

Volunteering Motivations in Humanitarian Logistics: A Case Study in the Food Bank of Viana do Castelo

International Conference on Optimization, Learning Algorithms and Applications

OL2A 2021: Optimization, Learning Algorithms and Applications pp 599-616 | Cite as

- Ana Rita Vasconcelos (1)
- Ângela Silva (1) (2) [View author's OrcID profile \(View OrcID profile\)](#)
- Helena Sofia Rodrigues (1) (3) [Email author \(sofiarodrigues@esce.ipvc.pt\)](#) [View author's OrcID profile \(View OrcID profile\)](#)

1. Escola Superior de Ciências Empresariais, Instituto Politécnico de Viana do Castelo, , Valença, Portugal
2. Centro de Investigação em Organizações, Mercados e Gestão Industrial (COMEGI), Lusíada University, , Lisboa, Portugal
3. CIDMA - Centro de Investigação e Desenvolvimento em Matemática e Aplicações, Departamento de Matemática, Universidade de Aveiro, , Aveiro, Portugal

Conference paper

First Online: 01 January 2022

- 144 Downloads

Part of the [Communications in Computer and Information Science](#) book series (CCIS, volume 1488)

Abstract

The importance of humanitarian logistics has been increasing over time, caused by economic or family crises. Volunteering has a fundamental role at the Food Bank of Viana do Castelo, contributing to the quality of life improvement of disadvantaged families. This way is necessary to understand the motivations that determine to be a volunteer in this kind of entity, to improve the experience and at the same time, increase the number of people that could be potential volunteers. A questionnaire was prepared to determine the motivations that this volunteer experience allows to achieve, namely, the impact that the volunteer experience has on each person's life. The results obtained show the existence of a positive association between the different dimensions of personal development, establishing ties, collaboration among other volunteers, and also acquiring professional skills with the experience of volunteering.

Keywords

Humanitarian engineering Logistics Volunteering Food bank
Volunteer motivations

Supported by FCT - Fundação para a Ciência e a Tecnologia.

This is a preview of subscription content, [log in](#) to check access.

Notes

Acknowledgements

This work is supported by The Center for Research and Development in Mathematics and Applications (CIDMA) through the Portuguese Foundation for Science and Technology (FCT - Fundação para a Ciência e a Tecnologia), references UIDB/04005/2020 (Silva), and UIDB/04106/2020 and UIDP/04106/2020 (Rodrigues).

This research was part of a Logistics' Master thesis of the student Ana Rita Vasconcelos.

References

- Alfonso-Costillo, A., Morales-Sánchez, R., López-Pintado, D.: Does volunteering increase employment opportunities? An experimental approach. *Econ. Lett.* **203**, 109854 (2021)
[CrossRef](https://doi.org/10.1016/j.econlet.2021.109854) (<https://doi.org/10.1016/j.econlet.2021.109854>)
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Does%20volunteering%20increase%20employment%20opportunities%3F%20An%20experimental%20approach&author=A.%20Alfonso-Costillo&author=R.%20Morales-S%20C3%A1nchez&author=D.%20L%20C3%B3pez-Pintado&journal=Econ.%20Lett.&volume=203&pages=109854&publication_year=2021) (http://scholar.google.com/scholar_lookup?title=Does%20volunteering%20increase%20employment%20opportunities%3F%20An%20experimental%20approach&author=A.%20Alfonso-Costillo&author=R.%20Morales-S%20C3%A1nchez&author=D.%20L%20C3%B3pez-Pintado&journal=Econ.%20Lett.&volume=203&pages=109854&publication_year=2021)
- Council of supply chain management professionals. <https://cscmp.org/> (<https://cscmp.org/>). Accessed 26 Apr 2021
- Daud, M.S.M., et al.: Humanitarian logistics and its challenges: the literature review. *Int. J. Supply Chain Manage.* **5**(3), 107–110 (2016)
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Humanitarian%20logistics%20and%20its%20challenges%3A%20the%20literature%20review&author=MSM.%20Daud&journal=Int.%20J.%20Supply%20Chain%20Manage.&volume=5&issue=3&pages=107-110&publication_year=2016) (http://scholar.google.com/scholar_lookup?title=Humanitarian%20logistics%20and%20its%20challenges%3A%20the%20literature%20review&author=MSM.%20Daud&journal=Int.%20J.%20Supply%20Chain%20Manage.&volume=5&issue=3&pages=107-110&publication_year=2016)
- IBM. <https://www.ibm.com/analytics/spss-statistics-software> (<https://www.ibm.com/analytics/spss-statistics-software>). Accessed 10 Apr 2021
- McAteer, B., Flannery, W., Murtagh, B.: Linking the motivations and outcomes of volunteers to understand participation in marine community science. *Mar. Policy* **124**, 104375 (2021)

[CrossRef](https://doi.org/10.1016/j.marpol.2020.104375) (https://doi.org/10.1016/j.marpol.2020.104375)

[Google Scholar](http://scholar.google.com/scholar_lookup?title=Linking%20the%20motivations%20and%20outcomes%20of%20volunteers%20to%20understand%20participation%20in%20marine%20community%20science&author=B.%20McAteer&author=W.%20Flannery&author=B.%20Murtagh&journal=Mar.%20Policy&volume=124&pages=104375&publication_year=2021) (http://scholar.google.com/scholar_lookup?title=Linking%20the%20motivations%20and%20outcomes%20of%20volunteers%20to%20understand%20participation%20in%20marine%20community%20science&author=B.%20McAteer&author=W.%20Flannery&author=B.%20Murtagh&journal=Mar.%20Policy&volume=124&pages=104375&publication_year=2021)

6. McNamara, T.K., Gonzales, E.: Volunteer transitions among older adults: the role of human, social, and cultural capital in later life. *J. Gerontol. B Psychol. Sci. Soc. Sci.* **66**(4), 490–501 (2011)
[CrossRef](https://doi.org/10.1093/geronb/gbro55) (https://doi.org/10.1093/geronb/gbro55)
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Volunteer%20transitions%20among%20older%20adults%3A%20the%20role%20of%20human%20social%20and%20cultural%20capital%20in%20later%20life&author=TK.%20McNamara&author=E.%20Gonzales&journal=J.%20Gerontol.%20B%20Psychol.%20Sci.%20Soc.%20Sci.&volume=66&issue=4&pages=490-501&publication_year=2011) (http://scholar.google.com/scholar_lookup?title=Volunteer%20transitions%20among%20older%20adults%3A%20the%20role%20of%20human%20social%20and%20cultural%20capital%20in%20later%20life&author=TK.%20McNamara&author=E.%20Gonzales&journal=J.%20Gerontol.%20B%20Psychol.%20Sci.%20Soc.%20Sci.&volume=66&issue=4&pages=490-501&publication_year=2011)
7. Medina, R.D.: *Manual on the Measurement of Volunteer Work*. International Labour Organization, Measurement, Geneva (2011)
[Google Scholar](https://scholar.google.com/scholar?q=Medina%2C%20R.D.%3A%20Manual%20on%20the%20Measurement%20of%20Volunteer%20Work.%20International%20Labour%20Organization%2C%20Measurement%2C%20Geneva%20%282011%29) (https://scholar.google.com/scholar?q=Medina%2C%20R.D.%3A%20Manual%20on%20the%20Measurement%20of%20Volunteer%20Work.%20International%20Labour%20Organization%2C%20Measurement%2C%20Geneva%20%282011%29)
8. Miller, M.R.: *College Students' Perceptions of the Impact of Volunteering in a Medical Center*. The Ohio State University (2013)
[Google Scholar](https://scholar.google.com/scholar?q=Miller%2C%20M.R.%3A%20College%20Students%E2%80%99%20Perceptions%20of%20the%20Impact%20of%20Volunteering%20in%20a%20Medical%20Center.%20The%20Ohio%20State%20University%20%282013%29) (https://scholar.google.com/scholar?q=Miller%2C%20M.R.%3A%20College%20Students%E2%80%99%20Perceptions%20of%20the%20Impact%20of%20Volunteering%20in%20a%20Medical%20Center.%20The%20Ohio%20State%20University%20%282013%29)
9. Nascimento, C.M.: *Capital Social e Trabalho Voluntário: Um Estudo Sobre a Pastoral da Criança de Santos/SP*. Pontifícia Universidade Católica de São Paulo, São Paulo (2008)
[Google Scholar](https://scholar.google.com/scholar?q=Nascimento%2C%20C.M.%3A%20Capital%20Social%20e%20Trabalho%20Volunt%C3%A1rio%3A%20Um%20Estudo%20Sobre%20a%20Pastoral%20da%20Crian%C3%A7a%20de%20Santos%20FSP.%20Pontif%C3%ADcia%20Universidade%20Cat%C3%B3lica%20de%20S%C3%A3o%20Paulo%2C%20S%C3%A3o%20Paulo%20%282008%29) (https://scholar.google.com/scholar?q=Nascimento%2C%20C.M.%3A%20Capital%20Social%20e%20Trabalho%20Volunt%C3%A1rio%3A%20Um%20Estudo%20Sobre%20a%20Pastoral%20da%20Crian%C3%A7a%20de%20Santos%20FSP.%20Pontif%C3%ADcia%20Universidade%20Cat%C3%B3lica%20de%20S%C3%A3o%20Paulo%2C%20S%C3%A3o%20Paulo%20%282008%29)
10. Nesbit, R., Brudney, J., Christensen, R.: The limits and possibilities of volunteering: a framework for explaining the scope of volunteer involvement in public and nonprofit organizations. *Public Adm. Rev.* **78**(4), 502–513 (2018)
[CrossRef](https://doi.org/10.1111/puar.12894) (https://doi.org/10.1111/puar.12894)
[Google Scholar](http://scholar.google.com/scholar_lookup?title=The%20limits%20and%20possibilities%20of%20volunteering%3A%20a%20framework%20for%20explaining%20the%20scope%20of%20volunteer%20involvement%20in%20public%20and%20nonprofit%20organizations&author=R.%20Nesbit&author=J.%20Brudney&author=R.%20Christensen&journal=Public%20Adm.%20Rev.&volume=78&issue=4&pages=502-513&publication_year=2018) (http://scholar.google.com/scholar_lookup?title=The%20limits%20and%20possibilities%20of%20volunteering%3A%20a%20framework%20for%20explaining%20the%20scope%20of%20volunteer%20involvement%20in%20public%20and%20nonprofit%20organizations&author=R.%20Nesbit&author=J.%20Brudney&author=R.%20Christensen&journal=Public%20Adm.%20Rev.&volume=78&issue=4&pages=502-513&publication_year=2018)

11. Nogueira, C.W., Gonçalves, M.B., Novaes, A.G.: A logística humanitária: apontamentos e a perspectiva da cadeia de assistência humanitária. Congresso de Pesquisa e Ensino Em Transportes - ANPET, 12 (2009)
[Google Scholar](https://scholar.google.com/scholar?q=Nogueira%2C%20C.W.%2C%20Gon%C3%A7alves%2C%20M.B.%2C%20Novaes%2C%20A.G.%3A%20A%20log%C3%ADstica%20humanit%C3%A1ria%3A%20apontamentos%20e%20a%20perspectiva%20da%20cadeia%20de%20assist%C3%A2ncia%20humanit%C3%A1ria.%20Congresso%20de%20Pesquisa%20e%20Ensino%20Em%20Transportes%20-%20ANPET%2C%2012%20%282009%29) (https://scholar.google.com/scholar?q=Nogueira%2C%20C.W.%2C%20Gon%C3%A7alves%2C%20M.B.%2C%20Novaes%2C%20A.G.%3A%20A%20log%C3%ADstica%20humanit%C3%A1ria%3A%20apontamentos%20e%20a%20perspectiva%20da%20cadeia%20de%20assist%C3%A2ncia%20humanit%C3%A1ria.%20Congresso%20de%20Pesquisa%20e%20Ensino%20Em%20Transportes%20-%20ANPET%2C%2012%20%282009%29)
12. Pohlert, T.: The pairwise multiple Comparison of Mean Ranks Page. Creative Commons License (2016)
[Google Scholar](https://scholar.google.com/scholar?q=Pohlert%2C%20T.%3A%20The%20pairwise%20multiple%20Comparison%20of%20Mean%20Ranks%20Page.%20Creative%20Commons%20License%20%282016%29) (https://scholar.google.com/scholar?q=Pohlert%2C%20T.%3A%20The%20pairwise%20multiple%20Comparison%20of%20Mean%20Ranks%20Page.%20Creative%20Commons%20License%20%282016%29)
13. Federação Portuguesa dos Bancos alimentares contra a fome. Federação Portuguesa dos bancos alimentares contra a fome.
www.bancoalimentar.pt/media/1197/brochura.pdf
(http://www.bancoalimentar.pt/media/1197/brochura.pdf). Accessed 26 Apr 2021
14. Robbins, S.P.: Comportamento Organizacional. Pearson Prentice Hall, São Paulo (2006)
[Google Scholar](http://scholar.google.com/scholar_lookup?title=Comportamento%20Organizacional&author=SP.%20Robbins&publication_year=2006) (http://scholar.google.com/scholar_lookup?title=Comportamento%20Organizacional&author=SP.%20Robbins&publication_year=2006)
15. Rushton, A., Croucher, P., Baker, P: The Handbook of Logistics and Distribution Management: Understanding the Supply Chain, 5th edn. Kogan Page (2012)
[Google Scholar](https://scholar.google.com/scholar?q=Rushton%2C%20A.%2C%20Croucher%2C%20P.%2C%20Baker%2C%20P%3A%20The%20Handbook%20of%20Logistics%20and%20Distribution%20Management%3A%20Understanding%20the%20Supply%20Chain%2C%205th%20edn.%20Kogan%20Page%20%282012%29) (https://scholar.google.com/scholar?q=Rushton%2C%20A.%2C%20Croucher%2C%20P.%2C%20Baker%2C%20P%3A%20The%20Handbook%20of%20Logistics%20and%20Distribution%20Management%3A%20Understanding%20the%20Supply%20Chain%2C%205th%20edn.%20Kogan%20Page%20%282012%29)
16. SDSN and IEEP: The 2020 Europe Sustainable Development Report: Meeting the Sustainable Development Goals in the face of the COVID-19 pandemic. Sustainable Development Solutions Network and Institute for European Environmental Policy, Paris and Brussels (2020)
[Google Scholar](https://scholar.google.com/scholar?q=SDSN%20and%20IEEP%3A%20The%202020%20Europe%20Sustainable%20Development%20Report%3A%20Meeting%20the%20Sustainable%20Development%20Goals%20in%20the%20face%20of%20the%20COVID-19%20pandemic.%20Sustainable%20Development%20Solutions%20Network%20and%20Institute%20for%20European%20Environmental%20Policy%2C%20Paris%20and%20Brussels%20%282020%29) (https://scholar.google.com/scholar?q=SDSN%20and%20IEEP%3A%20The%202020%20Europe%20Sustainable%20Development%20Report%3A%20Meeting%20the%20Sustainable%20Development%20Goals%20in%20the%20face%20of%20the%20COVID-19%20pandemic.%20Sustainable%20Development%20Solutions%20Network%20and%20Institute%20for%20European%20Environmental%20Policy%2C%20Paris%20and%20Brussels%20%282020%29)
17. Serapioni, M., Ferreira, S., Lima, T.: Voluntariado em Portugal: contextos, atores e práticas. Centro de Estudos Sociais da Universidade de Coimbra, Fundação Eugénio de Almeida (2013)

[Google Scholar](https://scholar.google.com/scholar?q=Serapioni%2C%20M.%2C%20Ferreira%2C%20S.%2C%20Lima%2C%20T.%203A%20Voluntariado%20em%20Portugal%3A%20contextos%2C%20atores%20e%20opr%C3%A1ticas.%20Centro%20de%20Estudos%20Sociais%20da%20Universidade%20de%20Coimbra%2C%20Fundac%C3%A7%C3%A3o%20Eug%C3%A9nio%20de%20Almeida%20%282013%29) (https://scholar.google.com/scholar?

q=Serapioni%2C%20M.%2C%20Ferreira%2C%20S.%2C%20Lima%2C%20T.%203A%20Voluntariado%20em%20Portugal%3A%20contextos%2C%20atores%20e%20opr%C3%A1ticas.%20Centro%20de%20Estudos%20Sociais%20da%20Universidade%20de%20Coimbra%2C%20Fundac%C3%A7%C3%A3o%20Eug%C3%A9nio%20de%20Almeida%20%282013%29)

18. Stuart, J.: The volunteering impact assessment toolkit: what difference does volunteering make? *Int. J. Volunteer Adm.*, XXV I(1), 50–54 (2009)
[Google Scholar](http://scholar.google.com/scholar_lookup?title=The%20volunteering%20impact%20assessment%20toolkit%3A%20what%20difference%20does%20volunteering%20make%3F&author=J.%20Stuart&journal=Int.%20J.%20Volunteer%20Adm%2C%20XXV&volume=I&issue=1&pages=50-54&publication_year=2009) (http://scholar.google.com/scholar_lookup?title=The%20volunteering%20impact%20assessment%20toolkit%3A%20what%20difference%20does%20volunteering%20make%3F&author=J.%20Stuart&journal=Int.%20J.%20Volunteer%20Adm%2C%20XXV&volume=I&issue=1&pages=50-54&publication_year=2009)
19. Taber, K.S.: The use of Cronbach's alpha when developing and reporting research instruments in science education. *Res. Sci. Educ.* **48**, 1273–1296 (2018)
[CrossRef](https://doi.org/10.1007/s11165-016-9602-2) (https://doi.org/10.1007/s11165-016-9602-2)
[Google Scholar](http://scholar.google.com/scholar_lookup?title=The%20use%20of%20Cronbach%E2%80%99s%20alpha%20when%20developing%20and%20reporting%20research%20instruments%20in%20science%20education&author=KS.%20Taber&journal=Res.%20Sci.%20Educ.&volume=48&pages=1273-1296&publication_year=2018) (http://scholar.google.com/scholar_lookup?title=The%20use%20of%20Cronbach%E2%80%99s%20alpha%20when%20developing%20and%20reporting%20research%20instruments%20in%20science%20education&author=KS.%20Taber&journal=Res.%20Sci.%20Educ.&volume=48&pages=1273-1296&publication_year=2018)
20. United Nations Volunteers (UNV): State of the World's Volunteering Report 2011 - Universal Values for Global Well-being. United Nations Development Programme (2011)
[Google Scholar](https://scholar.google.com/scholar?q=United%20Nations%20Volunteers%20%28UNV%29%3A%20State%20of%20the%20World%E2%80%99s%20Volunteering%20Report%202011%20-%20Universal%20Values%20for%20Global%20Well-being.%20United%20Nations%20Development%20Programme%20%282011%29) (https://scholar.google.com/scholar?q=United%20Nations%20Volunteers%20%28UNV%29%3A%20State%20of%20the%20World%E2%80%99s%20Volunteering%20Report%202011%20-%20Universal%20Values%20for%20Global%20Well-being.%20United%20Nations%20Development%20Programme%20%282011%29)
21. Visão Magazine, online publication.
<https://visao.sapo.pt/atualidade/economia/2021-02-03-covid-19-banco-alimentar-do-porto-com-aumento-de-600-nos-pedidos-de-ajuda/>
[\(https://visao.sapo.pt/atualidade/economia/2021-02-03-covid-19-banco-alimentar-do-porto-com-aumento-de-600-nos-pedidos-de-ajuda/\)](https://visao.sapo.pt/atualidade/economia/2021-02-03-covid-19-banco-alimentar-do-porto-com-aumento-de-600-nos-pedidos-de-ajuda/). Accessed 20 Jun 2021

Copyright information

© Springer Nature Switzerland AG 2021

About this paper

Cite this paper as:

Vasconcelos A.R., Silva Â., Rodrigues H.S. (2021) Volunteering Motivations in Humanitarian Logistics: A Case Study in the Food Bank of Viana do Castelo. In: Pereira A.I. et al. (eds) Optimization, Learning

Algorithms and Applications. OL2A 2021. Communications in Computer and Information Science, vol 1488. Springer, Cham. https://doi.org/10.1007/978-3-030-91885-9_44

- First Online 01 January 2022
- DOI https://doi.org/10.1007/978-3-030-91885-9_44
- Publisher Name Springer, Cham
- Print ISBN 978-3-030-91884-2
- Online ISBN 978-3-030-91885-9
- eBook Packages [Computer Science](#) [Computer Science \(Ro\)](#)
- [Reprints and Permissions](#)

Personalised recommendations

SPRINGER NATURE

© 2020 Springer Nature Switzerland AG. Part of [Springer Nature](#).

Not logged in Instituto Politécnico de Viana do Castelo, member of B-on Consortium Portugal (3000182229) - B-on Consortium Portugal (3991329481) 193.137.65.17

Volunteering motivations in humanitarian logistics: a case study in the Food Bank of Viana do Castelo [★]

Ana Rita Vasconcelos¹, Ângela Silva^{1,2}[0000-0001-7448-291X]
Helena Sofia Rodrigues^{1,3}[0000-0002-6319-7782]

¹ Escola Superior de Ciências Empresariais, Instituto Politécnico de Viana do Castelo, Portugal

² Centro de Investigação em Organizações, Mercados e Gestão Industrial (COMEGI), Lusíada University, Portugal

³ CIDMA - Centro de Investigação e Desenvolvimento em Matemática e Aplicações, Departamento de Matemática, Universidade de Aveiro, Portugal
{angela.a, sofia.rodrigues}@esce.ipvc.pt

Abstract. The importance of humanitarian logistics has been increasing over time, caused by economic or family crises. Volunteering has a fundamental role at the Food Bank of Viana do Castelo, contributing to the quality of life improvement of disadvantaged families. This way is necessary to understand the motivations that determine to be a volunteer in this kind of entity, to improve the experience and at the same time, increase the number of people that could be potential volunteers. A questionnaire was prepared to determine the motivations that this volunteer experience allows to achieve, namely, the impact that the volunteer experience has on each person's life. The results obtained show the existence of a positive association between the different dimensions of personal development, establishing ties, collaboration among other volunteers, and also acquiring professional skills with the experience of volunteering.

Keywords: humanitarian engineering · logistics · volunteering · Food Bank · volunteer motivations

1 Introduction

With the economic, financial, and social crisis, family budgets are the most affected, with unemployment being the preeminent cause. To respond to these social problems, it is essential to have an institution such as the Food Bank Against Hunger, which aims to reduce food waste generated daily in the market and help the families in need.

With the COVID 19 pandemic, the increase in requests for help from families has been increasing. The Porto Food Bank, in Portugal, has recorded a 600% increase in requests for help since the start of the pandemic, revealed the manager of the institution in a magazine interview, adding that the institution supports 60,000 people [21]. Thus, Food Bank Against Hunger leads to an oversize challenge. Not only needs to have more efficient logistics - with warehouses and collection, preparation of baskets, food distribution - but also at the volunteer level. However, there has been more active participation of society in social causes, support with monetary, material, or human donations.

In the specific case under study, from the BACFVC, through the donation of individuals and companies, as well as daily collections and campaigns, it obtains a sufficient amount of food to distribute for around 70 social solidarity institutions, which are delivered to about 15,000 people with proven food shortages, in the form of baskets or cooked meals. The management of all these logistical activities, which we may call Humanitarian Logistics, will have to be very efficient, in particular the management and motivation of human resources. The number of volunteers is unpredictable, especially during the food collection campaigns, which is an extra challenge.

In this sense, this project is intended to analyse the importance of the volunteering experience and to understand the motivations that determine being a volunteer in a type of entity such as the Food Bank, aiming to increase the number and the availability of volunteers, promoting more efficient logistic processes in the delivery of the materials, encouraging solidarity in the community and contributing to the Sustainable Development Goals (SDGs) [16], more specifically the SDG 2: "Zero hunger". The characterization of the motivations of the volunteers will allow the Food Bank of Viana do Castelo to define new ways to attract the volunteers and invest in training programmes specifically for each kind of volunteer, reducing the unpredictable number of volunteers.

[★] Supported by FCT - Fundação para a Ciência e a Tecnologia

The research methodology used in this study will be quantitative to achieve the established objectives. The results obtained in this study may enable a vast knowledge of volunteer behavior to understand the contributions that the voluntary activity may bring to each type of person.

The paper is organized into five main sections, as outlined next. A review of the relevant literature was conducted in Section 2. The methodology adopted is presented in Section 3. Statistical tools were used to analyse the answers of the volunteers and to analyze the importance of the volunteering experience (Section 4). Finally, the main conclusions are carried out in Section 5.

2 Literature Review

2.1 Humanitarian logistics

Logistics is an integral part of the Supply Chain, which is responsible for planning, implementing and controlling the efficient and effectively direct and reverse flow and storage operations of goods, services and related information between the point of origin and the point of consumption in a way to meet customer needs [2].

Rushton *et al.* [15] state that logistics is a diverse, dynamic and flexible function and should change according to the various restrictions and requirements imposed on it and concerning the environment in which it works.

Humanitarian logistics is different from the traditional logistical process, its objective is to provide humanitarian support through medicines, water, food and shelter [3]. It focuses on responding to saving lives and restoring self-sufficiency, with many of these operations being prevented by logistical problems. During the humanitarian logistics process, it is necessary to deliver suitable products in good condition; coordinate and prioritize the use of limited and shared transport; store, prepare and move the goods; transporting people and deliver specifically from outside the affected area.

As described by Nogueira *et al.* [11] and following the understanding of the International Federation of the Red Cross, humanitarian logistics consists of processes and systems involved in the mobilization of people, resources, and knowledge to help vulnerable communities affected by natural disasters or complex emergencies. It intends to respond to a large number of people, avoiding waste. At the same time, acting within a limited budget, organize the various donations received.

Humanitarian Logistics uses the logistic concepts adapted throughout its process, to respond to the countless assists, to minimize the improvisations that are common in these cases and be effective, in terms of response time. However, there are countless challenges that the human being has to be able to respond to, namely his assistance in a correct manner and in an appropriate time, as only in this way is it possible for Humanitarian Logistics to be efficient.

We can identify two types of humanitarian logistics operations, one short-term and the other long-term. Short-term humanitarian logistics operations are understood to be those aid activities, whether due to disasters or terrorist attacks. Long-term humanitarian logistics operations are activities that involve continuous aid, as is the case with food banks. It is important to note that humanitarian operations in natural disasters are different from those of the Food Bank, here logistics plays an important role for humanitarian services since its the management of all the material and information flows that will determine the success of all the food distribution process. In this sense, there must be a set of volunteers in these operations, as this is the only way to develop these mutual assistance activities.

2.2 Volunteering and human development

Currently, volunteering is associated with social participation and solidarity, which are the main assets. Serapioni *et al.* [17], state that the word volunteer has a Latin origin, more specifically from the adjective "voluntarius" which, in turn, derives from the word "voluntas" or "voluntatis", meaning the ability to choose or decide. Volunteering is an action to help an individual who is valued by him or her and, however, is not intended directly for material gain or coerced by others.

According to Medina [7], volunteering presents several benefits not only for society but also for the volunteers themselves, such as:

- It makes it possible to gain experience for future employment and access to the workforce;
- Offers services that are not provided by paid workers, more specifically in terms of guidance;
- Increases social solidarity, social capital, political legitimacy and the quality of life in society;
- Helps to promote social inclusion and integration;

- Volunteers feel greater personal satisfaction, fulfilment, well-being and involvement in society.

Voluntary work enables the development of skills, knowledge and attitudes, forming a set of behavioral skills. These skills are generated in human capital (personal development), social capital (establishment of ties, cooperation and mutual aid) and physical and economic capital (professional skills).

According to the author Robbins [14], human capital refers to all individual capacity, skills and experiences, as well as to the formal knowledge that people have.

McNamara and Gonzales [6] developed a study to understand how human, social, and cultural capitals are associated with the volunteer process, that is, engagement (starting), intensity (number of hours), and cessation (stopping), among older adults. In their work, they define human capital such as “knowledge, skills, and physical capacity embedded within the individual, which are valued in the paid and non-paid labour markets”; social capital is defined as the “social linkages or connections among a closed network of people where there is a potential transfer of knowledge and resources that may benefit or advance its members” and cultural capital “includes the shared values, attitudes, and behaviours that are routinely practised as a group and as a member of that group. Together, these capitals enhance agency, health, social connectedness, material resources, and goods.

The Institute for Volunteering Research developed the Volunteering Impact Assessment Toolkit in late 2004 to help organizations undertake their own research to assess the impacts of volunteering, categorising these impacts into five key areas or “capitals” defined as [18]:

- Economic capital: financial or economic effects of volunteering;
- Physical capital: products or outputs of volunteering (e.g., increased quantity and quality of services provided by an organization through involving volunteers);
- Human capital: personal development and skills accrued as a result of volunteering;
- Social capital: relationships, networks and trust developed through volunteering (e.g., the forming of friendships between volunteers and service users); and
- Cultural capital: the sense of cultural and religious identity and understanding developed through volunteering.

Voluntary involvement represents a huge set of skills, energy and knowledge that allows the personal, social and economic development of each volunteer [20].

The volunteer program allows you to establish bonds, collaboration and mutual assistance with other volunteers. Nascimento [9] refers to this dimension as social capital, which is an asset that brings social, economic and political benefits, generated through interpersonal cooperation relations.

Social capital is a quality of relationships between people, however, volunteering can generate social capital, in the case that volunteers create trust between people who volunteer.

Volunteering allows the volunteer to perform a set of tasks, manage resources and people, negotiate, lead, organize time and logistics, divide tasks, ensure good relationships with institutions, communicate with different people, which allows to develop a set of skills that are relevant at the professional level. Thus, this voluntary practice promotes the training of all those who participate in this experience and, at the same time, allows them to acquire knowledge to face the professional challenges that the job market requires.

McNamara and Gonzales [6] concluded that bolstering older adults’ capitals, particularly among lower socioeconomic status groups, can increase volunteer engagement. Additionally, a variety of organizational policies including respite programs for caregivers and employer policies allowing employees to reduce their work hours might indirectly affect participation rates and commitment. Potential pools of volunteers exist in families, workplaces, and religious organizations, but more research is necessary to identify how to recruit and retain individuals in social networks where volunteer participatory rates are low.

Based on a review of the literature, Nesbit *et al.* [10] present a conceptual framework and several research propositions concerning how organizational characteristics, volunteer management, and environmental factors affect the overall scope of volunteer involvement in an organization. Also, Alfonso-Costillo *et al.* [1] studied the benefits of doing volunteer work when seeking employment opportunities and concluded that people who do volunteer work receive 45percent more callbacks for interviews.

Recently, McAteer *et al.* [5] developed a study on the volunteer’s participation evaluation, to improve their engagement in community science projects aiming to satisfy the motivations and desired personal outcomes of their volunteers. Applying a survey to 308 volunteers of 8 marine community science projects in Ireland and the UK, they found a range of patterns amongst respondents and identify 4 types of volunteer profiles: Activists, Conservationists, Professionals and Hobbyists and they concluded that projects seeking to better understand volunteer’s participation should broaden their evaluative scope to embrace a wider range of volunteer motivational pathways.

The Portuguese Federation of Food Banks Against Hunger says that BA are animated by volunteers and associations of different human and spiritual inspiration. They may have different ideas, beliefs and beliefs without this affecting solidarity. Throughout the year the Banks Food work through volunteer work, whether by people who are willing to help, either by companies that voluntarily give the goods they produce or even provide their services.

In this sense, the BACFVC was chosen as a case study, where the volunteers made themselves available to collaborate with the study, in the sense of realizing the benefits that the experience of volunteering can bring in people's lives.

3 Methodology

3.1 Case study: Food Bank Against Hunger in Viana do Castelo

All food banks in Portugal are coordinated by the Portuguese Federation of Food Banks Against Hunger, which ensures compliance with the mission and values and represents those with public authorities, national companies and international organizations, animates the network by providing information and material means, and effect, at a national level, the distribution of some gifts, creating a vast chain of solidarity. [13].

The Food Bank Against Hunger in Viana do Castelo, appeared on June 19, 2009, but only on July 16 of the same year was its official presentation, in a space where the rental was supported by the inter-municipal community of Alto Minho. In November 2010, a new warehouse with 692 m² was inaugurated and where 3 jobs were created, which include a technical coordinator, a warehouse manager and an administrative technician. In addition to the 3 full-time people, help was needed from 13 volunteers who go to BA between 1 to 5 days a week, where they provide their help.

BACFVC's mission is to fight waste by taking food products to the neediest and mobilizing all those who are part of this noble cause, which we designate as volunteers. The Vision of the Food Bank of Viana do Castelo is as follows: 'A World, in which all Men, have guaranteed the right to food, based on social inclusion'. The main Values that BAVC defends are Gift and Sharing. It is in this sense that relationships are established with BA volunteers and partners, forming bonds of solidarity. Thus, through giving and sharing, three principles emerge:

- Recover the production and agricultural surpluses of the agrifood sector, restaurants, always complying with the hygiene requirements of the products;
- Mobilize people to contribute with food and offer their work free of charge;
- Distribute not directly to people, but to institutions that know and support people in poverty.

The BACFVC supports about 69 institutions, bringing food items to these IPSS, and then the food is distributed to needy families. On average, about 16149 people are dumped per month, which corresponds to approximately 652 tons of food. Most of the financial aid is through public funds (Social Security) and private funds, including donations from companies and individuals.

3.2 Research design

The research of the motivations volunteers of the Food Bank of the Viana has twofold. First, it is essential to characterize the volunteer of the food bank, associating sociodemographic characteristics. Another concern is to understand the main individual reasons that a person spends their free time helping others. This way, it is desirable to understand personal motivations, and it also is possible to design new perspectives to capture more volunteers.

In this sense, it was prepared a survey divided into three sections. The first section has questions such as gender, age, academic qualifications, and labor situation. The second is concerned with the volunteer and its relationship with the food bank, namely the number of times that made volunteering, how to know the volunteer actions in the food bank, and the intention to continue to practice volunteering. With all these questions, it is possible to trace a profile of the food bank's volunteer. The last part of the survey, adapted from Miller [8] work, is related to the personal motivations to practice volunteering. It has three dimensions related to human development: Human Capital (acquisition of skills and personal development), Social Capital (personal development with the establishment of bonds, collaboration, and mutual assistance with other volunteers), and physical and economic capital (professional skills to enhance future career path). For the last section of the survey, the 5-point Likert scale was used (1 - Decreased a lot; 2 - Decreased; 3 - Stayed the same; 4 - Increased 5 - Increased a lot) for several items per

dimension (see Table 1). This type of scale makes it easier for respondents to understand and respond effectively, allowing the researcher to perform a more appropriate statistical analysis.

Table 1: Dimensions of human development with volunteering

Dimension	Item	Item description
Human Capital	H1	Confidence in my own abilities
	H2	Sense of self esteem
	H3	Sense of self-management
	H4	Sense of making a useful contribution to the community
	H5	Awareness of the effects of my actions to the others
	H6	Sense of motivation
	H7	Willingness to try new things
	H8	Trust in other people
	H9	General well-being
Social Capital	S1	Ability to communicate with other people
	S2	Social and interpersonal skills
	S3	Friendships
	S4	Support networks
	S5	Sense of community
	S6	Interest in volunteer work
Physical and Economic Capital	PE1	Direct access to training/learning related to a future career
	PE2	Direct access to experience related to a future career
	PE3	Ability to use my skill set
	PE4	Recognition received
	PE5	Ability to get a job
	PE6	Number professional contacts

The questionnaires were made available on paper to the volunteers during the weekend of the food collection campaign. This collection has elements in supermarkets and the food bank's warehouse. Thus, the sample is for convenience, having obtained 144 completed surveys, 55 collected in the warehouse and the others in the Volunteering motivations: a case study in the Food Bank of Viana do Castelo.

4 Results and discussion

Data processing was performed using IBM SPSS software, version 27 [4]. The analysis of the results is divided into three parts: the first is related to volunteer profile describing the social characteristics of the individual and at the same time its relationship with the practice of volunteering; the second part is concerned with the individual and the personal development obtained with the volunteering experience; the last one, is an exploratory analysis, where some multivariate statistics is used to a better insight of the volunteer thinking.

4.1 Volunteer profile

Table 2 presents a sociodemographic sample characterization, with information about gender, age, educational qualifications, employment status. The most common volunteer is a young female student,

Table 2: Sociodemographic characterization

Gender	Age			Educational Qualifications			Employment status			
	10-30	31-50	> 50	Midle	High	Bachelor or higher	Student	Employee	Retired	Other
Female	34.7%	15.3%	10.4%	21.5%	22.9%	16%	28.5%	22.9%	5.6%	3.5%
Male	25.7%	8.3%	5.6%	22.2%	14.6%	2.8%	22.9%	12.5%	1.4%	2.8%

with a high school academic background. This analysis is important to perceived and prepare new communications forms to recruit new volunteers, for instance, to create a specific advertisement for Higher Education Institutions.

The volunteering bank food program is analyzed in Table 3. It shows that most of the respondents have none or little experience in volunteering, knew the program by a friend or relative, and intend to return to volunteering. Interestingly, social networks were not mentioned in the way they learned about the Food Bank program. This strategy could be a strong bet in the future to recruit new volunteers since the costs with advertisement are lower when compared with traditional media, and the friends' network could be very effective.

Table 3: Volunteering information

Number of volunteer actions taken previously		Knowledge of the volunteer program		Intention to do volunteering again	
None	26%	Family or friend	32%	Yes	99%
1-3	51%	Scouts	24%	No	1%
4-6	14%	Work	16%		
7 or more	9%	Webpage	6%		
		Other	22%		

In the next section, the experience of volunteering is analyzed how it could add value to the life of each volunteer.

4.2 Human Capital

In this subsection, the motivations that lead an individual to join a volunteer program is scrutinized. In this way, different characteristics related to personal development are presented: the establishment of bonds, collaboration, and mutual assistance with the other volunteers, and the professional skills that impact the career in the future.

In Figure 1, it is possible to observe that most of the respondents answered increased concerning the proposed items related to the gains obtained with the frequency in the volunteer program. The minimum value of responses in most indicators is 3, which indicates the experience was at least neutral or positive.

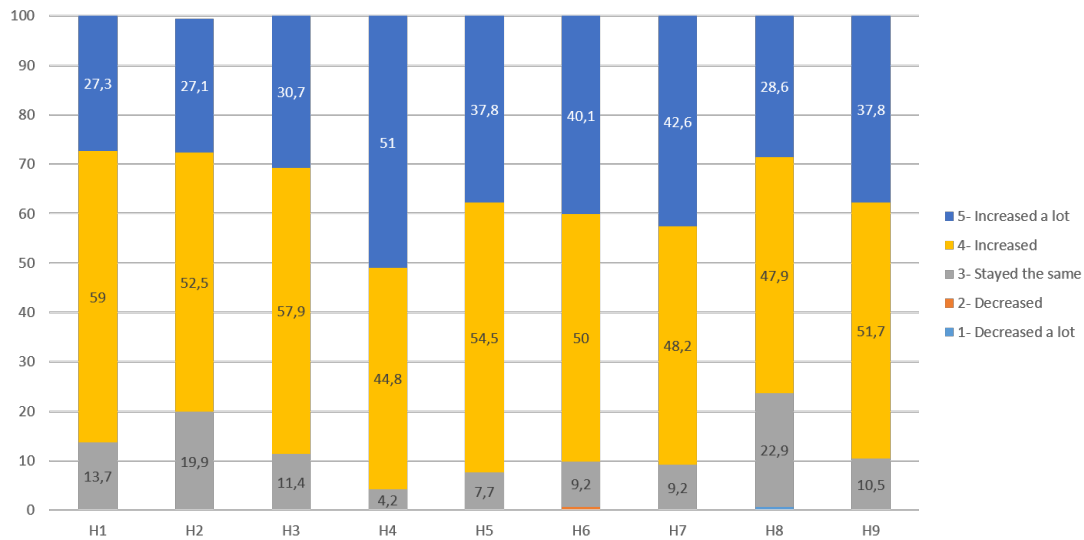


Fig. 1: Volunteers rating (%) about indicators of the human capital dimension

Table 4 refers to the Human Capital dimension already described. In the same sense as the previous figure, the minimum value of responses in most indicators is 3. Besides, all indicators show an average of more than 4, meaning a positive experience to this experience. Through the analysis of Cronbach's alpha, it was possible to analyze the reliability of the scales, and α value reached 0.925, which indicates good internal reliability of the dimension [19].

Table 4: Human capital dimension

Item	Descriptive statistics					Cronbach's alpha	PCA			
	Min	Max	Mode	Mean	St.Dev		KMO Measure	Bartlett's test	Communalities	Loadings
H1	3	5	4	4.14	0.628	0.925	0.847	< 0.001	0.688	0.830
H2	3	5	4	4.08	0.687				0.686	0.828
H3	3	5	4	4.19	0.622				0.620	0.787
H4	3	5	5	4.47	0.579				0.555	0.745
H5	3	5	4	4.30	0.606				0.638	0.799
H6	2	5	4	4.30	0.661				0.685	0.827
H7	3	5	4	4.33	0.640				0.590	0.768
H8	1	5	4	4.04	0.763				0.462	0.680
H9	3	5	4	4.27	0.641				0.736	0.858

A Principal Component Analysis (PCA) was conducted to understand the relationship between variables (Table 4). According to the communalities achieved, all the variables in the analysis (except H8) are significant, because they have values higher than 0.5. Besides, the Kaiser-Meyer-Olkin (KMO) measure is near to 1 for all items. Bartlett's test gives a significant level of less than 0.001, which indicates a possible relationship between the variables.

All items were tested using nonparametric tests to understand if factors such as gender, academic qualifications, or employment status influence the evaluation of this dimension. Despite almost all of the items do not show any difference, two presents considerable disparity:

- H2 presents significant differences considering the academic qualifications factor (Kruskal-Wallis Test, with sig=0.033). The sense of self-esteem has more amplitude for volunteers that only have high school

degrees. A more detailed analysis provided by SPSS shows graphically that differences (Figure 2): individuals with only middle school education evaluate higher when compared with the ones with a master’s degree or Ph.D. This visual difference between Middle school and master or Ph.D. is reinforced by the Bonferroni Test (adjusted sig=0.049) [12].

- H7 presents significant differences considering the gender factor (Mann-Whitney U Test, with sig=0.028). Figure 3 shows that female volunteers considered the experience their willingness to try new things, while most male volunteers quoted the experience just as increase.

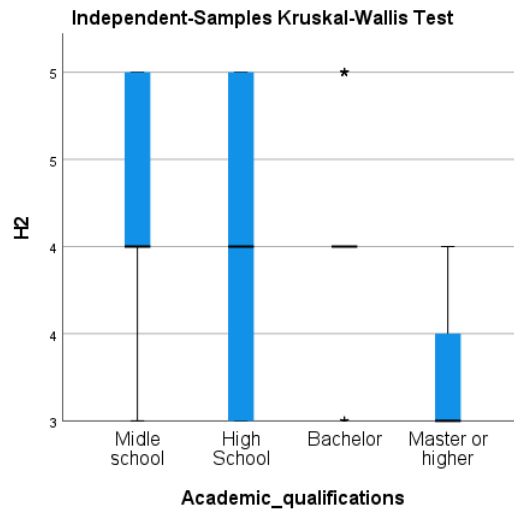


Fig. 2: Analysis of item H2 (Sense of self-esteem), considering academic qualifications as group of differentiation (analysis provided by Kruskal-Wallis test)

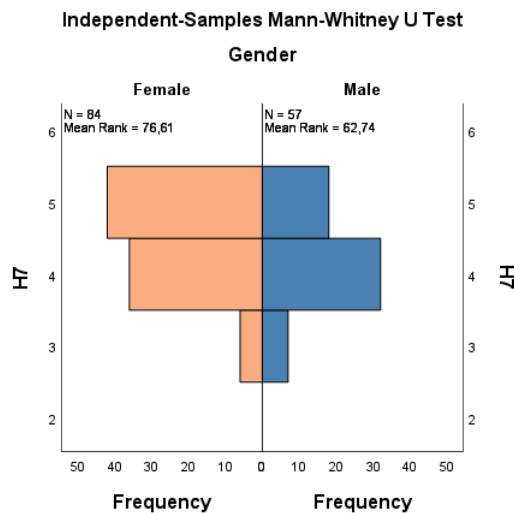


Fig. 3: H7 item (willingness to try new things), considering gender factor

4.3 Social Capital

This subsection analyzes the relations between the volunteer and other people, focusing on communication competencies, network establishment, and interpersonal skills.

In the same direction as the previous dimension, all items were classified as neutral or bring a positive experience to the volunteer (See Figure 5). The majority answered that the time spent in the food bank increased their social skills and interest in the community.

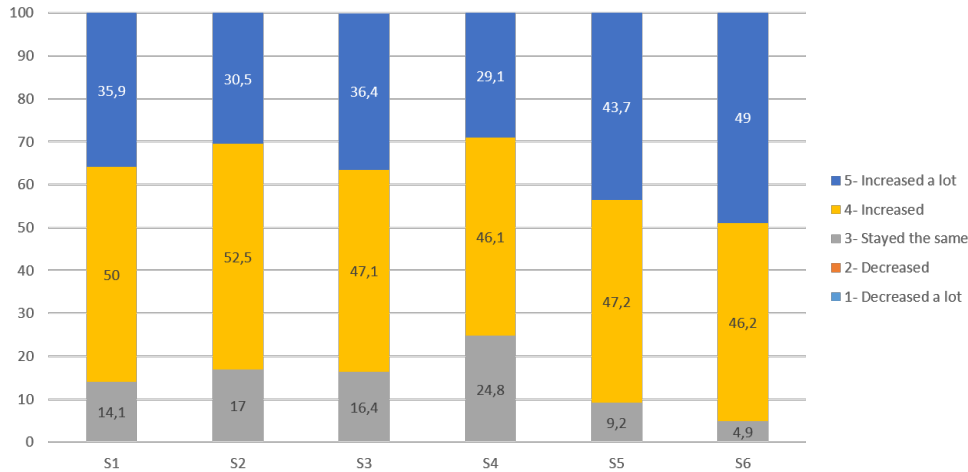


Fig. 4: Volunteers rating (%) about the indicators of the social capital dimension

Table 5 summarizes the self-evaluation. The majority of the respondents answers that this volunteering experience contributed positively to their social relationship, and the item most quoted was the growing up of the sense of community (S7). The item with a low mean (even very high) was item S4, concerning the support network. One possible explanation could be that the volunteers share the purpose of the charity activity but do not have time enough to create friendships and support beyond the weekend volunteering.

Bartlett’s sphericity test and the KMO test enable that is possible to summarize the information provided by the initial variables in one factor. The communalities (after extraction) achieved allow us to understand the proportion of the variable’s variance can be explained by the principal component. In this case, all items reached values higher than 0.6.

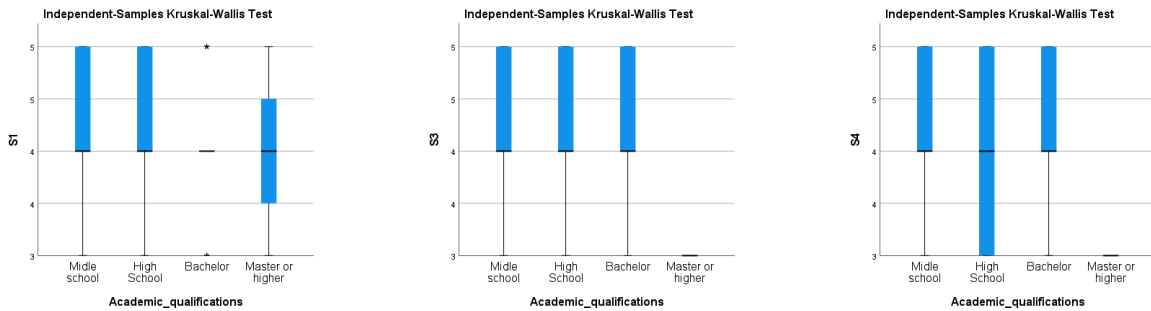
Table 5: Social capital dimension

Item	Descriptive statistics					Cronbach’s alpha	PCA			
	Min	Max	Mode	Mean	St.Dev		KMO Measure	Bartlett’s test	Communalities	Loadings
S1	3	5	4	4.22	0.675	0.892	0.801	< 0.001	0.603	0.777
S2	3	5	4	4.13	0.678				0.620	0.777
S3	3	5	4	4.20	0.701				0.629	0.788
S4	3	5	4	4.04	0.736				0.658	0.793
S5	3	5	4	4.35	0.642				0.733	0.856
S6	3	5	5	4.44	0.589				0.658	0.811

For this dimension, nonparametric tests were carried out, to check if there is statistical evidence that supports some differentiation of responses in terms of gender, academic qualifications, or professional

situation. There is no evidence of response using gender factor. Nevertheless, there are some differences when the other factors are considered:

- S1, S3, and S4 present significant differences, if the academic qualification factor is contemplated (Kruskal-Wallis Test, with sig=0.015; 0.007 and 0.044, respectively). Figure 5 exposed the differences between volunteers in the three items. According to the multiple-comparison posthoc Bonferroni test, S1 presents statistical differences between volunteers' responses with middle school and bachelor (adj. sig=0.028). For the items S3 (friendship) and S4 (support network), most of the volunteers classified the experience with the two higher evaluations; however, the volunteers with master or Ph.D. have a more conservative opinion (Bonferroni test less than 0.05 for all comparisons).
- S6 presents significant differences considering the employment status factor (Kruskal-Wallis Test, with sig=0.040). Figure 6 presents the different answers; with the posthoc test, it is confirmed that there are significant differences between students and employee volunteers.



(a) S1 (Ability to communicate)

(b) S3 (Friendships)

(c) S4 (Support networks)

Fig. 5: Differences of social capital items, considering academic qualifications of the volunteers as factor of differentiation

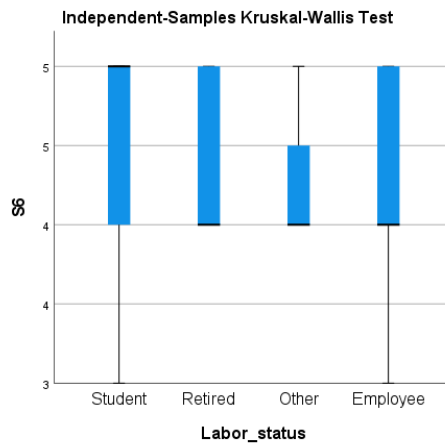


Fig. 6: Differences of social capital items S6 (interest in volunteer work), considering labor status of the volunteers

4.4 Physical and Economic Capital

Physical and economic capital concerns the measurement of professional skills gained while volunteering, and it can be used to enhance the future career path. Figure 7 presents the percentage that each element

was rated. Compared to the previous dimensions, it has increased the percentage of people who think that this experience was neutral for the economic issue.

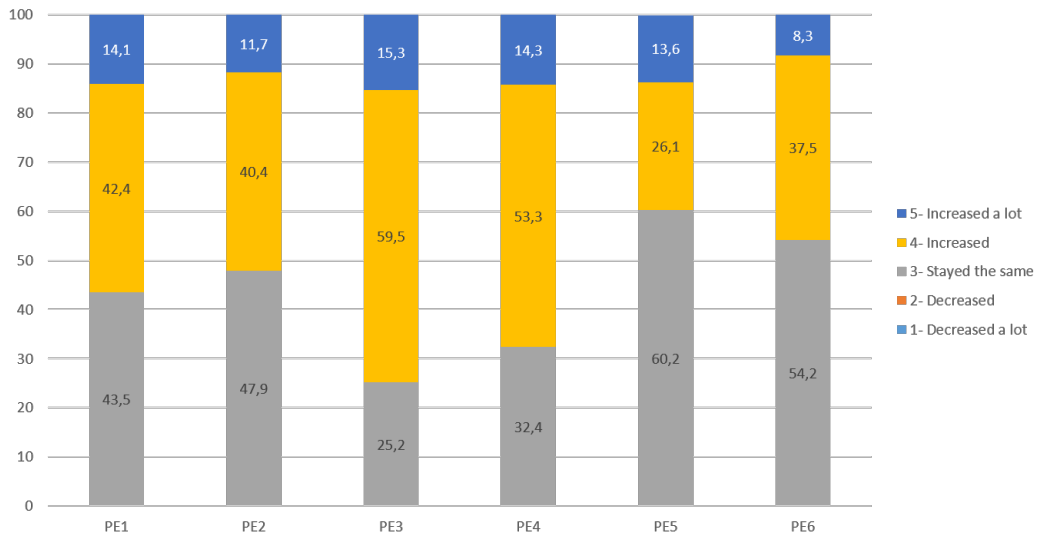


Fig. 7: Volunteers rating (%) about the indicators of the physical and economic capital dimension

Table 6 summarizes the descriptive statistics obtained. The evaluation done was significantly lower for this dimension; to prove this, the mode of the answers got down to 3 (stay the same) in most of the items, and all the items' means are lower than 4. These results could be explained by the fact that some part of the volunteer's set is very young and do not think in a future career, and another group is already employed and does not face this activity as an opportunity for a job change.

The adequacy of the data for the PCA accomplishment was achieved: the KMO result is close to 1, and the Bartlett test leads to the significance level lower than 0.001. The factor loadings were greater than 0.5, for all items, suggesting a good representation of their attributes.

Table 6: Physical and Economic dimension

Item	Descriptive statistics					Cronbach's alpha	PCA			
	Min	Max	Mode	Mean	St.Dev		KMO Measure	Bartlett's test	Communalities	Loadings
PE1	3	5	3	3.71	0.704	0.918	0.849	< 0.001	0.785	0.886
PE2	3	5	3	3.64	0.686				0.791	0.889
PE3	3	5	4	3.90	0.632				0.746	0.864
PE4	3	5	4	3.82	0.662				0.699	0.836
PE5	3	5	3	3.53	0.726				0.634	0.796
PE6	3	5	3	3.54	0.648				0.612	0.782

A nonparametric analysis was done to understand the differences by gender, academic qualifications, and employment status. There are no significant differences of opinions between volunteers when compared to gender or labor status. Although there are contrasts when the academic qualifications are involved:

- PE1 presents significant differences considering the academic qualifications factor (Kruskal-Wallis Test, with sig=0.025). Figure 8 presents several differences. Despite that, the Bonferroni posthoc

test only qualifies as significant, the answers given by volunteers with middle school versus the bachelor's holders. (adj. sig=0.036).

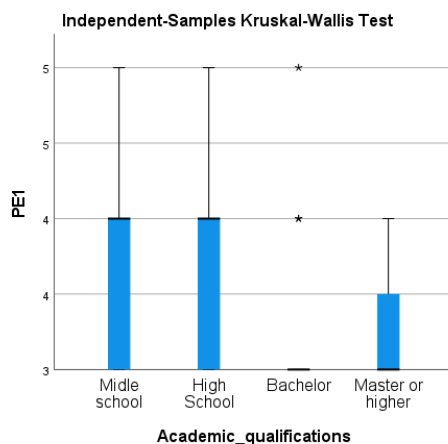


Fig. 8: Differences PE1 item (direct access to training/learning related to future career), considering academic qualifications of the volunteers

As a final analysis, it was verified if the previous experience of volunteer programs could influence the evaluation of the bank food experience. Despite the individual that no had previous volunteering experience classified slightly better the program, there are no significant differences in the answers given.

5 Conclusion

Given the current situation due to the pandemic, a social project of support a community is essential. Volunteers play an indispensable role in the activity of the BACFVC. Thus, it became essential to understand the human input, during the food collection campaign, analyzing the importance of the volunteer experience.

With the survey applied in one of the food collects, it was possible to observe that more young woman is doing this volunteer work. The experience is more impactful for those who participate for the first time.

Regarding human capital, the highest score was obtained in the item related to the sense of useful contribution to the community. There was a difference in gender response concerning the willingness to try new things, where women are more propensity to classify this experience better than men. Probably this could be the reason why the number of female volunteers is higher.

In several items of Social Capital, the response are quite distinct regarding the academic qualifications, which could be explained to their background community of work or studying.

Finally, the dimension that had less evaluation was physical and economic capital. This dimension is associated with skills for a future career. A part of the respondents are retired or with a full position at their work and do not think to change their status. Another part is young students that do not think of this experience as an opportunity to have more competencies for their future jobs.

Based on this study, the BACFVC could diversify the methods of recruiting volunteers through the use of social networks and establish partnerships with educational institutions that promote these initiatives, adding value to the CV, reaching more youngest volunteers.

The assessment of volunteers motivations could help the organizations to improve their volunteering program, raise the volunteering profile internally and externally and to recruit volunteers.

Acknowledgement

This work is supported by The Center for Research and Development in Mathematics and Applications (CIDMA) through the Portuguese Foundation for Science and Technology (FCT - Fundação para a

Ciência e a Tecnologia), references UIDB/04005/2020 (Silva), and UIDB/04106/2020 and UIDP/04106/2020 (Rodrigues).

This research was part of a Logistics' Master thesis of the student Ana Rita Vasconcelos.

References

1. Alfonso-Costillo, A., Morales-Sánchez, R., López-Pintado, D.: Does volunteering increase employment opportunities? An experimental approach. *Economics Letters*, **203**, 109854 (2021)
2. Council of Supply Chain Management Professionals, <https://cscmp.org/>, Last accessed 26th April 2021
3. Daud, M. S. M., Hussein, M. Z. S. M., Nasir, M. E., Abdullah, R., Kassim, R., Suliman, M. S., Saludin, M. R.: Humanitarian logistics and its challenges: The literature review. *International Journal of Supply Chain Management* **5**(3), 107–110 (2016)
4. IBM, <https://www.ibm.com/analytics/spss-statistics-software>, accessed 10 april 2021
5. McAteer, B., Flannery, W., Murtagh, B.: Linking the motivations and outcomes of volunteers to understand participation in marine community science. *Marine Policy*, **124**, 104375 (2021)
6. McNamara, T.K., Gonzales, E.: Volunteer Transitions among older adults: the role of human, social, and cultural capital in later life. *The Journals of Gerontology, Series B: Psychological Sciences and Social Sciences*, **66**(4), 490–501 (2011)
7. Medina, R. D.: *Manual on the Measurement of Volunteer Work. Measurement*. Geneva: International Labour Organization (2011)
8. Miller, M. R.: *College Students' Perceptions of the Impact of Volunteering in a Medical Center*. The Ohio State Universit (2013)
9. Nascimento, C. M. . *Capital Social e Trabalho Voluntário: Um Estudo Sobre a Pastoral da Criança de Santos/SP*. Pontifícia Universidade Católica de São Paulo, São Paulo (2008)
10. Nesbit, R., Brudney, J., Christensen, R.: The Limits and Possibilities of Volunteering: A Framework for Explaining the Scope of Volunteer Involvement in Public and Nonprofit Organizations. *Public Administration Review*, **78**(4), 502–513 (2018)
11. Nogueira, C. W., Gonçalves, M. B., Novaes, A. G.: A logística humanitária: apontamentos e a perspectiva da cadeia de assistência humanitária. *Congresso de Pesquisa e Ensino Em Transportes - ANPET*, **12** (2009)
12. Pohlert, T.: The pairwise multiple Comparison of Mean Ranks Page. Creative Commons License (2016).
13. Federação Portuguesa dos Bancos alimentares contra a fome. Federação Portuguesa dos bancos alimentares contra a fome. <https://www.bancoalimentar.pt/media/1197/brochura.pdf> accessed 26th April 2021
14. Robbins, S.P.: *Comportamento Organizacional*. Pearson Prentice Hall, São Paulo (2006)
15. Rushton A., Croucher P., Baker P: *The handbook of logistics and distribution management: understanding the supply chain*. 5th ed. Kogan Page (2012)
16. SDSN and IEEP. *The 2020 Europe Sustainable Development Report: Meeting the Sustainable Development Goals in the face of the COVID-19 pandemic*. Sustainable Development Solutions Network and Institute for European Environmental Policy: Paris and Brussels (2020)
17. Serapioni, M.; Ferreira, S.; Lima, T.: *Voluntariado em Portugal: contextos, atores e práticas*. Centro de Estudos Sociais da Universidade de Coimbra, Fundação Eugénio de Almeida (2013)
18. Stuart, J.: The Volunteering Impact Assessment Toolkit: What Difference Does Volunteering Make?. *The International Journal of Volunteer Administration*, **XXVI**(1), 50–54 (2009)
19. Taber, K. S.: The use of Cronbach's alpha when Developing and reporting research instruments in Science Education. *Res Sci Educ* **48**: 1273–1296 (2018)
20. United Nations Volunteers (UNV): *State of the World's Volunteering Report 2011 - Universal Values for Global Well-being*. United Nations Development Programme (2011)
21. *Visão Magazine*, online publication. <https://visao.sapo.pt/atualidade/economia/2021-02-03-covid-19-banco-alimentar-do-porto-com-aumento-de-600-nos-pedidos-de-ajuda/> accessed 20th jun 2021