affected by

FIGURE 4. Projects realised with the Surviving questionnaire.

these diseases and those who care for them. They also discovered their capacity for altruistic collaboration, seeing that they could actively help associations.

The students presented their results (Figure 5), after addressing challenges such as data cleaning, which was particularly complex due to the large number of open-ended responses. Some groups performed the pre-coding of qualitative variables in Excel before importing the datasets into SPSS for statistical processing.

FIGURE 5. Presentation of projects by students.

Some of the results obtained are:

- Males were predominantly from the Comunidad Valenciana (almost 40%), followed by Cantabria and Galicia (around 15–18%). Females showed the highest representation in the Comunidad de Madrid and Asturias (both around 25–27%), with notable proportions also from the País Vasco and Extremadura (about 13–15%) (Figure 6):
- The most common reaction to the diagnosis of the disease was fear, helplessness and anxiety, and the least common reaction was to rescue abandoned projects.
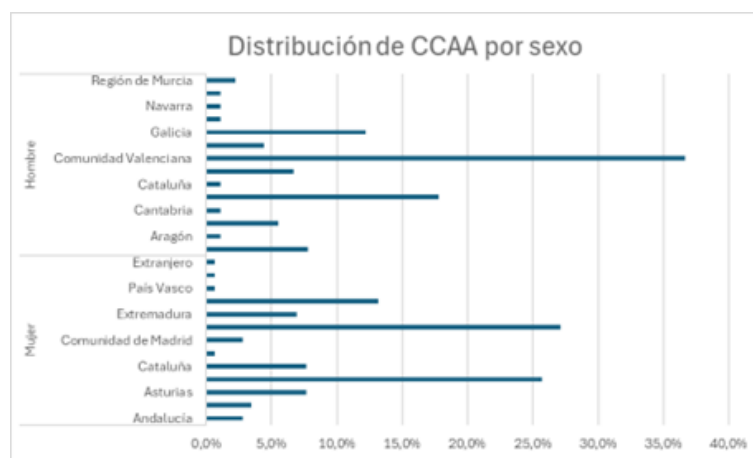
FIGURE 6. Distribution of the sample by sex and autonomous community.

- Initially 87% of the studied population decided to find out about the disease. The majority did so on the internet, and the second largest group chose to seek information from their doctor. Some people get information from more than one source (Figure 7).
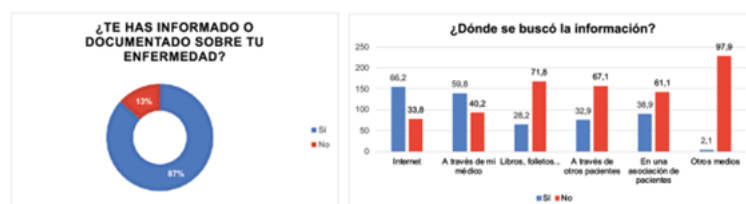
FIGURE 7. Type of media in which information is sought.

- In asking this question differentiating by gender, the results show very similar patterns between men and women. Among men, 86.7% reported having sought information about their disease compared to 86.8% of women, while 13.3% of men and 13.2% of women stated they had not done so (Figure 8).

FIGURE 8. People seeking information by biological sex.

- When asked whether the information has been useful or not, most respondents considered it to be very useful (42.3%) or quite useful (35.5%). A smaller proportion stated they had not sought information (14.5%), while 7.3% considered it of little use and only 0.4% found it useless (Figure 9).

FIGURE 9. Usefulness of the information obtained.

- In terms of family cancer history:
    - 49.1% reported cancer other than haematological cancer.
    - 14.4% reported a history of haematological cancer.
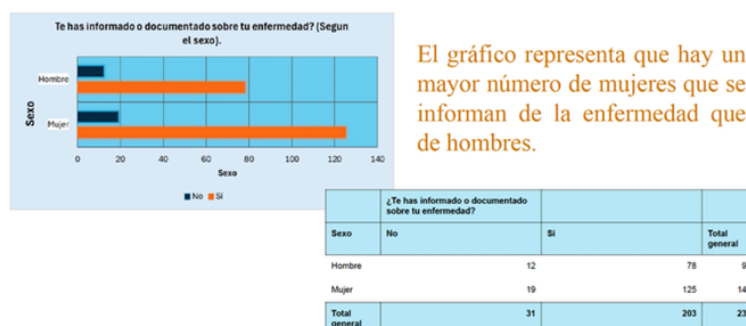   - 35.5% reported no history
- The most common side effect suffered by patients in the sample, both men and women, is tiredness, hair loss and loss of taste (ageusia).

3.2. **Questionnaire for people affected by haematological diseases.** The programs developed by most of the associations within the federation are based on the needs directly expressed by patients and their caregivers. Daily contact with the reality of individuals diagnosed with a hematological disease plays a decisive role in shaping the direction of our efforts and guiding our priorities for action [6].

It is well known that for many patients it is particularly challenging to reconcile their illness with work responsibilities, whether due to the difficulties of returning to their previous job after treatment or the barriers to accessing new employment opportunities as a result of treatment-related sequelae. This situation is often compounded by the fact that companies frequently fail to provide the necessary adaptations to the workplace or working hours, further exacerbating the problem. As a consequence, patients frequently experience a significant loss of purchasing power, with all the social and personal repercussions that this entails [7].

In this context, the questionnaire serves as an essential tool to gain a more accurate understanding of the labor and economic situation of a considerable number of patients. Its analysis provides a solid basis for the development of targeted initiatives and actions aimed at alleviating these difficulties, thereby contributing to an improved quality of life for patients and their families. The second questionnaire "Questionnaire for people affected by haematological diseases" received 221 responses and served as the basis for a Final Year Project (FYP) entitled: "Evaluation of a comprehensive questionnaire to improve support services for haematological

diseases from a multivariate perspective". In this study, advanced statistical techniques such as the External Logistic Biplot (ELB) and the Chi-squared Automatic Interaction Detection (CHAID) algorithm were used [2, 12].

As discussed in the FYP, these methodologies enabled the identification of complex patterns, the discovery of protective factors that support patient recovery, and the detection of barriers that increase the vulnerability of both patients and their caregivers. The FYP was carried out by Isaac de Íscar López, a student on the Statistics Degree Programme, under the direction of the lecturer María Anciones-Polo and concluded that these methodologies allowed the identification of complex patterns, the discovery of protective factors that favour patient recovery, and the detection of barriers that increase the vulnerability of both patients and caregivers.

The descriptive and inferential analyses provided a detailed profile of the sample from a socio-demographic, clinical and social approach. The population was mainly adult, with a medium-high level of education, and a significant impact of the diagnosis in both the economic and employment spheres. The main support network was the family, although instances of loneliness were also detected, a particularly relevant aspect in analysing psychosocial and economic needs.

Significant associations were found between the biological sex of the diagnosed person and the role of the primary caregiver, as well as between sex and access to psychological care or specialised information. Although some trends were not statistically significant, they provided valuable insights into support dynamics, the economic impact of the illness, and inequalities in access to resources The ELB enabled the visualization of relevant patterns, highlighting variables strongly associated with positive patient outcomes, such as emotional education, healthy eating, relaxation techniques, and effective communication with healthcare staff.

In contrast, barriers related to physical limitations, occupational problems, and sexual difficulties were grouped in an opposite direction in the analysis, being associated with higher vulnerability. This differentiation provides a robust empirical basis for patient-centred interventions, integrating both physical and emotional well-being.

Moreover, the ELB showed remarkable efficacy in classifying categorical variables related to the recovery process. The predictive regions allowed precise distinction between the presence or absence of optimal factors and the main obstacles perceived by patients and caregivers.

The segmentation analysis using the CHAID algorithm identified distinct risk profiles and contextual conditions influencing access to resources and the employment impact of caregiving.

In the first model, knowledge about social support was strongly linked to the degree of disability of the diagnosed person and, especially, to the information received at diagnosis. Patients with less disability who were informed through associations had a higher level of knowledge, whereas the most vulnerable profiles corresponded to those who did not receive such information.

The second model revealed that the primary caregiver's request for medical leave was the main predictor of leaving employment. Interestingly, among those who did not request leave, lack of knowledge about support associations was associated with a lower likelihood of leaving employment, suggesting the possible influence of unobserved factors.

The results of this work have yielded relevant conclusions: some confirmed previous intuitions based on experience with people diagnosed with haematological diseases; others, completely new ones, have opened ways to define new and more effective intervention projects.

This can be summarised in the following way:

- The socio-demographic and clinical characterisation revealed a predominantly adult population with medium-to-high educational attainment, significant economic and employment repercussions following diagnosis, and a primary reliance on family support networks. Notably, cases of social isolation were also identified, underlining the need to address psychosocial dimensions of care. The analysis also confirmed a significant association between the biological sex of the diagnosed individual and the role assumed by the primary caregiver, suggesting underlying gender-related dynamics in caregiving.
- The application of the ELB made it possible to pinpoint factors most strongly associated with positive recovery outcomes, including emotional and dietary education, relaxation practices, and effective communication with healthcare professionals. Conversely, physical limitations, work-related challenges, and sexual difficulties emerged as barriers contributing to greater vulnerability.
- The CHAID segmentation analysis identified distinct profiles influencing access to social assistance and the economic consequences of caregiving. Specifically, knowledge about available support was closely linked to the degree of disability and to the information provided at the time of diagnosis, with associations playing a decisive role in enhancing awareness. Furthermore, the request for medical leave by the primary caregiver emerged as a determinant in withdrawal from the labour market, highlighting the interplay between caregiving demands and employment sustainability.

Overall, these results underscore the importance of early, structured, and personalised interventions that address both the health and social needs of patients and caregivers. They also emphasise the critical role of information dissemination and the active involvement of patient associations in mitigating the multidimensional impact of haematological diseases.

3.3. **Sharing the result with the AELCLÉS associations.** The study was shared with all AELCLÉS member associations in an online event (given their geographical distribution), so that each could adapt the results to their specific needs (Figure 10).

FIGURE 10. Presentation of the FYP to the AELCLÉS associations.

4. Collaborations with CSIC

4.1. **Hospital activity.** An experience was conducted in the hospital within the framework of Recreational Physics (Figure 11). This activity provided moments of wellbeing and disconnection for patients, caregivers and healthcare staff, positively impacting the mental health of all participants.

Figure 11. Recreational Physics at the Hospital: Playing and Thinking with Experiments.

4.2. **Security workshop.** There was also a workshop on safety (Figure 12), a topic of great importance given the sensitivity of the material used in these partnerships. This workshop was held at the Marista Champagnat school, a member of the GIRLS group.

Figure 12. Safety workshop at Marist Champagnat School: Gaining Usability and Security in Cybersecurity.

5. Conclusions

These Service-Learning projects demonstrate how the union between the academic and associative worlds can generate a positive and tangible impact on society. Through service-learning, students not only acquire professional skills, but also become committed citizens. Initiatives

such as those developed together with AELCLÉS not only contribute scientific and social value, but also consolidate the idea that shared knowledge saves, improves and transforms lives.

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