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Influence of internship, service learning and student mobility programmes on the development of critical thinking disposition in higher education

Paula Álvarez-Huerta^{a,*}, Alexander Muela^b, Inaki Larrea^a

^a *Innovation and Intervention in Inclusive Education, Mondragon Unibertsitatea, Dorleta, Eskoriatza, 20540, Spain*

^b *Department of Clinical and Health Psychology and Research Methodology, University of the Basque Country, Tolosa Hiribidea, 70, 20018, Donostia, Spain*

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ABSTRACT

A willingness to explore new ideas and to maintain reflective skepticism is necessary to exercise critical citizenship. Importantly, the disposition to think critically is a dynamic (rather than static) characteristic of a person that can be developed through different educational experiences. The aim of this study was to examine the influence of three applied learning experiences – namely, internships, service learning and participation in international mobility programmes – on higher education students' disposition toward critical thinking. Participants were 147 Spanish undergraduates aged between 17 and 24 years ($M = 18.36$, $SD = 1.16$; 69.39% women). They were enrolled in degree programmes in the fields of social and legal sciences (81.6% of students) and engineering and architecture (18.4%). Critical thinking disposition was assessed at two time points: at the beginning of their undergraduate studies and at the end of year 2, by which time some students had participated in applied learning experiences. No changes were found in the disposition toward critical thinking of students who did not participate in experiences of this kind. However, students who had engaged in service learning projects showed gains in their critical thinking disposition. Contrary to expectations, no significant improvement in critical thinking disposition was observed among students who carried out internships or participated in mobility programmes. These findings emphasize the importance of promoting service learning experiences in higher education so as to promote and develop students' disposition toward critical thinking.

1. Introduction

The disposition toward critical thinking implies a willingness to reflect and analyse, to evaluate information and to consider multiple perspectives before drawing firm conclusions (Facione et al., 1995). This is not, however, a static trait but rather a dynamic characteristic that can be developed through different educational experiences (Christodoulakis et al., 2023; Giancarlo & Facione, 2001). The importance of cultivating a disposition toward critical thinking lies in its key contribution to problem solving and decision making (Kirmizi et al., 2015). Critical thinking is deemed essential for discerning false information and, in general for navigating, comprehending, and evaluating the vast volume of information in contemporary society (Thornill-Miller et al., 2023). A recent study found that the disposition of university students' critical thinking significantly predicted their ability to detect fake news on social media platforms (Orhan, 2023b).

In an era marked by technological development and rapid social change, by uncertainty and information overload, promoting people's

ability to think critically is an essential part of empowering them to contribute significantly in an increasingly complex and interconnected world (Roetzel, 2019). Accordingly, there is a growing emphasis within higher education on experiential learning outside the classroom, which is seen as providing opportunities to foster critical thinking disposition among students (Álvarez-Huerta et al., 2023; Orhan, 2023a). The study by Heinrich et al. (2015) demonstrated how experiential learning can serve as a vehicle for fostering the critical development of students in university contexts. The present study analyses the influence of three kinds of applied learning experience – namely, internships, service learning and participation in international mobility programmes – on higher education students' disposition toward critical thinking.

1.1. Disposition toward critical thinking

The ability to think critically is one of the competences that enable individuals to engage actively with their social environment. Its impact therefore goes beyond the classroom and is discernible into the future

* Corresponding author.

E-mail addresses: palvarez@mondragon.edu (P. Álvarez-Huerta), alexander.muela@ehu.eus (A. Muela), ilarrea@mondragon.edu (I. Larrea).

(Bezanilla-Albisua et al., 2018).

Critical thinking is generally considered to comprise both a cognitive and a dispositional dimension (Facione et al., 1995; Sosu, 2013). The former refers to a person's ability to solve problems and come up with reasoned solutions to them through a process of analysis, interpretation or evaluation (Sosu, 2013). As for the dispositional dimension, this reflects a person's willingness to apply these skills when there is a problem to be solved or a decision to be made (Facione et al., 1995). Halpern (1999) was one of the first to stress the importance of helping students specifically to develop a disposition toward critical thinking, insofar as this is the most demanding of the two dimensions; knowing when critical thinking skills are necessary and being willing to apply them is likewise crucial. In other words, the cognitive dimension of critical thinking is not in itself sufficient, and hence it is necessary both to foster a disposition to engage these skills (Chen et al., 2020; Syahfitri et al., 2019) and to create opportunities for this to take place (Sk & Halder, 2020). Accordingly, activities that promote self-awareness, attention, discussion and an acceptance of doubt and uncertainty have all been linked to a stronger disposition toward critical thinking in educational settings (Krupat et al., 2011). In a similar vein, a recent cross-sectional study of higher education students found that reflective and integrative learning and participation in high-impact practices were associated with a greater disposition toward critical thinking (Álvarez-Huerta et al., 2023).

Critical thinking disposition has also been linked to the use of higher-order thinking skills (Darby & Rashid, 2017), as well as to enhanced research competence among health professionals (Chen et al., 2020). Also in the health context, Khoshgofar and Barkhordari-Sharifabad (2023) found a relationship between the reflective capacity of medical students and their critical thinking disposition, suggesting that reflection is a necessary component of medical education. Other studies have associated critical thinking disposition with creative thinking among higher education students (Álvarez-Huerta et al., 2022), and with the scientific creativity of high-school students (Qiang et al., 2020). However, it is important to consider context when analysing the influence of different educational strategies on students' critical thinking disposition, insofar as cultural factors may impact the meaning that is ascribed to critical thinking (Le & Chong, 2024).

1.2. Applied learning experiences

Applied learning experiences offer students the opportunity to put into practice what they have learned in the classroom (Trolian & Jach, 2020), although the extent to which they are implemented varies considerably both within and across higher education institutions and contexts. With increasing emphasis now being placed on developing generic skills among higher education students, it is essential to reflect on the level of competence that is being achieved by students and to evaluate the effectiveness of the pedagogical strategies being employed by institutions (Van Damme and Zahner, 2022). Within Europe, three types of applied learning experience that are commonly available to students are internships, service learning and international mobility programmes.

Internships offer higher education students the opportunity to apply their classroom learning in professional scenarios and to develop practical skills and acquire specialist knowledge (Binder et al., 2015; Silva et al., 2016). Often regarded as a bridge between academic theory and real-world practice, internships expose students to a unique setting in which to face challenges, make decisions and gain experience of a professional context. Accordingly, they are afforded the opportunity not only to experience the complexities of the labour market but also to analyse, evaluate and synthesize information in a real-life work setting (Silva et al., 2016). Internships generally involve practical tasks, projects and collaborations with professionals, allowing students to develop a deeper understanding of the chosen field and increase their employability (Silva et al., 2016). Research suggests that students who complete

an internship face a lower risk of unemployment during the first year of their career (Margaryan et al., 2019). Internships have also been found to have a positive effect on students' subsequent academic outcomes (Binder et al., 2015).

Service learning in higher education provides students with opportunities to engage with the real needs of their community and contribute towards its improvement, and in the process a reciprocal relationship is forged between classroom learning and its application in real-world settings (Salam et al., 2019). This kind of educational experience aims to improve academic outcomes by promoting student participation in projects that bring social benefits to the community, and thus they often involve collaboration with community organizations or local government agencies. Research suggests that service learning can have a positive impact on students' social connectedness, intercultural awareness, openness to diversity and capacity for socially responsible leadership (Kilgo et al., 2015). Experiences of this kind have also been linked to longer-lasting learning (Macías Gomez-Estern et al., 2021) and enhanced student growth (Pelco et al., 2014). Importantly, participation in community engagement projects has been found to have long-term benefits across the academic, professional, personal and civic domains (Pak, 2020). Service learning also offers an alternative way of developing students' critical thinking skills, insofar as they will have to deal with complex real-world problems, weigh up different perspectives and make decisions (Macías Gomez-Estern et al., 2021).

Finally, international mobility programmes have become increasingly popular over the past thirty years in Europe (d'Hombres & Schnepf, 2021). It is considered that programmes of this kind can, by exposing students to different cultural contexts, lead to personal growth in the form of greater cultural awareness and intelligence (Roy et al., 2019). As a result, students may come to reflect critically on their personal prejudices and on the interconnectedness of global problems (Roy et al., 2019). There is also evidence that student mobility is associated with higher employment probability (d'Hombres & Schnepf, 2021).

All the above kinds of experiential learning are considered high-impact practices, because of their potential positive impact on students' development (Kuh, 2008). The aim in each case is that students engage actively with real-world contexts, whether through internships in professional scenarios, participation in community-based projects or by experiencing different cultural settings as part of their studies.

There is evidence that students perceive an improvement in their critical thinking following internships and service learning projects (Duncan et al., 2017). Diversity experiences have likewise been associated with gains in active and critical thinking skills (Gurin et al., 2002; Pascarella et al., 2014), as well as with increased disposition toward critical thinking (Laird, 2005). Cole and Zhou (2014) similarly found that diversity experiences helped students become more civically minded, although this varied depending on their cultural background. However, none of these experiences was found to be associated with critical thinking in the longitudinal analysis by Kilgo et al. (2015).

1.3. The present study

As established in the introduction, promoting critical thinking disposition among higher education students is essential to ensuring that future generations are able to take a more objective, reflective and analytical approach when dealing with the social challenges they will face (Facione et al., 1995). Increased knowledge about how best to promote students' critical thinking disposition would help educators, researchers and social and educational policy makers to implement strategies that could enhance the competences and prospects of graduates.

As already noted, cultivating a disposition toward critical thinking among higher education students is also important with regard to their ability to solve problems and make decisions. However, in order to do so effectively it is necessary to consider context, insofar as cultural factors may impact the way in which critical thinking is understood (Le &

Chong, 2024). It has been suggested that critical thinking transcends cultural boundaries and should be regarded as a variable that can be contextualized within different cultural frameworks. Bali (2015) emphasizes the importance of considering the cultural context when developing approaches to foster critical thinking. Similarly, Manalo et al. (2013) underscore the necessity of explicitly acknowledging both the cultural and pedagogical contexts in research pertaining to critical thinking. As part of the European Higher Education Area, universities in Spain use a methodological approach based on key competences and learning outcomes. In terms of experiential learning, the options most commonly available to students are internships, service learning and international mobility programmes, all of which have been shown to have a positive impact on students' academic performance and employability (d'Hombres & Schnepf, 2021; Margaryan et al., 2019; Pak, 2020). However, little is known about the influence that each of these educational experiences may have on the critical thinking disposition of higher education students, nor whether this influence differs according to the type of experience. A further point to consider is that although critical thinking is regarded as a key component of higher education (Bezanilla-Albisua et al., 2018), a recent report by the Organisation for Economic Co-operation and Development (Van Damme and Zahner, 2022) suggests that students' ability in this respect falls short of what one might hope or expect. With the aim of contributing to a better understanding of these processes, the present study analyses the influence that the three most common types of experiential learning have on the critical thinking disposition of higher education students. To this end, we assess students' disposition toward critical thinking at two time points: at the beginning of their degree studies and at the end of year 2, by which time they will have had the opportunity to participate in some form of experiential learning, namely internships, service learning or an international mobility programme. This longitudinal approach will provide information about students' development over the first two years of their degree studies and help to identify areas for improvement with regard to later stages of their university education. This is important given the lack of studies that have used repeated measures when exploring the impact of applied learning experiences on student development (Roy et al., 2019).

As regards the study hypotheses, we expected to observe no change in the critical thinking disposition of students who did not participate in any high-impact practice during year 2 of their degree programme. By contrast, it was expected that students who completed an internship, a service learning project or an international mobility programme would show gains in critical thinking disposition by the end of year 2 of their studies. Furthermore, we hypothesized that the effect would be greater among students who had engaged in service learning. Finally, we expected to find that participation in more than one type of high-impact practice would have a cumulative positive effect on students' critical thinking disposition.

2. Method

2.1. Participants

A total of 147 undergraduates attending a Spanish university took part in the study. They were aged between 17 and 24 years ($M = 18.36$, $SD = 1.16$; 69.39% women) and were enrolled in degree programmes in the fields of social and legal sciences (81.6% of students) and engineering and architecture (18.4%).

2.2. Instruments

2.2.1. Disposition toward critical thinking

This was assessed using the Spanish version of the Critical Thinking Disposition Scale (CTDS; Bravo et al., 2020; original instrument by Sosu, 2013). The CTDS comprises 11 items that explore two dimensions of critical thinking: critical openness (e.g. I am often on the lookout for new

ideas) and reflective skepticism (e.g. I usually check the credibility of the source of information before making judgements). Items are rated using a 5-point Likert-type scale (1 = Strongly disagree; 5 = Strongly agree) and are summed to give a total score for critical thinking disposition. The higher the score the stronger the disposition toward critical thinking. The scale takes approximately 4 min to complete. The study by Bravo et al. (2020) evaluated the suitability of the Critical Thinking Disposition Scale (CTDS; Sosu, 2013) for use in the Spanish context. Through confirmatory factor analysis (CFA), they assessed the internal structure of the scale and examined its validity, reliability and measurement invariance across gender. Additionally, a nomological validity study was conducted using a multiple-indicator multiple-causes (MIMIC) model specifically tailored to the university setting. The findings indicated that the Spanish version of the CTDS exhibits favorable psychometric properties and is deemed appropriate for assessing disposition toward critical thinking among youth within our cultural context. Internal consistency of scale scores (Cronbach's alpha) in the present sample was 0.78 and 0.80 in the first and second administration, respectively.

2.2.2. Participation in applied learning experiences

Information about students' participation in applied learning experiences during the first two years of their degree programme was gathered by asking them to respond to three dichotomous (Yes/No) items: (1) I've carried out an internship; (2) I've taken part in service learning experiences; (3) I've participated in an international mobility programme.

2.2.3. Procedure

At the beginning of their degree studies (year 1), students completed the CTDS so as to provide a baseline measure of their disposition toward critical thinking. The same instrument was administered a second time at the end of year 2, at which point students were also asked to respond to the three questions about their participation in applied learning experiences. At both assessment points, responses were given via an online platform. Concerning ethical issues, it is important to note that this research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest. Prior to any data being collected, students were informed about the nature of the study and how to access the online questionnaire. It was made clear that participation was entirely voluntary and that all data would remain confidential and be used for solely for research purposes. Participants were not exposed to risks greater than those encountered in everyday life. The primary inconvenience experienced by participants was related to the time commitment required by the study. Students were not rewarded (e.g. in the form of course credits) for their participation, and all those who agreed to take part signed and submitted (electronically) an informed consent form. The study was approved by and conducted in accordance with the principles of the Research Ethics Committee of the university where the research was carried out.

2.2.4. Data analysis

To determine whether there was any significant change in critical thinking disposition among students who did not participate in high-impact practices during year 2 of their degree programme, we calculated the Student's *t*-test for their scores on the CTDS at the two assessment points. To examine the influence of participation in applied learning experiences on students' disposition toward critical thinking, we performed a series of analyses of covariance, taking the type of high-impact practice as the independent (predictor) variable and scores on critical thinking disposition at the end of year 2 as the dependent (criterion) variable. Scores on critical thinking disposition in year 1 were included in the model as a covariate. The effect size of any differences was estimated by calculating partial eta squared (η^2_p). Multiple post hoc comparisons were conducted using Tukey's test, calculating Cohen's *d* as a measure of the effect size associated with any differences.

All analyses were performed using SPSS 28.0.

3. Results

Table 1 shows means and standard deviations for scores on critical thinking disposition in years 1 and 2 of the degree programme, according to the type of high-impact practice in which students had participated during year 2.

Among students who did not participate in any type of high-impact practice there was no significant difference in their score on the CTDS at the two assessment points ($t(85) = 0.957; p = 0.341, d = 0.10$). This suggests that there was no change in their disposition toward critical thinking across years 1 and 2 of their degree programme.

In the analyses of covariance conducted to examine the influence of participation in high-impact practices on students' disposition toward critical thinking the results showed that scores on the CTDS increased significantly among students who had taken part in service learning experiences, $F(2,143) = 4.811; p = 0.010, \eta^2p = .06$. Multiple post hoc comparisons with Tukey's test indicated that these students differed significantly in critical thinking disposition from their peers who had not engaged in any high-impact practices ($p = 0.008, d = 1.01$). A significant difference was also observed between students who had participated in service learning experiences and those who had engaged in other types of high-impact practice ($p = 0.011, d = 0.94$).

Regarding participation in internships, the results showed that this had no significant impact on critical thinking disposition, $F(2,143) = 0.593; p = 0.554, \eta^2p = .01$. Participation in mobility programmes was likewise observed to have no significant influence on students' disposition toward critical thinking, $F(2,143) = 0.253; p = 0.777, \eta^2p = .01$. As expected, therefore, multiple post hoc comparisons with Tukey's test showed no significant difference between students who had participated in these types of applied learning experience and those who had not engaged in any high-impact practices. Furthermore, the effect sizes associated with any differences in means were very small.

Finally, and in order to examine whether participation in more than one high-impact practice had a positive effect on students' critical thinking disposition, we conducted a further analysis of covariance, including as a covariate the score obtained on the CTDS in year 1. The results indicated that participation in more than one high-impact practice had no significant impact, $F(2,143) = 1523; p = 0.222, \eta^2p = .02$.

4. Discussion

The aim of this study was to examine the influence of three applied learning experiences – namely, internships, service learning and

Table 1
Means and standard deviations for scores on the CTDS in years 1 and 2 of the degree programme, according to the type of high-impact practice in which students had participated in year 2.

Disposition toward critical thinking				
Academic year	Participation in high-impact practices	Mean	SD	N
Year 1	No	41.91	5.26	147
Year 2	No	41.58	4.56	86
Type of high-impact practice: Internship				
Year 2	Yes	42.21	6.18	47
	Participation in another type of high-impact practice	40.71	5.30	14
Type of high-impact practice: Service learning				
Year 2	Yes	46.00	4.86	11
	Participation in another type of high-impact practice	40.96	5.85	50
Type of high-impact practice: Mobility programme				
Year 2	Yes	42.11	7.15	27
	Participation in another type of high-impact practice	41.68	4.96	34

participation in international mobility programmes – on higher education students' disposition toward critical thinking. As expected, we observed no change in critical thinking disposition among students who did not take part in any of these high-impact practices during the first two years of their degree programme. However, those who had participated in service learning experiences did show gains in their critical thinking disposition, suggesting that this kind of high-impact practice fosters a willingness among students to engage in critical thinking. By contrast, no gains in critical thinking disposition were found among students who took part in internships or international mobility programmes. This study's results align with other studies that suggest that students can develop their critical thinking through community projects (Duncan et al., 2017; Macías Gomez-Estern et al., 2021). The study contributes to our understanding of the disposition to critical thinking by studying longitudinally and from a dispositional perspective the capacity of general pedagogical practices to improve university students' critical thinking.

A possible explanation for these findings has to do with the fact that service learning aims to improve academic outcomes by providing students with the opportunity to participate in projects that bring social benefits to the community (Salam et al., 2019). Experiences of this kind have been linked to longer-lasting learning (Macías Gomez-Estern et al., 2021), and it is suggested that they have a positive impact in terms of students' intercultural awareness, openness to diversity and capacity for socially responsible leadership (Kilgo et al., 2015). Although further studies are needed to elucidate the mechanisms by which service learning can positively impact students' critical thinking disposition, one may speculate that it is the engagement with complex, real-world needs that helps them to develop the capacity for critical analysis and evaluation of different scenarios. Exposure to a diversity of opinions, perspectives and experience may likewise encourage students to reflect critically and to question their own assumptions, as well as those of others.

As to why participation in internships or international mobility programmes had no significant impact on students' critical thinking disposition, this may be because their benefits relate to other aspects of personal development. Although internships, like service learning, expose students to real-life challenges in a professional setting, research suggests that the gains that follow from this have more to do with students' employability after graduation (Margaryan et al., 2019), rather than, for example, an increased capacity for critical reflection and problem-solving, which is not necessarily the focus of an internship. By contrast, because service learning engages students with projects aimed at serving the community, it implicitly requires critical thinking, the ability to analyse the consequences of individual actions, a proactive attitude towards solving social problems and challenges, and a commitment to the common good (Batlle et al., 2019).

Regarding international mobility programmes, these are widely considered to bring numerous benefits to students, especially in terms of developing their intercultural awareness and competence in foreign languages (Roy et al., 2019). This does not mean, however, that they are an effective way of promoting students' critical thinking skills. Indeed, if critical thinking is understood as a willingness to explore new ideas and maintain reflective skepticism, then our results suggests that participation in a student mobility programme does not lead to significant gains in this respect. This is consistent with the claim that the internationalization of higher education needs to become more inclusive, focusing less on mobility per se and placing greater emphasis on equipping students to make a meaningful contribution to society (de Wit et al., 2015).

While the necessity of conducting further studies to thoroughly analyse these results is acknowledged, service learning seems to facilitate the development of student's critical thinking abilities through the management of real-world challenges, consideration of diverse perspectives, and decision-making processes (Macías Gomez-Estern et al., 2021). Conversely, internships typically prioritize task-oriented objectives aimed at enhancing professional competence and productivity.

Similarly, international stays have the potential to enrich students' cultural perspectives and personal development; however, they often lack structured opportunities for critical reflection. This is due to their primary emphasis on cultural immersion and language acquisition, rather than the systematic examination of social issues or reflective exploration of the learning process itself.

Our final study hypothesis was that participation in more than one kind of applied learning experience would have a stronger (cumulative) impact on the critical thinking disposition of students, insofar as they would be exposed to a wider variety of perspectives, methods and approaches. However, our results suggest that this is not the case, which further underlines the importance of promoting service learning as the most effective way of enhancing students' willingness to adopt a critical and reflective approach to problem solving and decision making.

5. Practical implications

Drawing upon our findings, institutions may prioritize the integration of service learning projects into their curricula to encourage students' disposition toward critical thinking. Service learning, characterized by its emphasis on real-world problem-solving and community engagement, might serve as a catalyst for fostering critical and analytical skills. Institutions might consider supporting faculty in the design and implementation of these projects, fostering community partnerships, and incorporating structured reflection activities. Such efforts can provide opportunities for engaging with diverse perspectives and enhancing critical analysis skills.

While internship and international mobility programs offer benefits in terms of employability and cultural competence, they may not inherently foster critical thinking to the same degree. To enhance the effectiveness of these programs in promoting critical thinking, it might be pertinent to consider integrating reflective learning practices. For instance, internships could incorporate activities such as reflective journals, interdisciplinary projects, or structured mentoring and feedback sessions to encourage critical analysis and reflection. Similarly, the incorporation of structured reflection activities throughout and following international experiences has the potential to transform mobility programs into more effective platforms for nurturing students' critical thinking skills.

6. Conclusion

In summary, the findings of this study suggest that participation in service learning projects during the first two years of a degree programme leads to positive gains in students' critical thinking disposition. Applied learning experiences of this kind require students to reflect, analyse and make informed decisions about real-life social problems, and in this respect they are aligned with the Sustainable Development Goals. By contrast, internships and participation in international mobility programmes appear to have no significant impact on students' disposition toward critical thinking, most likely because they are more closely focused on promoting future employability and aspects such as intercultural awareness.

Limitations and future research

This study has a number of limitations that should be acknowledged. One is that all participants were recruited from a single university in northern Spain, making it difficult to know to what extent the results are generalizable. Further studies involving students from different universities and across a wider range of degree programmes are therefore needed. The results also need to be interpreted with caution due to the relatively small sample size, both overall and, especially, in the subgroups corresponding to the three types of applied learning experience. Although the longitudinal design, with assessment at two different time points, gives a degree of robustness to the results, the inclusion and

assessment of students from other intakes would support this further. We also acknowledge that students' social and professional development may be influenced by individual differences, as well as by contextual variables. Likewise, intersectional approaches contemplating students' gender identity, ethnic culture, and socioeconomic variables could substantially improve our knowledge and provide relevant insights on how to nurture a critical thinking disposition. Furthermore, it is acknowledged that employing mixed-method designs in future research could enhance our understanding of the development of students' disposition toward critical thinking throughout their university experience. That said, it should be remembered that this study had a pragmatic aim, namely to add to knowledge about the relative effectiveness of different kinds of applied learning experiences with regard to promoting students' critical thinking disposition, thereby providing teachers and educational institutions with a platform from which to plan and develop strategies geared towards this end.

To conclude, the results of this study help to shed light on the kinds of applied learning experiences that are likely to be most effective in building higher education students' capacity for critical citizenship. In particular, they highlight the key role that service learning can play in promoting critical thinking skills by affording students the opportunity to engage with and contribute to solving real-world problems of relevance to society.

CRedit authorship contribution statement

Paula Álvarez-Huerta: Writing – original draft, Investigation, Conceptualization. **Alexander Muela:** Writing – review & editing, Formal analysis. **Inaki Larrea:** Supervision, Data curation.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Paula Alvarez-Huerta reports financial support was provided by Gipuzkoa Provincial Council. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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