Towards Human-Scale Competitiveness: Priority Challenges for Triple Helix towards 2030

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Abstract: The future of regions must be built on human-scale competitiveness based on quality employment, sustainability (climate, digital, and demographic), knowledge and skills, new business projects focused on people, and equality between women and men. The achievement of this competitiveness requires cooperation among the Triple Helix, i.e., cooperation between companies, universities, and administration. However, as extant studies indicate, cooperation levels between universities and companies remain low. Therefore, the development of research projects and tools to foster this cooperation is necessary. As can be seen in the United Nations Sustainable Development 2030 Agenda, the challenges that the Triple Helix must face in the runup to 2030 are manifold. Given these multiple challenges and the limitation of existing resources, the identification of priorities is crucial in order to optimise resources, focus policies, and develop an agenda to guide cooperation. To this end, by conducting an exhaustive review of the literature, four focus group sessions with 24 participants and a quantitative questionnaire answered by 90 institutions, this study identifies the challenges that the Triple Helix of the Basque Country (Northern Spain) considers to be a priority for 2030 in order to ensure regional human-scale competitiveness. In accordance with the results of the study, eradicating gender-based violence, favouring the establishment of companies in the territory (incentives, legal measures, recognition, etc.), and developing alternative energy sources are some of the main priority challenges.

Keywords: university–business cooperation; triple helix; challenges; employment; lifelong learning; gender equality

1. Introduction

The future of regions must be built on human-scale competitiveness based on quality employment, sustainability (climate, digital, and demographic), knowledge and skills, new business projects focused on people, and equality between women and men [1,2]. Many studies and countries highlight the importance of the interaction among the agents that make up the Triple Helix (universities, companies, and the administration) in achieving regional socio-economic development and competitiveness [3–5]. Industry and higher education institutions are recognised as essential players in regional competitiveness due to their important contribution to sustainable economic growth, employment, and prosperity [6]. Therefore, fostering cooperation between the agents that form the Triple Helix is vital to achieve human-scale competitiveness.

Although, in the beginning, universities were mainly responsible for disseminating and producing knowledge, the university’s role has evolved, acquiring a role increasingly rooted in territorial development through its “third mission” [7,8]. This evolution has made it more important that universities establish bi-directional relationships and networks...
with the rest of the agents in the territory, giving rise to the emergence of the Triple Helix model. This model of interaction emphasises the role of cooperation between universities, companies, and administration in the transformation of society towards a knowledge-based society [9].

Several studies and governments endorse the importance of the interaction between the Triple Helix [10–12]. Nevertheless, despite the support of the administration, current studies show that cooperation levels between universities and companies are low [13,14]. This situation implies a need to carry out further research on the topic and to develop tools that foster such cooperation.

As observed the United Nations Sustainable Development 2030 Agenda, the challenges that the Triple Helix must face in the run-up to 2030 are manifold [15,16]. Given these multiple challenges and the limitation of existing resources, the identification of priorities is crucial. Prioritising these challenges allows the optimisation of resources, and this focuses the policies and development of an agenda to guide cooperation among universities, companies, and administration. To this end, this paper contributes to the Triple Helix literature and policy making by identifying the challenges that the Triple Helix of the Basque Country (northern Spain) considers to be the priorities for 2030 in order to achieve human-scale competitiveness.

The Basque Country is a small region in the north of Spain that stands out in the Spanish landscape due to its strong industry and well-educated workforce [17]. The region is characterised by a long trajectory in manufacturing activities and has a solid industrial base. As regards to the governmental mechanisms for promoting cooperation among the Triple Helix, it must be stressed that, even though there is still much work to be conducted, Basque Country is a region committed to moving forward [18]. Basque’s government promotes cooperation between universities and companies by using various mechanisms such as the I 2022 Basque University-Business Strategy (Basque Government, 2017) and Hazitek (https://www.spri.eus/es/ayudas/hazitek, accessed on 26 January 2021).

Elkartek (https://www.spri.eus/es/ayudas/elkartek, accessed on 26 January 2021) and Basque Digital Innovation Hub (https://bdih.spri.eus/es/, accessed on 26 January 2021), among others.

This article begins with the description of the theoretical framework underpinning the research study. Firstly, the importance of cooperation among the Triple Helix is highlighted, followed by a description of the multiple challenges found in the literature in relation to the areas on which human-scale competitiveness is based: future and quality employment, the triple transition (digital, social and ecological), lifelong learning, and gender equality. Once a theoretical framework has been described, the methodology used in the analysis is described in detail. Subsequently, the results obtained in the study are shown, together with a discussion of these. This section shows that eradicating gender-based violence, favouring the establishment of companies in the territory (incentives, legal measures, recognition, etc.), and developing alternative energy sources are among the most important challenges. Finally, the conclusions reached and the limitations and future lines of the study are described.

1.1. The Emergence of the Triple Helix

While the original purpose of the university in its early days was to provide education through its knowledge base, the first academic revolution transformed the university from a knowledge silo to a knowledge-generating agent [4]. Thus, in the early 19th century, the modern university emerged, combining teaching and research [19]. Under this “pure” academic university model, the university was limited to conducting high-level research and transferring this knowledge [20]. However, in advanced economies, there was a widespread concern that teaching and research were not sufficient to address the economic and social goals of the regions [21]. As a result, social and economic actors began to expect an increasingly important role for universities in regional development and competitiveness [20]. This demand led to a second academic revolution, which integrated a third university mission for socio-economic development. This revolution led to traditional training and the research
university became an “entrepreneurial university” [4]. In this new scenario, academia began to be seen as a key provider of new technologies and entrepreneurial ventures, becoming a driver of regional development and an economic engine [22].

Until the emergence of the entrepreneurial university, higher education institutions and industry were generally separate spheres. Thus, the development of cooperation activities has been one of the main challenges of universities as they have had to evolve from individual non-interconnected activities to more structured and systemically required ones [22]. Since the appearance of an entrepreneurial university, both universities and companies have started to assume tasks that were largely in the province of others [19]. This shift in economy also led to changes in parts of the knowledge infrastructure. Prior to the entrepreneurial university, exchange across institutional boundaries was organised through arms-length transactions and mediated by organisations such as non-profit organisations [23]. Nevertheless, in this new entrepreneurial scenario, since universities are increasingly viewed as key players in national and regional innovation systems, distinct boundaries are blurred and replaced by a tie network. This has had an impact not only on the relationship between university and business but also on the interaction between university, government and business spheres as science and technology gains great importance for socio-economic development [19]. The analysis of this triadic interaction led to the “Triple Helix” theory, postulating that interaction between university, industry, and government is the key to improving conditions for innovation and competitiveness in a knowledge-based society [4].

Within the Triple Helix model, university–business cooperation (hereinafter UBC) is developed through the implementation of different activities that are selected based on the objective with which the cooperative relationship is born. Several studies [24–26] have demonstrated the multiple benefits that this cooperation brings to companies, universities, and society itself. These benefits contribute to the achievement of the challenges that the Triple Helix must face in terms of lifelong learning, triple transition (climate, digital, and demographic), gender equality, and the future of employment to achieve a human-scale competitiveness by 2030 [16].

1.2. Challenges That the Triple Helix Must Face to Achieve a Human-Scale Competitiveness by 2030

1.2.1. Lifelong Learning

Lifelong learning is a fundamental dimension at both an individual and collective level, and it is linked to increased employability, productivity, and social cohesion [27–29]. At the EU level, lifelong learning is intrinsically connected to the development of different policies, such as employment policy or economic policy. Currently, in the midst of the debate on what the Industry 4.0 Revolution will mean, lifelong learning is gaining prominence because of the opportunities it is associated with in the contemporary socio-economic context [30,31].

Innovation and digitalisation of the economy constitute present and future challenges that demand citizens who are prepared to lead the changes that the productive system is progressively facing [32]. Therefore, the achievement of the economic and social objectives that are outlined at the near horizon are influenced by the availability of qualified and competent professionals. However, according to [33], there is a lack of connection between training programmes and business needs, which may limit the usefulness of the available training. According to [29], clear approaches on how to manage knowledge are also required. In addition, several factors have been identified as ways to contribute to lifelong learning, the most representative of which will be highlighted to address emerging needs. The authors of [34] propose three strategic areas through which to adopt lifelong learning in line with current needs: matching the demand for skills in the labour market, integrating stakeholders in the construction of the training offer and, lastly, and providing advanced skills. In this regard, both [35] and [33] point out the importance of strengthening cooperation between educational institutions and the productive system so as to achieve a full match between the training available and the skills that professionals need.
Collaboration between industry and universities makes it possible to integrate the different stakeholders and consolidate a relationship through which to maximise the benefits of lifelong learning, catalysing educational innovation, and consequently, multiplying the added value that training is capable of generating for society [34,36,37]. The authors of [38] proposed channelling cooperation between the productive and training sectors through the design of mentoring programmes aimed at individually facilitating the skills that each person will have to exercise in their specific environment. In turn, [39] highlighted that having discussion groups with professionals can contribute to feedback and encourage the discovery of new methods to intensify opportunities for personal and professional development through the acquisition of new learning. In this process, [40] stress that it is essential to train teachers to take on this role and to provide effective leadership in lifelong learning. This requires teachers with pedagogical and technical skills, enabling them to design efficient didactic actions focused on the practical knowledge that citizens are required to adapt to in a productive environment [33,39]. The studies by [27,31,41] highlighted the need to broaden the type of skills that are promoted among individuals in order to respond to current needs, fostering a change of mentality and a reliable commitment among workers so that they contribute to progress and innovation from their respective jobs and involving active participation in the search for alternatives on the basis of which to build a better society.

1.2.2. The Triple Transition (Climate, Digital, and Demographic)

According to the report on mega-trends recently produced by the United Nations, the major transformations affecting humanity are climate, digital, and demographic. For each of the mega-trends, the interactive relationships between the three dimensions, the two-way impacts arising from major transformations, and their categorisation as positive or negative effects have been identified [42].

The effects of the environmental transition are distinguished in two dimensions: those effects measured in demographic terms, and those measured in technological-digital terms [42]. Starting with the latter, the positive effect of climate change as an accelerator of technologically intensive innovation is highlighted, as well as policies that enable cost reductions in the production, storage, and use of renewable energy technologies, such as solar and wind. However, it has caused significant damage to supply chains, buildings, and IT infrastructure, including adaptive technologies such as dams and dykes.

For the demographic dimension, the report identifies three negative impacts. First, an increase in rural–urban migration flows may be observed among the population concerned due to increased livelihoods, insecurities caused by rising sea levels, severe weather events, droughts, rising temperatures, insect infestations, and water scarcity. As a result, conflict may emerge or intensify in the destination towns and cities, in the countries of origin themselves, or between countries. Second, the vulnerability of countries with relatively high population growth, high population density, fertility rates, and dependence on rain-fed agriculture will increase. Thirdly, there is a possible increase in mortality mainly due to heat waves, epidemics, insect infestations, and the increase in scale, frequency, and intensity of natural hydrological hazards [42].

The report shows that digital transformation has a number of impacts that affect both the climate dimension and demographic transformation. The positive impacts of the digital transformation on the climate dimension include teleworking that helps reduce greenhouse gas emissions, improved water efficiency, improved recycling rates through product tracking, and a reduced carbon footprint through the consumption of local products. Similarly, industrialisation based on renewable energy, such as solar and wind energy, can greatly reduce greenhouse gas emissions, mitigate climate change, and support sustainable development. Negative impacts include technological development linked to fossil fuels in industry and commerce, which has accelerated energy consumption, greenhouse gas emissions, e-waste, groundwater depletion, land erosion, or environmental degradation and climate change. The overall result has been unsustainable production, trade (e.g., shipping and zoonotic diseases), and consumption patterns.
Looking at the effects of the digital transformation on the demographic dimension, positive impacts include life extension and healthy ageing, the wellbeing of the elderly, and the impact on fertility with assisted reproductive technologies. Furthermore, automation can enable an ever-smaller workforce to remain sufficiently productive, making an ageing population structure sustainable. Technologies also make transport and communications cheaper and faster, facilitating internal (rural to urban) and international (urban to urban) movement due to increased incentives to migrate and reduced travel costs. This may be counterbalanced by a reduced need for commuting, given the improved technology for teleworking. On the other hand, the report highlights as negative the impact of the unequal diffusion of technology in many countries, creating a digital divide between populations living in rural and urban areas, as well as between population groups within urban areas.

The demographic transition produces effects on environmental and technological-digital dimensions, closing the two-way circle between the three spheres. In the environmental dimension, the following are identified as positive impacts: On the one hand, slowing population growth can help countries gain time to invest in building resilience and capacities to adapt to climate change; on the other hand, declining fertility leads to lower population growth. However, the negative environmental effects outweigh the positive ones: Population growth and ageing contribute moderately to increased energy consumption and global warming, especially in high-income countries. Decreasing average household size increases carbon emissions, leading to environmental degradation, and rapid population growth (especially in sub-Saharan Africa and low-income countries) is a major factor in increasing demands for food and agricultural production, placing pressure on scarce resources such as energy, water, and land. Finally, among the effects of demographic transformation on the technological dimension, population ageing is identified as a negative impact and concerns are raised about possible negative consequences on innovation, labour productivity, and macroeconomic dynamism. However, the following positive impacts are listed, such as increased demand for technological innovations, the need for lifelong learning, or a slowdown in population growth with a smaller working-age population, which increases the labour force and encourages immigration to older countries.

1.2.3. Gender Equality

As stated in the fifth goal of the Sustainable Development Goals elaborated by the United Nations, a world with full equality has not yet been achieved, where all legal, social, and economic barriers to women’s empowerment have been removed. Differences have been aggravated by the COVID-19 socio-health crisis. It is, therefore, necessary to change the values that sustain and justify the subordination of women in all spheres of life, which is essential for sustainable human development. This change of values implies the construction of new values, which requires key agents in society and the economy (such as universities, companies, and the administration) to transform society and the economy and to reinforce the social recognition of equality as part of sustainable human development.

According to data provided in the report on the UN Women Strategic Plan 2022–2025, less than two-thirds of women are in the labour market, while 90% of men are there, a figure that has improved over the last 30 years. At the same time, the jobs held mainly by women are undervalued. For this reason, within the different plans developed by the various governments to achieve gender equality, there are actions related to valuing and raising society’s awareness of the importance of jobs and spaces where women participate in the majority for collective and social wellbeing. Recognising and ascribing value to care work as an indispensable condition for the sustainability of life is a key task for achieving equality between men and women given that women spend three-times more hours than men in unpaid domestic and care work.

Women’s empowerment is an objective, a tool, and a process that has to take place at different levels (personal, collective, social, and political) and to which everyone has to contribute from different spaces. In relation to the business sphere, one of the great
tasks pending is to eradicate discrimination and the wage gap [45], which is one of the challenges to which societies must respond to urgently. In relation to employability and gender inequality, it is continually observed that despite the fact that the number of women with higher education is greater than the number of men, the presence of women in public positions of representation and/or social and political decision-making is lower. Despite the progress made by women in leadership positions, women only represent a quarter of all parliamentary seats and only 24 women govern a country worldwide [43]. As to the Science and Technology system, the data continue to show the existence of great inequalities in relation to gender, which is why it is essential to consider the need to facilitate women’s access to science and research and the development of their scientific careers. Promoting the presence of women in the field of science and technology and encouraging STEM (Science, Technology, Engineering, and Mathematics) vocations is a key point on the agendas.

According to the report developed by [43], 1 in 10 women over the age of 15 have suffered physical or sexual violence by someone close to them. Gender-based violence continues to be one of the greatest social burdens. Based on a report by [42], the COVID-19 crisis has increased violence against women and girls, with domestic violence cases increasing by 30%. Eradicating gender violence is one of the great challenges to which society must respond in a cooperative manner [42,46,47].

1.2.4. Employment of the Future and the Future of Employment

The employment of the future and the future of employment has been the subject of study for more than 50 years. Currently, motivated by the current situation and the rapid progress of society, the interest it arouses is even greater both from a technological and a human resources perspective [48]. It is, therefore, necessary to analyse current needs and shortages in order to anticipate the state of employment, possible scenarios, as well as the key aspects to be addressed in the timeframe of the 2030 agenda.

Stability is necessary to ensure quality employment in regions. Specifically, it has been detected that the mobilization of companies that move out of the territory has a negative impact on this stability. To this end, it is necessary to encourage companies to remain in the territory, with actions such as tax incentives, legal measures, recognition, benefits of various kinds depending on the activity and size of the company, etc. [49–51]. Directly related to this point, there is a need for cross-border collaboration with European regions, promoting strategic cooperative projects that will boost R&D activity in the territory in order to be more competitive in the future [52]. In addition, it would be highly beneficial to encourage technological entrepreneurship (supporting the creation of start-ups), intra-entrepreneurship, and the diversification of activities [53,54]. In the same manner and directly derived from the progressive digitalisation of society, the “reality” of growing automation of economic activities is appearing. The technological-digital transition brings with it a set of keys that directly affects the productive sectors and that can be summarised as investing in greater and better connectivity; strengthening industrial and technological presence in strategic points of the digital supply chain; channelling investments towards strategic digital capabilities (artificial intelligence, cybersecurity, secure communication, cloud data infrastructure, 5G and 6G networks, supercomputers, quantum computing, blockchain, etc.); and building a data economy as an engine for innovation and job creation [55].

In relation to the scenario of population ageing, which is currently recording population peaks, a demographic structure can be observed with more people aged 65 or over than under 21, a trend that has been accentuated year after year. This progressive reduction in the active population will lead to a reduction in the number of people of working age and, consequently, companies will find themselves with a shortage of workers, which will be a challenge to be addressed by the collective strategy of countries [55]. For this reason and with the consequent aim of managing population ageing, it is considered necessary to encourage retraining and professional relocation, which translates into the retraining of workers currently working in companies (due to the effect of greater automation or the decline of certain sectors) [56]. Likewise, the inversion of the population pyramid, with the
corresponding ageing of the population, means that the labour market integration of young people (under 25 years of age) is key to maintaining an increasingly ageing system [57]. It is, therefore, necessary to promote decent employment conditions for young people when they enter the labour market (through methods such as dual training), as well as to reduce the impact of student mobility [58,59]. In view of the above, failure to provide decent conditions could lead to a brain drain from the territory. Similarly, offering adequate conditions must also be extrapolated to the rest of the population, as the trend indicates that more and more technical and highly qualified profiles are required; thus, the capacity to attract and retain talent must be developed within the regions [60,61].

In relation to the impact that the global COVID-19 pandemic has had (and still has) on employment, although recovery is expected in the medium term, there is still a scenario of uncertainty as to the pace of recovery that will take place. At the level of the Basque Country, the effects of the crisis generated by COVID-19 on employment have been significant. In 2020, registered unemployment has grown in the Basque Country by just over 15,000 people to over 129,000 people registered as unemployed in December 2020 [55]. Likewise, the COVID-19 crisis is profound, affecting both the labour markets in the short and medium-term and the way in which work is organised. On this point, telework may be here to stay, as recent evidence suggests [62]. This is why, in view of the fact that teleworking is proving to be viable, it is necessary to adapt company dynamics to facilitate the reconciliation of work and family, combining personal and professional life [63].

2. Materials and Methods

This study is based on two main parts: on a theoretical basis comprising a literature review that has allowed us to establish the theoretical framework set out in the previous section and in a series of research and fieldwork activities. These activities were carried out sequentially and are complementary to each other in the following chronological order: Firstly, a literature review was carried out; secondly, a contrasting session was held with 4 focus groups made up of expert agents belonging to the Triple Helix of the Basque Country; finally, a quantitative online questionnaire was carried out to determine quantitatively which were the most significant challenges.

2.1. State of Art Review

The first stage of the project consisted of a literature review of the topics that are the focus of research: (i) quality of employment, (ii) lifelong learning, (iii) triple transition, and (iv) gender equality. The results of the literature review are presented in Section 1.2: Challenges that the Triple Helix must face to achieve a human-scale competitiveness by 2030.

Thus, in this first stage, the challenges that the Triple Helix of the Basque Country must face jointly by 2030 were selected in accordance with the studies and works collected in the previous section. With this information, it was possible to define an initial list of challenges in the four topics mentioned above; furthermore, it was necessary to contrast them with experts, as well as to quantify their importance and impact.

2.2. Focus Group

The next stage consisted of a contrast session/workshop with agents of the Triple Helix, with the double goal of validating challenges that were previously identified in the state-of-the-art review, as well as to add new undetected challenges. At this stage, it was considered necessary to have the perspective of experts from the different fields of each of the three helices. The session was focused on the 4 themes exposed in the previous stage in order to maintain the consistency of the study when validating and adding new challenges.

The contrast session involved 24 agents from the three helices, assigning them equally into 4 focus groups with 6 agents in each of them; this was considered to be an adequate sample for this type of method [64,65]. Out of the 24 agents, 14 belonged to the university helix, 3 belonged to the business helix, and 7 belonged to the public administration helix. Among the profiles, attending the session were 6 university lecturers, 10 direc-
tors/coordinators of different areas, 3 vice deans of the university, and 5 technicians from different branches. Moreover, all participants read and signed a consent form to process the data collected during the workshop. The workshop was also approved and supervised by the ethics committee of the University of Mondragon.

Each of the 4 focus groups worked on 2 of the themes (quality of employment, lifelong learning, triple transition, and gender equality) in 45 min intervals. In this manner, each agent carried out twice the procedure described below. Moreover, during the focus groups, a moderator expert in each of the topics focused on asking questions and took notes of the agents’ answers. The working sequence was as follows:

Brief presentation of the agents: propeller of origin, field of work, and main functions (5 min).

Individual reflection has the aim of having each agent identify the most relevant challenges for one of the four themes and then quantitatively assess these challenges (15 min). At this stage, it was decided not to bias the participants; therefore, they were not shown the challenges previously identified in the state of art review stage. This was considered necessary so that the challenges proposed in the focus group would not be affected or conditioned by the literature review [66]. In addition, it was agreed that a minimum number of challenges that each agent could identify would not be set but, on the other hand, it was considered appropriate to set a maximum number of 10 challenges per topic and agent [66]. Furthermore, the challenges were evaluated on a quantitative scale (Likert-type scale from 1 to 10 [67]) according to two criteria: the strategic nature of the challenge and priority for the Basque Country for 2030 [68]. As support material at this stage, each agent was provided with a working document with different sections: (i) identification of challenges at individual level, (ii) classification of the challenges according to the two criteria set out above using a quantitative scale, and (iii) joint discussion to select the most relevant challenges. The working document is attached as Supplementary Materials.

Individual presentation of the challenges identified by each of the agents, based on the working paper and the two assessments previously presented (10 min).

Discussion between the agents contrasting the challenges identified by each of them, with the aim of jointly selecting the most representative ones (15 min).

After the collection of data in each of the focus groups, the selected challenges were pooled, eliminating challenges that were repeated in the two roundtables that had worked on the same topic. Subsequently, after comparing the results of the literature review and contrast session, it was found that a significant number of challenges were repeated in both stages. Afterwards, those challenges that were similar to each other were unified to finally obtain a set of 19 challenges that the Basque Triple Helix must address in the 2030 framework.

2.3. Online Quantitative Questionnaire

In the next phase, it was considered necessary to establish the importance of these challenges in order to prioritise them. For this purpose, a quantitative online questionnaire was developed to assess the 19 selected challenges using a Likert-type scale.

The Likert-type scale is commonly used in all fields of research [69,70]. Rensis Likert developed it in 1932 and a typical Likert-type scale is a 5-7-10 point ordinal scale used by respondents to rate the degree of agreement or disagreement with a statement [71–73]. As [67] pointed out, ten-point Likert-type scales offer a form of rating (one to ten) that is within common experience, which increases the sensitivity of the measurement instrument. Given this advantage, a ten-point scale was defined for the variables measured via a Likert-type scale in the study. The scale ranges from “1 strongly disagree” to “10 strongly agree”.

In the field of business and management research, the questionnaire is the most widely used method in survey strategy, providing an effective way to collect responses for a large sample prior to quantitative analysis. According to the study by [74] in which the advantages and disadvantages of these types of methods are analysed, it turns out that the online questionnaire is the best type of questionnaire and strategy to reach the required sample for the development of the study.
The online questionnaire was sent to 90 institutions and agents belonging to the Triple Helix, with the classification of the agents being as follows: 70 companies, 10 university agents, and 10 public administration agents. The platform used to send and collect the online questionnaire data was Google Forms, which was selected for its manageability and openness [75].

2.4. Statistical Analysis

A descriptive analysis of the results of the online quantitative questionnaire was carried out. First, some descriptive parameters were calculated for the 19 challenges: mean, standard deviation, confidence interval, and range, without disaggregating according to the agent’s helix of origin. Next, the mean averages of each challenge were calculated according to the helix to which each participant belonged. In addition, a one-factor ANOVA test has been carried out on in order to verify differences between the challenges according to the helix. The three groups were compared simultaneously, and a test pairwise comparison was also carried out. The statistical software used for the calculations was IBM SPSS statistics [76].

3. Results

3.1. Identified Challenges That the Triple Helix Must Address

The 19 challenges identified, after the review of the state of the art and the subsequent analysis in the contrast session, are set out below and are classified according to the four themes that are the focus of this work:

3.1.1. Triple Transition

1. Develop alternative energy sources to fossil fuels; renewable, robust, and efficient, based on digital solutions and economically competitive;
2. Promote and achieve energy savings through education of citizens and optimisation of consumption;
3. Manage generational change in the productive system by integrating youth in an orderly handover; boosting digitalisation to fill demographic gaps (thereby covering the future shortage of employees); and employing and integrating migrants;
4. Manage and achieve a healthy ageing population, generating socio-economic opportunities;

3.1.2. Lifelong Learning

1. Identify and resolve training needs and matching skills between supply and demand, focused on tackling the transformation of work and industry (digitalisation, robotisation, and automation);
2. Promote the creation of networks, integrating the education system and companies so as to encourage specialisation in training programmes for lifelong learning;
3. Promote highly specialised training to position the Basque Country not as an eternal follower, but (in some areas, sectors or companies) as a technological leader;
4. Increase the participation of Basque society in continuous training actions, especially in the segments of the population with fewer qualifications or that are immersed in risk factors;

3.1.3. Future Employment

1. Promote the integration of young people into the labour market in decent conditions, thus developing the capacity to attract and retain highly qualified technical profiles and thereby avoiding the flight of talent from the territory, both to other Autonomous Regions and to Europe;
2. Favour the establishment of companies in the territory (incentives, legal measures, recognition, etc.);
3. Promote strategic cooperative projects and cross-border (European) collaboration. Boost research and transfer (R&D) activity in collaboration with Europe to improve competitiveness;
4. Encourage technological entrepreneurship (start-up), intra-entrepreneurship, and diversification;
5. Promote the reconciliation of personal, family, and working life. Encourage positive parenting and co-responsibility. Encourage teleworking and flexible working, adapting the dynamics of companies;

3.1.4. Gender Equality
1. Publicise and raise awareness in society of the importance of the work and spaces in which women play the majority role for collective and social well-being. Recognise and give value to care work as an indispensable condition for the sustainability of life;
2. Tackle the pay gap;
3. Transform the economy and society to achieve equality and strengthen social recognition of equality as part of sustainable human development;
4. Promote the presence of women in the field of science and technology. Promote STEM (Science, Technology, Engineering and Mathematics) vocations;
5. Increase the presence of women in public positions of social and political representation and/or decision making;
6. Eradicate gender-based violence.

3.2. Quantitative Assessment of the Challenges
The results of the quantitative online questionnaire in which 90 agents of the Triple Helix participated are shown in Table 1. The table shows the mean, standard deviation, upper and lower confidence interval, and range of the 19 challenges identified and they are structured into four themes that are the focus of the research: triple transition, lifelong learning, future employment, and gender equality.

Table 1. Quantitative assessment of the 19 challenges identified. ID: identifier (ID as listed in Section 3.1); SD: standard deviation; CI: confidence interval; UP: upper limit; LL: lower limit.

| Topic                      | Triple Transition | Lifelong Learning | Future Employment | Gender Equality |
|----------------------------|-------------------|-------------------|-------------------|-----------------|
| ID                        | 1                 | 2                 | 3                 | 4               | 5               | 6               | 7               | 8               | 9               | 10              | 11              | 12              | 13              | 14              | 15              | 16              | 17              | 18              | 19              |
| Average                  | 8.76              | 8.70              | 8.71              | 8.66            | 8.59            | 8.67            | 8.61            | 8.33            | 8.71            | 8.84            | 8.46            | 8.20            | 8.44            | 8.58            | 8.42            | 8.42            | 8.26            | 9.62            |
| SD                       | 1.38              | 1.28              | 1.15              | 1.06            | 1.04            | 1.08            | 1.09            | 1.20            | 1.08            | 1.09            | 1.28            | 1.31            | 1.64            | 1.15            | 1.22            | 1.32            | 1.32            | 1.29            | 0.80            |
| CI 95%—UL                | 8.47              | 8.43              | 8.47              | 8.43            | 8.37            | 8.44            | 8.38            | 8.08            | 8.48            | 8.62            | 7.98            | 8.18            | 7.86            | 8.20            | 8.32            | 8.15            | 8.15            | 7.98            | 9.45            |
| CI 95%—LL                | 9.04              | 8.97              | 8.95              | 8.88            | 8.81            | 8.89            | 8.84            | 8.58            | 8.94            | 9.07            | 8.51            | 8.73            | 8.34            | 8.69            | 8.83            | 8.70            | 8.70            | 8.53            | 9.79            |
| Range                    | 8                 | 5                 | 4                 | 5               | 4               | 5               | 5               | 5               | 4               | 5               | 6               | 6               | 9               | 5               | 5               | 5               | 5               | 5               | 5               |

Figure 1 shows graphically the average score of the challenges, classified according to theme. Furthermore, the different challenges have been analysed independently according to the helix to which the agents who participated in the quantitative online questionnaire belonged. The ANOVA test carried out shows significance differences between the three groups in only three challenges: 4. manage and achieve a healthy ageing population, generating socio-economic opportunities; 7. promote highly specialised training to position the Basque Country not as an eternal follower, but (in some areas, sectors, or companies) as a technological leader; and 10. favour the establishment of companies in the territory (incentives, legal measures, recognition, etc.). These significance differences have been marked in Figure 1.

Figure 2 shows the average of each of the challenges according to the helix of the agents, as well as the average of the three helices. The pairwise comparison of the different helixes shows that there are significant differences only in the helix of the university with respect to business and public administration in the following challenges: 7. promote highly specialised training to position the Basque Country not as an eternal follower, but (in some
areas, sectors, or companies) as a technological leader and 10. favour the establishment of companies in the territory (incentives, legal measures, recognition, etc.)

Figure 1. Average of the challenges classified according to theme. * Significance differences in the simultaneous comparison of the three groups are marked with an asterisk.

Figure 2. Average of the challenges as a function of the agent’s helix classified according to theme.
4. Discussion and Conclusions

The main objective of this article was to identify the challenges that the Triple Helix of the Basque Country considers to be the priorities for the year 2030 to ensure regional human-scale competitiveness. According to the results of the study, the most critical challenge among the 19 identified is that of eradicating gender-based violence (with a score of 9.62 points out of 10). It is striking that while this is considered the most important challenge, the other challenges related to gender-based violence have not obtained such a high score, all of them being dependent on each other [43]. With regard to the future and quality of employment, the promotion and integration of young people into the labour market under decent conditions (8.71 points out of 10), as highlighted by [56–61], and favouring the establishment of companies in the territory (8.84 points out of 10), in line with [49–51], are selected as the top priority challenges. As to the area of the Triple Transition, the most noteworthy challenges are the development of alternative energy sources to fossil fuels (8.76 points out of 10) and the management of generational change in the production system by promoting digitalisation that will alleviate demographic deficiencies and employing migrants (8.71 points out of 10). This reinforces the theory of the study carried out by [42]. It is noteworthy that hardly any significant differences were detected between the helix in the challenge scores. This means that the agents of the three helixes were aligned in quantifying the importance of the challenges.

It is worth noting that the challenges included in the area of lifelong learning, despite having a score of more than 8, did not stand out as the most important challenges of the Triple Helix in Basque Country. In this respect, it may be necessary to look more deeply into the reason for these lower results and to implement different initiatives that highlight the importance of lifelong learning as a fundamental dimension at both the individual and collective level, linked to increased employability, productivity, and social cohesion [27–29].

5. Limitations and Future Lines

This study is not without its limitations. Firstly, it is worth highlighting the limitation of the sample used to identify the priority challenges. Thanks to the participation of the three universities that make up the Basque University System and the three Provincial Governments that make up the Basque Administration, the data obtained in the questionnaire can be extrapolated to the population. However, the perception of the companies is biased due to the fact that the sample collected is not extrapolable and only represents the sample analysed.

Secondly, the importance of the regional context in the analysis of Triple Helix implied that the results achieved in this study could be useful for regions that share similar structural conditions to the Basque Country such as Aragón (Spain), Emilia-Romagna (Italy), West Midland (England-United Kingdom), Niederösterreich (Austria), Piemonte (Italy), Niedersachsen (Germany), Schleswig-Holstein (Germany), Wales (United Kingdom), Comunidad Foral de Navarra (Spain), and Nordrhein-Westfalen (Germany) [77]. Finally, the companies that have participated in the study are manufacturing companies; therefore, the study is limited to this industry. This bias implies carrying forward future studies that analyse the perspective of other types of companies.

Having identified the challenges considered as priorities to be addressed by 2030 by the Triple Helix, as a future line, it is important to develop a shared roadmap, an agenda, for the Triple Helix in which a cooperation strategy is defined for achieving human-scale competitiveness. The development of this Agenda will also require an analysis of the type of cooperation activities that should be carried out in order to respond to the prioritised challenges. At the same time, to ensure its achievement, it will be necessary to analyse the factors that hinder or facilitate cooperation. Finally, it will be necessary to identify a set of indicators to monitor the agenda.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/su14138141/s1, Data Base_Quantitative Questionnaire, Informed Consent Statement_Signed and Supplementary Material_Working Document.
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