

SOCIAL INNOVATIONS IN EDUCATIONAL SCIENCES: ANALYSIS OF CURRENT RESEARCH AND POLICY DOCUMENTS

Alise Oļesika

University of Latvia, Latvia

ABSTRACT

The Guidelines for Science, Technology Development and Innovation for 2021–2027 developed by the Ministry of Education and Science of Latvia focus on promoting research excellence and increasing the social and economic value of research. Considering the previously mentioned, higher education institutions' goal is not only the transfer of knowledge but also the creation of economic and social value, which communicates to society through learning and research results.

Social innovation as a driver of social change promotes societal openness and active participation in socio-economic processes. The introduction of new forms of social innovation as Responsible Research and Innovations (RRI) can bridge the gap between science and societal needs by engaging in social debate and policy decisions in society and fostering collaboration between scientists from different sectors. The study aims to analyze Social Innovation's essence and the academic and administrative definitions and dimensions of the Responsible Research and Innovation approach. In order to achieve the aim of the study, a systematic literature analysis was performed. The study reveals the main features of Social Innovation and the perspective of Responsible Research and Innovation implementation in higher education in the institutional and processual dimensions.

Keywords: *Educational Sciences, Higher education, Innovations, Responsible research, Social Innovation.*

Introduction

New social practices, such as social innovation, need to be tackled successfully in order to meet the various social challenges. Its promotion has become one of the European Union's priorities, as it contributes to the country's sustainable development, promotes competitiveness, and improves the quality of life of society (Vingre, 2018).

Informative involvement of stakeholders in social innovation processes is needed to understand and identify complex needs and gather ideas for new and better solutions. One of the stakeholders are higher

education institutions, which have a role to play in providing knowledge and skills, as they inform the public about existing knowledge or generate new knowledge, and work with the social partners to jointly create new knowledge for social innovation (Benneworth, Cunha, 2015; Vingre, 2018; Oganisjana, 2019).

In order to promote public participation in socio-economic processes, it is necessary to introduce new forms of social innovation, which can take the form of concrete ideas, activities, frameworks, models, systems, processes, services that would promote the development of social innovation-oriented education (Nicholls, Simon, Gabriel, 2015; Felt, 2014). One of these forms of social innovation is Responsible Research and Innovation (hereinafter referred to as RRI), a cross-cutting issue in Horizon 2020, which seeks to identify research and innovation issues, anticipate the consequences of research and innovation, and engage the public in discussions on how to create a world and society that suits future generations (RRI Tools, 2015).

The topicality of responsible research and innovations is also substantiated in Latvia in the document of the Ministry of Education and Science – The Guidelines for Science, Technology Development and Innovation for 2021–2027, which focuses on promoting research excellence and increasing the social and economic value of research (*Par Zinātnes, tehnoloģijas attīstības un inovācijas pamatnostādņēm 2021.–2027. gadam*, 2021). Responsible research and innovation is a tool that can be used to promote research, as one of the reasons for the introduction of RRI is the interaction of economic growth, humanities, social sciences with science and bridging the gap between science and society (RRI Tools, 2016; Ribeiro Smith, Millar, 2016).

The problem of the study is that the concept and understanding of social innovations are so far portrayed with increasing importance worldwide on the one hand and with a vague understanding and untapped potential on the other hand and the studies into Responsible Research and Innovation approach will provide a better awareness of how to put social innovation into practice (Howaldt, Domanski, Kaletka, 2016; Oganisjana, 2019; Moalert, 2017). This systematic literature review aims to analyze research articles, monographs, and policy documents on the social innovations and Responsible Research and Innovation approach. To achieve the aim of the research, two research questions were raised: How are social innovations defined, and what are their structure and types? What are the academic and administrative definitions and dimensions of Responsible Research and Innovation?

Method

To find the answers to the research questions mentioned above, a systematic literature review was conducted. A systematic review was carried out in five phases, developed by Xu Xiao and Maria Watson (Xiao, Watson, 2019). The first phase included searching the literature in the EBSCOhost Web search platform, including the databases – Web of Science, Science Direct, and Primo. The keywords for the search were stemmed from the research questions mentioned above and from the researcher’s knowledge of the field. Originally, studies were selected using the following keywords: “*social innovation in education*,” “*responsible research and innovation in higher education*,” “*social innovation in higher education*”.

All searches were limited to the full text available, published between 2017–2020, English and Latvian language articles. The search procedure covered the search in Primo using above mentioned keywords. After reviewing the first fifteen pages of search results, a total of 10 potentially relevant articles were found. A search on Web of Science and Science Direct databases using the same keyword resulted in 565 records of scientific articles. After an initial screening of the titles, 20 studies were selected. Overall, 30 potential studies were identified.

Within the second phase, based on the review of abstracts, each article was screened to decide whether it should be included for data extraction and analysis. Inclusion and exclusion criteria were developed that selected material must meet to be included or excluded from the study (see Table 1).

Table 1. Inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
Studies in the English and Latvian language.	Studies in other languages.
Studies from the higher education field.	Studies from other fields.
Scientific articles, reviews or books, monographs.	Conference review, Conference paper.
Definition of Social innovation or Responsible research and innovation.	No definition provided.

After careful review, a total of 14 studies were excluded for different reasons (primary education was described in the articles, there was no definition of social innovations or responsible research and innovations, the full text was not available, only abstract, there were articles only in French or Spanish languages). Overall, 15 studies from the initial search were included in the next stage of full-text analysis.

To obtain a complete list of literature, the backward search was conducted to identify relevant work cited by the articles by using the list of references at the end of articles (Webster, Watson 2002; Xiao, Watson, 2019). Such search resulted in 4 more articles, expanding the search criteria – the year of publication of scientific articles, and the need to include policy documents in the analysis was highlighted, as the concepts of definitions of social innovations have evolved from the policy.

Results

In the third phase, after screening for inclusion, full texts of studies were obtained for the quality assessment to refine the full-text articles, and it is the final stage in prepare studies for data extraction and analysis (Xiao, Watson, 2019). In total, 19 units of different research and policy documents were selected – three scientific monographs, ten literature or policy document reviews, three policy papers, two frameworks, and one empirical study. The research was conducted from 2012 to 2019 in the following countries: Latvia, England, Luxembourg, Canada, Italy, Norway, Belgium, and the Netherlands which emerged as a result of the data analysis of 19 units of research and policy documents.

In the fourth phase – data extraction or characterization of the studies (Xiao, Watson, 2019) from each study, information was extracted and divided into research areas or categories by an inductive method. After

Table 2. Thematic categories of systematic review

Thematic category	Authors
Definitions and structure of social innovation	Oganisjana, 2019 Bella, 2018 Rüede, Lurtz, 2012 Howaldt et al., 2016
Social innovations in policy documents and research	Nicholls, Simon, Gabriel, 2015 European Commission, 2013 Moulaert et al., 2017 Bonifacio, 2014 Benneworth et al., 2014
Social innovation in higher education	Kumari, Kwon, Lee et al., 2019 Milley, Szijarto, Bennett, 2020 Benneworth et al., 2015
Responsible Research and Innovation approach	European Commission, 2013 European Commission, 2020 Tassone et al., 2017 Tassone, Epping, 2016 Ribeiro, Smith, Mirral, 2016 Burget, Bardone, Pedaste, 2015 RRI Tools, 2015

careful reading of the literature units and policy documents, four thematic categories were developed: Definitions and structure of social innovation, Social innovations in policy documents and research, Social innovation in higher education, and Responsible research and innovation approach (see Table 2).

Discussion

The main features of the thematic inductive analysis were applied to analyze the content of the given articles, monographs, and policy documents, dividing them into four categories, as mentioned in the previous section (see Results section).

“Thematic analysis is a method for describing data, a distinguishing feature of thematic analysis is its flexibility to be used within a wide range of theoretical and epistemological frameworks and to be applied to a wide range of study questions, designs, and sample sizes.” (Kigel, Varpio, 2020, p. 2).

Definitions and structure of social innovation

In order to reveal the main features of social innovation, several definitions of social innovations and their structures were selected from the four analyzed scientific articles. The first definition is mentioned in the monograph “Social innovation: challenges and solutions in Latvia” where “Social innovation is a better, more efficient, and more rational (compared to existing) solution and implementation of current social problems, creating a new culture of cooperation and promoting social progress in society.” (Surikova, Licite, Grinberga-Zalite, 2019, p. 26).

Another definition of social innovation brings up five features that are needed to be able to talk about social innovation in general. Firstly, social innovation must be something new. Secondly, it must address a problem or need that is relevant to society, or at least update it, which shows that social innovation can also be a process. Thirdly, it must be put into practice, otherwise, it would be more accurately called a social invention, which is just an idea. Fourthly, it must involve the target groups it concerns in order to ensure its legitimacy. Finally, it must be able to change social behavior and bring change (Vingre, 2018, Howaldt et al., 2016).

Dominik Rüede and Kathrin Lurtz, in their study, analyzed 318 scientific articles and monographs, as a result of which seven categories of social innovation were developed:

1. Does something good for society – includes the promotion of social welfare;
2. Change social practices and/or structure – highlighting new ways in which people organize their social interactions;

3. Contributes to the development of the environment or society, it combines the notion of “socially desirable” with changes in social interactions in favor of disadvantaged and socially excluded people;
4. Reorganizes the work process – where the organizational aspect is emphasized, but it is applied only a narrower understanding of the work environment;
5. Attaches technological significance and essence to technological innovation, where technological and social aspects are different, but both contribute to the overall innovation process;
6. Promotes changes in the sphere of social work – on social work and social policy;
7. Creates innovation in the digital context – linked to the introduction of Digital social innovations (Rüede & Lurtz, 2012).

Analyzing the definitions of social innovations, it can be concluded that social innovations are mentioned in scientific articles as a solution to current social problems that will be applied in practice. Several studies point out that social innovation must also involve target groups or people, improving their opportunities for collaboration in the form of new social practices or change in them (Rüede, Lurtz, 2012; Howaldt et al., 2016; Surikova, Līcīte, Grinberga-Zālīte, 2019).

Social innovations in policy documents

An analysis of policy papers reveals that social innovation is defined as a new idea (products, services, and models) to meet social needs and create new social relationships or collaborations. It represents new responses to current social demands that affect the process of social interaction. It aims to improve people’s well-being. Social innovation is the innovation that is social both in setting goals and means to achieve them. These are innovations that not only benefit society but also enhance the capacity of those who are involved (Guide to Social Innovation, 2013; Moulaert et al., 2017).

Policy documents and one monograph also described the research process of social innovation, which has the following characteristics: it must be interdisciplinary, where social science disciplines interact with others. It must be transdisciplinary, meaning that external stakeholders are closely involved in the research, not only as informants and/or “users” of the research but as partners in helping to define research questions, methods, analysis, and dissemination formats in a continuous reflexive way (Guide to Social Innovation, 2013; Nicholls, Simon, Gabriel, 2015).

Several researchers point out that there is no consensus on the definition of social innovation, as the definition of social innovation is largely determined by the branch of science that looks at it. This means that research

on social innovation is interdisciplinary, as social innovation is of interest to different sub-sectors of the social sciences, exploring it from different perspectives (Bonifacio, 2014; Benneworth et al., 2014; Surikova, Līcīte, Grinberga-Zālīte, 2019).

Social innovation in higher education

When thinking about social innovations from the perspective of the university, the main question is about their practical implementation. The strict institutional environment and lack of flexibility to adapt to the changing social context have hampered social innovation initiatives in higher education. Improving efficiency in higher education requires a more flexible environment that is more accountable to society (Kumari, Kwon, Lee, Choi, 2019).

To create successful innovations, higher education institutions depend on the capabilities of their social networks, such as pooling resources, the process of disseminating knowledge, and identifying opportunities through social networking, thus increasing the legitimacy of collective action and the social innovation process. Social innovation in higher education usually results from collective action and cooperation with institutional institutions (Kumari et al., 2019). The above mentioned demonstrates the importance of understanding the ways in which higher education institutions can ameliorate their networking capacity to foster shared social innovation (Kumari et al., 2019; Milley, Szijarto, Bennett, 2020).

Research suggests that the promotion of social innovation in higher education requires the development of interdisciplinary and transdisciplinary cooperation while using innovative methods that help to engage and strengthen cooperation between higher education institutions and social actors (Milley, Szijarto, Bennett, 2020; Kumari et al., 2019; Benneworth, Cunha, 2015).

Responsible research and innovation approach

Responsible research and innovation in research are defined as a transparent, interactive process in which societal actors and innovators become mutually responsible, considering (ethical) acceptability, sustainability, sociability, and the relevance of the innovation process to society (Options for Strengthening Responsible Research and Innovation, 2013; RRI Tools, 2015).

The analysis of research on responsible research and innovation allowed to highlight three perspectives of this concept: RRI as an umbrella term, which combines aspects of research, innovation, and society; RRI as a process in which society is involved in science, research, and innovation processes; RRI as a political initiative through which the European Union

addresses current issues. RRI implementers are actors in the general public: policymakers, the educational community, researchers, entrepreneurs, civil society organizations (RRI tools, 2015; Burget, Bardone, Pedaste, 2015; Options for Strengthening Responsible Research and Innovation, 2013; The Horizon Work Programme 2018-2020).

The research and innovation process must comply with certain procedural dimensions, which are divided into four groups that characterize the research process:

- **Diverse and inclusive** (involve different actors in research and innovation processes to show different perspectives and create high-quality science that is inclusive);
- **Predictable and reflective** (in the process of research and innovation, it is necessary to rethink the motives and consequences of the research project, to reveal uncertainties and dilemmas more clearly, to reveal visions to the general public);
- **Open and transparent** (the research and innovation process must be open to the public in a meaningful and fair way in order to build public confidence in science, taking into account the adaptation of information to the needs of stakeholders);
- **Responsive and able to adapt to change** (Research and innovation must respond to the views of stakeholders and be able to adapt to different views and changing circumstances by changing existing thinking and behavioral routines) (RRI Tools, 2016; Tassone et al., 2017).

In order to provide some guidance on RRI in the policy context, the European Commission has identified a number of key institutional dimensions of RRI. These dimensions can be seen as strong policy agendas, each with its own potential to deliver RRI processes and outcomes. In 2013, the European Commission defined six dimensions of RRI, but later in 2015, they were supplemented by two additional dimensions (Options for Strengthening Research and Innovation, 2013, Tassone et al., 2016).

These eight dimensions are: governance, public involvement, gender equality, science education, open access, ethics, sustainability, and social justice (RRI Tools, 2015; Burget, Bardone, Pedaste, 2015).

Several studies mention that the practical application of a Responsible Research and Innovation approach is difficult, so it is necessary to study the practical attempts to implement this approach (Burget, Bardone, Pedaste, 2015; Ribeiro, Smith, Millar, 2016).

To promote the RRI approach to higher education, the EnRRICH project developed the EnRRICH (*Enhancing Responsible Research and Innovation through curricula in higher education*), a tool designed to improve university curricula based on a Responsible Research and Innovation approach.

The structure of this tool consists of three pillars and two interrelated elements: definition of RRI, design principles, and competencies. (Tassone, Eppink, 2016).

The definition of RRI includes the promotion of RRI in higher education curricula, which is the encouragement of students to think about the future through the management of research and innovation practices that address current challenges in an ethically, sustainably, and socially desirable way (Tassone, Eppink, 2016,2017). To facilitate the implementation of RRI in higher education, three main design principles are proposed:

- **Education for a society** where education can become a tool to help students navigate today's challenges and improve the use of interdisciplinary knowledge in the context of societal challenges.
- **Education with a society** where science and innovation are not only meant for the challenges of society, but also for meeting the needs of actors or participants of society, including values, wishes while solving the above-mentioned problems, fostering interaction between academia and society.
- **Education to “whole” persons** The EnRRICH instrument mentions three domains that are essential to facilitate the implementation of RRI: the cognitive, affective, and physical learning domains. Cognitive learning is necessary to learn and understand today's complex issues, navigate uncertainties, apply the acquired knowledge, experiment, and evaluate new solutions to these problems in society. However, learning about RRI also includes learning in the affective field, which manifests itself in affective abilities, such as feelings and management, cooperation, feelings of responsibility, social attitudes, and values, which is a way to relate to oneself, to others. The physical field is related to the tangible and physical manifestations of cognitive and affective abilities, knowledge, and attitudes, such as appropriate communication skills, use of equipment in laboratories, etc. (Tassone, Eppink, 2016, 2017).

It is also crucial to think about what competencies higher education students need to successfully participate in responsible research and innovation practices (Tassone, Eppink, 2016, 2017).

The EnRRICH tool defines RRI competence as a comprehensive and multidimensional competence that ensures responsible research and innovation. Competencies are formulated in four dimensions or quadrants: anticipation, reflexivity, inclusion, and responsiveness. (Tassone, Eppink, 2016, 2017). Although each of the proposed competencies is in a certain dimension, these competencies and dimensions are interrelated, and each competence dimension is supplemented with application possibilities that will not be discussed in this article.

Analyzing the dimensions of RRI, it can be concluded that it has not only a basis for promoting responsible research and technological development but also an educational component aimed at developing knowledge, skills, and attitudes related to “RRI-based thinking” on past and present and future scenarios for scientific and technological developments (RRI Tools, 2016; Tassone, Eppink, 2016, 2017; Burget, Bardone, Pedaste, 2015).

Conclusions

In regard to answering the two research questions, systemic literature analysis showed that the main features of academic definitions of social innovations are related to the solutions of social problems or at least the updating of these problems and the implementation of these solutions in practice, involving the target groups. Policy documents, on the other hand, emphasized meeting the social needs of society and new aspects of social relations or cooperation, highlighting that the innovation research process is interdisciplinary and that there is no consensus on the definition of social innovation. In turn, the seven categories of social innovation included the above-mentioned basic features as well as were supplemented with the sphere of social work, technological innovation, and digital context, which actualized the concept of “Digital social innovation” and creates the need for further research of this definition.

Analyzing social innovations from the perspective of the university, it can be concluded that universities need to improve interdisciplinary and transdisciplinary cooperation and promote cooperation with social actors. Using a Responsible Research and Innovation approach can ensure that scientific and technological advances are properly incorporated into society. The concept of RRI can be seen from three perspectives: as a unifying umbrella term linking science, research, and society, as a process of public involvement in the above aspects, and as a policy initiative through which the European Union addresses current societal issues.

The perspective of RRI in higher education can be implemented through a procedural dimension, which is divided into four groups and describes the research or education process, and the institutional dimension, which is divided into eight areas that were developed as policy programs. Each of the perspectives has the potential to implement the RRI approach. Practical attempts to promote a RRI strategy in higher education have resulted in the development of the EnRRICH tool, which has three interlinked pillars: RRI definition, three RRI design principles, and RRI competencies that include four procedural dimensions. However, there is a need for a broader systemic literature analysis involving other researchers to enhance the validity of the study, as well as a review of studies on the applicability of the above-mentioned RRI tool.

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