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Research Article

Evaluation of Open Science for co-creation of Social Innovations: A conceptual framework

Evaluación de la Ciencia Abierta para la co-creación de Innovaciones Sociales: Un marco conceptual

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Abstract: Open Science is a rapidly expanding and diversifying field of social innovation with significant implications for and potential benefits to society, policy and various academic research areas. However, much is still unknown about the co-creation processes in Open Science and an overall conceptual framework which aids such understanding is missing. The article aims to address these limitations and identify the key dimensions of an ecosystem allowing co-creation in Open Science to unfold its social and economic impact. The research presented integrates the literature analysis on co-creation in multi-stakeholder ecosystems and suggest that three important dimensions have to be considered in evaluation of Open Science ecosystems: *framework conditions, system conditions and outcomes*. The proposed model was applied in qualitative analysis of thirty-three Open Science case studies. Based on the results of evaluation, it can be concluded that Open Science landscape is highly heterogenous, fragmented and not fully coordinated. The fragmentation appeared in all dimensions of evaluation. The outcomes of the research provide a first exploratory step in proposing innovative measures to determine the elements of co-creation practices within Open Science context.

Keywords: open science; social innovation; stakeholder engagement; co-creation.

Resumen: La Ciencia Abierta es un campo de innovación social en rápida expansión y diversificación, con importantes implicaciones y beneficios potenciales para la sociedad, la política y diversas áreas de investigación académica. Sin embargo, todavía se desconoce mucho sobre los procesos de co-creación en la Ciencia Abierta y se carece de un marco conceptual general que ayude a su comprensión. Este artículo pretende abordar estas limitaciones e identificar las dimensiones clave de un ecosistema que permita la co-creación en la Ciencia Abierta para desplegar su impacto social y económico. La investigación presentada integra el análisis de la literatura sobre la co-creación en ecosistemas de múltiples partes interesadas y sugiere tres dimensiones importantes a ser consideradas en la evaluación de los ecosistemas de Ciencia Abierta: *las condiciones marco, las condiciones del sistema y los resultados*. El modelo propuesto ha sido aplicado en el análisis cualitativo de treinta y tres estudios de caso de Ciencia Abierta. A partir de los resultados de la evaluación, se puede concluir que el panorama de la Ciencia Abierta es muy heterogéneo, fragmentado y no está totalmente coordinado. La fragmentación aparece en todas las dimensiones de la evaluación. Los resultados de la investigación proporcionan un primer paso exploratorio para proponer medidas innovadoras que permitan determinar elementos clave en las prácticas de co-creación en el contexto de la Ciencia Abierta.

Palabras clave: ciencia abierta; innovación social; participación de las partes interesadas; co-creación.

1. Introduction

Open Science is one of the approaches put forward by the European Commission and international institutions such as UNESCO and OECD addressing the inefficiencies of R&I (European Commission, 2021; UNESCO, 2021; OECD, 2021). The trend towards openness, transparency and inclusion is mirrored in a paradigm shift from deficit to the participative mode in science communication where knowledge is created with those who are likely to use it and within the context of its use (Greenhalg et al., 2016; Gagliardi, 2016). Such an outlook has the potential to transform the society through the validated scientific knowledge and allow different Quadruple Helix stakeholder groups to make the science useful for themselves, their working environments and the society overall.

There is a large literature about Open Science initiatives covering different areas such as transdisciplinary research (OECD, 2021), university-driven interactions (D'Este & Perkmann, 2011), citizen science (MacSweeney et al., 2019) and Triple Helix relations between universities, industry and government (Etzkowitz & Leydesdorff, 2000). New forms of engagement are mostly based on principle of co-creation where value is created as the nexus of interaction (Osborne et al., 2018). The strength of co-creation is that it both captures the plurality of actors and the innovative potential that emerges when the actors aim to solve shared social problems (Mezirow, 2000). Given the centrality of the co-creation concept in Open Science discourse, it is vital for contemporary research to deepen and extend the understanding of the phenomenon in R&I systems since it seldom occurs naturally. Much is still unknown about the co-creation processes in Open Science and an overall conceptual framework which aids such understanding is lacking.

Hence, the scientific question emerges: what are the key dimensions of an ecosystem allowing the co-creation in Open Science to unfold its social and economic impact? It is this question that provides the focus of the article. To address it, first an integrative review of the academic literature regarding co-creation in complex systems was conducted to go beyond the scope of a single theory. Hence, the underlying premise of the proposed conceptual model is the interdisciplinarity integrating multiple reference disciplines dealing with co-creation in complex multi-agent systems. The literature review showed that although the researchers agree on the importance of co-creation as a new type of organizing, how to actually design Open Science initiatives for co-creation is researched to a much lesser extent. This is in part because the concept of value co-creation itself is elusive (Grönroos & Voima, 2013). The second part of the study applied the proposed conceptual framework through a meta-analysis of 33 Open Science case studies. The last part of the paper is dedicated to conclusions and implications for further research and innovative practices of Open Science.

2. Conceptualizing the Co-Creation in Open Science

Traditional innovation theories focus on the linear and one-directed flows of information from science to industry (Arnkil et al., 2010). Recent academic thought, however, increasingly acknowledges that multifaceted knowledge is needed in addressing the global social and environmental problems (Kazadi et al., 2016). Such knowledge cannot be generated within the boundaries of a single organization. Hence, we argue that knowledge creation processes in Open Science should be approached through the view of the ecosystem since it embraces a much wider socio-cultural system than the pure dyadic relationships of research/industry or research/civic society. In contrasts to the linear process approach, the ecosystem view emphasizes complex interdependencies between a variety of stakeholders and their different expectations and capacities (Clarysse et al., 2014). The notion of ecosystems has been widely used in collaborative innovation research with different qualifiers such as innovation ecosystem (e.g. Adner, 2006; de Vasconcelos Gomes et al., 2018), social innovation ecosystems (e.g. Domanski et al., 2020; Terstriep et al., 2020), knowledge ecosystem (Järvi et al., 2018), open innovation ecosystem (Chesbrough, 2003) and ecosystems of shared value (Kramer & Pfitzer, 2016). The functional

purposes of the ecosystems vary but they share certain inherent features especially when it relates to the facilitation of co-creation between different Quadruple Helix actors.

Table 1. Dimensions and criteria of conceptual evaluation framework.

Dimensions	Framework conditions	System conditions	Outcomes
Criteria for evaluation	Policies and funding Commitment of formal institutions and decision-makers Infrastructure for openness Socio-economic and cultural aspects	Diversity of actors involved Consistent and dynamic communication Shared vision and trust Feedback mechanisms Intermediaries	Outcomes of co-creation activities / benefits for stakeholders
Definition	*Favorable for Open Science implementation.*	*Favorable for co-creation and stakeholder engagement processes.*	*Beneficial for all stakeholders involved.*

Source: Developed by author.

Theoretical insights from these fields were harmonized into more general evaluation dimensions defined in Table 1. The framework suggests that in the evaluation of Open Science ecosystems three important dimensions have to be considered: framework conditions, system conditions and outcomes. Further sections will detail the three dimensions and related research.

2.1. Framework conditions

Scientists, research teams and research performing institutions do not operate in a vacuum. They work in environments which can be seen as a reservoir of possible (dis)incentives for Open Science. The contextual characteristics can influence the content, course and consequences of co-creation processes (Kumari et al., 2019). Implicitly, this means that the capacity to adopt Open Science practices and co-create depends on the wider economic and institutional environment. The framework conditions focus on the contextual factors such as policies, governance, financial and social structures amendable through policy interventions. Even though the framework conditions cannot be distinguished incisively as they are overlapping, the literature focuses on the following aspects:

- **Policies and funding favoring Open Science approaches.** Researchers strongly depend on external funding to carry out their work. Therefore, policies and funding criteria which seek to bring science closer to society can influence research practices (European Commission, 2021) and make open collaborations more attractive for professional scientists (Silvertown, 2009). Regeer and Bunders (2009) suggest that adequate funding criteria serve as stimuli for enhanced cooperation. Both OECD (2021) and UNESCO (2020) guidelines on Open Science mainstreaming in R&I systems recognize the importance of developing effective institutional and national policies and legal frameworks in line with the values and principles of Open Science.
- **Commitment of formal institutions and decision-makers.** Co-creation processes involving broad spectrum of stakeholders are big challenges for public leaders since the leadership in networks cannot rely on traditional forms of authority. Co-creative approaches require creation of mutual trust, dialogue with the stakeholders and removal of power balances in collaborations (Torfing et al., 2019; Maiello et al., 2013).
- **Infrastructure for openness (tools, spaces and training).** Open Science requires systematic and long-term strategic investments in technical and digital infrastructures and related services, including their long-term maintenance (UNESCO, 2020). Both

financial and human resources are needed for the upkeep of sustainable infrastructures which serve the needs of different communities (OECD, 2021). The resources, however, do not have intrinsic value on their own. Rather, they become valuable for a specific actor when applied in co-creative process (Mele et al., 2010). Hence, strategies are also needed to develop necessary skills to manage and use the infrastructures, while taking measures to facilitate its openness, reliability and integrity.

- **Socio-economic and cultural aspects.** Political statements and infrastructure are not enough for co-creative approaches to occur. Scientific knowledge production is a societally embedded process (Smart et al., 2019). Hence, scientific community needs at large to accept the changes on how research is conducted, measured and valued. Eckhardt et al. (2021) define the context of norms as societal framework conditions.

2.2. System conditions

While the traditional approaches to Open Science evaluation focus on the policies, infrastructures and funding that support openness paradigm by broadening attention to the ecosystem more intangible and qualitative aspects affecting knowledge co-creation can be isolated. The ecosystem concept provides a framework for co-creation, in which actors with diverse backgrounds and perspectives collectively work to improve their environment to make it favorable to innovation (Valkokari et al., 2017; Mercan et al. 2011). The co-creative ecosystem can be characterized through the following system conditions:

- **Diversity of actors involved.** When discussing the stakeholders of Open Science, the Quadruple Helix model defining industry, government, academia and civil society as the main actors in any innovation system dominates (Smart et al., 2019). Heterogeneity of actors involved is increasingly recognized as an important feature of co-creative processes. However, few studies identify the exact number and range of stakeholders needed for co-creation to happen (Reypens et al., 2016). Corsaro et al. (2012) based on previous literature identified six attributes of actors' heterogeneity which seem to influence the development of collaborative knowledge: goals, knowledge bases, capabilities and competences, perceptions, power and position, culture. This shows the importance of capacity evaluation of different stakeholder groups (i.e. can and how they participate in co-creation processes).
- **Consistent and dynamic communication.** Luoma-aho & Halonen (2010) argue that communication is a key process supporting knowledge creation by network of actors. The dynamic dialogue stipulates sharing of experiences which in turn leads to greater co-creative potential (Tchorek et al., 2020). Open communication increases awareness and diminishes resistance of the stakeholders (Tabarés-Gutiérrez et al., 2020). Dobers and Stier (2018) suggest a focal enabler here are the communication skills in how to adjust information and vocabulary depending on the target group, context and purpose of co-creative activities. Consistent communication provides a common language between interacting actors and strengthens their relationships (Frow et al., 2016). The development of common language, however, requires time and an open climate between the potential co-creators (Dobers & Stier, 2018).
- **Shared vision and trust.** Innovation ecosystems are defined by the complex interactions between various stakeholders. For co-creative outcomes to emerge the stakeholder relations require trust and understanding rather than status and position (Haxeltine et al., 2016). Here the notion of social capital reveals its importance. Social capital refers to the social networks of individuals and the norms and trustworthiness that arise from them (Putnam, 2000). According to the social capital theory, a high level of trust reduces transaction costs between stakeholders and thus increases the efficiency of ecosystems (Tchorek et al., 2020). Coordinated actions reduces conflicts and creates synergies (Torfing et al., 2019).

- **Feedback mechanisms.** For systems to learn and adapt, crucial process is one of the feedback (Chandler et al., 2019). The feedback loops in innovation ecosystems arise from the interactions between different actors and resources (Ngongoni et al., 2021). The adjustment of certain key factors may have a lasting and effective impact on the system and its stakeholders. According to Roundy et al. (2018) the quantity and quality of feedback determines the overall effectiveness of ecosystem due to the mutual interdependence of actors. Tabarés-Gutiérrez et al. (2020) suggest that the integrated feedback mechanisms also create incentives for the uptake of Open Science practices.
- **Intermediaries.** There is also extensive literature on innovation intermediaries providing support for collaboration between two or more actors and bridging gaps of knowledge, competency and capability (Edler & Yeow, 2016). Intermediaries possess experiences and insight into the logics, language and obstacles of co-creation (Dobers & Stier, 2018). Such facilitators support the ecosystem actors in making new connections and sharing their knowledge and resources in concrete ways (Ketonen-Oksi & Valkokari, 2019). Universities seem to play an essential role in innovation ecosystems as knowledge integrators (Tolstykh et al., 2021; Cai et al., 2020).

2.3. Outcomes of co-creative activities

Researchers agree on the significant benefits of co-creation including but not limited to active enhanced innovation processes and democratized participation (Torfing et al., 2019; Rock et al., 2018). As co-creation involves new social practices and modes of interaction, Eckhardt et al. (2021) consider it as an emerging and currently diffusing social innovation itself. Opening up the scientific process is not simply about sharing, but increasingly about participation, ensuring new knowledge is better used for societal improvement (MacIntosh et al., 2017). There is already qualitative (D'Este et al., 2018) and quantitative evidence (Mascarenhas et al., 2018; Sjöö & Hellström, 2019) that open collaboration in science generates benefits for the society and the economy. The notion of ecosystem emphasizes the systemic nature of relation of actors linked together in mutually beneficial collaborations (Mele et al., 2014). Hence, when evaluating the outcomes deriving from co-creative ecosystems both benefits for the whole ecosystems and individual actors have to be considered.

3. Practical Understanding of Open Science: Applying the Conceptual Evaluation Framework

Meta-analysis aims to apply the proposed conceptual evaluation framework and gain a more practical perspective of co-creation in Open Science. The meta-analytical methods offer powerful means to summarize and synthesize existing knowledge. Meta-analyses are becoming an increasingly popular way of combining findings across research studies in social science (e.g. Jensen & Rodgers, 2001; Newig & Rose, 2020; van der Jagt, 2020). In general, meta-analysis presumes that the originating question in primary studies is not dramatically different. Hence, case studies focusing on Open Science implementation were selected.

Two primary sources were used for meta-analysis: Open Science Monitor (2019) and European Research Council (2019) case studies. Open Science Monitor (OSM) study covers cases on applications of open access to publications, open research data and open collaboration. The OSM data collection approach included semi-structured interviews, direct observations and secondary data analysis. European Research Council (ERC) case studies focused on specific ERC projects that showcase particularly interesting Open Science related activities. The aim of the case studies was to identify common challenges encountered by researchers, incentives and support available to them. These two before mentioned sources provided access to 33 case studies representing a broad spectrum of Open Science initiatives concerning the entire cycle of scientific process and different fields of science (see Table 2 for summary).

Table 2. Sample of case studies.

Code	Project title and/or acronym	Code	Project title and/or acronym	Code	Project title and/or acronym
OSC1	AsPredicted	OSC12	Mendeley	OSC23	Neuronal Dynamics
OSC2	Zenodo	OSC13	Research Data Alliance	OSC24	BrainInBrain
OSC3	The Netherlands' Plan on Open Science	OSC14	Electronic Laboratory Notebooks (ELNs) as Key Enablers of Open Science	OSC25	OurMythicalChildhood
OSC4	Yoda	OSC15	Citizen Science in the Surveillance and Monitoring of Mosquito-Borne Diseases	OSC26	INDIRECT
OSC5	Open Targets	OSC16	ORCID	OSC27	CompMusic
OSC6	REANA	OSC17	Open Metadata of Scholarly Publications	OSC28	Twelwe Labours
OSC7	Pistoia Alliance	OSC18	Open Hardware Licences: parallels and contrasts	OSC29	PROduCTS
OSC8	Faculty of 1000	OSC19	DATA SCIENCE	OSC30	RATE
OSC9	White Rabbit	OSC20	WORDS FOR ART	OSC31	TransMID
OSC10	Utrecht University Open Science Programme	OSC21	PHASENANOCRACKER	OSC32	VIRALPHYLOGEOGRAPHY
OSC11	Finnish Open Science and Research Initiative	OSC22	CompEnzymeEvolution	OSC33	BEGMAT

Source: Developed by author.

The research objectives can be described as exploratory. Although each case had unique challenges and characteristics which can influence the knowledge co-creation and behavior of involved stakeholders, it was possible to gain transferable insight. The case-based evidence was collected using the qualitative content analysis. The content was coded using content analysis software Nvivo. The bottom-up approach was applied by creating simple codes and eventually grouping them together. Each case study was analyzed to find instances where the case study discussed (1) framework conditions; (2) system conditions and (3) outcomes of Open Science initiatives. After descriptive coding, output lists per code and per code set were analyzed and recurrent themes were identified for each code set (thematic analysis). By treating these cases as a series of experiments, the focus was on finding patterns across different contexts. One of the main limitations of this meta-analysis is that it analyzed a limited number of case studies to explain a complex and evolving phenomenon. Also, some aspects that are relevant to the evaluation framework were not discussed in full depth in primary case studies. It certainly does not provide a complete overview of all types of factors influencing co-creation processes nor can it be a generalization of all Open Science initiatives.

4. Results of the meta-analysis

4.1. Framework conditions

4.1.1. Policies and funding favoring Open Science approaches

The meta-analysis of cases studies confirmed that the "current system of rewards <…> is geared towards the impact factor of journals and the importance of the journal of publication"

(OSC8). In addition, the analysis revealed that there is no clear structure and responsibilities (OSC11) and well-aligned vision for science between EU (and national) and research institutions (OSC13). OS contributions of researchers are not visible (OSC13) and predominant model at the moment is decentralized (OSC2). The discussions also focused on the financial barriers such as additional costs of databases (OSC20, OSC24, OSC29), software development (OSC24, OSC31), assistance of IT professionals (OSC14) and high open access publishing fees (OSC22, OSC29). Meta-analysis revealed difficulties in ensuring the longevity of projects in terms of associated costs and resources needed for platform maintenance after the end of grant (OSC29). It has been noted, that "OSC2: "Policies usually emphasize the problem of adoption of open science practices <…> but they also need to address the challenge of sustaining and scaling up the services"). In addition, most of the projects are still new and developing, hence there are limited examples of successful "sustainability models for the maintenance, development, and exploitation of science gateways" (OSC13). In addition, Open Science practices require a serious commitment and time resources from researchers (OSC7, OSC22, OSC23, OSC28, OSC29, OSC31).

The case studies revealed an absence of legal mechanisms ensuring a fair economic return for contributors (OSC9). The current regulatory framework is insufficient and/or outdated (OSC21: "Scientific publishing is run under a legislation that is not designed for it: the copyright law is not appropriate for academia but rather is designed to protect the authors of novels"). Hence, there is a need to establish a clear legal framework at least within projects e.g., OSC9: "A legal framework was also provided by CERN to foster the knowledge sharing among the diverse organizations." Management of data, information and knowledge flows pose several complex challenges which inhibit implementation of Open Science. Such uncertainties include concerns about applicable copyright of data shared (OSC25, OSC30), liability issues (OSC4, OSC18), data integration between tools (OSC2, OSC31), data fragmentation (OSC19), research ethics (OSC30, OSC31) and data security (OSC3, OSC14, OSC30, OSC31).

However, the situation is not so dim and one can already notice positive developments in Open Science application. For example, the requirements of funding agencies for Open Access (OSC19, OSC21) influenced the way research results are published. Hence, similar top-down approaches were suggested in the case studies including coordination and commitment of key actors with a central role dedicated to European Commission (OSC2, OSC3, OSC8, OSC11, OSC13, OSC14, OSC16), stable funding (OSC17), monitoring (OSC5, OSC9, OSC11) and development of basic infrastructure (tech solutions, data infrastructure) (OSC3, OSC11, OSC13, OSC16).

4.1.2. Commitment of institutions and decision-makers

The commitment of institutions and decision-makers was discussed to a limited extent. The case studies underlined the importance of clear European policies and guidelines in furthering national developments and raising awareness about benefits of Open Science (OSC11). However, the case studies did not further extent on the obligations of other institutions and decision-makers.

4.1.3. Infrastructure for openness

Although current research infrastructures have grown both in quality and quantity, there is still a wide range of aspects to improve in order to support research and collaboration workflows to transit to a culture of openness. Technologies pose both the complication of OS processes and acceleration of their solutions. The case studies underlined the difficulties in finding a cost-efficient and reliable solutions for data management (OSC22), platforms offering a one-size-fits-all approach despite the fact that researchers are solving unique problems with different methods (OSC14, OSC20), the complexity of data preparation (OSC29), use (OSC14), licensing (OSC18)

and integration (OSC16) within technological solutions; challenges in mimicking industrial-scale data management software (OSC33), limited accessibility (OSC14, OSC26) and interoperability (OSC5, OSC8, OSC12, OSC14) of open science tools. A number of case studies underlined the lack of training on what Open Science is, how to do it and why it is beneficial (OSC8, OSC13, OSC22).

4.1.4. Socio-economic and cultural aspects

Socio-cultural barriers come mainly from researchers and are related to the lack of motivation (OSC13), benefits for a career (OSC4, OSC8, OSC9, OSC10, OSC11) and awareness of what Open Science entails (OSC6, OSC8, OSC11). The ecosystem faces resistance to change (OSC11) since the researchers are attached to the more traditional ways of conducting research (OSC6) and feel a strong sense of ownership towards research data (OSC3). In most cases, open science approaches are understood as an additional burden (OSC22: "The extra effort involved in curating and managing data is a challenge for many people. They feel they could be working on another paper instead of curating the data"). In the research and innovation systems, a culture of secrecy often prevails (OSC4: "the prevailing culture of secrecy has been one of the most significant barriers in creating and making grow YODA"). Hence, cultural change is inevitable on the part of other stakeholder groups including research institutions, funders and government bodies on their vision, policies, practices (OSC19: "The simple reason is that the changes around data sharing are cultural, involving tensions and conflicts between parts of academia and beyond academia"). The case studies highlighted some signs of changes. Most notably the positive perceptions of Open Science by young researchers (OSC22) and collaborative culture in some research fields such as insect neurophysiology (OSC23, OSC24, OSC25, OSC27, OSC32).

4.2. System conditions

4.2.1. Diversity of actors involved

The concept of Open Sciences calls for more transparent, collaborative and participative science. The way to achieve this is through cooperation with different stakeholders during the research process. The meta-analysis aimed to identify the variety of stakeholder groups involved in Open Science initiatives. The main actors identified fall into the four categories defined in the Quadruple Helix model. However, the qualitative content analysis provided a more granular view of the stakeholders involved in the system (See Table 3 below).

The case studies underlined the need for stakeholder diversity in (1) levering the capabilities of many organizations by giving access to different stakeholders leading to combination of expertise, capabilities and capacities (OSC5); (2) harnessing the strengths of all stakeholders (OSC5); (3) facilitating data exchange and information flows between stakeholders (OSC7) and (4) use of information in combination with stakeholders' own knowledge and experiences (OSC3). The case studies indicated that there is no one-size-fits-all approach when it comes to defining stakeholders of Open Science initiatives. Stakeholders are often drawn to the reputation and/or unique resources (knowledge, technologies, infrastructure) the initiative possesses.

Table 3. Stakeholders of Open Science ecosystems.

Academia	**Industry**	**Government**	**Civil Society**
Researchers	Startups, SMEs	Governmental institutions	General public
Administrators and research managers	Large industrial organizations	Public health organizations	Individual citizens
Research performing organizations	Private funding bodies	Environmental organizations	Citizen scientists
Universities and other higher education establishments	Individual entrepreneurs	Public funding agencies	Non-Governmental Organizations (e.g. UN, OECD)
Libraries	Experts from private sector	European level institutions	
Open science platforms, tools (developed by universities)	Commercial publishers	Museums	
	Private research institutions		
	Open science platforms, tools (commercial)		

Source: Developed by author.

4.2.2. Consistent and dynamic communication

The case study content underlined the importance of knowledge sharing through dialogue (OSC10, OSC11), knowledge exchange between public and private sectors (OSC13), diverse collaborative practices, tools, and protocols (OSC9), new modes of collaboration (e.g. OSC31: workshops with collaboration researchers, OSC5: forming partnerships in earlier stages of R&D process; OSC7: collaborative development of common standards between industry and academia). Purposeful communication is needed when showcasing the benefits of Open Science (OSC8: "that open science is not seen as an alternative to good science - open science is good science and good science needs to be open science"). The role of success stories here is of crucial importance because they can illustrate a real-life impact on individual researchers, research groups and institutions (OSC25). Education and training were also highlighted as an essential element of communication through the fostering of the international exchange of practices and learning activities (OSC11), skills development at scientist, specialist and managerial levels (OSC3, OSC6, OSC11), training activities for citizens for better data collection outcomes (OSC15), promotion of open science platforms by funders (OSC8) and mentoring programmes (OSC13).

4.2.3. Shared vision, confidence and trust

The case studies highlighted a lack of coordination and common between stakeholders (OSC11, OSC13). Upfront credit of trust is necessary for broader stakeholder groups to align with visions of openness (OSC16: "This shows that in order for the ORCID registry to be implemented, a certain, upfront credit of trust is necessary - at least as long as network effects due to growing numbers of users are not visible yet, or as long as benefits are not immediately visible either."). A number of strategies were suggested to alleviate this barrier including centralized support through consensus and regular discussion (OSC13), guidance (OSC14), concerted action (OSC16), economic support of funding organizations (OSC2), operationalization of policies (OSC3), targeted action plans (OSC3).

4.2.4. Feedback and monitoring

Feedback and monitoring mechanisms were discussed to a limited extent. Case studies mentioned the importance of transparent, periodical and systemic monitoring as a prerequisite for a merit system inclusive of Open Science (OSC3, OSC5, OSC9, OSC11). However, more concrete instances of how the initiatives and stakeholders collect evidence and use it to improve performance were missing in analyzed content. The lack of feedback loops can be attributed to a limited number of Open Science projects that are ongoing for a longer period of time.

4.2.5. Intermediaries

The roles and presence of intermediaries of the ecosystem were mentioned seldomly. While waiting for more complete public regulation, effective initiatives can be put in place by stakeholders. The case study content revealed that such initiatives are prominent drivers of Open Science. For example, PubMed by the United States National Library of Medicine at the National Institutes of Health (OSC17), Initiative for Open Citations (i4OC) (OSC17), CERN (OSC2, OSC6, OSC9) and Center for Digital Humanities at the University of Trier (OSC20). In most cases, such organizations are understood as more neutral providers in terms of content custody and are perceived more positively by various stakeholders (OSC2).

4.3. Outcomes

The content analysis revealed that the perceived outcomes of the Open Science initiatives are mostly academia-centric and do not consider potential added-value for all Quadruple Helix groups. Especially when it comes to the participation of civil society in the scientific processes. This might of course be the fault of limited diversity of case studies. However, the findings relate to other studies and broader trends in Open Science, which highlight that opening up the scientific processes, especially when it involves the general public, is a complicated endeavor requiring time, resources and dedicated strategies (Wehn et al., 2020). The outcomes discussed in the case studies can be grouped in three broad categories: (1) for science system and progress, (2) for researchers and (3) for non-academic actors.

4.3.1. Outcomes beneficial for the science system (quality of science) and progress

The first set of outcomes relates to the scientific advancements and improvements in how the science is conducted. In most cases, the focus was on more abstract outcomes of opening up the science e.g., advance knowledge, make research easier, increased research coverage. However, some more specific impact was mentioned too such as an emergence of new subfields of research (OSC30), novel scientific findings (e.g. detections further from known insect invasion areas in OSC15), application of innovative methodology based on a highly sophisticated network of interlinked information (OSC20). The case studies also showed that Open Science can lead to a greater impact of research (OSC31), visibility of science and scientific papers (OSC30) by reaching wider academic and non-academic public (OSC28).

One of the core values of Open Science is sharing, not only traditional research outputs such as publications, but also the scientific data and corresponding documentation. The case content analysis showed a clear move towards applications of FAIR (findable, accessible, inter-operable and reusable) data principles. The meta-analysis of selected case studies revealed that when properly used Open Science tools (e.g. ELNs) can help promote the implementation of FAIR principles (OSC10, OSC13, OSC14). When the scope of the initiative is broad (e.g. OSC10, OSC7 initiatives in national context or consortiums of partners), the FAIR principles are presented as general guidelines for collaboration. However, how the principles are applied depends on the specific disciplines, methods used and contexts. When discussing the outcomes, some projects

focus some FAIR principles more than others e.g., defined standards, databases, repositories and policies (OSC13, OSC14, OSC33), efficient reuse of data (OSC15, OSC19, OSC20, OSC28, OSC31, OSC6), transparency (OSC16, OSC8), effort to improve practices around documenting and depositing data and software (OSC25, OSC27), access to data (OSC2, OSC4, OSC5, OSC24).

4.3.2. Outcomes beneficial for the researchers

If we are looking at the outcomes of Open Science directed towards researchers, the meta-analysis showed the impact in various steps in the academic work cycle: investigation of literature (OSC12), easier compliance with internal and external standards (e.g. rules, regulations) (OSC14, OSC33), enhanced academic productivity (OSC12, OSC14), more sophisticated tech tools supporting research (OSC7). For the teams of researchers, the application of Open Science can lead to spending less time on managerial issues (OSC16), enforcement of academic communities and/or research teams' goals (OSC18) and a more comprehensive overview of workflows between team members (OSC33). In general, Open Science is mentioned often in the context of enhanced collaboration opportunities. The participants of the case studies (OSC28, OSC29, OSC31) noted that the researchers applying the Open Science principles are often perceived as more accessible and OS tools allow them to connect with colleagues working outside their institutional boundaries. This might also lead to new career opportunities (OSC12), especially for scholars who are less advanced in their careers and do not have established positions or well-known names (OSC20). Open Science can also bring personal satisfaction to the project leaders when they see data used in different contexts (OSC29).

4.3.3. Outcomes beneficial for non-academic actors

The outcomes for other stakeholder groups were discussed to a much lesser extent. In relation to the civil society, Open Science initiatives can lead to an increased innovative capacity (OSC3), accountability of science to society (OSC16) and relevance to the wider communities (OSC10). It can also result in reduction of costs (e.g. OSC5: "lengthy, costly, low success rate, high attrition rates and complexity in drug discovery"). From the public interest perspective, open information makes it easier for governmental authorities to make decisions (i.e. implement evidence-based policies). In the case of OSC29, the novel information sources allowed the team to track the pesticide transformation products in the ground water. In the context of benefits for industry, it was mentioned that companies could gain some reputational benefits because of collaborations with established academic institutions (OSC9). Otherwise, the benefits discussed were academia focused.

5. Conclusions

The proposed conceptual model allowed to gain a deeper understanding of how Open Science initiatives work and provided a basic, open analytical grid for data synthesis through ecosystem heuristics. Based on the results of evaluation, it can be concluded that Open Science landscape is highly heterogenous, fragmented and not fully coordinated. The fragmentation appeared in all dimensions of evaluation. The analysis of the framework conditions indicated a clear need for political commitment and regulation. The analyzed ecosystem of 33 Open Science initiatives currently lacks an enabling environment for actors to engage in co-creation activities. The analysis of system conditions showcases limitations on part of common vision, clear communication and intermediaries. The outcomes of analyzed initiatives are mostly academia-centric and do not consider potential added-value for other Quadruple Helix groups. This is largely in line with findings from previous literature. For example, the 2020 UNESCO multi-stakeholder consultation on Open Science concluded that the Open Science policy system is fragmented and appears to be a collection established by individual universities and research

funding agencies (UNESCO, 2020). However, the case-based findings allow to pin down the specific aspects of Open Science implementation which need to be refined.

This paper extends knowledge on co-creation in research and innovation systems by conceptualizing the phenomenon. First, the paper captures the conceptual essence of Open Science and co-creation. Second, the paper integrates the research to capture the multiple dimensions of the concepts and adapts it to conceptual framework. Third, the proposed conceptual framework is applied in analysis of Open Science case studies. Hence, from a scientific point of view, the research contributes to the literature by deconstructing the social rather than technological links in Open Science development. The proposed framework underlines the importance of evaluation of the collective actions by multiple stakeholders in creating innovations. The conceptual framework offers a first exploratory step in proposing measures to determine the elements of co-creation practices within Open Science context. The study provides insights for the exploration of the co-creation of social innovation and settles research agenda for further studies.

The practical implication of the analysis is the provision of evaluation tool leading to the insights for policy-makers on how to facilitate co-creation of social innovations through Open Science measures. Open Science is a rapidly expanding and diversifying field of social innovation with significant implications for and potential benefits to society, policy and various academic research areas. In facing global challenges, the scientific knowledge development needs to leverage strength of different stakeholder groups and to find new ways to control the influx of information. Society is currently facing grand challenges which are complex, interconnected and multidisciplinary. The solutions to such problems are almost impossible without the active and direct participation of actors of society. Effective measurement and management of the co-creation processes in Open Science would strengthen the confidence of the public in the science system and enable collective problem-solving in multiple contexts.

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Research Article

Bridging Social Innovation in Education and Organisational Learning

Conectando la Innovación Social en la Educación con el Aprendizaje Organizativo

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Abstract: This article combines two research approaches so far not connected but mutually reinforcing each other: social innovation and organisational education. On the one hand, theoretical and practical development of social innovation in education is a growing research area. On the other hand, organisational education, through its outlined Research Memorandum Organizational Education, is strengthening research of organisations and learning processes, especially on learning in, by and between organisations. To unfold the potential of social innovation in education, new cooperation and governance structures are needed to integrate all the relevant stakeholders to solve educational demands and mismatches. This is a prerequisite for making the formal education system more receptive to social innovations. The organisational education approach is focusing on a yet neglected part of the social innovation process: the change of organisations by mutual learning processes within an innovation ecosystem bringing together stakeholders from education and research, economy, policy, and civil society. The article shows the connections between both approaches by drawing on examples in practice from different applied research projects.

Keywords: social innovation; social innovation in education; organisational education; networks; new skills alliances; education and training.

Resumen: Este artículo combina dos enfoques de investigación hasta ahora no conectados, pero que se complementan mutuamente: la innovación social y la educación organizacional. Por un lado, el desarrollo teórico y práctico de la innovación social en la educación es un área de investigación en crecimiento. Por otro lado, la educación organizacional, a través de su Memorándum de Investigación sobre Educación Organizativa, está robusteciendo la investigación sobre las organizaciones y los procesos de aprendizaje, especialmente sobre el aprendizaje en, de y entre las organizaciones. Para desplegar el potencial de la innovación social en la educación, se necesitan nuevas estructuras de cooperación y gobernanza que integren a todas las partes interesadas para resolver las demandas y desajustes educativos. Este es un requisito previo para que el sistema educativo formal sea más receptivo a las innovaciones sociales. El enfoque de la educación organizacional se centra en una parte aún descuidada del proceso de innovación social: el cambio en las organizaciones mediante procesos de aprendizaje dentro de un ecosistema de innovación que reúne a las partes interesadas del ámbito de la educación, la investigación, la economía, la política y la sociedad civil. El artículo muestra las conexiones entre ambos enfoques a partir de ejemplos prácticos basados en diferentes proyectos de investigación aplicada.

Palabras clave: innovación social; innovación social en la educación; educación organizacional; redes; nuevas alianzas de competencias; educación y formación.

1. Bridging Organisational Education and Social Innovation in Education

The study of social innovation aims to understand how new social practices are configured (Howaldt & Schwarz, 2010) and how change of social practices manifests itself in different dynamics, institutions and contexts. Recent research has examined how social innovations contribute to social change (Howaldt et al., 2015; Maldonado-Mariscal, 2020). Key dimensions identified for social innovations address (1) societal challenges and social demands, (2) concepts and understanding, (3) resources, capabilities and constraints, (4) governance, networks, actors, and (5) process dynamics.

Schröder and Kuschmierz (2017, p. 2) allocated these five dimensions to the policy field of education and used them as parameters for the description of social innovation initiatives and social innovation processes: (1) by referring to societal challenges and social demands on the regional local level (e.g. reducing educational disadvantages), (2) describing concepts and understanding by types of social innovations in education, (3) taking advantage of given capabilities and overcoming constraints, (4) establishing new networking and governance structures (e.g. for lifelong learning); and (5) collaborating innovation processes of mutual learning.

Organizational education investigates learning processes in three different dimensions: the internal processes of an organisation, the institutions created by the organisations, and finally, the networks created between the different organisations. Therefore, we can say that organisation education is mostly interested in learning processes in, by and between organisations (Schröer et al., 2020, p. 3).

Observing recent advances in research on social innovation and organisational education, the main link between both lies in changing institutions and networks and developing new social practices: "A key aspect is research into networks and alliances, together with the emergence of new societal, cultural, economic and political practices." (Göhlich et al., 2018, p. 208).

Against this backdrop, the main connection between both approaches relies on the implications for organisations and the related education and learning perspective. Special interest of organisational education is given to organisational learning and creativity of institutions (Weber & Peters, 2019). Therefore, as a central dimension of organisational education, we will concentrate in the following on learning in, by and between organisations, and on new organisational structures for social innovation in the field of education.

1.1. Organisational Education: Learning In, By and Between Organisations

The Research Memorandum Organizational Education (Göhlich et al., 2018) is focusing on six research topics which are to a great extent compatible with the key dimensions of Social Innovation. In the following Table 1, we present the key dimensions of both fields.

Looking at the Research Memorandum Organisational Education (Göhlich et al., 2018) the research objectives are covering most of the social innovation dimensions, especially understanding learning and organisational change. Organisational education is mostly interested in learning processes within organisations, by the organisations, and between the different organisations. One of the most interesting aspects of research in organisational education for sociology is the formation of networks or collectives (Gamoran et al., 2000). Both the individual and collective characteristics of organisations allow for a better understanding of educational contexts. Similarly, a key research question of organisational pedagogy is about the development of hybrid organisations or hybrid stakeholder constellations (Schröer et al., 2020, p.3; Weber & Peters 2019).

Additionally, the "participative, processual, aestheticizing and creation-oriented research approaches" (Göhlich et al., 2018, pp. 207-211) of Organisational Education are very much in line with bottom-up and co-creation concepts of most of the grassroots social innovation initiatives.

Table 1. Key dimensions of Organisational Education and Social Innovation.

	Organisational Education	Social Innovation
1.	Organisational learning structures and processes	Processes
2.	The protagonists of organisational learning	Actors
3.	General framework conditions of organisational learning	Capabilities and constraints
4.	Institutionalized support for organisational learning	Governance and networks
5.	Organisational learning in specific fields of practice	Practice fields, societal challenges, social demands
6.	Institutionalization, professionalization and internationalization of organisational education	Social practices, mechanisms of diffusion

Source: Own elaboration based on Göhlich et al. (2018) and Schröder & Krüger (2019).

1.2. Social Innovation in Education

Despite a growing body of research on social innovation worldwide (Ayob et al., 2016; Howaldt et al., 2014), there is not yet a consensus on a definition for social innovation in general (Howaldt et al., 2016; Howaldt et al., 2018; Edwards-Schachter & Wallace 2017; Rüde & Lurtz 2012; Pol & Ville, 2009; van der Have & Rubalcaba, 2016) and such consensus is missing as well in the field of education. Concerning social innovation in education it has to be stressed that even the term "social innovation" is not reflected in the policy field education; although a lot of social innovation initiatives are existing, they are not labeled as social innovations (Schröder, Krüger & Kuschmierz, 2017). However, analysis of innovative initiatives in education underlined the definition and key elements of the social innovation concept for educational innovations.

In the context in which social innovation in education happens, new actors emerge as innovators and give place to new collaborations between communities, schools, government, and non-governmental organisations (Maldonado-Mariscal et al., 2018). Also, new networks between companies, educational institutions, and different stakeholders emerge at the local, national and international level; building in this way challenge-related ecosystems of innovation where relevant stakeholder groups are involved and have different roles and responsibilities (Schröder & Krüger, 2019).

Key elements of social innovation are new social practices (Howaldt & Schwarz, 2010; Butzin et al., 2014a, 2014b), which are identified within "the creation of new institutions, new ways of organisation, new social relations and re-location of power; combination of factors, processes or institutions in order to give place to new forms for better solutions, and to foster social change" (Maldonado-Mariscal, 2017, p. 39).

We will show this by (1) the impact of grassroots initiatives on existing structures and organisations of the education system, and (2) social innovation at workplace: the need for combining Industry 4.0 with qualification and learning (Work/Qualification 4.0) by New Skills Alliances (comprising technological, organisational and social impact).

2. Concepts and Examples of Social Innovation in Education

Social innovations in education refer to recent educational challenges and demands leading to different innovation processes and practices, governance, networks and actor constellations. New types of partnerships, introducing new roles for actors and building ecosystems, require appropriate coordination and governance strategies combining different levels and, over time, indicate new institutionalized practices. This will be illustrated by the results of the SI-DRIVE project (www.si-drive.eu/) and selected examples of the policy field education: Exchanging Education for Habitation and HESSENCAMPUS (new regional structures for lifelong learning).

Referring to the mainly technology-led discussion of Industry 4.0 there are also social innovations in and for skills adjustments, illustrating different learning processes within, by and between companies (economic and educational organisations), creating new processes for adjusting skills to new demands at the workplace proactively. Taking this up and focusing on cooperation and learning between organizations, networks are created and new organisational governance structures for (vocational) education and training emerge; illustrated by new sectoral Skills Alliances: The European Steel Skills Alliance (ESSA www.estep.eu/essa) and the Skills Alliance for Industrial Symbiosis (SPIRE-SAIS www.spire2030.eu/sais).

2.1. Exploring the ground for Social Innovations in Education

The most extensive examples of social innovation in education can be seen in the framework of the large-scale global project Social Innovation - Driving Force of Social Change (SI-DRIVE)[1], which was funded by the European Union (EU) from 2014 till 2017. The project represents relevant research on social innovation due to its global nature but also because of its theoretical and empirical research. Within the overall mapping of 1,005 cases of social innovation initiatives in different policy fields (leading to the Atlas of Social Innovation (www.socialinnovationatlas.net; Howaldt et al. 2018 and 2019) first insights in Social Innovation in Education were examined, collecting and analysing 211 social innovation initiatives and cases in this field. With these cases, social innovation in education became visible because of their advanced phase of implementation, responding to (local) social demands with the following main topics (practice fields): (a) reduction of educational disadvantages, (b) new learning arrangements, (c) digital inclusion, (d) improvement of the quality of education system, and (e) strategic partnership between education and economy (Schröder & Kuschmierz, 2017, p. 5).

Between the different key dimensions (listed in chapter 1) one of the main elements of social innovation within SI-DRIVE concerns governance. In order to understand relevant ways of social innovation governance, we need to better understand networks, different cooperation forms and communication channels (Schröder & Kuschmierz, 2017, p. 114).

An example of social innovation giving us insights on these aspects is an initiative that worked towards a reduction of educational disadvantages by developing a strategic partnership between civil society, educational institutions and social enterprises in Germany: Exchanging Education for Habitation (Tausche Bildung für Wohnen –TBfW)[2] (Schröder & Kuschmierz, 2017, pp. 17-18). This initiative started in 2011 improving social and educational integration of children with a precarious living background. Exchanging Education for Habitation is a registered association providing free housing for young education mentors (students) in a disadvantaged district (Duisburg-Marxloh). The initiative is based on exchange principles (barter economy), where children from economic and social disadvantaged neighborhoods are taught and coached by students who get a flat in the district without paying rent in exchange. By exchanging rent-free living space for education activities, a win-win-win situation for children, teaching students and the disadvantaged neighborhood is given (by also modernizing run-down houses), all in all leading to an improvement of the living situation in the district in the long-term.

The partnership of this initiative includes mainly local actors: schools, youth centers, social centers, churches, cultural and pedagogical centers, and charity organisations. A non-profit foundation supported this initiative through a start-up consultancy service, because the initiative won a competition of social enterprises working on education. Additionally, university-based entrepreneurship centers supported this initiative through consultancy in the design phase of this project (ibid).

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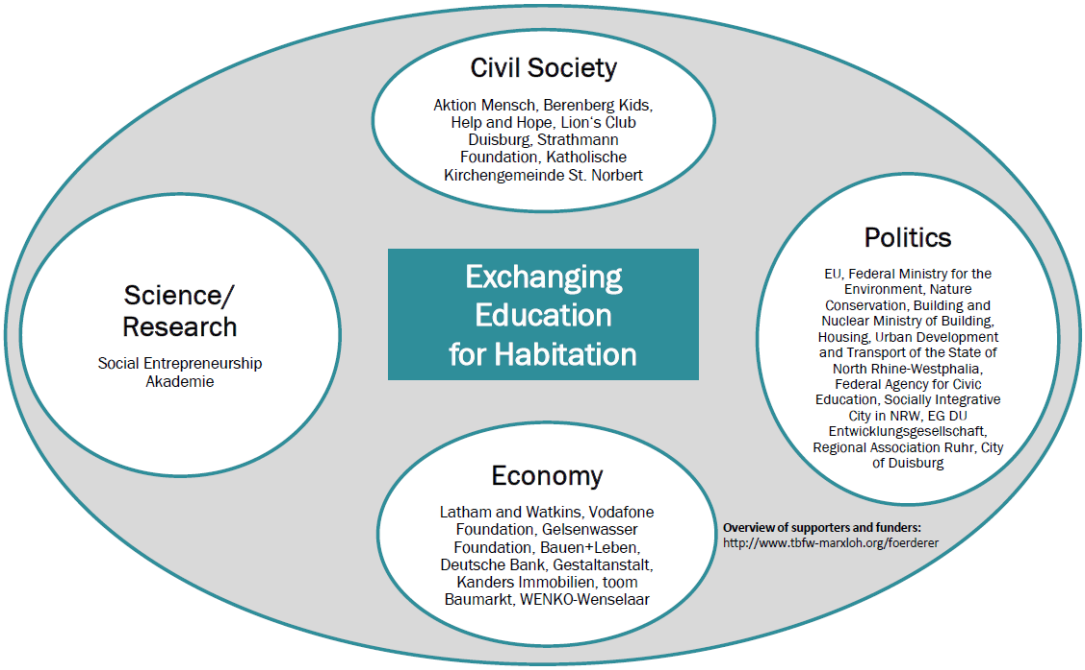
[1] SI-DRIVE (Social Innovation: Driving Force of Social Change). This project has received funding from the European Union's Seventh Framework Programme for research, technological development and demonstration under grant agreement no 612870. https://www.si-drive.eu/

[2] Tausche Bildung für Wohnen –TBfW. https://tauschebildung.org/

Figure 1. Social Innovation Ecosystem, an example of Exchanging Education for Habitation.



Source: Tausche Bildung für Wohnen e.V./Exchanging Education for Habitation, taken from Schröder & Krüger (2019).

Another example on social innovation education is the initiative HESSENCAMPUS (https://www.hessencampus.de). Based on the hypothesis that successful Lifelong Learning has to go beyond existing institutional education and training structures up to new overarching and comprehensive lifelong learning structures and systems, a paradigm shift from an institutional or organisational perspective to an unrestricted learner or learning process perspective was transferred into practice. This includes that adult learning is different from children's learning: Adult learning needs to go from pedagogy to an "andragogy"-based approach (see Knowles' andragogical theory in Knowles 1973) with adult specific education and training didactics and methods.

The initiative started from the assumption that the implementation of Lifelong Learning needs not only a system-related approach but a "social innovation" process, in which relevant stakeholders, institutions and policy makers as well as the inhabitants of the region and its related localities are involved.

HESSENCAMPUS therefore shifted from an institutional to a strict learner's and learning process perspective, establishing new overall and comprehensive structural principles of the education system. It was organised as an overarching regional-local social innovation process for the following objectives:

- improving, changing, and creating new social practices concerning social roles, relations, norms and regulations,
- going beyond existing borders and pure networking,
- following the aim of a strict user focus instead of the traditional institutional focus.

HESSENCAMPUS (HC) was initiated by the Ministry of Culture in the German federal state of Hessen in 2006 in order to further develop adult education through a binding cooperation of mainly public educational institutions in a new and innovative regional-local partnership and structure ("HESSENCAMPUS") referring to different local framework conditions. More than 200 actors (79 schools, mostly adult and vocational schools; 51 training institutions; 25 employer associations and employment agencies; 13 regional or local administration departments, and

others) developed more than 100 different operational fields, products and solutions leading to 21 different regional governance structures and topics.

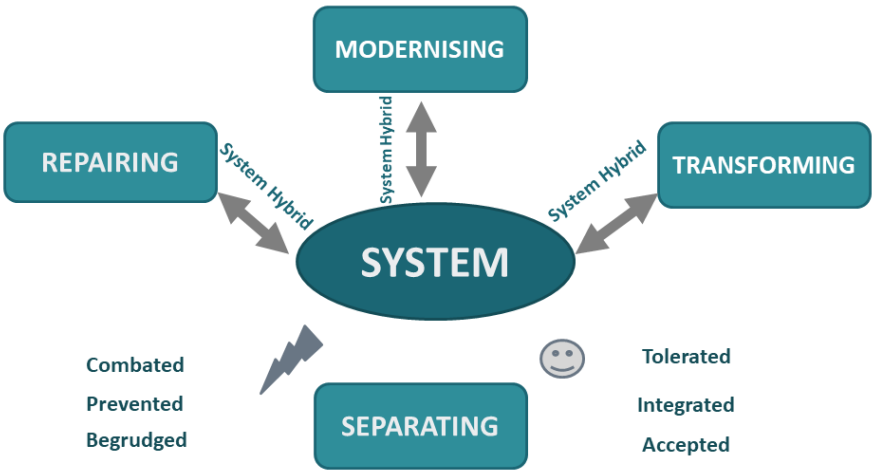
Based on public responsibility for education of the Land Hessen (Germany), development and co-creation in partnership was providing a common ground and a cautiously formulated framework of development aims and procedures. With such a social innovation process, existing structures and responsibilities were changed leading to organisational education and learning and system changes in correspondence to the regional-local demands and overarching cross-regional support and legislation structures. Tensions appeared, because of the need of structural changes concerning the own organisation. Learning in, by and between the organisations became a day-to-day management and governance task.

Within a process of collective creation (Crozier & Friedberg, 1993) this social innovation process finds its challenges and success within binding structures going beyond pure networking accepted by all the involved actors with increased demands for the organisational model and the management of this improved networking (for further information see Schröder, 2012).

The two examples demonstrate organisational education and learning on the local (TBfW) and the regional-local cooperation level (HC). They illustrate not only the capacity of local or regional actors to innovate where social needs are present, but also the learning in, by and between organisations, leading more or less to new educational structures.

Some of the analysed case studies in the framework of SI-DRIVE are local initiatives within the formal system of education. Other initiatives are part of the non-formal education system, but they represent initiatives by actors that identified social, educational, and economic needs and create partnerships with different institutions to attend these needs. As elaborated by Rabadijeva et al. 2018, the education system is affected by social innovation initiatives through modernizing, repairing, and transforming the system and therefore its organisation, (see Figure 2). Even separated and "standing outside" innovations have an impact on the system and its organisation by showing additional solutions for solving educational demands.

Figure 2. Typology of Social Innovations in the Field of Education.



Source: Rabadijeva et al. (2018, p. 86).

2.2. Sectoral Skills Alliances Development as Educational Social Innovation Processes (ESSA and SPIRE-SAIS)

To solve education and training related challenges due to recent technological developments (green and digital transformation) there are several approaches on the company, the sectoral and European level. On the European level, sectoral, network and workplace related solutions are favorized. E.g. the European Workplace Innovation Network (EUWIN,

https://workplaceinnovation.eu/euwin/) promotes "the concept of workplace innovation throughout Europe as a way of enhancing capacity for product, service and process innovation, increasing business competitiveness and creating better working lives for our citizens". The European Commission renewed the already existing New Skills Agenda in 2020 and set up a "sectoral Blueprint" Program under the funding scheme of ERASMUS+ (recently comprising more than 20 sectors). Our international projects ESSA[3] and SPIRE-SAIS[4] are part of this program, funded by the European Commission. They are part of the European New Skills Agenda and aim at establishing alliances of stakeholders: ESSA in the steel sector and SPIRE-SAIS for Industrial Symbiosis embedding eight energy-intensive sectors of SPIRE[5] across Europe, in order to detect and tackle changes in skill requirements proactively. This includes defining new training and curricula requirements and new ways of short-term implementation in companies and VET systems. They will result in a Blueprint of a coherent upskilling scheme and efficient management of knowledge. The other main objective of these projects is to identify and recommend political support measures by integrating stakeholders and policy makers of the EU and national level into the learning process of the project. Also, there is the objective of raising the attractiveness of the industries for recruitment and retention of employees and to install Key Performance Indicators (KPIs) to monitor success and adjustment needs of the skill strategy continuously.

Concepted as a social innovation process the cooperation between the different stakeholders requires different learning processes within the participating organisations, between them and between different levels of organisations and political institutions. The social innovation process combining technological and social innovation (Kohlgrüber et al., 2019; Kohlgrüber & Schröder, 2019; Howaldt, 2019) relies on the involvement of representatives of relevant stakeholders from companies, training providers, associations and social partners, to policy makers. Identifying industry related skill gaps resulting from the digital and green transformations, the new strategies and alliances are looking for a proactive adjustment of and reducing the mismatches with new training arrangements and offers with support of the different national VET systems.

To establish a sustainable coherent and concerted European skills strategy and alliance the ESSA Blueprint plans to set-up (a) a European Steel Technology and Skills Foresight Observatory (ESSA ETF) (demand side), and (b) a European Online Training Ecosystem (ESSA OTS) as well as Regional Skills and Training Ecosystems (ESSA RTS) (supply side) (Schröder 2020).

After inaugurating European governance and leadership structures, a rollout of the European Steel Skills Alliances to the EU Member States is planned, especially focusing on a number of European steel regions (ESSA) and regional Hubs for Circularity (SPIRE-SAIS), combining European Online Training Ecosystems with Regional Training Ecosystems, involving the main stakeholders of the region (see Schröder, 2020).

The described social innovation process based on the cooperation of a huge number of stakeholders that form a diverse and heterogeneous partnership means that there are a number of challenges for this process to be successful. The perspectives of the different stakeholders, their knowledge and opinions, their different interests and ideas have to be understood and then, in the process, aligned and harmonised in order to be able to develop and act according to a common strategy. There are not only stakeholders from different domains such as education, policy, private economy and associations but also different levels of organisational hierarchies and policy frameworks, meaning that there are European, national and regional organisations

[3] Blueprint "New Skills Agenda Steel": Industry-driven sustainable European Steel Skills Agenda and Strategy (ESSA) - Erasmus+ Programme Key Action 2 - Cooperation for innovation and the exchange of good practices - Project Number: 600886-EPP-1-2018-1-DE-EPPKA2-SSA-B https://www.estep.eu/essa

[4] Blueprint Skills Alliance for Industrial Symbiosis: A Cross-Sectoral Blueprint for a Sustainable Process Industry" (SPIRE-SAIS) - Erasmus+ Programme Key Action 2 - Cooperation for innovation and exchange of good - Project Number: 612429-EPP-1-2019-1-DE-EPPKA2-SSA-B https://www.spire2030.eu/sais

[5] SPIRE Sustainable Process Industry through Resource and Energy Efficiency is a public-private partnership under the EU Horizon 2020 program https://www.spire2030.eu/

involved who themselves act in European, national or regional policy frameworks and fields of action. When the different stakeholders collaborate, they need to understand each other and learn from each other to a certain extent in order to discuss their goals and lines of action within the project. Various aspects such as working cultures, VET systems, and legal frameworks need to be considered when working together on such kind of social innovations.

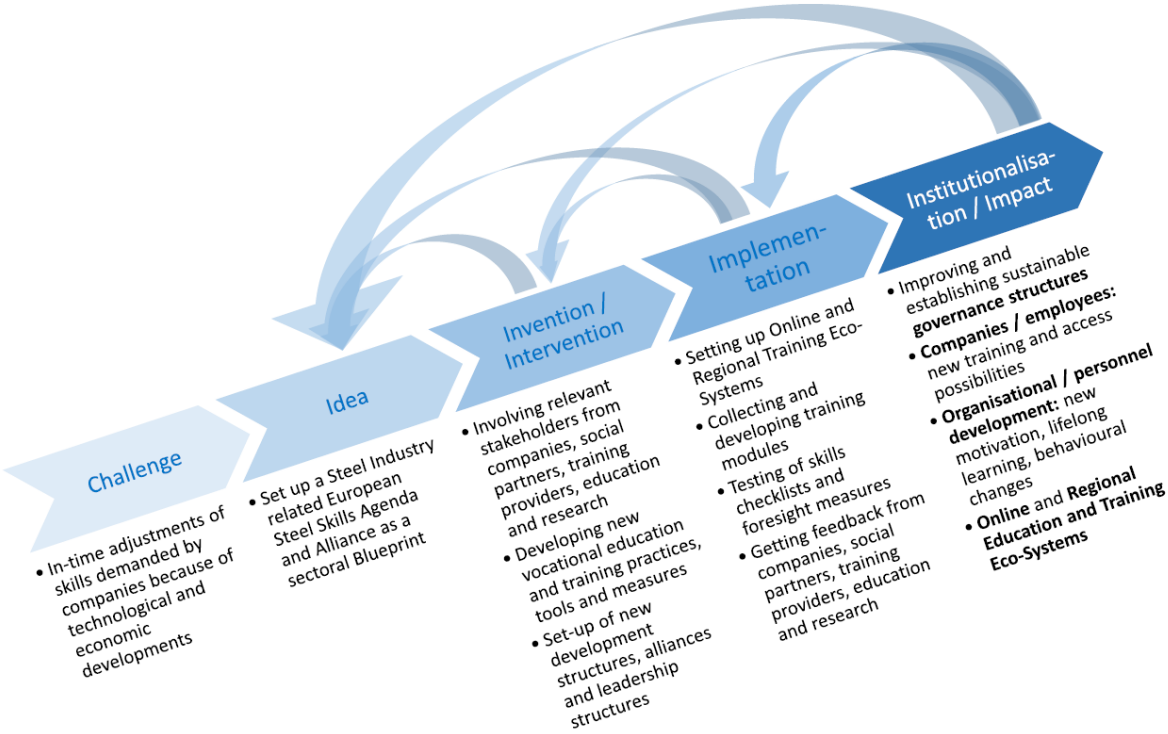
Not only the different organisations and levels of organisation have to be reflected, but also the different aspects of the social innovation process. Setting up the development of the Blueprint as an industry driven social innovation process means that technological, organisational and social aspects and impacts were considered right from the beginning of the process in an interrelated way. It also means that the workers, trainees and responsible managers of the companies have to be included in the development process, integrating their know-how and ensuring their view on both demands and solutions (see Schröder, 2020).

The social innovation process sets "ground for a continuous improvement process embedding technological innovations and their impact on the skills needs of the workforce leading to a proactive adjustment process" (Schröder, 2020, p. 21). By establishing new social practices that help to better adjust skill supply to skill demand and which facilitate direct and useful ways of communication between the partners and involved stakeholders, the process of social innovation does not stop with the end of the project. The new practices are shaped during the project in a process of mutual learning and co-creative strategy development will continue in the newly formed networks, structures and institutions.

The process in ESSA so far is described in the Mid-term report of the ESSA project, giving a more concrete insight into the process of social innovation: "Starting with the challenge of adjusting skills needs because of new technological and economic development, the idea of a sectoral Blueprint offered by the European Erasmus+ program was taken up, leading to the intervention of setting up a first European Steel Skills Agenda and Alliance (Blueprint) with the interested stakeholders from companies, training providers, and social partners (steel associations and unions), testing the developed Blueprint during an implementation phase, and setting the claims for institutionalisation and impact right from the beginning. Already in the planning of the project iterative and cyclical feedback loops were designed, ensuring upgrading of the interventions and implementation of the Blueprint during the course of the project and beyond." (Schröder, 2020, p.21). Additionally, the project agreed on process-oriented Key Performance Indicators (KPI) (such as stakeholders' involvement and endorsement of the Blueprint) and built in feedback loops that require cooperation at different stages of the project, helping to align common "ideas, objectives, intervention, implementation strategies and the institutionalisation procedures and structures as well as the impact." (Schröder, 2020), (see Figure 3).

While the process of social innovation in the SPIRE-SAIS project is planned similarly, one challenge lies in the cross-sectoral depiction of the process. In addition to the different domains and organisational levels of organisations interacting with each other, in SPIRE-SAIS eight different industry sectors seek to join forces in order to better detect skill gaps and adjust skill provision for Industrial Symbiosis. The establishment of systems of Industrial Symbiosis requires the collaboration of these respective sectors in a social innovation process being particularly complex. SPIRE-SAIS has the potential to create new social practices which solve the problem of skill gaps currently complicating and hindering the establishment of Industrial Symbiosis by leading to new networks, structures, governance and institutions enabling the rise of Industrial Symbiosis in Europe.

Figure 3. Blueprint development as a social innovation process.



Source: Schröder (2020, p. 22).

3. Organisational Education as Inherent Part of Social Innovation

The examples above show that organisational change and learning is pushed by social innovation initiatives and processes to modernize, repair and transform organisational challenges and system failures. Social innovation initiatives, as shown in the examples of SI-DRIVE and the sectoral Skills Alliances like ESSA and SPIRE-SAIS, are platforms for learning in, by and between organisations within a social innovation process engaging relevant stakeholders. These stakeholders reflect and learn within and beyond their own organisations, give input of their own organisations, learn by inputs from other organisations and the organisations together co-create common solutions, exchanging knowledge and learning between organisations.

3.1. Collaborative Networks and Organisational Learning as Social Innovations in Education

Looking at recent advances in research on social innovation and organisational education, we can identify relevant interaction points within the SI-DRIVE examples TBfW and HC, such as continuous learning and knowledge exchange of organisations. New collaborative work structures appear, where networks of organisations develop new strategies of solving problems and new strategies of collective learning, as well as new institutional settings in order to improve performance and (re-)distributed responsibilities among actors.

SI-DRIVE provides some examples of innovation in education, especially where new forms of governance are built and the change in institutions is a consequence of a sum of smaller and progressive innovations through new ways of collaboration and interaction between actors and emerging networks. This means that the role of the actors and stakeholders is re-invented, e.g. by the empowerment of the local actors to solve social demands and societal challenges in its local appearance. This process of giving an important role to each stakeholder in a social innovation process helps to build ecosystems, solving problems with divided actions and responsibilities, combining different accesses and competences ("the sum is more than its single parts", actors are mutually pushing each other). This means that a demand-adequate and mutually aligned

coordination strategy needs to be implemented at the local, regional, and national level (Schröder, Krüger & Kuschmierz, 2017). Additionally, innovation in education is present in new learning arrangements, where actors agree on new settings and new roles. These kinds of arrangements create different and actor and topic specific environments of collaboration and networking, supporting bottom-up initiatives and learning through empowerment and capacity building. And, if successful they lead to new (institutionalized) practices of change (Schröder & Kuschmierz, 2017).

3.2. Sectoral Blueprints as Organisational Learning and Education

In the Skills Alliances, the representatives of the participating organisations (namely companies, training providers, associations, trade unions, research organisations, regional administrations) learn while conducting the foreseen research and development activities during the project, thus learning in, by and between organisations. This knowledge is the background to analyze or organize the detection of changes in tasks, work organisation, job roles, structures of communication in other organisations and thus initiate a process of learning in the organisations.

One of the key elements of the Alliances is the establishment and fostering of exchange and networks between a whole range of stakeholders of the involved European sectors. During meetings, during the research and structural development as well as through the common elaboration of new tools, upskilling-schemes, and governance structures, the network and participants from different organisations learn from each other and provide a platform for the learning between organisations. This can happen in all constellations of the participating organisations and is explicitly part of the project.

HESSENCAMPUS shows that under the common framework and governance structure every one of the 21 regions in Hessen developed their own regional structure of lifelong learning, with different actors, topics and activities. In ESSA and SPIRE-SAIS the partnerships are composed of more than 30 consortium and associated partners, covering the industry sectors and allowing a rollout of the European Blueprint to specific and diverse implementations at the member states and industry regions. The transnational and multi-stakeholder composition of the partnership is based on already existing platforms and networking on the European and national level ensuring the European, member states, and for ESSA the steel regions' integration.

Thus, we can interpret the organisational learning between organisations within the alliances to be contextually multi-layered embedded (Göhlich et al., 2018, p. 207). The communication between different levels of policy scope is one of the goals of the projects, trying to create a coherent and aligned European strategy of skill provision for the steel and energy intensive sectors in Europe. The organisational learning in, by and between organisations are at the same time method and goal of the Alliances.

4. Conclusions

In terms of the research topics that the Research Memorandum Organisational Education (Göhlich et al., 2018) proposes, all six of them are interlinked with both social innovation initiatives and examples of alliances discussed above. Some specific relationships are given for the following points:

- Organisational learning structures and processes (topic 1).
- The protagonists of organisational learning (actors giving policy advice in order to change the general framework for organisational learning) (topic 2).
- General framework conditions of organisational learning (capabilities and constraints) (topic 3).
- Specific types of institutionalized support for organisational learning and Organisational Education (topic 4).
- The examples include organisational learning in specific fields of practice (topic 5), namely skills development across the different job profiles of the steel sector in ESSA

(Schröder, 2020) and skill development for employees and managers that deal or will deal with Industrial Symbiosis or Energy Efficiency within the companies and the cross-sectoral cooperation of the different SPIRE sectors. Also relevant job profiles and occupations will be selected and targeted in a more focused way.

- Finally, the described cases are examples for the type of projects mentioned under research topic 6 for Organisational Education "Institutionalization, professionalization and internationalization of organisational Education" (Göhlich et al., 2018, p. 213) where it says: "At the European level, use of the so-called platform strategies of multi-stakeholder research represents a relevant approach. These not only focus on participatory research, but involve design-based research, integration research and development in a form that is extensively interconnected. As a result, organisational education research is becoming increasingly involved in the debate on the responsibility and responsibilization of science and scholarship." (Göhlich et al., 2018, pp. 213-214).

HC, TBfW, ESSA and SPIRE-SAIS use platform strategies of multi-stakeholder research in a social innovation process-oriented way. The methods of research are participative, processual and creation-oriented and stand aligned to the Research Memorandum Organisational Education (Göhlich et al., 2018, p. 215).

Social innovation research and organisational education have similarities and can learn from each other. The main link between these two lies in research on innovation and change in institutions and networks. Additionally, the distinction made in the Research Memorandum Organisational Education (Göhlich et al., 2018) between organisational learning in, by and between organisations proofed helpful to understand the details of the social innovation process of the described initiatives and projects regarding necessary learning processes and steps of the according communication processes.

The examples and its discussion above illustrate in our view, that social innovation and organisational education research have the potential of learning from each other and develop an interlinked understanding on the theoretical and practical level. Within this article, we identified first interaction points between these two research fields: Further research will contribute to the development of theory based empirical research, illustrating the relevance of social innovation for organisational change, education and learning.

More research is needed in this direction, especially to answer research questions such as: How can research on innovation in education be better theorized? To what extent do organisational learning and social innovation in education describe similar aspects of the innovation process? How can organisational research and social innovation develop a better understanding of networks? Does an organisation learn without applying new social practices? How does external learning differ from internal learning in organisations?

Against this backdrop and from a social innovation point of view, the concept of organisational learning in, with and between organisations could be integrated in the research and implementation of social innovations in order to create a better comprehension and connection between the two still separated research fields. The integration of this concept will help to improve theoretical and empirical research on social innovation. Especially through the impact of (mutual and internal) organisational learning processes on the development, implementation and scaling of social innovations. But also by improving specific tools of social innovation research, such as co-creation, cooperation and networking.

This enriches social innovation by emphasising the organisational perspective, while at the same time organisational learning benefits from the contribution of social innovation and its integration into its holistic view. Furthermore, some contributions are evident in the development of learning capacities, skills and commitment of actors in educational practices, which represents one of the key areas of social innovation and the field of social innovation in education.

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Research Article

Regional Entrepreneurial Ecosystems: The case of the Basque Country

Ecosistemas Regionales de Emprendimiento: El caso del País Vasco

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Abstract: By using the concept of regional entrepreneurial ecosystems, the article analyses the case of the Basque Country (Spain). Specifically, the paper focuses on the analysis of two ecosystems: machine tool and smart mobility. While the former serves as a reference of a consolidated ecosystem, the latter represents an incipient and emerging activity in the region. Based on qualitative methodologies and stakeholder's participation it presents a description of each of the ecosystems described focusing on socio-economic aspects in a context of digital transformation. In addition, the article includes some policy implications and conclusions that can contribute to ecosystem development. In particular, the ability to extract knowledge that can be transferred from one ecosystem to another.

Keywords: entrepreneurial ecosystems; regional development; digital transformation; inclusiveness.

Resumen: Mediante el uso del concepto de los ecosistemas regionales de emprendimiento, el artículo analiza el caso del País Vasco (España). En concreto, se centra en el análisis de dos ecosistemas: el de la máquina herramienta y el de la movilidad inteligente. Mientras que el primero sirve como referencia de un ecosistema consolidado, el segundo representa una actividad incipiente y emergente en la región. El artículo, basado en metodologías cualitativas y en la participación de los interesados, presenta una descripción de cada uno de los ecosistemas descritos centrándose en los aspectos socioeconómicos en un contexto de transformación digital. Además, el artículo incluye una serie de implicaciones políticas y conclusiones que pueden contribuir al desarrollo de los ecosistemas. En particular, la capacidad de extraer conocimientos y aprendizajes que puedan transferirse de un ecosistema a otro.

Palabras clave: ecosistemas de emprendimiento; desarrollo regional; transformación digital; inclusión.

1. Introduction

Following the neo-Schumpeterian concept of technological revolution (Freeman et al., 2001; Perez, 2002) it has been recognised that technologies do not evolve in isolation. Technological revolutions involve successive technology systems.

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The building of a technology system sees the creation of positive context factors or synergies, as the socio-economic context gradually adapts to facilitate the flourishing of the new technologies. This adaptation is aided by the establishing of adequate business arrangements and institutional context (Perez, 2002). In the light of digital transformation revolutionary technologies are defined as:

> "*Major radical innovations – e.g., computers – with multiple uses across many sectors and see technology systems as strongly inter-related groups of radical innovations – e.g., computers and software – and finally technological revolutions as the creative gales of destruction that encompass many technology systems and spread across the whole economy*" (Perez & Murray Leach, 2021, p. 31).

The strength of neo-Schumpeterian research on technological revolutions is that it identifies recurring structures and a regular sequence in the diffusion process and the form of absorption of change by the economy, society and policy.

Where technological transformations are concerned, regional ecosystems stimulate and support through technology and innovation policy. At regional level entrepreneurship is an important vector of economic change. It is probably for this reason that entrepreneurial ecosystems are starting to gain relevance in research (Alvedalen & Boschma, 2017) and policy making (Martiarena et al., 2019).

Importantly, there is an emphasis on system-wide capacity building to manage, with stakeholders recognising and being committed to a broad agenda of individual, business and local economic interests. In this regard, interventions within ecosystems are designed for whole regions or industries, not just individual companies (Anderson & Warhurst, 2012).

The entrepreneurial ecosystem approach (Stam, 2015) has proven successful in linking the supply and demand for innovative ideas. Literature suggests that effective entrepreneurial ecosystems are a blend of 'top down' and 'bottom-up' approaches (Mason & Brown, 2014; Stam, 2015). In this scenario, the ecosystem approach enables exploration of the role and impact of main actors and institutions in technology transformation.

The article is organised as follows. First, a conceptual approach to regional entrepreneurial ecosystems is presented. This section incorporates an introduction to the regional ecosystem of the Basque Country (Spain), which distinguishes between the incumbent machine tool ecosystem and the emerging smart mobility ecosystem. Secondly, the methodology used is described. Then, thirdly, the results for each of the ecosystems are presented, focusing on socio-economic issues in relation to digital transformation. Finally, the article ends with a series of policy implications and conclusions.

2. Entrepreneurial Ecosystems

First coined by Moore (1993), definitions of entrepreneurial ecosystems emphasize the importance of localized and interdependent relationships between different entrepreneurial actors (firms, venture capitalists, business angels, banks) (Isenberg, 2011; Brown & Mason, 2017). Other actors such as universities, public research institutes and public sector agencies interact with entrepreneurial actors and co-shape performance. In addition, governments influence ecosystem behaviour and growth in important ways.

This article connects the functioning of the entrepreneurial ecosystems as described by Stam (2015). An entrepreneurial ecosystem is "a set of interdependent actors and factors coordinated in such a way that they enable productive entrepreneurship" (Stam, 2015, p. 1765). Resorting to this concept allows us to explain economic results by emphasizing the interaction between the actors of the ecosystems in question. Additionally, this approach allows observing the role of governments, regional authorities and other government institutions.

Ten elements play a role in regional entrepreneurial ecosystems; entrepreneurship culture; networks; physical infrastructure; finance; leadership; talent; new knowledge; demand; and, intermediary services. Table 1 provides an explanation of each of these elements.

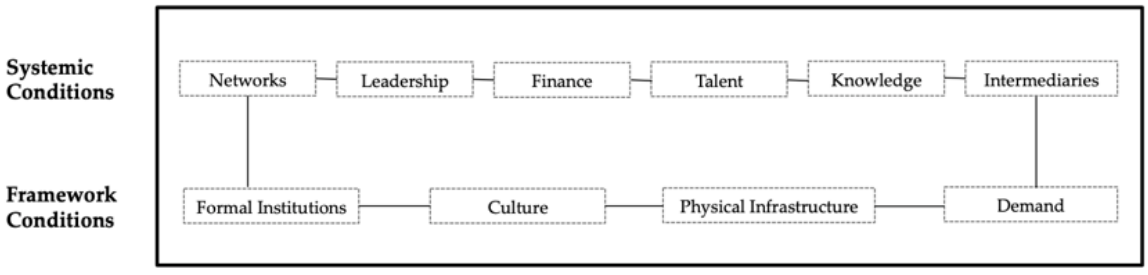
Table 1. Description of entrepreneurial elements.

Elements	Description
Formal institutions	The rules of the game in society
Entrepreneurship culture	The degree to which entrepreneurship is valued in a region
Networks	The connectedness of businesses for new value creation
Physical Infrastructure	Transportation infrastructure and digital infrastructure
Finance	The availability of venture capital and bank loans to firms
Leadership	The presence of actors taking a leadership role in the ecosystem
Talent	The prevalence of individuals with high levels of human capital, both in terms of formal education and skills
New Knowledge	Investments in new knowledge
Demand	Potential market demand
Intermediate services	The supply and accessibility of intermediate business services

Source: Author's elaboration adapted from Stam, (2015).

Of the ten elements described in Table 1, four are associated with framework conditions (formal institutions, culture, physical infrastructure, and demand) and the other six with systemic conditions (networks, leadership, finance, talent, knowledge, and support services/intermediaries) (Stam, 2015). Figure 1 indicates the organisation of these elements.

Figure 1. Framework and systemic conditions of entrepreneurial ecosystems.



Source: Author's elaboration adapted from Stam and van de Ven (2021).

The entrepreneurial ecosystem approach focuses on growth-oriented entrepreneurship. However, since each ecosystem is based on specific conditions, each ecosystem is unique, which requires the application of different approaches (Mason & Brown, 2014). The impact of an ecosystem depends on the context and the type of enterprise. For that reason, formal institutions are considered as crucial elements for the functioning of the ecosystem and the results it produces (Stam, 2015). Schrijvers et al. (2021) suggests the positive relationship between the quality of the ecosystems and the entrepreneurial output. If regions improve their ecosystems' framework and

systemic conditions, then they can expect more entrepreneurial activity. In this sense, well-developed entrepreneurial ecosystems generate more growth (Leendertse et al., 2020).

3. From incumbent to emergent ecosystems; a taxonomy to understand how ecosystems perform at regional level

When studying entrepreneurial ecosystems in the light of digital transformation, we differentiate between two forms or types. On the one hand, the incumbent ecosystems, i.e. those that have a strong presence/articulation in a given region, compared to the emerging ecosystems, which are in the process of formation.

The term incumbent entrepreneurial ecosystem refers to the concept of incumbent industry. Incumbent industry is an already longer existing business ecosystem with a strong presence in the region, often represented by a large 'anchor' firm with its headquarters and R&D facilities, and sometimes also main production facilities in close regional vicinity, together with its main suppliers, and other relevant stakeholders such as relevant research institutes and universities and local/regional government (for an extensive list of characteristics see Brown and Mason (2017, p. 23)).

The concept of emerging ecosystem refers to a business ecosystem that still is in the process of being formed, hence not yet fully matures, and is created around to a specific theme or industry, or applies to new industries. Emerging ecosystems can be – but not necessarily are – characterised by a high number of growth-oriented start-ups. An emerging ecosystem can also arise from the dissolution/disintegration of a large incumbent ecosystem. An emerging entrepreneurial ecosystem may, over time, transform itself into a scale-up ecosystem with mature characteristics, such as strong levels of interaction, large rapidly growing companies, strong vertical networks, a strong base of financiers and many more characteristics (Brown & Mason, 2017).

4. Entrepreneurial ecosystems in the Basque Country region; Machine-tool and Smart Mobility

Although the Autonomous Community of Basque Country (onwards: Basque Country) has been analysed as an ecosystem (Dhondt et al., 2022; Schrijvers, Bosma & Stam, 2022), this article focuses on two regional entrepreneurial ecosystems. Specifically, the ecosystems under study are the machine tool ecosystem, as a reference of a consolidated economic activity, and the smart, electric and sustainable mobility ecosystem, as an example of an emerging activity.

Located in the north of Spain, the Basque Country (NUTS21) is one of the most advanced and economically competitive regions in Spain and Europe. The region has been recognised as a success story of industrial transformation (OECD, 2011). In addition, the 2021 Regional Innovation Scoreboard (RIS), which evaluates innovation performance in different regions of Europe, considers the Basque Country to be a reference of excellence as a high innovation region with moderate levels of innovation (European Commission, 2021). However, this pattern is affected by automation and digitalisation, which is catching up with the COVID-19 scenario in certain sectors, generating an impact on inclusion (OECD, 2020). The region has many employed in knowledge-intensive sectors and shows relatively high innovation expenditures. Public support drives most of the knowledge spill-overs.

4.1. Commitment of institutions and decision-makers

The machine tool sector is a mature economic activity in the regional ecosystem that has been defined as resilient, especially at the territorial level (Valdaliso, 2020). Although the manufacturing sector has its roots back to the end of the 19th century, it is from the 1960s onwards that a domestic market and foreign trade began to grow. Since then, the sector has been at the

technological forefront, first importing technology and later developing it, characterising the activity as highly specialised.

The machine tool sector is important for the region, mainly because of its relevance in international markets. This industrial tradition is currently supported by the regional smart specialisation strategy, in which Industry 4.0 plays a major role. Furthermore, given the relevance of the application of machine tools in key sectors such as energy, aeronautics, and automotive, Industry 4.0 key technologies play a key role in the digitalisation process of the sector.

The regional ecosystem is made up of a set of leading international companies. The sector is the third-largest machine tool producer in the world behind countries such as Germany and Italy, with exports exceeding 75%. The sector consists mainly of SMEs, which are highly flexible and specialise. In addition to business leadership, the ecosystem has a cutting-edge network of technology centres, assisted by a network of universities and vocational training centres that place it at the forefront of the sector. One example is the cluster of machine tool manufacturers (state-wide) established in the region (AFM). Another example, which emerged from the cluster, is IMH, the Machine Tool Institute, a pioneer in training and education.

4.2. Smart Mobility as an emergent ecosystem

"Smart mobility" is an emerging entrepreneurial ecosystem in the Basque Country. The term refers to the application of new technologies in traditional sectors, which can lead to the emergence of new products and services related to transport and mobility. However, the concept of smart mobility in a broad sense covers different industrial sectors and activities. Smart mobility is at the core of the so-called Industry 4.0. Mobility is one of the most disruptive segments currently immersed in a technological, energetic, and social transition. The ecosystem emerges due to the identification of a market in full development in which the automotive, energy and Electronics, Information and Communication Technologies (EICT) sectors converge. This case highlights the crosscutting and enabling nature of EICT in Industry 4.0. At the regional level, the Basque Smart Specialisation Strategy includes Advance Manufacturing and Energy as strategic priorities, focusing R&D efforts on the different phases of the value chain.

The positioning of local companies has many faces as it addresses different activities ranging from the automotive industry, transport, logistics and intelligent transport systems. As a point of reference, the presence of large local companies operating in international markets, dedicated to the manufacture of buses and trains stands out. Currently, the ecosystem has a production capacity of about 4,500 electric vehicles per year and 14,000 products between companies such as Mondragon Corporation, Irizar Group and CAF. In addition, there are other strategic companies and stakeholders related to the energy sector (electricity, oil and gas). In addition, the ecosystem has a robust network of research centres and strong public institutional support in conjunction with business actors.

5. Method

In order to carry out the research and elaborate the case studies analysing the two ecosystems mentioned above, the methodology employed combines desk research, interviews, identification of relevant actors and stakeholders and the organisation of workshops. All these actions were carried out from the end of 2020 until mid-2021.

The first part of the research work consisted of reviewing literature and websites with qualitative and quantitative information on the region and its development. Desk research also helped us to define what we understand as an entrepreneurial ecosystem.

The second step was to develop a method to measure the main variables of the study to operationalize the dominant concepts and constructs. Since the study aims to understand better the mechanisms of how ecosystems evolve, the accent was on a qualitative approach. Sources of data to answer the questions were: stakeholders in regions, the ecosystem and the particular

businesses, core companies and companies in the network of companies; existing publications; statistical databases, documents; and websites and other sources. An interview guide was developed to conduct interviews with stakeholders and company representatives, which contained the operationalization of the main concepts and the elements of the entrepreneurial ecosystem model.

Having a clear vision of an entrepreneurial ecosystem, the third step identified the relevant actors to help us assess the performance and functioning of an ecosystem. The fieldwork consisted of conducting interviews with regional stakeholders and company representatives. Regional stakeholders were representatives of governmental bodies, business associations, employer organizations, unions, knowledge institutes and educational institutions, financial institutions, and regional development organizations. Company representatives were also interviewed. Table 2 lists the actors and stakeholders involved. See Annex 1 for an extended list of participants. The research was conducted by probing with different sets of interviews into the functioning of the ecosystems.

The fourth step was to conduct regional workshops for each entrepreneurial ecosystem. The workshops allow for corroborating the interview results. They also allowed for the development of future perspectives.

Table 2. List of interviewees and participants.

Companies & Employees	1 sectoral organisation 11 managers (5 companies) 1 venture capital 9 employees (4 companies)
Policymakers & Stakeholders	7 policymakers 4 associations specialist
Research & Education	2 educational specialists 4 technology experts, academics

Source: Author's elaboration.

6. Results

This section is dedicated to the analysis of the incumbent and emerging ecosystem. To this end, each of the two ecosystems is described and analysed separately. In this analysis, the socio-economic dimension and digitalisation are taken into account.

6.1. Incumbent ecosystem: socio-economic performance

The regional machine tool ecosystem is slowly declining, but still the most important business activity in the region. The sector is representative of Industry4.0 in Spain.

The ability of the machine tool sector to successfully adapt to different transformations over the decades is directly related to aspects such as "business size, flexibility and productive specialisation; absorptive and innovative capacity; and geographical concentration in a regional ecosystem highly favourable to skilled human capital formation, innovation and cooperation" (Valdaliso, 2020). The machine tool sector has been concentrated in the Basque Country region. Geographical proximity and clustering have facilitated learning and knowledge, improving the absorptive capacity of firms, as well as company collaboration. In this framework, it can be argued that the region has developed a productive system very favourable to innovation and human capital. From the 1970s onwards, the number of firms tends to decline. However, in terms of employment, the number of workers per company has remained unchanged. Overall, it can be

stated that the machine tool sector confirms the maintenance of employment, as an example of resilience, despite the fact that sales in the sector were in line with the decline in industrial production due to the pandemic context. Although the effect of the pandemic is evident, in absolute terms, the final turnover for the sector in 2020 was lower than in 2019. The sector has received institutional support that has allowed its reorganisation and internationalisation, in particular with the demand crisis at the end of the 20th century. In the context of digital transformation, the machine tool cluster is working on a strategy for the reactivation and transformation of the Advanced Manufacturing and Machine Tool sector, which includes measures to support activity and employment focused on digitalisation and sustainability.

The Basque Country has developed a regional policy that has strengthened its industrial base by supporting industry-based skills (OECD, 2013). According to OECD data (2020), between 2000 and 2017, the region's labour market has become polarised: low and high-skilled jobs are growing, while medium-skilled jobs are decreasing. However, compared to other regions in Spain, polarisation has been more moderate. The pace at which technology is introduced determines the effects of automation, how workers adapt and the many differences in work organisation between countries and regions. The region has a higher proportion of jobs at high risk of automation compared to the OECD average (22.2% compared to 14% of OECD countries), which can generate inequalities (OECD, 2020). According to the Employment Agency of the Basque Country, the employment opportunities to be created between 2020 and 2030 by the prospects of economic development (expansion demand) and by the needs for replacement due to retirement of people currently working in the Basque labour market (replacement demand) in the manufacturing industry indicates an increase in the variation of 4% (from 197,385 to 206,670 jobs). In terms of net job openings by occupation in manufacturing, fixed plant and machinery operators will have a negative change of 7% (from 38,065 to 35,189).

6.1.1. The incumbent ecosystem in the light of the Stam model

The determining factors of the machine-tool ecosystem in the Basque Country are related to production flexibility and its specialised nature, competing in a niche market of international dimension. The added value is thus translated into a competitive offer. The formation of human capital, supported by the training and research system, as well as the innovation dimension create a favourable ecosystem that has proven to be sustainable over several decades and transformation processes.

Table 3 summarises the findings for each of the elements that make up the entrepreneurial ecosystem model.

Table 3. Description of the incumbent entrepreneurial model elements.

Formal institutions	Strong institutional context, well developed network and attitudes
Entrepreneurship culture	Strongly developed and supported
Physical and IT infrastructure	Strongly developed, multi-modal
Demand	Markets are global, not building on local demand
Finance / financing	Well-developed and strongly funded financial system
Talent	Strong supply of talent and system to support it
(New) Knowledge	Strong knowledge system support for the ecosystem
Services by Intermediaries	Strongly developed network of intermediaries
(Social) Networks	Very strong, historical networks in the ecosystem
Leadership	Sector associations driven leadership

Source: Author's elaboration.

Entrepreneurial leadership in conjunction with knowledge, intermediary structures, networks and talent has positioned the ecosystem at the forefront. In addition, key aspects such as demand, infrastructure, talent and financing have played an important role.

6.1.2. Digital transformation

Digital technologies are transforming traditional industrial production models. The machine-tool ecosystem is directly linked to manufacturing and innovation in strategic sectors that apply to all types of products. Industry 4.0 means that machines, lines and systems as well as factories are connected. In particular, sensorisation, data collection and interpretation, process improvement, and the provision of new services are emerging as new ways of generating value. Within the Regional Smart Specialisation Strategy advanced manufacturing is a priority. In this framework, advanced manufacturing is understood as: the incorporation of intelligence in production means and systems; the use of emerging capabilities and technologies in new products and processes; the integration of advanced materials in solutions with higher added value or improved processes; the efficiency and sustainability of the resources used; and, the integration of high added value services in business activities related to different industrial sectors (transport, capital goods, etc.).

6.2. Emergent ecosystem: socio-economic performance

The smart mobility regional ecosystem represents an extra industrial network, building on the incumbent ecosystem strength.

One of the characteristics of the smart mobility ecosystem lies in the Reference Centre called MUBIL. This centre for Smart and Sustainable Mobility brings together two transformation processes shared by administrations and companies: technological-digital and energy. MUBIL was created within the framework of the “Building the Future” collaborative and open governance programme, promoted by the Provincial Council of Gipuzkoa, whose aim is to identify the challenges of the territory in order to plan and carry out projects for the future. One of the pillars is to reinforce the smart specialisation of the territory, with new mobility being one of the main lines of action. Smart mobility is included as a "strategic project for economic recovery and transformation” in the basque regional government's “Recovery and Resilience Programme (2021-2016)".

The region has a strategy for employability and inclusive activation for the period 2018-2022, which aims to promote the development of an integrated strategy for; economic reactivation and competitiveness; quality employment; and social policies to improve the social cohesion of groups (such as people in a situation or at risk of exclusion; unemployed people with a medium-low degree of employability; and people in precarious employment).

Within the framework of the energetic revolution, the automation of automobile production is causing a significant drop in employment in the industrial sector. However, the new mobility, electric and sustainable, has sufficient potential for the creation of new direct jobs in sectors related to new technologies. This leads to a scenario where competences become highly relevant. In particular, the creation of new occupations will require the adaptation of the labour force to new occupations. Considering the industrial concentration and diversity of the Basque Country, the region has developed a policy that has reinforced industry-based skills, innovation and cluster development (OECD, 2013). The region has evolved from the traditional vision of industrial innovation policies towards a more systemic vision involving other departments such as education. However, between 2000 and 2017, the region's labour market has become polarised (OECD, 2020): low-skilled and high-skilled jobs are growing, while medium-skilled jobs are declining. During this period, medium-skilled jobs have decreased by more than 6 percentage points, while low-skilled and high-skilled jobs have grown by 1.6 and 4.8 percentage points

respectively. In relation to employment, the smart mobility sector brings together different activities such as manufacturing industry (transport materials; machinery and mechanical equipment; electrical material and equipment); transport and warehousing; ITC and energy provision. The diversity of activities encompassing this emerging ecosystem makes it difficult to have a clear picture. However, job opportunities and net employment projections for the period 2020-2030 can be obtained independently.

6.2.1. The emergent ecosystem in the light of the model

The driving forces of the ecosystem are mainly public and business leadership in direct conjunction with support services (intermediaries) leading to the creation of new knowledge. Table 4 summarises the findings for each of the elements that make up the entrepreneurial ecosystem model.

Table 4. Description of the emergent entrepreneurial model elements.

Formal institutions	Strong trustworthy institutional environment
Entrepreneurship culture	Strongly developed
Physical and IT infrastructure	Strongly developed
Demand	Local demand and international focus
Finance / financing	Well-developed public and private funding system
Talent	Abundant supply
(New) Knowledge	Sufficient knowledge to support
Services by Intermediaries	Systemic support system; public and private cooperation.
(Social) Networks	Strong sector association networks
Leadership	Public sector leadership with strong participation of lead companies

Source: Author's elaboration.

The territorial commitment aims at the creation of productive entrepreneurship. The regional strategy, which involves a variety of actors, revolves around three axes: specialisation, excellence and collaboration. The first seeks to orient the mobility, transport and automotive industry towards electric, connected, shared and autonomous mobility. The excellence axis aims to turn the local industry into an international benchmark in smart and sustainable mobility. Finally, the collaboration axis aims to generate new opportunities, transform and strengthen the industry ecosystem.

6.2.2. Digital transformation

The development and application of information technologies are contributing to the generation of an unknown amount of data. New trends driven by digital technologies make it possible to generate a multitude of new services based on connectivity between people, vehicles and infrastructures. To carry out this interaction, it is necessary to develop technologies that companies in the sector must incorporate. The alignment of policies for the creation of new value and inclusive growth of the ecosystem are aligned with other regional policies; this is how the entrepreneurial ecosystem takes advantage of the digitalisation process. Specifically, within the Smart Specialisation Strategy, which prioritizes smart mobility, the set of core technologies transversally linked to the areas of specialisation. Within the emergent ecosystem the use of digital technologies is increasing but us still limited, mainly based on the sectorial application of technologies (Industry 4.0). The impact on business models is data-driven by lead companies.

7. Policy implications

This section summarises the most important points for each of the ecosystems described. Implications for regional public policies are also outlined. In relation to the incumbent machine tool ecosystem, three ideas stand out:

- To maintain a competitive position, flexible production and specialised products in international niche markets have become critical.
- As the sector is highly dependent on external shocks (especially related to investment levels due to its high dependence on strategic sectors), it is necessary to consider policy action in terms of industrial policy.
- For the future, among other things, it is essential to have highly qualified staff to deal with any problems that may arise during the digitisation process. In this scenario, coalition building with the actors (such us universities, vocational education centres, government and industry) becomes relevant.

As far as the emerging smart mobility ecosystem is concerned, it can be argued that the policy implications impact on:

- Strong institutional leadership and public-private collaboration in areas related to smart specialisation and niche markets.
- Support sectoral diversification in mature economic activities through the use of levers (new digital technologies).
- Improve the adaptation of new professional profiles (occupations) in emerging activities.

8. Conclusions

In summary, the entrepreneurial ecosystem model seems to be recognized by actors from the ecosystems as a useful tool for investigating and assessing these ecosystems.

As reflected in the previous sections, a key determinant of the sustained success of the machine tool industry is directly related to the capacity it has shown to cope with change. In the highly concentrated and geographically proximate configuration of the ecosystem, a knowledge network has formed that has enabled learning to take place. This absorption capacity has enabled research and training centres (university and vocational training) to respond to products that are highly valued and competitive in international markets, i.e. niches with a very specific range of products.

With regard to the ecosystem of smart mobility, the institutional capacity to link local action with regional policies should be highlighted as an element of success. Public support for the transformation of high-contribution sectors (in economic and employment terms) and the promotion of sectoral diversification is a driver in a process where enterprises simultaneously undertake the adoption and adaptation of new technologies. The adoption of territorial strategies also contributes to the potential attraction of structural funds and the possibility of higher levels of public and private investment.

In overall, from comparison of the entrepreneurial conditions, it appears that the emergent ecosystem covers all conditions. The initiative should be able to stimulate new entrepreneurial activity in the Basque Country. New products and services appear to function under major companies´ umbrellas in the region. These companies reduce the risks for new product and services to launch, and work as knowledge spill-over context to these new initiatives.

Appendix. List of participants in the field study.

Ecosystem	Sector	Type of interviewee	Role
Incumbent	Machine Tool	Education and Research	General Director
Incumbent	Machine Tool	Policymakers and Stakeholders	Adjunct General Director
Incumbent	Machine Tool	Education and Research	Director
Incumbent	Machine Tool	Education and Research	Head of strategy
Incumbent	Machine Tool	Policymakers and Stakeholders	Head of Service of Knowledge Promotion
Incumbent	Machine Tool	Policymakers and Stakeholders	Technician
Incumbent	Machine Tool	Policymakers and Stakeholders	Project manager
Incumbent	Machine Tool	Companies, employees	Chief Executive Officer
Incumbent	Machine Tool	Companies, employees	Head of Manufacturing
Incumbent	Machine Tool	Companies, employees	Chief Executive Officer
Incumbent	Machine Tool	Companies, employees	Sales Director
Incumbent	Machine Tool	Companies, employees	General Manager
Incumbent	Machine Tool	Companies, employees	Engineer IT
Incumbent	Machine Tool	Companies, employees	Engineer IT
Incumbent	Machine Tool	Companies, employees	Engineer IT
Incumbent	Machine Tool	Companies, employees	HR Director
Incumbent	Machine Tool	Companies, employees	President
Incumbent	Machine Tool	Companies, employees	Director
Incumbent	Machine Tool	Companies, employees	Assembler
Incumbent	Machine Tool	Companies, employees	Assembler
Emergent	Smart mobility	Policymakers and Stakeholders	General Director
Emergent	Smart mobility	Policymakers and Stakeholders	Director of Strategic Projects
Emergent	Smart mobility	Policymakers and Stakeholders	General Manager
Emergent	Smart mobility	Policymakers and Stakeholders	Project Manager
Emergent	Smart mobility	Education and Research	Coordinator of Technological Innovation and Intelligent Systems
Emergent	Smart mobility	Education and Research	Technician of Technological Innovation and Intelligent Systems
Emergent	Smart mobility	Education and Research	Executive Director
Emergent	Smart mobility	Education and Research	Researcher
Emergent	Smart mobility	Education and Research	Head of Intelligent Transport Systems
Emergent	Smart mobility	Policymakers and Stakeholders	Project Manager
Emergent	Smart mobility	Companies, employees	Chief Technical Officer

Emergent	Smart mobility	Companies, employees	Chief Executive Officer
Emergent	Smart mobility	Companies, employees	Engineer 1
Emergent	Smart mobility	Companies, employees	Engineer 2
Emergent	Smart mobility	Companies, employees	Engineer 1
Emergent	Smart mobility	Companies, employees	Chief Executive Officer
Emergent	Smart mobility	Companies, employees	Chief Technical Officer
Emergent	Smart mobility	Companies, employees	Head of Testing
Emergent	Smart mobility	Companies, employees	Engineer

Source: Author's elaboration.

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Research Article

Can Social Innovation advance the PMTCT programme? A South African reflection

¿Puede la Innovación Social contribuir al avance del programa PMTCT? Una reflexión sudafricana

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Abstract: The prevention of mother to child transmission (PMTCT) programme is an initiative developed to enable health care practitioners to provide essential care to mothers in order to prevent the transmission of HIV to their infants. However, the PMTCT programme has not been reaching its intended prevention objectives. This paper identifies the social issues that elucidate the gap between PMTCT program goals and the role that Social Innovation could play in improving the status quo. Supporting Social Innovation in health helps reduce infectious diseases by empowering communities to become active participants in their health challenges through local adaptation of global strategies that facilitate the reduction of health system limitations. The article combines a review of the literature with empirical evidence extracted from research that has analyzed the postpartum experiences of mothers living with HIV in the context of the PMTCT program in Khayelitsha, Cape Town, South Africa in 2021. To address the research question, exploratory research has been adopted through a case study. The research is qualitative, exploratory and descriptive based on a case study constructed with secondary data. The results show that Social Innovation contributes to addressing healthcare challenges by providing more personal, analytical and preventive healthcare pathways. In addition, Social Innovation makes a critical contribution to addressing demographic challenges by helping those who are unable to access healthcare. This paper argues that Social Innovation in health is most effective when it occurs from the bottom up, as it is a process that engages the community and connects social change and health improvement through the diverse efforts of local actors. The article demonstrates that having local beneficiaries drive the development of a Social Innovation programme in health results in more viable and sustainable solutions. It also demonstrates that Social Innovation harnesses the ingenuity and willingness of community members, strengthening conventional health service systems and helping to achieve improved and sustainable health services.

Keywords: social innovation; SIH: Social Innovation in Health; PMTCT: Prevention of Mother to Child Transmission; MTCT: Mother to Child Transmission; LMICs: Low-Middle in Countries.

Resumen: El programa de prevención de la transmisión materno-infantil (PMTCT) es una iniciativa desarrollada para que los profesionales de la salud proporcionen atención esencial a las madres con el fin de prevenir la transmisión del VIH a sus hijos. Sin embargo, el programa PMTCT no ha alcanzado los objetivos de prevención previstos. Este documento identifica las cuestiones sociales que explican la brecha entre los objetivos del programa de PMTCT y el papel que podría desempeñar la Innovación Social para mejorar el statu quo. El apoyo a la Innovación Social en materia de salud ayuda a disminuir las enfermedades infecciosas al empoderar a las comunidades para que se conviertan en participantes activos de sus retos sanitarios, mediante la adaptación local de estrategias globales que faciliten la reducción de las limitaciones del sistema sanitario. El artículo combina una revisión de la literatura con evidencia empírica extraída de

una investigación que ha analizado las experiencias posparto de las madres que viven con el VIH en el marco del programa PTMH en Khayelitsha, Ciudad del Cabo, Sudáfrica en 2021. Para abordar la pregunta de investigación se ha adoptado un diseño de investigación exploratoria mediante un estudio de casos. La investigación es cualitativa, exploratoria y descriptiva, basada en un estudio de caso construido con datos secundarios. Los resultados muestran que la Innovación Social contribuye a abordar los retos sanitarios proporcionando vías de atención sanitaria más personales, analíticas y preventivas. Además, la Innovación Social contribuye de forma decisiva a abordar los retos demográficos, ayudando a los que no pueden acceder a la asistencia sanitaria. Este documento sostiene que la Innovación Social en el ámbito de la salud es más eficaz cuando se produce de abajo hacia arriba, ya que es un proceso que involucra a la comunidad y que conecta el cambio social y la mejora de la salud a través de los diversos esfuerzos de los actores locales. El artículo demuestra que el hecho de que los beneficiarios locales impulsen el desarrollo de un programa de Innovación Social en materia de salud da lugar a soluciones más viables y sostenibles. Asimismo, demuestra que la Innovación Social aprovecha el ingenio y la voluntad de los miembros de la comunidad, fortaleciendo los sistemas convencionales de servicios sanitarios y ayudando a conseguir unos servicios sanitarios mejorados y sostenibles.

Palabras clave: innovación social; SIH: Innovación Social en Salud; PMTCT: Prevención de la Transmisión Materno Infantil; MTCT: Transmisión Materno Infantil; LMICs: Países de renta media-baja.

1. Introduction

The Prevention of Mother to Child Transmission (PMTCT) is a global intervention programme that was initiated by the United Nations (UN) to protect children around the world from HIV infection (Nyamhanga, Frumence & Simba, 2017). The PMTCT programme has undergone extensive transformation since its initiation (Chersich et al., 2018). However, retention in care in the PMTCT programme remains a challenging problem, even though access to Antiretrovirals (ARVs) treatment and the PMTCT programme has improved (Fayorsey et al., 2016). According to de Villiers (2021), retention in care is influenced by physical accessibility, access to health and case studies, financial affordability and acceptability which are problems originating from social context. For the effective management of the PMTCT programme, it is crucial to recognise the involvement of HIV/AIDS as a disease necessary to effectively manage mothers living with HIV.

The support of Social Innovation in health helps lessen infectious diseases of poverty by empowering communities to become active participants of their health challenges, through the local adaptation of global strategies that facilitate the reduction of health system limitations (Dako-Gyeke et al., 2020). The contribution of Social Innovation in health helps also bridge gaps in primary health care systems by providing a fresh lens to strengthen these health care systems and engaging communities in creating and sustaining solutions (Dako-Gyeke et al., 2020).

Literature highlights the expedient influence of Social Innovation in reducing infectious diseases and contributing positively towards health systems (van Niekerk, Manderson & Balabanova, 2021). This paper combines a review of the literature with empirical evidence extracted from a master's research which explored the experiences of postpartum mothers, living with HIV, of the PMTCT programme in Khayelitsha, Cape Town in 2021. The case study approach adopted in this paper aims to identify the social issues that explain the gap between PMTCT program goals and the role that could be played by Social Innovation to improve the status quo.

2. Literature Review

2.1. Overview of PMTCT programme in South Africa (SA)

In the past decade, there has been widespread progress globally in the prevention of mother-to-child transmission (PMTCT) of HIV and in 2014, the World Health Organisation (WHO) launched the call for elimination of mother-to-child transmission (MTCT) of HIV. Countries must meet specific criteria to achieve elimination status, including ≤50 new paediatric infections per 100.000 live births. For countries with high prevalence of antenatal HIV, these targets are very challenging and will only be achieved with extremely low transmission rates requiring almost total coverage of a comprehensive package of PMTCT interventions (Pellowski et al., 2019).

Scaling up of the PMTCT policy did not yield enough results to meet the Millennium Development Goal of reducing child mortality by two-thirds back in 2015 (United Nations [UN], 2015). Therefore, more work needs to be done in the quest to meet the Sustainable Development Goals (SDGs) particularly goal 3, which aims to "ensure healthy lives and promote well-being for all at all ages". The target of this goal is to "end preventable deaths of new-borns and children under-five years of age by 2030" (UN, 2015). To achieve the SDG, more radical efforts are needed from all stakeholders to respond to the gaps that still exist in the PMTCT programme, and finally rescue children from this infectious yet preventable disease. To achieve the set SDG target of ending AIDS by 2030, a new way of doing things and a different thinking is urgently needed. Some of the challenges, such as losing cases to follow up, inadequate documentation and stigma, cannot be ignored. Accessibility to healthcare facilities for all members of the community needs to be prioritised. In rural areas, women still give birth at home without the assistance of a trained health worker. Shortages of human resources in healthcare facilities, socio-economic conditions, and patriarchal cultural practices that exist in rural areas contribute massively to the challenges that affect implementation of the PMTCT programme (Anígilájé, Ageda & Nweke, 2016).

Furthermore, poor implementation of policies and guidelines has often been reported (du Plessis et al., 2014) as one of the major contributors to poor management and treatment of children under five years of age who are exposed to HIV. Nonetheless, it is imperative to acknowledge that management of HIV infection is complex, and the dynamics that influence the success of programmes such as PMTCT need to be understood in all their stages. Hence, the aim of this integrative literature review is to explore the impediments to and reasons for poor management of children under five years of age who are exposed to HIV in SA (Buthelezi, Modeste & Phetlhu, 2020).

2.2. Overview of PMTCT programme in South Africa (SA)

In South Africa, the PMTCT programme was first initiated in 2002 in Khayelitsha, Cape Town's largest township (Nicol, Dudley & Bradshaw, 2016), which had the highest HIV prevalence in the Western Cape- 34.3% of pregnant HIV positive women in 2012 (Stinson et al., 2016). According to the most recent census of 2011, Khayelitsha has a population of 391 749 (Frith, 2019). The national PMTCT programme began with maternal and infant single dose Nevirapine (NVP) and later transitioned to triple ARV therapy in February 2008. The programme has been amended and updated over the years and currently is Option B+, which is the provision of ARV's to all women living with HIV irrespective of CD4 or WHO clinical staging (Goga et al., 2016). The PMTCT programme is implemented through a comprehensive approach whereby women are given comprehensive antenatal services including HIV testing, implementation of safe childbirth services including counselling on infant feeding, and follow-up of mother and infant in the postnatal period (AVERT, 2018).

Western Cape, a province in South Africa, its PMTCT programme offers HIV testing for all pregnant women and those who test positive are immediately started on lifelong HIV treatment (Western Cape Government consolidated guidelines for HIV treatment, 2018). The risk of transmission is prevented during labour, after delivery and right through the postpartum phase,

including monitoring the mothers' viral load every three months for the duration of breastfeeding (Western Cape Government, 2018). The new WHO global health strategy on HIV was endorsed by the World Health Assembly in 2016, which called for all states and WHO to aim towards the target of zero new HIV infections in infants by 2020 (Banja & Gebrehanna, 2020).

Despite the great progress in the implementation of this programme, there is still room for improvement due to the lack of adequate follow up treatment of mothers living with HIV, thus increasing the risk of mother-to-child transmission (Mutabazi, Zarowsky & Trottier, 2017). Goga et al. (2016) reported that, in 2016, the national target for South Africa of <2% transmission risk at six weeks has not yet been achieved. UNAIDS (2010) and WHO (2011) shared that the cumulative loss to follow-up in Sub-Saharan Africa PMTCT programmes is estimated between 20-28% during antenatal care, up to 70% after four months after delivery and close to 81% at six months after delivery. Retention in care is essential as it provides opportunities to monitor response to treatment, prevent HIV associated complications and reduce the risk of transmission (Yehia et al., 2015). ART and retention of mothers in care are also vital in achieving the goal of eliminating new infections among children at a global level. Mothers who are retained in care are less likely to transmit the virus to their infants and both have improved health outcomes.

2.3. Problematic of the PMTCT programme

Mother to Child Transmission of HIV (MTCT) remains the most common cause of paediatric HIV infection in sub-Saharan Africa. In the absence of interventions, the risk of MTCT increases (Obai et al., 2017). The chance of vertical HIV infection without any intervention ranges between 15–45% and providing timely antiretroviral prophylaxis for HIV-exposed infants and ART for HIV-positive mothers are helping to cut back the risk below 5% (Belachew, Tewabe & Malede, 2020). Globally there has been significant progress in the prevention of mother to child transmission towards the goal of eliminating paediatric HIV infection.

Velapi (2021) in her dissertation that was exploring the experiences of mothers living with HIV of the PMTCT programme in Khayelitsha, recognised various contributors that influence the retention of mothers in the programme. The study revealed issues of health facility (institutional segregation) based on the patient's condition (HIV status), this made the mothers feel stigmatized and discouraged them to return for follow up visits (Velapi, 2021). The mothers also experienced that many health care workers showed hostile attitudes towards their patients. This created uncertainty and fear for the mothers. Examples included being shouted at if they had missed an appointment or being afraid to ask for information about their prescribed medication. Rasmussen et al. (2018) have identified this as one of the health care system challenges that limit the optimal uptake of the programme. Some of the mothers were predisposed to such treatment by health care workers as they were employed and their employers were not flexible in allowing them to visit the clinic once a month every month, as per PMTCT protocol. This made the mothers reluctant to return based on the anticipated reception. Other areas of concern, as revealed by the study was the minimal knowledge of HIV/AIDS and PMTCT programme that the mothers' possessed; unsatisfactory male partner involvement as a support system; fears and uncertainties of raising the HIV-exposed baby; fear of stigma risk of being identified as People living with HIV (PLWH).

2.4. The nexus between Social Innovationand Health

Before we can explore the relationship between Social Innovation and health, it is important to discuss what Social Innovation is. This will give a better understanding and overview of the role that can be played by Social Innovation in strengthening health systems and practices.

2.4.1. Overview of Social Innovation

Polman et al. (2017) defines Social Innovation as the reconfiguring of social practices, in response to societal challenges, which seeks to enhance outcomes on societal well-being and necessarily includes the engagement of civil society actors.

Social Innovation has ascended as a pioneering theme in the study of innovation. It has been regarded as an evolving research field in which there has been several descriptions. Such elements contribute to amplify discussions between scholars and practitioners about how the concept should be defined and which terms should be used, once it is commonly, but not consistently used in the literature (Moulaert et al., 2013).

To present a definition of Social Innovation is not an easy task given that Social Innovation is variously defined (Elliott, 2013), hardly seems as a plainly outlined scope (Howaldt & Schwarz, 2010) and has a number of conceptual overlays (Iizuka, 2013).

Social innovations are known as new practices used to tackle social challenges; they have a positive influence on individuals, society, and organizations. Social innovations have also been defined as new models, services, and products that simultaneously meet social needs (Marolt et al., 2015).

Two comparable definitions are those by Murray et al. (2010) who define social innovations as new ideas (products, services and models) that concurrently meet social needs and create new social relationships. Simply put, they are innovations that are both good for society and enhance society's capacity to act. Similarly, Bacon et al. (2008) holds that the term 'social innovation' refers to new ideas developed to fulfil unmet social needs. The cumulative use of the term Social Innovation has brought different meanings and therefore concepts with different understandings.

This study is nevertheless steered by the Benneworth (2013) description of social innovation. He positions that a true Social Innovation is systems-changing by developing novel solutions in border spanning learning communities to create social value and promote community development, challenging existing social institutions through collaborative action developing wider networks.

2.4.2. Social Innovationin Health

Social innovations in health are all-encompassing solutions to address access to healthcare gap through a multi-stakeholder, community-engaged process. Many social innovations have been developed in response to specific community needs. A subset of social innovations has transformed health service delivery in low- and middle-income countries (LMICs) (Akuffo & Soop, 2020).

According to Reeder et al. (2019, gaps remain to persist in healthcare and access to health services, LMICs. Social innovations offer a renewed perspective to reinforce health systems and primary health care. Through inclusive approaches, innovative solutions are developed and implemented by multiple-stakeholders address complex and longstanding health problems. Social innovations enable healthcare delivery to be more inclusive, effective and affordable. Social Innovation tackles "how" to improve health, by engaging communities in creating and sustaining solutions (Reeder et al., 2019).

Health systems and access to health services in South Africa continue to face critical challenges. Social innovations offer a renewed approach to reinforce health systems and primary health care. Social innovations play a critical role in transforming the lives of individuals and communities and it has the ability to make healthcare services to be more inclusive and accessible. Social Innovation has to improve health, by engaging communities in creating and sustaining solutions (Mason et al., 2015). Social Innovation in health is a community-engaged process that links social change and health improvement, drawing on the diverse strengths of local communities (Halpaap et al., 2020).

South Africa's social and health challenges are associated with the past and present circumstances of inequality. Several of difficulties in the South African healthcare system can be traced back to the apartheid era in which the healthcare system was extremely disjointed, with inequitable consequence, between racial groups (Baker & Mehmood, 2015). Social and structural conditions that excluded people from the health system are still obstinate. Social Innovation has

emerged as an alternative to address complex and obdurate societal challenges such as poverty and inequality, and as a way to yield lifelong social change.

Dako-Gyeke et al. (2020) assert that, marginalised countries, such as South Africa, encounter challenges related to poverty, tenacious health difficulties, underdeveloped infrastructure, limited capacity of local actors to detect appropriate, workable and accessible interventions. Social Innovation in Health offers a means by which various stakeholders can cultivate and support local responses to daily needs and constraints to access health services.

3. Research Methods

3.1. Case studies as theory building

The case study remains one of the most frequently employed study designs in Social Innovation due to its probing nature. Case studies are practically an example of 'researching 'open systems' where the phenomena can less be controlled, variables are not linear and they interact in changing ways over time (Merriam, 1998).

To address the research question with this framework, we espoused an exploratory research design using a case study. The basis for steering case study research branches from the fundamental work of Yin (2009) and Eisenhardt (1989), precisely, on their references for writing up qualitative research. Yin (2009) labels a case study as an empirical inquiry that investigates a modern phenomenon in depth and within its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident. He further clarifies how this research strategy is suitable for a situation with many variables of interest, multiple data sources and useful previously developed theoretical propositions. Similarly, in-depth case study research analysis is especially suited to theory building in an area where there is little prior research and understanding is relatively poor (Benbasat, 2017). Eisenhardt (2018) provides details about how to develop theory in connection with case studies, determining steps for developing a qualitative study and specifying how these steps can enrich theory by leading to new theoretical propositions.

Using their recommendations, this case study is an appropriate method for informing theory. The research strategy of this article is to develop a theoretical understanding of the role that Social Innovation can play in improving equity in public health. To this end, the case study remains one of the most commonly employed study designs in Social Innovation due to its exploratory and explanatory potential. Case studies are methodologically an example of researching a phenomenon that can less be controlled, variables are not linear and they interact in changing ways over time, just as Social Innovation itself is an ongoing evolving process that is highly context bound (Bansal & Corley, 2012).

3.1. Research design and setting

This paper aims to identify the social issues that explain the gap between PMTCT program goals and the role that could be played by Social Innovation to improve the status quo. This research is qualitative, exploratory and descriptive, based on a case study built with secondary data.

This study was conducted in the Khayelitsha township of Cape Town, in one of the largest community health care centres. Khayelitsha has one of the highest HIV burdens globally (Berkowitz et al., 2018). In the Western Cape, Khayelitsha has the highest HIV prevalence (Stinson et al., 2016).

Patients in Khayelitsha that are on ART account for 17.5% of the total number of people on ART in the Western Cape. In this province, treatment is provided in over 250 clinics, which is approximately 1% of the total number of patients nationally across 3 800 clinics (Kaplan et al., 2017). There has been an increase in the percentage of HIV-infected pregnant women from 19.3% in 2000 to 34.3% in 2012, compared with 29.5 % on a national scale (Stinson et al., 2016).

Khayelitsha is the largest peri-urban township in the Cape Town metropole, located approximately 35km from the city centre and is an area of 43.51 square kilometers. The population is estimated to be 391,749 with an unemployment rate of 38%. Similar to other areas, migration from South Africa's bordering provinces and countries is the main contributor to the high population density in Khayelitsha (Stinson et al., 2016).

Approximately one fifth of women of childbearing age (15–49 years) in South Africa are HIV-infected (Statistics SA, 2018). According to Stinson et al. (2016), in 2012, 34% of pregnant women in Khayelitsha were HIV-infected. For this research, the target population was mothers who had been diagnosed as HIV-positive with exposed but HIV-negative infants who were being managed in the PMTCT programme in the health facility in Khayelitsha. The participants that were included were mothers who have been in the programme since initiation, mothers who seldom participated in the programme, and mothers who were recently initiated into the programme.

3.2. Data Collection

In order to address the research questions, the collection of secondary data (existing publications, thesis, reports and journals) was used for this research. Existing data was extracted to better understand and achieve a rigorous framework for how Social Innovation can be effectively employed to improve the experiences of the mother living with HIV in the PMTCT programme.

3.3. Data analysis

The researcher will use pattern matching suggested by Yin (2009) as a preferred strategy for case studies. Creswell (2009) suggests that a data analysis plan be used because it helps in providing categories of information that help in establishing emergent themes. The study will use emergent coding, and pattern matching coding which are analytical strategies that use codes to organize and group the coded data into categories based on common characteristics, and this sets the beginning of a category or theme in the data. Thematic analysis was used which is associated with inductive approaches and identifying themes that emerge. It was used for the purpose of producing trustworthy and insightful findings and was also beneficial in finding patterns in the data that relate to the aim.

4. Results and Discussion

In this paper, we have asked the research question of how Social Innovation can improve PMTCT, through a reflection of the experiences of the mothers in the PMTCT programme. Our case study has analysed an example of Social Innovation projects that have a social objective and emphasises the participation of the concerned communities.

As alluded in the introduction, this paper combines a review of the literature with empirical evidence extracted from research which explored the experiences of postpartum mothers, living with HIV, of the PMTCT programme in Khayelitsha, Cape Town in 2021 and the Social Innovation in health case studies. The analysis aims to identify the social issues that explain the gap between PMTCT program goals and the role that could be played by Social Innovation to improve the status quo.

With the aim to determine if Social Innovation can improve the PMTCT program, this paper establishes a link between the effective Social Innovation strategies in the presented case studies and recommendations in "Mothers living with HIV in PMTCT program in Cape Town, Khayelitsha" study.

The study aimed to explore the experiences of mothers living with HIV in the PMTCT programme and to explore the experiences of their infants' treatment process. The qualitative approach probed the researcher to understand the participants' lived experiences. The study

revealed that community support and health system related factors played a role in participants' engagement in the programme. Based on the mothers' experiences, recommendations from the study included education regarding PMTCT practices be improved during initiation of the programme to facilitate prevention of the transmission of HIV, continuous staff training and development for the maintenance of accurate service delivery, remove barriers such as the specific demarcation of HIV services in the facility as this contributes to patient identification and stigma. Lastly, the study also suggested that facilities should offer flexible opening times for mothers who find it difficult to attend as they are employed, alternatively an after-hour clinic.

4.1. Espousal of Social Innovationapproaches to enhance health programs

Social innovations are deeply rooted in the knowledge of the community and that effective solutions built upon the knowledge and experience gained in seeking to address adversity and problems. Social innovations in health are inclusive solutions to resolve the healthcare challenges, and need to be a multi-stakeholder and community-engaged process.

Furthermore, one can deduce from the case studies that, when the search for answers to healthcare issues is inclusive and it doesn't just involve health experts and authorities, it is possible that it can also address fundamental factors that wave the social, cultural and economic conditions for the issue to persist.

Below we discuss some of the themes that emerged from the case studies and how they speak and relate to the challenges and recommendations made by the PMTCT study conducted in Khayelitsha, South Africa.

4.1.1. Theme 1: Community Knowledge and Education

In the case of Khayelitsha Cape Town, participants of the study displayed limited knowledge with regards to HIV, the PMTCT programme and its principles. This study recommended that the facility develops a strategy to assess the effectiveness of the programme, with specific reference to mothers' knowledge and understanding of the programme and adherence to it. Health information and education provided to the mothers should be focused, contextual, practical, and with a clear rationale for the information and advice. This recommendation is supported by the case study where the cases presented those effective social innovations were profoundly entrenched in the knowledge of the community, and that results were constructed on the knowledge and skill attained in efforts to solve hardship and challenges. Knowledge dissemination in and amongst communities permitted the adoption of solutions. Education was mutual to all the Social Innovation case studies and thought to be crucial to the efficiency and long-term effect of each social innovation.

4.1.2. Theme 2: Community Support and Engagement

The PMTCT study suggested that community support was as important as partner and family support. For some participants, the community services provided more assistance than family or partners. The support participants received from community programmes influenced the way in which they interacted in the PMTCT programme. The mothers in the PMTCT programme were allocated to a treatment buddy, a person who is a member of the community who follows up on the patients in their homes and on progress with their treatment. Treatment buddies clarified any misconceptions that mothers may have and checked that mothers understood information provided by health practitioners.

The Social Innovation process exemplifies a bottom-up view of strategy and application that begins with the acceptance that entire members of society have agency and have the ability to resolve their own difficulties (Mulgan et al., 2007). We can deduce from our case studies that Social Innovation is a communal process allowing the generation of notions by people who seek to enhance wellbeing. They point towards the need to support the community's capacity to engage in collaborative processes. The ideas from our Social Innovation cases are, to a great extent, established by community members as a rejoinder to healthcare challenges, such, the cases

exemplify how community-driven Social Innovation initiatives make a positive contribution to addressing specific challenges faced by the community.

4.1.3. Theme 3: Transform healthcare practice through Social Innovation

According to Godin (2015) Social Innovation can contribute to new policy solutions in the health system. Successful social innovations can be replicated and scaled up to reach larger influence and the results from these social innovations can offer valued information on how health care services can be distributed.

The thesis recommended the evaluation and efficacy of the MTCT programme as participants displayed limited knowledge with regards to HIV, the PMTCT programme and its principles. The study holds that the facility develops a strategy to assess the effectiveness of the programme, with specific reference to mothers' knowledge and understanding of the programme and adherence to it.

Social innovations provide a renewed perspective to reinforce health systems and health care. Through inclusive methods, innovative solutions are planned and executed by community members, health workers and other actors to tackle multifaceted and long-lasting health issues. The case is a testimony that when new practices and methods are needed to address new or recurring health challenges. Social Innovation strategies and processes can create sustainable change within health and eventually improve population health outcomes. As such, Social Innovation offers new perspectives and tools to tackle the key health policies that are perhaps not effectively working for a certain segment of the population.

Furthermore, our case study further emphasises that when conventional approaches and top-down strategies are not effective, the solutions identified through the "Shortening distances through telemedicine in Honduras" case demonstrate the ingenuity of communities to fortify health systems. These social innovations offer a novel approach to solve existing and deeply entrenched health challenges. In all the three case studies presented in the paper, social innovations thrived in solving prevailing challenges and have the potential of addressing and contributing to the positive alteration of the health systems and practices.

4.1.4. Theme 4: Bottom up approach and inclusiveness

According to Gregoire (2016) effective and efficient Social Innovation is a bottom-up, citizen-led approach that results in developing and application of inventive solutions that unravel persistent health system problems. Espousing this method can aid the aims and objectives outlined in the policy framework. The Khayelitsha study, suggested that engaging the community to actively address social factors outside of the clinic environment, ongoing patient-tailored counselling for HIV-positive mothers, and increasing male involvement are key to the success of PMTCT programmes in Khayelitsha and similar locations.

The lesson drawn from the case study is that, central to Social Innovation is the notion that societies are capable of forming solutions to solve their own health care challenges. This understanding permits for inclusive participation in solution-creation by all members of the society, including, health workers, community members and policy makers. When Social Innovation adopts a bottom-up approach, the results are specific to the contingent and socio-economic intricacies of a community. Shared application, community involvement and agency ensure that solutions are sustained and continuous over a period of time, as such people remain in charge of their well-being. This inclusive nature of Social Innovation leads to communities with enhanced capacity to act and take ownership of implemented solutions and their own health (Chomane & Biljohn, 2021). The case of the PMTCT programme in South Africa is not a unique case. Many well-intended programmes and projects flop to effectively address social challenges. Programmes are often imposed into the society with slight or no contextual understanding. Consequently, the lack of engagement with marginalised communities result in South African policy makers missing out on the opportunity for more informed contributions.

5. Conclusions

The findings of this paper suggest that Social Innovation can aid in addressing numerous social challenges including health challenges. This case study shows that Social Innovation contributes towards addressing health challenges by providing more personal, analytical and pre-emptive health care paths. Furthermore, there is a critical contribution made by Social Innovation towards addressing demographic challenges by helping those that are unable to access healthcare. Additionally, the results of this paper highlight that, through Social Innovation healthcare delivery can be inclusive, effective and affordable by engaging communities in creating and sustaining solutions.

To this end, social innovative solutions presented here were based on the knowledge and experience of individuals and communities facing adverse circumstances, this knowledge was shared through health promotion and education, resulting in empowerment of the communities. The primary problems addressed by the solutions were the limited access to health care services and unsuccessful conventional approaches. These innovative and inclusive solutions verified how Social Innovation can brace health systems by providing new perspectives to health care problems and aiding societies to take ownership of their lives.

This paper holds that Social Innovation in health is more effective when it occurs bottom-up, as it is a community-engaged process that connects social change and health enhancement, through the diverse efforts of the local actors. The paper shows that having local beneficiaries drive the development of a Social Innovation health programme results in more workable and sustainable solutions. It demonstrates that Social Innovation draws into the ingenuity and will of community members, unsettling conventional systems of health care services and aiding to accomplish improved and sustainable health services.

Simply put, it demonstrated that Social Innovation in healthcare can bridge the existing

gap in disenfranchised communities by generating prompt ideas, fosters a social proposal along with building sustainable healthcare solutions.

To conclude, this paper set to determine how Social Innovation can aid in developing strategies to improve the outcomes of the PMTCT programme by addressing the recommendations highlighted in the mothers living with HIV in the PMTCT programme.

To respond to this research question, the paper established that Social Innovation in health aids in reducing and improving health care shortcomings by empowering communities to become active participants of their health challenges, through the local adaptation of global strategies that facilitate the reduction of health system limitations. The contribution of Social Innovation in health helps also bridge gaps in primary health care systems by providing a fresh lens to strengthen these health care systems and engaging communities in creating and sustaining solutions.

As such, social innovations in health are inclusive solutions to address the healthcare delivery gap that meet the needs of end users through a multi-stakeholder, community-engaged process (Gregoire, 2016). The Social Innovation solutions highlighted demonstrated how Social Innovation can reinforce health systems by providing fresh solutions to health needs and innovative solutions were based on the knowledge and experience of individuals and communities facing adverse situations. Therefore, there is clear evidence that Social Innovation can improve health systems and programs such as the PMTCT programme.

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Research Article

Social Innovation for the promotion of decent work for people with disabilities

Innovación Social para el fomento del trabajo digno de las personas con discapacidad

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Abstract: In modern conditions, disability is a social phenomenon that no society can avoid. There are more than 2.7 million people with disabilities in Ukraine. The realities of today allow us to state the fact that people with disabilities belong to the most vulnerable segments of the population, who are deprived of some basic life benefits. The problems of employment and labor, which need sufficient attention from the state, are also often overlooked. Unfortunately, in recent years there has been a significant increase in the number of people with disabilities in the country. Therefore, the question of the urgent need to study the protection of labor rights of persons with disabilities is relevant. Research methods are chosen to take into account the purpose and objectives of the study, its object, and its subject. In the course of the research philosophical, general scientific, as well as special legal methods of scientific knowledge were used. The purpose and task of the research are to determine the legislative and theoretical legal provisions regarding national instruments for the protection of the labor rights of persons with disabilities, to outline the existing guarantees for persons with disabilities in the field of work, to identify problematic aspects in the field of employment, to develop recommendations and proposals for the optimal ways of reforming labor legislation to effectively protect employees with disabilities.

Keywords: labor market; right to work; employers; disabilities; social protection.

Resumen: En las condiciones actuales, la discapacidad es un fenómeno social que ninguna sociedad puede evitar. En Ucrania hay más de 2.7 millones de personas con discapacidad. Las realidades de hoy nos permiten afirmar que las personas con discapacidad pertenecen a uno de los segmentos más vulnerables de la población que se ven privados de algunas prestaciones vitales básicas. Los problemas de empleo y trabajo, que necesitan una atención suficiente por parte del Estado, también suelen pasarse por alto. Desgraciadamente, en los últimos años ha aumentado considerablemente el número de personas con discapacidad en el país. Por lo tanto, existe una necesidad urgente de estudiar la protección de los derechos laborales de las personas con discapacidad. Los métodos de investigación en este análisis son elegidos teniendo en cuenta la finalidad y los objetivos del estudio, su objeto y su sujeto. En el curso de la investigación se han utilizado métodos filosóficos, científicos generales y jurídicos.

El propósito y la tarea de la investigación son determinar las disposiciones jurídicas legislativas y teóricas relativas a los instrumentos nacionales de protección de los derechos laborales de las personas con discapacidad, esbozar las garantías existentes para las personas con discapacidad en el ámbito del trabajo, identificar los aspectos problemáticos en el ámbito del empleo, elaborar recomendaciones y propuestas sobre las formas óptimas de reformar la legislación laboral para proteger eficazmente a los empleados con discapacidad.

Palabras clave: mercado laboral; derecho al trabajo; empleadores; discapacidades; protección social.

1. Introduction

Since the beginning of the 2000s, the state has had a policy of employment of persons with disabilities, the components of which are: "quotas" - a normative definition of the number of jobs (4%) for the employment of persons with disabilities; assisting enterprises of sheltered employment (enterprises of public organizations of the disabled); providing subsidies for job creation. However, people with disabilities remain a category that suffers from discrimination, including in the labor market. Increasing opportunities for their competitive participation in employment requires government intervention.

The Constitution of Ukraine (Verkhovna Rada of Ukraine, 1996) proclaims that all human beings are free and equal in dignity and rights (Article 21). Also important is the norm of the Constitution of Ukraine, which stipulates that citizen have equal constitutional rights and freedoms and are equal before the law. There may be no privileges or restrictions based on race, color, political, religious, or other beliefs, sex, ethnic or social origin, property, place of residence, language, or other characteristics (Article 24, Constitution of Ukraine). In modern conditions, disability is a social phenomenon that no society can avoid. Unfortunately, in recent years the country has seen a significant increase in the number of people with disabilities. There are more than 2.7 million people with disabilities in Ukraine, which is 5.2% of the total population. According to UNESCO, in 1977 there were 450 million people with disabilities on the globe, by 1983 this figure had risen to 514 million, and the number of people with disabilities in the world today has reached 1 billion, or 15% of the population. The realities of today allow us to state that persons with disabilities belong to the most vulnerable segments of the population, who are deprived of some basic benefits of life; quite often the problems of employment and employment that need sufficient attention from the state are ignored. Therefore, the question of the urgent need to study the legal mechanism for the protection of labor rights of persons with disabilities is relevant.

The protection of labor rights of persons with disabilities, as well as the implementation of these rights, is an urgent problem for both foreign countries and Ukraine. It should be noted that the state has not only committed itself to support such citizens but also creates all the conditions for people with disabilities to feel on an equal footing with other citizens. According to statistics, about 30% of people with disabilities of working age are officially employed in Ukraine. Please note that the peculiarity of the above-mentioned persons exercising the right to work is that for them this possibility is limited by the contraindications of certain types of work due to health conditions. Employment of persons with disabilities is carried out by the state employment service, social protection bodies, local executive bodies, local self-government bodies, public organizations of persons with disabilities, enterprises, institutions, and organizations. It should be noted that over the last decade in Ukraine there has been a declining trend in the number of people with disabilities who apply to the bodies of labor and social protection for employment.

The idea of social innovation occupies one of the leading places in the politics of developed countries today, while in Ukraine it is just beginning to spread. Social innovations are understood as new solutions (products, services, models, processes, etc.) that meet social needs (more fully and effectively than existing solutions) and lead to new, improved opportunities, values, and/or relationships. In other words, social innovation is good for society and drives that society to action. Social innovations are the process of the emergence of new methods and technologies, and forms of social relations that contribute to the improvement of the effectiveness of the public social policy, aimed at improving working conditions, and solving problems of health care, education, and culture. In our opinion, social innovations are capable of bringing about positive changes and contributing to decent employment and proper working conditions for persons with disabilities, ensuring their rights and freedoms. This can be achieved through the introduction of the legislation of decent social security and protection conditions, the creation of comfortable working conditions at workplaces, increasing the possibility of homework for the disabled, and the promotion of professional training for the disabled.

Despite the availability of some scientific work on the protection of the labor rights of persons with disabilities, this problem has not been fully studied and researched, and some problems in this area, including employment and dismissal of persons with disabilities, remain unresolved. Many scientific works, including such scholars as S.Ya. Vavzhenchuk (2016), R.Ya. Butynska (2019), V. Kondratenko (2018), G. Kazarian (2017), and V.P. Miller (2018) are devoted to the issues of protection of rights and promotion of employment of persons with disabilities. Given the scientific work and recommendations of scientists, it is advisable to continue research on this issue. Given the above, the goal and task of the research are to determine the legislative and theoretical legal provisions regarding national instruments for the protection of the labor rights of persons with disabilities, outline the existing guarantees for persons with disabilities in the field of work, identify problematic aspects in the field of employment, develop recommendations and proposals for optimal ways of reforming labor legislation to effectively protect workers with disabilities.

2. Materials and Methods

Several general scientific and special methods of cognition were used for comprehensive research, achievement of an objective scientific result, and formulation of conclusions and recommendations. The study is based on the dialectical method, which contributed to a comprehensive study of the state-legal mechanism for the protection of the rights of workers with disabilities in its relationship and interdependence with the globalization and European integration processes of society, which revealed the current state of the research topic (used in the first point of the Results section). The application of system-structural and system-functional methods, as well as methods of classification and grouping, helped to systematize the actual problems of implementing legislation on the protection of labor rights of persons with disabilities in Ukraine (used in the Discussion section).

The modeling method is reflected in the development of the concept of improving the legal protection of the rights and employment of disabled people and the formation of specific proposals for improving the legislation of Ukraine in the field of the protection of the rights of workers with disabilities to solve the current problems of protecting domestic workers by the standards of the European Union (used in the Discussion section). The theoretical and prognostic method provided an opportunity to substantiate proposals and recommendations for improving the current labor legislation of Ukraine in the issue, which became the subject of research. In particular, the dialectical method helped to determine the foundations of Ukraine's state policy on employment and employment of persons with disabilities making it possible to establish causal links in the process of analyzing the problems of state policy in the field of employment of persons with disabilities.

With the help of the formal-legal method, a comprehensive scientific analysis of modern national legislation on state policy in regulating relations in the field of labor of persons with disabilities. Methods of analysis and synthesis were leading throughout the work, from the analysis of factual material for research, the study of the works of scientists, and normative and empirical bases to substantiate the conclusions. The method of induction was used to theoretically generalize the complex mechanism of state policy in the field of employment of persons with disabilities and to draw conclusions. The use of these methods made it possible to analyze the scientific-theoretical and applied legal aspects related to the administrative and legal regulation of state policy in the field of protection of labor rights and promotion of employment of persons with disabilities.

A number of articles related to the research topic were also analysed (Table 1).

Table 1. Articles analysed.

Article	Author
"Unity and differentiation of measures of preventive protection, protection of labor rights and measures of labor liability"	Vavzhenchuk, S. (2015)
"Protection and protection of labor rights of workers: a textbook"	Vavzhenchuk, S.Ya. (2016)
"Problems of legal guarantees of labor rights of employees when concluding, changing and terminating an employment contract"	Melnik, K.Yu., & Babenko, A.O. (2016)
"Organizational and legal forms of employment promotion"	Shoemaker, D.Yu. (2017)
"Precarization as a factor in the transformation of the institution of labor law "employment and employment" in a shortage of decent work"	Amelicheva, L.P., & Nefedov, O.V. (2017)
"Between equality and discrimination: disabled persons in Romania"	Baciu, E.L. & Lazar, T.A. (2017)
"Administrative and legal means of ensuring the right to work of persons with disabilities: the system and ways of development"	Kondratenko, V. (2018)
"International legal regulation of social protection of persons with disabilities in the field of rehabilitation and labor: theoretical and legal approach"	Miller, V. P. (2018)
"Features of employment of persons with disabilities in the socio-economic development of Ukraine"	Safonik, N. P. (2018)
"Workers with Disabilities Between Legal Changes and Persisting Exclusion: How Contradictory Rights Shape Legal Mobilization"	Lejeune, A. & Ringelheim, J. (2019)
"Labor protection as a function of labor law"	Butynska, R.Ya. (2019)
"Scientific and methodological mechanisms of socio-economic support of persons with disabilities"	Kazarian, G. (2019)

"World experience in implementing the state policy of support for persons with disabilities and its implementation in Ukraine"	Halytsky, O.M. (2019)
"Factors influencing and employment indicators of persons with disabilities with the assistance of the state employment service"	Overchuk, V.A. (2019)
"Issues with interpreting the social and legal value of a person in the context of the integrative type of legal-awareness"	Shevchenko, A., Kydin, S., Kamarali, S., & Dei, M. (2020)
"Application of technologies of formal and non-formal education for continuous professional development of the modern specialist"	Sydorenko, V., Shorobura, I., Ponomarenko, A., Dei, M., & Dzhus, O. (2020)
"Regarding the range of persons who have additional guarantees in promoting employment"	Zabeyda, T.O., & Chepys, I.V. (2020)
"Public policy of state institutions on socio-economic security of persons with disabilities"	Oliynyk, V.V., Ghazaryan, G.G., & Shcherbata, M.Yu. (2021)

Source: Developed by author.

3. Results

3.1. Legislative regulation of employment of people with disabilities in Ukraine

The formation of the labor market, especially in the context of the development of Ukraine as a democratic, social and legal state, requires the formation of clear, barrier-free access mechanisms to it, as well as the introduction of additional employment guarantees for persons who are not fully competitive. Such persons include the disabled. There is no universally accepted definition of the concept of "disability", although there have been many different attempts to derive a single meaning of the word. The World Health Organization (WHO) in its International Classification of Functioning, Disability, and Health (ICF) takes into account the social aspects of disability and does not consider disability only as a phenomenon of "medical" or "biological" dysfunction. WHO defines two key concepts as follows. Impairment: Any loss or abnormality of a psychological, physiological, or bodily structure or function, such as paralysis or loss of vision.

Disability: "any limitation or lack (due to impairment) of the ability to perform activities in the manner or within the limits considered normal for a person" (United Nations, 2020). The United Nations Convention on the Rights of Persons with Disabilities (United Nations, 2006) states that "the concept of disability is evolving and that disability is the result of the interaction between people with health impairments and attitudinal and environmental barriers that prevent their full and effective participation in society on an equal footing with others." According to Article 1, "persons with disabilities include those with long-term physical, mental, intellectual or sensory impairments..." (United Nations, 2006). The extent to which these impairments disable someone depends on the level of barriers they face in society.

A recent position taken by international organizations is that the presence of a disability is the result of dynamic interaction, on the one hand, between a person's health and other personal factors (such as age, gender, personality, or level of education) and, on the other hand, social and the physical environment in which they are found. This approach is called the "social model of disability". It is important to note that it is quite important for the state to create conditions for the realization of the rights of persons with disabilities on an equal basis with other citizens. Even though there are no unambiguous approaches in society and the state among employers

regarding the involvement of people with disabilities in the labor market, and their employment, however, these issues have recently become more and more relevant given this.

Issues of labor of persons with disabilities are regulated by general labor legislation, such as the Labor Code of Ukraine (Verkhovna Rada of Ukraine, 1971), the Law of Ukraine "On Employment" (Verkhovna Rada of Ukraine, 2013), "On Vacations" (Verkhovna Rada of Ukraine, 1997), "On Labor Protection" (Verkhovna Rada of Ukraine, 1992), etc., and special legislation - the Law of Ukraine "On the Fundamentals of Social Security of the Disabled in Ukraine" (Verkhovna Rada of Ukraine, 1991), "On Rehabilitation of the Disabled in Ukraine" (Verkhovna Rada of Ukraine, 2006), as well as normative legal acts adopted for implementation, in particular disability legislation. In particular, anti-discrimination provisions are defined in Article 2.1 in the field of labor, for example, violation of the principle of equality of rights and opportunities, direct or indirect restriction of workers' rights, and this provision also applies to people with disabilities.

It should be noted that according to the Constitution of Ukraine, the Convention on the Rights of Persons with Disabilities (hereinafter - the Convention) (General Assembly, 2006), the Law of Ukraine "On the Fundamentals of Social Security of the Disabled in Ukraine" (Verkhovna Rada of Ukraine, 1991), with disabilities in Ukraine have all the full socio-economic, political, personal rights and freedoms enshrined in the Constitution of Ukraine, laws of Ukraine and international treaties, the binding nature of which was approved by the Verkhovna Rada of Ukraine. The Convention (Article 27) provides that States Parties recognize the right of persons with disabilities to work on an equal basis with others; it includes the right to be able to earn a living by work freely chosen or freely agreed upon by a person with a disability, in an environment where the labor market and working environment are open, inclusive and accessible to persons with disabilities. Taking into account the provisions of the Constitution of Ukraine, and the Convention on the Rights of Persons with Disabilities, the legal aspects of employment of persons with disabilities are determined based on Section IV "Employment, Education, and Training of Persons with Disabilities" of Law No. 875-XII. They provide such features:

First, to realize the creative and productive abilities of persons with disabilities and consider individual rehabilitation programs, they are guaranteed the right to work, as well as engage in entrepreneurial and other employment activities that are not prohibited by law. Secondly, an important guarantee of employment of persons with disabilities is that the refusal to conclude an employment contract or promotion, dismissal, or transfer to another job without his consent on the grounds of disability is not allowed, except when the conclusion medical and social examination, the state of health interferes with the performance of professional duties, threatens the health and safety of others or the continuation of work or changes in its nature and scope threatens the deterioration of health. In the legal sense, this guarantee is designed to promote sustainability and stability of relations between the employer and the employee with a disability by prohibiting unjustified (on the grounds of disability) refusal of such a person to conclude an employment contract, promotion, transfer, or dismissal.

Third, the legislator sets certain requirements for the organization of the workplace. Fourth, employers have set a quota (norm) for the employment of persons with disabilities. Fifth, administrative and economic sanctions are introduced for employers who violate the established standards for the employment of persons with disabilities. The further process of development of the labor market in Ukraine will set trends to increase the motivation of employers to employ people with disabilities, ensuring appropriate, healthy, and safe working conditions, to the needs and interests of such workers.

Among the normative legal acts devoted to the legal regulation of work of persons with disabilities, the Law of Ukraine "On the Fundamentals of Social Security of the Disabled in Ukraine" occupies a decisive place, although the subject of its legal regulation is not directly labor relations with this category of persons. Thus, by this Law, to realize the creative and productive abilities of persons with disabilities and taking into account individual rehabilitation programs,

they have the right to work in enterprises, institutions, and organizations, and engage in entrepreneurial and other activities not prohibited by law. Ensuring the rights of persons with disabilities to employment and paid work, including the condition of work at home, is carried out by their direct application to enterprises, institutions, organizations, or the state employment service. The selection of a job is carried out mainly at the enterprise where the disability occurred, taking into account the wishes of the person with a disability, his/her professional skills, and knowledge, as well as the recommendations of medical and social expertise.

It should be noted that the legislation of Ukraine, as well as the legislation of foreign countries, enshrines rules that determine the responsibility of persons for violations of the rights and freedoms of persons with disabilities. It should be noted that in Ukraine the amount of fines provided by law is so insignificant (Article 20 of the Law of Ukraine "On the Fundamentals of Social Security of the Disabled in Ukraine", Article 53 of the Law of Ukraine "On Employment") that they lose their meaning as sanctions for violating the law. Sometimes it is more profitable for some companies to pay a fine than to employ this category of people. Thus, today there is an urgent need to strengthen state supervision and compliance with employers' quotas for the employment of persons with disabilities and to ensure proper working conditions for this category of persons.

3.2. Legal guarantees for persons with disabilities in the field of work

On the one hand, persons with disabilities have all the same employment rights as persons with disabilities, and on the other hand, the state provides several guarantees for people with disabilities aimed at their inclusion in the labor market. For example, people with disabilities are recognized as one of the categories of citizens who have additional guarantees for employment. The Law of Ukraine "On Employment" stipulates that: "Selection of suitable work for people with disabilities (including by reasonable adaptation of existing or new jobs) is carried out by their professional skills, knowledge, individual rehabilitation program and taking into account wishes regarding working conditions". People with disabilities have the right to work in enterprises, institutions, and organizations, as well as engage in entrepreneurial and other work activities that are not prohibited by law to realize their creative and productive abilities and take into account individual rehabilitation programs.

Note that the draft of the new Labor Code (LC) of Ukraine in terms of the rights of persons with disabilities is characterized by: a reflection of the general rights and guarantees contained in the Labor Code of Ukraine and certain special laws; endowment of persons with disabilities with a general set of rights, without taking into account the peculiarities of their work; failure to take full account of the provisions of the UN Convention on the Rights of Persons with Disabilities; lack of requirements and norms on public control over the work of public organizations of people with disabilities. In such circumstances, there is a high probability that the labor issues of people with disabilities will be formal if the LC approves them, and thus their participation in the labor market will be declarative.

Given the above, we will find out how the protection of labor rights of persons with disabilities, who enter into employment, stay in them, or terminate them, is manifested. In the Labor Code of Ukraine, the section "Labor protection" contains Article 172, devoted to the use of the labor of persons with disabilities. This article states that in cases provided by law, the owner or his authorized body is obliged to organize training, retraining, and employment of persons with disabilities by medical recommendations, to establish at their request part-time or part-time work week and create benefits working conditions. The involvement of persons with disabilities in overtime work and night work without their consent is not allowed. It is not necessary to confuse the labor protection of persons with disabilities and the protection of labor rights of the specified category of persons in labor legal relations. Labor protection itself by Article 1 of the Law of Ukraine "On Labor Protection" is defined as a system of legal, socio-economic, organizational and technical, sanitary and hygienic, and therapeutic and preventive measures

and means aimed at preserving life, health, and ability to work in the process of work. Thus, by the legal norms, labor protection will avoid damage to the health, loss, or loss of life of the employee. The term "protection" refers to the implementation of certain preventive measures and means to achieve the ultimate goal - the preservation of the life and health of persons with disabilities.

3.3. Guarantees and rights provided by law to persons with disabilities in the process of termination or change of employment conditions

According to Article 14 of the Law of Ukraine "On Employment" (Verkhovna Rada of Ukraine, 2013) persons with disabilities who have not reached retirement age, belong to the category of persons who are provided with additional guarantees of assistance in employment. The essence of these guarantees is to establish the standard of their employment by determining the quota and reservation of jobs. Legal guarantees provided to persons with disabilities at employment are a system of legal guarantees determined by the norms of labor law, which follow from the exercise of the right to full employment and the established procedure for concluding an employment contract. This group of guarantees should be classified into two groups:

1) general guarantees of the right to work in employment, provided for all citizens, which persons with disabilities have an equal footing with others;
2) additional guarantees for the exercise of the right to work of persons with disabilities provided to them during employment.

Guarantees of the right to work of persons with disabilities provided to them in the performance of their job functions are:

1) the obligation of the employer to provide the employee with reduced working capacity with a job that meets the requirements of legislation and MSEC recommendations;
2) the legally established longer duration of annual basic leave and additional leave without pay compared to other employees. Annual basic leave is granted regardless of the availability of six months of continuous work experience at the relevant enterprise, institution, organization, or individual who uses hired labor by the law;
3) prohibition to involving persons with reduced working capacity in night work and overtime work without their consent. Involvement of this category of workers in the specified works occurs on the condition that it does not contradict medical recommendations;
4) the statutory obligation of the owner or his authorized body to transfer employees who need to provide easier work due to their health condition, with their consent, to work by a medical opinion;
5) prohibition of temporary transfer by the owner or his authorized body of the employee to another job not stipulated by the employment contract if it is contraindicated due to his health condition.

Legal guarantees provided to persons with disabilities in the process of termination of an employment contract are a system of legal guarantees determined by the norms of labor law, which arise in the process of termination of an employment contract. The general guarantees of the right to work of persons with disabilities provided to them upon the termination of the employment contract are a) the existence of legal grounds for termination of the employment contract; b) compliance with the established procedure for dismissal.

Additional guarantees of the right to work of persons with disabilities provided to them upon the termination of the employment contract are:

1) the obligation of the owner or his authorized body to terminate the fixed-term employment contract at the request of the employee in case of illness or disability;
2) the preemptive right to leave the job when dismissing employees in connection with changes in the organization of production and work on equal terms of productivity and qualifications for employees who received at this company, institution, organization,

occupational injury or disease, as well as participants in hostilities, persons with disabilities due to war and persons covered by the Law of Ukraine "On the Status of War Veterans, Guarantees of Their Social Protection" (Verkhovna Rada of Ukraine, 1993), as well as persons with disabilities among participants in the aftermath accidents at the Chornobyl NPP and victims of the Chornobyl catastrophe, about which a causal link between the decline in working capacity and the Chornobyl disaster have been established, patients suffering from radiation sickness as a result of the Chornobyl catastrophe. It is appropriate to emphasize that in Ukraine the dismissal of employees due to disability is prohibited by law. After all, the fact of disability cannot be grounds for the dismissal of an employee under paragraph 2 of Art. 40 of the Labor Code of Ukraine.

The employer, unlike the employee, is deprived of the right to terminate an employment contract concluded for an indefinite period. His right to terminate an employment contract is more limited than the same right of an employee. The employer has the right to dismiss an employee on his initiative only if there are grounds on which the law connects the emergence of his right to terminate the employment contract. One of these is the ground provided for in paragraph 1 of Article 40 of the Labor Code of Ukraine, which allows the employer to terminate the employment contract with changes in the organization of production and labor. Under changes in the organization of production and labor in paragraph 1 of Article 40 of the Labor Code of Ukraine means liquidation, reorganization, bankruptcy, or reorganization of the enterprise, institution, organization, or reduction of the number of staff. In the process of dismissal under paragraph 1 of Article 40 of the Labor Code of Ukraine are the rules of Article 42 of the Labor Code of Ukraine, which establishes the preemptive right to stay at work. The advantage of staying at work is given to workers with higher qualifications and productivity. Thus, Part 2 of Article 42 of the Labor Code of Ukraine establishes a list of persons who, under equal conditions of productivity and qualifications, have an advantage in leaving work.

This category includes persons with disabilities as a result of war and employees who received an occupational injury or occupational disease at this enterprise, institution, or organization. It is worth noting that the law stipulates that in the event of illegal dismissal, the employer is liable - first of all, it is the imposition of a fine for violating labor laws. In addition, the law stipulates that violations of citizens' labor rights, including discrimination on the grounds of disability, may be grounds for instituting criminal proceedings. The protection of the rights and freedoms and legitimate interests of persons with disabilities takes place in court.

The legal literature has repeatedly raised the question: is an employer entitled to transfer a person with a disability who, according to MSEC recommendations, should be transferred to another permanent job if the person with a disability is not satisfied with the employer's proposal? It can be argued that regardless of the wishes of the disabled person, he cannot be left at a previous job if it is contraindicated. We believe that in this case, the employer cannot leave the employee for a previous job, which according to the MSEC is contraindicated due to his health condition, and in the absence of the employee's consent to transfer he is obliged to dismiss such employee under paragraph 2 of Article 40 of the Labor Code of Ukraine. Thus, by Part 3 of Article 9 of the Law of Ukraine "On Labor Protection" of October 14, 1992, employees who lost their ability to work due to an accident at work or occupational disease, retain their job (position) and the average salary for the entire period until recovery or the establishment of permanent loss of professional capacity for work.

If the victim is unable to perform previous work, he/she is trained and retrained, as well as employed by medical recommendations. It should be noted that dismissal of a person with a disability is allowed if, according to the MSEC, the state of health interferes with the performance of professional duties or the continuation of work may lead to the deterioration of the health of such an employee. If the employee has a disability, the employer needs to take certain actions, in particular, to analyze the recommendations of the MSEC with the conclusions on the conditions

and nature of work in the certificate to the MSEC inspection report or in the notification of the MSEC inspection results. In addition to these conclusions, Part 1 of Article 17 of the Law of Ukraine "On the Fundamentals of Social Security of the Disabled in Ukraine" of March 21, 1991, must also take into account individual rehabilitation programs.

Refusal to enter into an employment contract or promotion, dismissal at the initiative of the administration, transfer of a disabled person to another job without his consent on the grounds of disability is not allowed, except when MSEC concludes his health interferes with professional duties, threatens the health and safety of others, or the continuation of employment or a change in its nature and scope threatens the deterioration of health. Ensuring the rights of persons with disabilities to employment and paid work, including the condition of work at home, is carried out by their direct application to enterprises, institutions, organizations, or the state employment service. At the same time, employers are required to allocate and create jobs for people with disabilities, including special ones: "create working conditions for them, taking into account individual rehabilitation programs."

4. Discussion

The analysis of national legislation and the practice of its application show serious obstacles to the exercise of the right to work for persons with disabilities. The main symptoms that indicate the nature of the employment problem are discrimination against people with disabilities in the labor market. Despite the formal prohibition of discrimination in national law, in practice, persons with disabilities are not always perceived as professionals or professionals. Their jobs are mostly low-skilled. Promotion is accompanied by certain obstacles. There are also manifestations of discrimination based on the state of health, in particular, the employment policy does not take into account the degree of loss of health, which leads to a worse position for disabled people of the first group compared to disabled people of the second and third groups of disabilities. The group of disabilities is the degree of permanent disorder of the body's functions caused by disease, trauma (its consequences), congenital defects, and possible limitation of life activities when interacting with the external environment due to loss of health. A person recognized as a person with a disability is assigned the first, second, or third group of disabilities, depending on the degree of dysfunction of the body's organs and systems and the limitation of his/her vital activities.

In addition, there is no protection for people whose health is worse than other people with disabilities. These are people with psychosocial and intellectual disabilities. The offered services in the field of vocational guidance and vocational rehabilitation for people with disabilities do not meet the requirements of the labor market. In addition, despite the formal declaration of the right to education, persons with disabilities continue to face numerous barriers due to a lack of unimpeded access to educational institutions and a lack of reasonable accommodation.

First of all, to find out the best ways to reform the labor legislation on the protection of workers who are discriminated against on the grounds of disability by employers, it is necessary to consider the reasons for its occurrence. The field of protection of persons with disabilities should highlight the causes and conditions of violations of the rights of this category of citizens: 1) lack of awareness of persons with disabilities with their rights and responsibilities; 2) reluctance of employers to have people with disabilities in their staff, which is associated with emotional and psychological barriers in society; 3) low level of legal culture of persons with disabilities of non-legal specialties as subjects of social protection, which does not allow them to correctly understand the regulations governing the relevant relations; 4) shortcomings of legislative technique: the imperfection of the language of presentation of legal norms, which leads to confusion of concepts; sometimes contradictions can be not only in different acts but also in the norms of the same normative act, etc.

It is worth noting that one of the main measures to address the employment of people with disabilities in Ukraine is to establish quotas for the employment of people with disabilities. In

Ukraine, the quota for jobs for people with disabilities has existed since 1991 with the adoption of the Law of Ukraine "On the Fundamentals of Social Security of the Disabled in Ukraine" on March 21, 1991. The quota is an additional measure to promote employment for citizens competing in the labor market.

It should be emphasized that the current mechanism of employment for persons with disabilities is imperfect. In our opinion, for the quota system to work, the state must share with the employer the economic risks of such employment (finance additional measures to organize the work of a person based on his disabilities), provide basic and additional equipment, technical equipment on lease, etc.). In addition, one of the promising areas of employment of this category of the population in modern conditions, we believe, is the development of self-employment. Now the state should create a more favorable socio-economic climate for people with disabilities - entrepreneurs (provide a soft loan for self-employment; provide preferential taxation; organize free training for future entrepreneurs; provide information and free counseling for people with disabilities who have identified disabilities. own business).

Specialized enterprises of public organizations of persons with disabilities, in particular training and production enterprises (hereinafter - UTOS and UTOG) are of special importance for the implementation of the ability to work with persons with disabilities. This is because these companies have the opportunity to provide people with disabilities not only a specialized and adapted workplace but also professional skills, and the necessary social conditions at work. These enterprises have certain (albeit insufficient) benefits, support, and control from the state, which helps them to function in today's difficult economic conditions. It is also important that UTOS and UTOG have accumulated a lot of positive experience in employment, employment, vocational training and support, and labor and social relations with people with disabilities.

By the provisions of Article 18 of the Law of Ukraine "On the Fundamentals of Social Security of the Disabled in Ukraine" for people with disabilities who are unable to work in enterprises, institutions, and organizations, the state employment service assists in employment at home. At the same time, the analysis of the norms of the Labor Code of Ukraine shows that the issue of the possibility of home-based work is provided only for persons on childcare leave (Article 179). Issues of home employment are regulated by the resolution of the USSR State Committee for Labor and the Secretariat of the All-Ukrainian Central Executive Committee of September 29, 1981 No. 275 / 11-9921 (State Committee for Labor of the USSR and the Secretariat of the All-Ukrainian Central Executive Committee, 1981), which needs modernization. The first step should be the ratification of the ILO Convention 177 on Home Work (International Labor Organization, 1981), as well as the provision in labor law of conditions and requirements for the organization of homework and providing homeworkers with all labor rights.

The issue of job availability and smart accommodation remains open, and no progress has been made in recent years. The legislator, having introduced the term "reasonable accommodation" to the Law of Ukraine "On the Fundamentals of Social Security of the Disabled in Ukraine" and noted in the Law of Ukraine "On Principles of Preventing and Combating Discrimination in Ukraine" that this Law employer of the principle of reasonable accommodation, has not defined the principles of its implementation and responsibility for the refusal of reasonable accommodation.

It should also be noted that the legislation of Ukraine does not contain a definition of "discrimination on the grounds of disability", as well as a detailed definition of disability, which complicates the resolution of the subject of administrative relations to protect the rights and freedoms of persons with disabilities and prosecution subjects liable for the violation of the rights and freedoms of persons with disabilities. We propose to amend the Law of Ukraine "On Principles of Preventing and Combating Discrimination in Ukraine" (Verkhovna Rada of Ukraine, 2013) of October 14, 2014, in particular, to establish the definition of "discrimination on the grounds of disability" as defined in the Convention on the Rights of Persons with Disabilities. This scientific position, in our opinion, deserves support.

In our opinion, to ensure a higher level of social protection for workers with disabilities, it is necessary to amend the legislation to provide "adaptation" in the workplace for people with disabilities, as well as support the necessary support for people with disabilities in the workplace. We believe that Article 42 of the Labor Code of Ukraine "Preferential right to stay at work when dismissing employees in connection with changes in the organization of production and labor needs to be improved, in particular, to expand the preemptive right to stay at work in these circumstances not only with disabilities due to war, and for all persons with disabilities without exception." We believe that a separate chapter should be developed in the draft of the new Labor Code, which would be devoted to the legal regulation of the work of persons with disabilities. In addition, the definition of a person with a disability should be consolidated; guarantees after the employment contract, the specifics of their employment; transfer to another job, dismissal at the initiative of the employer, etc. There should also be a clear ban on the reduction of this category of persons and provide for the responsibility of the employer for non-compliance or violation of the labor rights of persons with disabilities.

5. Conclusions

Persons with disabilities in Ukraine have all the full socio-economic, political, and personal rights and freedoms enshrined in the Constitution of Ukraine and other legislative acts. According to the Law of Ukraine "On the Fundamentals of Social Security of the Disabled in Ukraine", to realize the creative and productive abilities of people with disabilities and individual rehabilitation programs, they have the right to work in enterprises, institutions, organizations, and entrepreneurial and other labor activity that is not prohibited by law. According to Article 18 of the same Law, enterprises, institutions, organizations, and individuals who use hired labor are obliged to allocate and create jobs for the employment of persons with disabilities, including special jobs, create working conditions for them, taking into account individual rehabilitation programs and provide other socio-economic guarantees provided by current legislation. In addition, by Article 19 of the Law, the standard for enterprises is set at 4% of the average number of full-time employees per year, and if they work from 8 to 25 people - one job.

Summarizing the above, we can conclude that anyone with any disability group has the right to work, and the establishment of a disability cannot be grounds for dismissal. Undoubtedly, the disability group assigned to an employee indicates a limitation or loss of ability to work, but not every limitation or loss of ability to work may lead to the employee's incompatibility with the position or work performed. After all, many positions can be held, or types of work that can be successfully performed by employees who have a disability group. In addition, such workers may perform preliminary work in special conditions. We believe that to ensure a higher level of social and legal protection for persons with disabilities, it is necessary to amend the labor legislation of Ukraine.

It should be noted that the recent reforms in Ukraine, as well as the realities of the modern labor market, necessitate continuous improvement of labor legislation and mechanisms for its implementation. We consider it necessary to develop a separate chapter in the draft of the new Labor Code of Ukraine, which would be devoted to the legal regulation of the work of persons with disabilities. In addition, it is necessary to consolidate the definition of "person with a disability", guarantees when concluding an employment contract, the specifics of their employment, transfer to another job, dismissal at the initiative of the employer, etc. It also seems expedient in the prospective labor legislation to envisage not only legislative measures to preserve jobs, but also a clear ban on reducing this category of persons and strengthening the protection of persons with disabilities from dismissal. In addition, it is necessary to provide for the responsibility of the employer for non-compliance or violation of the labor rights of persons with disabilities.

The results obtained in the research process can be used in further scientific studies of individual provisions that make up the content of labor relations with the disabled, as well as in

rule-making activities in the improvement of acts of the current legislation, which will be important for ensuring legal guarantees for the exercise of the right to work by the disabled. Future directions of research in this field may be the issue of establishing quotas for the employment of disabled people; employment mechanisms for persons with disabilities; self-employment of people with disabilities; provision of "adaptation" at the workplace for people with disabilities, etc.

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Research Article

Moving Prevention of Gambling Harm Upstream: Opportunities in Social Policy and Research

Anticipando la Prevención en Juegos de Azar: Oportunidades en las Políticas Sociales y la Investigación

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Abstract: This article analyses the specificities of the policymaking and research communities to explain why policies to prevent gambling disorder and other gambling-related harms have seen little change over the last two decades. Although existing knowledge on these issues suggests the implementation of prevention interventions based on public health perspectives, there are few government-led initiatives that adopt broad approaches beyond those advocated by the Responsible Gambling perspective. This situation would be influenced by two communities of actors with distinct professional cultures: policy makers face general incompatibilities with prevention policies, which are complex and go beyond political timeframes; gambling researchers, in turn, operate in fields dominated by approaches oriented towards measuring gambling disorder and with little interest in structural issues. To address this situation, the text advocates emphasising socio-economic inequalities related to gambling by the research field and improving science communication strategies as a means of influencing action to reduce the overall negative consequences of gambling.

Keywords: gambling harm; gambling prevention; public health; social policy, policy advocacy.

Resumen: Este artículo analiza las características de las comunidades de policymakers e investigadores/as para explicar las razones por las que las políticas de prevención del trastorno de juego y otros daños derivados de los juegos de azar apenas han visto transformaciones en las últimas dos décadas. A pesar de que el conocimiento existente sobre estas cuestiones sugiere la implementación de intervenciones de prevención basadas en perspectivas de salud pública, son pocas las iniciativas promovidas por gobiernos que adoptan planteamientos amplios, más allá de los defendidos por la perspectiva del Juego Responsable. Esta situación está influida por dos comunidades de actores con culturas profesionales diferenciadas: los/as responsables de políticas presentan incompatibilidades generales respecto a las políticas de prevención, las cuales son complejas y exceden los ritmos de la política institucional; a su vez, los/as investigadores/as sobre juego operan en campos dominados por planteamientos orientados a medir el trastorno de juego y con escaso interés por cuestiones estructurales. Para resolver esta situación, el texto aboga por enfatizar las desigualdades socioeconómicas relativas a los juegos de azar desde el ámbito investigador y mejorar las estrategias de comunicación científica como medio para influir en las acciones para reducir las consecuencias negativas totales derivadas de los juegos de azar.

Palabras clave: daño por juego; prevención de juego; salud pública; políticas sociales; promoción de políticas.

1. Introduction

Gambling is behind one of the most prominent behavioural addictions nowadays. Gambling disorder (GD) is recognised as an addictive disorder by the World Health Organization and by the DSM-V of the American Psychiatric Association (Potenza et al., 2019). Overall, the prevalence of GD worldwide is between 0.12% and 5.8%, although differences between regions and countries may be influenced by different ways of measurement (Calado & Griffiths, 2016). Since the 1980s, governments in the global North have promoted prevention policies based on 'responsible gambling' (RG) (Blaszczynski et al., 2011), which aimed to mitigate the harm caused by gambling through the promotion of moderate and mindful leisure habits.

However, the 'public health' perspective that understands gambling as an activity with broad social impacts has gained importance in the last two decades. It is increasingly evident and shared that the RG perspective is insufficient to develop policies capable of reducing the harm of gambling in society (Livingstone & Rintoul, 2020). The negative consequences of gambling extend beyond the individuals who gamble, with particular impact on their social settings (Wardle et al., 2019). Thus, gambling is not considered as just another leisure activity, but as a phenomenon with broader health and social implications (Langham et al., 2016). However, the public health perspective includes other considerations that go beyond the harm caused to gamblers and focuses upstream, i.e., on gambling opportunities, marketing and gambling discourses. These have received less attention in the literature, although they have a significant transformative capacity.

Parallel to this, the growth of the gambling industry over the last two decades has found a matching trend in public policies to regulate it and to address its negative consequences. Policies to reduce harm have taken a largely restrictive angle, focusing on limiting general availability, advertising and age of onset (Nikkinen et al., 2018). The effectiveness of these measures has been contested, as the policies with the greatest potential are those that regulate prices and the environmental conditions of gambling (Sulkunen et al., 2020). However, these are also the actions that can generate the most reluctance from policymakers, public opinion, and industry, as they would limit the revenue derived from the activity and would entail restrictions to individual choice, as it is often argued (Blaszczynski et al., 2008). Alternatively, social marketing campaigns are a tool increasingly used by national and local government bodies to influence the perceived attractiveness of gambling and its relational components (Thomas et al., 2015). These do not need to be accompanied by changes in legislation in order to mobilise opinions and make government stances visible, making them appealing to policymakers. Their effectiveness lies in their rhetorical approach: from a public health perspective, campaigns that emphasise messages aligned with responsible gambling are of little help to people affected by gambling (Miller & Thomas, 2017) and offer few novel debates for the public sphere.

In this setting, prevention has become more important and more extensive. Individual responsibility is less prominent when authorities recognise the width of the harm caused by gambling. Despite this, there is a considerable gap between the most prominent prevention initiatives carried out by governments and analysed by researchers, on the one hand, and the prevention initiatives desirable from a public interest point of view, on the other hand (McMahon et al., 2019). A considerable amount of evidence and recently deployed interventions focus on individual behaviour in gambling contexts, although their effectiveness is known to be limited (Sulkunen et al., 2020). Both policy and research embody tendencies that delay tackling gambling as a matter of general interest. There is a need for a combined analysis of the reasons that lead to the steering of preventive policies and prevention research in similar directions. Thus, the text first discusses the role of the policy community in the relative scarcity of public health prevention initiatives along with the political factors that influence them. It then examines the main characteristics of gambling research and the challenges for the research community. Finally, a general approach for communicating research results is proposed, aimed at transforming the dominant policy framework on gambling harm minimisation.

2. Policy, prevention, and normative assumptions

2.1. Prevention policy

Preventive public policies have an aspirational image and have been at the center of social policy agendas since the second half of the 20th century, offering the promise of significantly reducing inequalities and consequently reducing the costs of public services. If policies can be made less reactive, it is assumed, social spending would be more stable and contained (Billis, 1981). However, public policies that can be categorised as preventive are comparatively rare. Their attractiveness clashes with the complexity of the design and negotiation processes needed to implement them, i.e., the difficulty of translating an abstract vision into a tangible public initiative. The broadest conception of prevention policies as "a collection of policies designed to intervene as early as possible in people's lives to improve their well-being and/or reduce demand for acute services" implies the need to identify the phenomena behind the 'problems' to be tackled (Cairney & St Denny, 2020, p. 7). For example, anti-smoking policies in the UK included efforts to prevent young non-smokers from developing future smoking habits, for which a wide range of awareness-raising efforts were implemented (Levy et al., 2013). Despite the resources and efforts of the tobacco industry to delay such measures (Petticrew et al., 2017), policy makers generally had a clear understanding of the determinants of tobacco use and the need to act in a cross-cutting manner. Thus, rather than intervening on interconnected phenomena in the present, prevention policies are concerned with related but distinct factors that occur at different points in time.

The current state of gambling-related prevention policies, in general, places greater emphasis on the gambling contexts and the potentially negative elements it entails. Under the RG prevention model, the framework of preventive actions promotes messages of individual moderation and health protection for consumers of gambling entertainment. In short, the RG approach suggests that "the ultimate decision to gamble resides with the individuals and represents a choice, and to properly make this decision, individuals must have the opportunity to be informed" (Savard et al., 2022). Under this model, awareness-raising actions are aimed at informing individuals about the gambling offer in order to avoid misuse and secondary, on-site prevention is carried out by employees at gambling venues, other gamblers, and police authorities (O'Mahony & Ohtsuka, 2015). RG simplifies the tasks of policymakers because it does not focus on the life trajectories of gamblers or on the core properties of gambling, understood as the entertainment offer of an international industry with commercial and political interests; instead, policy makers under RG should be concerned with ensuring free access to 'safe gambling', which is primarily the responsibility of individuals.

RG has enjoyed wider support so far because it is comparatively simple to adopt, as opposed to more 'complex' frameworks. Policies that address the 'roots' of the problems they seek to solve must have the ability to seize opportunities in order to be adopted. In particular, prevention policies tend to clash with the dynamics and interests of politics. Given the multiple factors that influence most of the social problems to be prevented, government officials "show support for policy before they understand what it means. […] They choose a vague solution to an unclear problem" (Cairney & St Denny, 2020, p. 4). Later, when they begin to define the actions that would be needed in the eventual policy, other priorities on the public agenda tend to delay attention to prevention actions. In cases where the public agenda or stakeholders place other issues at the forefront of attention, "they often settle for the appearance of success, based on the popularity of their response or narrow indicators of outcomes, without addressing the 'root cause' of the problem they profess to be solving." (Ibid.). These frictions are intensified when the political climate is opposed to intervening in the lives of individuals, when the scientific evidence is not perceived as convincing, and when the social problem to be addressed is seen as too 'wicked', that is, having too many interacting elements and no agreeable solutions (Ibid.; McConnell, 2018).

2.2. Normative assumptions

Gambling legislation and, more specifically, the prevention of GD can be understood in this way. Firstly, regulation of the gambling industry in the United States and the European Union (EU) is fragmented, which makes it difficult to bring about significant transformations in the way policy makers understand gambling. In the United States, each state has the power to decide on access, prevention, and treatment policies related to gambling (Pavalko, 2004). Similarly, in the EU, each member state has control over the regulation of the gambling sector and licensing. Some countries run state owned enterprises that control most forms of gambling, such as Finland, while other countries' regulation gives more room to private companies, such as Spain. The European Commission provides some general guidelines for the protection of gambling consumers' rights, but does not dictate how these should be implemented in each member state's legislation (Selin, 2019; European Commission, 2021). The fragmentation of legal frameworks in two of the most influential markets in the globe contributes to reinforce discrepancies and deepens path dependency in gambling policies (Paldam, 2008).

Secondly, we must consider that a large part of the debates on potential measures to regulate gambling take place around the notions of equity or fairness. Indeed, there are important discrepancies in academia about the identification of the problematic aspects of gambling, what counts as a problem and what does not (van Schalkwyk et al., 2019; Shaffer et al., 2020). As a result, debates about 'what to do' in terms of regulation and prevention have intensified, both among policy makers and producers of scientific evidence (Latvala et al., 2019). The extent to which 'root causes' are addressed by prevention measures is closely linked to the position of stakeholders with regard to notions of inequality and fairness (Cohen, 1987). Evidence on the relationship between socio-economic structure where gambling options abound suggests that intensive gambling participation is linked to a higher GINI coefficient (Fiedler et al., 2019). Similarly, moderate levels of income inequality are associated with higher levels of expenditure on lottery and sports betting (Bol et al., 2014). In this respect, a normative position that accepts social inequality but rejects unfairness would find the deployment of comprehensive primary prevention policies unattractive. Calls to establish a discussion on gambling policy using only scientific evidence, despite "concerns about liberty and morality", such as Shaffer et al. (2020, p. 822), are an invitation to ignore ideological assumptions, both in academic debates and in policy making.

Moreover, the role of scientific evidence in social policymaking should be approached with caution, as it is usually other factors that most strongly influence the final outcome of government decisions, such as political debates and personal judgements (Head, 2008). Fundamentally, this is because policy makers operate under factors specific to their professional context, such as personal beliefs, media relations, career ambitions, or constituent opinion (Kingdon, 2011). Although researchers are also influenced by these factors (albeit in a different manner), policy makers and researchers belong to distinct professional communities (Bogenschneider & Corbett, 2021), which view scientific evidence differently. This was similarly noted by Weiss (1978), who observed that the use of scientific evidence and paradigm shifts in the field of social policy is driven by principles different from those of social sciences. In this context, the relationship between the two groups can be understood as one between 'research producers' (researchers) and 'research consumers' (policymakers) (Bogenschneider & Corbett, 2021).

Research consumers demand scientific evidence, especially on issues that are particularly complex or multi-causal. However, the degree of systematisation with which they use it differs from that of research producers. This is particularly noticeable in public health and primary prevention policymaking processes. Cairney & St Denny (2020, p. 12-14) propose a set of factors that describe potential issues in the relationship between the professional culture of decision makers and prevention policies. Given that prevention, as mentioned above, is more often an aspiration than a reality, it is relevant to consider the mechanisms present in the functioning of governments that contribute towards it:

- The scale of the task may become overwhelming for policymakers, as it exceeds the electoral term by which they tend to structure goals.
- There is high competition for policymaking resources, such as funds, attention, and political leverage. Often, the immediacy of emerging issues on the public agenda delays public prevention efforts.
- The benefits of preventive actions are difficult to measure and convey, particularly within electoral timeframes.
- Problems are 'wicked' and difficult to grasp. Both research producers and consumers may struggle to define clear terms about the causal loops they seek to address.
- If not done holistically, one aspect of prevention may undermine others, such as the redirection of funds from one prevention policy to another.
- The professional culture of policy makers usually requires that someone must be ultimately accountable. If prevention actions are designed in a broad and multilevel manner, responsibility is blurred and can lead to mistrust among government officials.

Thus, these general properties of preventive policies can also be applied to the case of gambling. Discussions held by policy makers based on equity and fairness criteria often make use of empirical data. However, as documented below, this use may be unreliable, limited, or invalid depending on the objectives pursued by policy makers and their relationship to the research output. As Miller and Michelson (2013) show, policy makers may fail to adequately assess the quality of evidence and use inappropriate data to advance their arguments and regulations. Crucially in this case, researchers do not escape this risk either. The ambivalence that arises between moral and rational arguments should not, yet, be understood as a malfunction in debates about 'what to do' in gambling (Ferraiolo, 2013), but as a property of gambling as an activity mediated by moral and ideological perspectives. This is supported by the findings on gambling policy by Cassidy et al. (2013, p. 8), which are consistent with the broader literature on policy-making processes and state that "the impact of evidence is unpredictable because its reception is contingent on factors including the constitution of boards, the personalities of board members, timing and luck".

It is clear, then, that the domain of social policies, both public health and inequality reduction policies, features internal logics that cause friction when the issues of GD prevention and regulation of gambling more broadly are brought to the table. Below we analyse the role of research producers in the state of knowledge and preventive actions, who represent another key actor for understanding the current state of these efforts.

3. Research, prevention, and influence

3.1. Prevention research

Based on the evidence-mediated relationship that exists between consumers and producers of research, we must assume that the changes that take place in the scientific field are subsequently translated into the field of policymaking. Although not at the same pace or in the same terms (Weiss, 1978), scientists' proposals are used as authoritative arguments in policy debates. In public health issues in particular, the reception and use of scientific knowledge tends to be beyond the reach of research producers, as it is uncertain, subject to bureaucratic structures and the values of those who occupy them (Almeida & Báscolo, 2006; Liverani et al., 2013). However, the prominence of the RG perspective in much of the regulatory frameworks and in the messages of the gambling industry is matched by the literature on gambling issues.

Indeed, not only is RG a relatively simple prevention perspective, and therefore attractive to policy makers, but it is also rarely challenged by the researchers who make use of it in their studies. This was already noted by Campbell & Smith (2003), who noted that discourses on RG omitted debates on the characteristics and justification of gambling as a business model, which had been salient previously. Nowadays, the literature on GD -as a relevant vector for prevention-

is dominated by studies focusing on the behavioural factors of individuals; specifically, in this area of knowledge "culturally responsive disordered gambling treatment appears to be lagging compared to the more robust focus on culture, diversity, and equity in related disciplines" (Christensen et al., 2022, p. 44). This trend is of significant importance if the goal of reducing the negative consequences of gambling is to be pursued broadly, taking socio-cultural factors into consideration.

Another relevant element in understanding current directions in prevention and public health research is the distribution of disciplines involved. The most influential journals and the concepts most used in gambling studies derive still from the fields of psychology, psychiatry, and medicine (Cassidy et al., 2013). Furthermore, most publications in these journals deal with issues related to the excessive gambling of individuals and their subsequent categorisation (Ibid.). Reynolds et al. (2020) found in a recent scoping review that almost 75% of the literature on RG is conducted by psychology and business researchers, who emphasise the behaviour of individual gamblers and the risk of 'pathological gambling'. When the literature is analysed through an umbrella review of interventions to reduce gambling harm it is found (McMahon et al., 2019) that the focus is again mainly on the individual behaviours of gamblers, over interventions focused on addressing the demand (primary prevention) and supply side of gambling. This is also true for reviews of more specific subjects, such as a recent review of problem gambling prevention programmes with young adults (Grande-Gosende et al., 2020), which found that the cases reviewed in the literature were dominated by the harm-reduction model based on RG.

Of course, these trends raise questions about the complementarity of knowledge produced by different disciplines. If the evidence produced by researchers in psychology, business, and medicine constitutes the majority of scientific production and is propelled by specific research questions and methods (Christensen et al., 2022), contributions from minority disciplines (in this field) such as sociology, geography, economics, or cultural studies face difficulties in integrating into the dominant stream. However, this does not constitute an essentialist perspective on these dominant disciplines, far from it: there are very diverse perspectives, for example, within psychology and most of them are fully compatible with the critical approaches displayed in other domains. As Livingston et al. (2018, p. 8) note, "structural, political and environmental perspectives are being embraced within the discipline of psychology, and methods such as social constructionism, critical discourse analysis and participatory action methodologies are now widely accepted", which differ substantially from the traditionally empiricist perspective employed by some of the most influential psychologists in gambling studies.

3.2. Methods as mechanisms of influence

In relation to methods, it is necessary to draw attention to the prevalence of Randomised Control Trials (RCTs) as a test of the reliability of interventions on gambling and GD prevention. RCTs have the reputation of being the "gold standard" of knowledge in several disciplines, as they allow for testing the effects of an action on two different groups of people influenced by the same set of factors. Under this procedure, researchers obtain clear information about the effects of such action (Hannes et al., 2013). RCTs, which are based on quantitative methods of measurement, are firmly established in the policy environments of many countries in the global North, mainly as an instrument for testing pilot interventions and evaluating established social policies. They are thus a highly influential type of evidence among policy makers who make enthusiastic use of research output (Bogenschneider & Corbett, 2021).

An example of their influence is the modification of the Family Nurse Partnership (FNP) in England following the publication of an RCT that questioned the cost-effectiveness of the programme. The FNP, introduced in 2007, is a preventive public health initiative that offers guidance and support to first time young parents aged 24 and under, generally to those who live in 'disadvantaged' socio-economic circumstances (Early Intervention Foundation, 2021). An RCT aimed at measuring the effectiveness of the FNP was published in late 2015 (Robling et al., 2016)

and a few weeks later attracted the attention of the national media (Andalo, 2015), as the results of the study indicated that the financial resources allocated to the FNP were not producing substantial results. This, in turn, led to considerable controversy (Hayes, 2017), resulting in adjustments to the programme's delivery with the aim of improving its cost-effectiveness and enhancing qualitatively measurable outputs (FNP & Dartington Service Design Lab, 2020). As we have highlighted above, the political atmosphere strongly conditions the chances of implementation and survival of preventive interventions, and the general stance of British public opinion between 2015 and 2018 was largely unfavourable towards increasing spending on non-employment social policies (O'Grady, 2022). The economic ineffectiveness of the FNP was consequently stressed by political and media actors interested in delegitimising equality-based measures, as opposed to equity-based measures.

However, there are compelling reasons to treat RCTs in the same way as other social policy research techniques and move away from the "gold standard" catchphrase. Primarily, it is necessary to consider that RCTs have a high level of internal validity, i.e., they have robust mechanisms that guarantee a very high level of reliability of the results, but, at the same time, the scope or generalisability of the results is very limited (Cartwritght, 2007). The specific conditions of an RCT describe the findings in the control group and in the target group, but do not provide a direct translation to the rest of society. To make the findings of an RCT operational, it is necessary apply the filter of "expert judgement" (Ibid., p. 19), i.e., those who are able to discuss, weigh and adapt the results into action in real-life scenarios. Moreover, the mere aggregation of RCTs for the identification of statistical patterns and averages in systematic reviews is not enough to understand the scope of interventions and policies that address complex social phenomena (Petticrew, 2015).

Despite these unfavourable prospects, RCTs have a strong presence in the literature on GD prevention and treatment, as the number of evaluation RCTs on GD treatment has doubled in the last 20 years (Christensen et al., 2022). The vast majority of these evaluation studies are published in gambling journals whose audience is composed of psychologists, psychiatrists, mental health professionals, and treatment providers (Ibid., p. 39). However, the use of RCTs in the current paradigm of mental health research has been thoroughly criticised (McPherson et al., 2020; Smith et al., 2021), as opposed to more pluralistic views for the identification of best practices. Regarding, again, the use of scientific evidence by policy makers and the limitations faced by preventive initiatives, it is necessary to pose research questions that address more than just the basic 'what works'; it is essential that GD treatment evaluations are also able to answer "for whom, where, why, for what, and when" will the intervention be effective (Gargani & Donaldson, 2011). For example, this would entail clearly describing which profiles of gamblers treatments are aimed at, including their socio-economic, cultural, and health conditions, gender implications, in which social settings they are best suited, or the type of friends or family members who could be involved in the process.

Thus, we observe that the causal and quantitative research paradigm, sophisticated and prominent in economics and psychology, has a favourable position in gambling research. This reality clashes with the growing presence of the public health approach and socio-cultural perspectives on GD prevention, especially in primary prevention. This approach assumes that prevention should be done 'upstream' "that is, it addresses determinants and factors that, if left undressed, will lead to harm for a considerable proportion of those who gamble or for others connected to those people" (Livingstone & Rintoul, 2020, p. 109). Similarly, as Lassnig (2012) notes, causal-quantitative research does not scape conflict, as it faces internal tensions between those who believe that they should have the capacity to transfer their results to stakeholders in real contexts and thus ensure their relevance in a time of change, and those who only dedicate their work to scholarly research.

There is currently a struggle to attract the attention of public decision-makers working on gambling related issues, since, as van Schalkwyk et al. (2021, p. e615) argue, many of the

determinants of gambling are explained through indirect causal relationships, which are difficult to quantify: "the relationship between gambling and harm is better conceptualised as 'conditional causation' reflecting how problems occur in combination with multiple factors reinforcing one another in a conditional relationship". Given the growing recognition of the complexity of gambling harm, the continuation of RG as the dominant perspective or, instead, the integration of new perspectives, is in dispute. The involvement of expert judgement, which is the decisive factor in synthesising and transferring scientific evidence to real-life contexts of action, plays a major role in this endeavour (Cartwright, 2007; Gargani & Donaldson, 2011).

4. Discussion

In this text we have analysed the main drivers that make gambling harm prevention policies protect the public interest in a limited capacity. It is now clear that a public health perspective that concentrates efforts on informing individuals about the possible risks of gambling is insufficient, as it does not prevent a small part of gamblers (0.12% - 5.8% of gamblers worldwide) from developing GD. Advocates of this perspective (Shaffer et al., 2020) argue that this proportion of gamblers affected by excessive levels of gambling are part of the gambling landscape and that it is not as significant a concern as some other academic experts suggest. However, the number of people behind this proportion is significantly higher than the capacity of health services to provide adequate treatment, particularly in low- and middle-income countries (Wainberg et al., 2017). To uphold the public interest, it is necessary that strategies for the prevention of GD and other lesser forms of gambling-related harm take a socio-cultural approach, which emphasises primary prevention and the reduction of gambling habit levels. As Sulkunen et al. (2020) point out, reducing the total number of people experiencing the negative consequences of gambling means reducing the total number of gamblers. Thus, even if the proportion of pathological gamblers remains stable, minimisation and treatment services would be of higher quality and less inequal.

As we have established above, participation in different forms of gambling is associated with higher levels of socio-economic inequality, both at group and individual levels (Bol et al., 2014; Fiedler et al., 2019; Latvala et al., 2021). Furthermore, the limited research available suggests that there are inequalities in gambling harm, i.e., that different categories of people are likely to suffer harm of varying intensities and types (Raybould et al., 2021). Future research can be expected to detail the differences and inequalities arising from gambling harm, such as those based on gender, age, and socioeconomic status.

In general, health inequalities are nowadays present in countries with the largest 'welfare states'. The environmental conditions in which people live have a major influence on this (Phelan et al., 2010). By environmental conditions we mean here aspects such as peer networks, knowledge, social prestige, housing, or income, among many others. Some of these conditions are a direct result of government policies, while others are more indirectly related. Health inequalities in contemporary societies are largely explained by habits developed around consumption and based on differences in people's cultural capital (Gagné et al., 2015). Given the importance of individual consumption choices in health, the question of the fairness or unfairness of inequalities arises (Mackenbach, 2012) and it is the policymakers' responsibility to decide on the form and extent of interventions to correct them. Furthermore, gambling legislation should be context-dependent, as similar legal frameworks in the European context show different levels of GD (Planzer et al., 2014). This is an intensely political issue and one that lies at the very heart of the debates on gambling regulation, as illustrated above.

However, barring short-term transformations in public sphere attitudes towards gambling that would alter the orientation of policy makers' work, the research field can be the main lever for the deepening of gambling harm prevention. Effective primary prevention policies are more difficult to be implemented than reactive ones (Cairney & St Denny, 2020), hence it is desirable that critical research on gambling deploys a pragmatic approach to dissemination. In this sense,

the policy community should be understood as priority recipients of critical evidence in gambling research. As Nicoll et al. argue (2022, p. iii), conducting critical research entails moving "beyond the "pull of the policy audience" and expand the lens of what counts as political by accepting our responsibilities, not only as researchers employed by universities, but also as highly educated professionals and citizens within democratic societies".

To achieve this, Bogenschneider & Corbett (2021, p. 262-290) propose a range of basic practices for engaging with policy makers and effectively convey the evidence supporting the wider prevention of GD and other gambling-related harms. These guidelines can be useful for both advocates of RG and proponents of more upstream-reaching perspectives, so we assume that arguments will encounter opposition when reaching the policy field. Thus, the guidelines are the following:

- Identify the policymakers to contact.
- Learn about the policymaker's interests and questions.
- Take the initiative to contact policymakers or intermediaries.
- Familiarize yourself with the policy process.
- Focus on those issues where research matters most.
- Conduct and communicate research that is policy relevant.
- Conceptualize policy outreach not as disseminating research to policymakers, but as developing relationships with them.
- Communicate research findings in the ways policymakers prefer.
- Consider whether to approach policymakers as an advocate or an educator.
- Forge common ground with policymakers around widely valued populations such as youth and families.
- Show respect for the knowledge and expertise of policymakers.
- Be patient and self-rewarding in defining success in policy efforts.

Public health researchers, it is assumed, have no difficulty in shaping sophisticated arguments about the benefits and harms of acting on a particular problem. They face more challenges, however, in coordinating their efforts and deploying effective tactics. Thus, in order to understand the practical implications of the above guidelines, it is worth considering the example of Sherraden et al. (2002), who presented a model of action that includes the participation of students, researchers, practitioners and stakeholders in social policy advocacy from the perspective of social workers. The effectiveness of their actions was evident in the legitimisation of social workers as an expert figure in a context where they were previously scarcely taken into account, which strengthened their voice in subsequent policy processes. Proponents of gambling harm prevention from a broad public health perspective can draw relevant lessons about the usefulness of coordinated action and effective dissemination.

5. Conclusions

The current status of gambling harm prevention and gambling disorder (GD) shows that interventions focus on reducing the negative consequences for those who engage in the phenomenon of gambling (McMahon et al., 2019). Responsible Gambling (RG) perspective, still dominant given the support it receives from governments and the gambling industry (Reynolds et al., 2020), promotes a narrow perspective that does not prevent gambling harm from impacting more strongly on social groups already suffering from socio-economic and health inequalities. A broader prevention perspective is needed in this context, which is able to deploy a wider perspective and target actions to reduce harm by reducing the total number of gamblers (Sulkunen et al., 2020; van Schalkwyk et al., 2021). The advancement of the public health perspective, however, encounters resistance from both the policymaking and research communities.

The policy community has general difficulties in adopting and implementing prevention policies. This is primarily because the social problems they seek to address are complex and multi-causal (McConnell, 2018), on the one hand, and because appropriate interventions to promote prevention tend to exceed the framework of electoral timeframes, both in their implementation and evaluation, on the other (Kingdon, 2011; Cairney & St Denny, 2020). In response, researchers often find it difficult to align their professional culture with that of policy makers (Bogenschneider & Corbett, 2021). There is also significant internal resistance in past and present research on gambling harm and its prevention. It is still dominated by scholars who favour pathologising approaches and quantitative methods, most of whom belong to the disciplines of psychology, psychiatry and medicine (Shaffer et al., 2020; Christensen et al., 2022). The inclusion of other approaches and methods capable of analysing structural and political questions about gambling, coming from psychology, sociology or geography, among other disciplines, remains in dispute (Cassidy et al., 2013).

However, there is a growing demand from policy makers for approaches and interventions from a public health perspective (Livinstone & Rintoul, 2020). Public services increasingly recognise that gambling harm adds another element to health inequalities, especially as the gambling industry contributes to exacerbating socio-economic inequalities (Nikkinen et al., 2018; Fiedler et al., 2019). Consumer habits greatly condition individuals' health today and the adoption of measures to tackle harm is a fundamentally political issue, as it is guided by conceptions of fairness and unfairness (Cohen, 1987; Mackenbach, 2012). However, its political nature does not exclude researchers from being able to act on it. In fact, researchers also have a role to play in deepening prevention measures and in questioning the preconditions of RG (Nicoll et al., 2022) and their representation depends on their ability to engage in coordinated communication efforts and collaboration with other stakeholders (Sherraden et al., 2002). Given the prevailing inertia in policy communities (Cairney & St Denny, 2020) and the strong influence of corporate interests (Petticrew et al., 2017; van Schalkwyk et al., 2021), researchers have a key role to play in moving policy frameworks on GD and gambling harm prevention upstream.

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