



# Innovation: The European Journal of Social Science Research

ISSN: (Print) (Online) Journal homepage: <https://www.tandfonline.com/loi/ciej20>

## Social innovation and educational innovation: a qualitative review of innovation's evolution

Karina Maldonado-Mariscal & Iwan Alijew

**To cite this article:** Karina Maldonado-Mariscal & Iwan Alijew (2023): Social innovation and educational innovation: a qualitative review of innovation's evolution, *Innovation: The European Journal of Social Science Research*, DOI: [10.1080/13511610.2023.2173152](https://doi.org/10.1080/13511610.2023.2173152)

**To link to this article:** <https://doi.org/10.1080/13511610.2023.2173152>



Published online: 24 Feb 2023.



Submit your article to this journal [↗](#)




View related articles [↗](#)



View Crossmark data [↗](#)



## Social innovation and educational innovation: a qualitative review of innovation's evolution

Karina Maldonado-Mariscal  <sup>a,b,\*</sup> and Iwan Alijew <sup>c,d</sup>

<sup>a</sup>*TU Dortmund University, Social Research Center (sfs), Department of Social Sciences, Dortmund, Germany;* <sup>b</sup>*ETH Zurich, KOF Swiss Economic Institute, Zurich, Switzerland;* <sup>c</sup>*Department of Philosophy, University of St Andrews, St Andrews, UK;* <sup>d</sup>*Department of Philosophy, University of Zurich, Zurich, Switzerland*

*(Received 5 January 2022; final version received 22 January 2023)*

The paradigm of innovation has evolved over the last decades worldwide. The old conception of innovation as technological change has become more diversified and specialised. Current debates express the need to provide a holistic view of innovation, with its pros and cons, including all dimensions of innovation in society and different fields. This paper consists of a qualitative review focusing on three concepts: 'innovation', 'social innovation' and 'innovation in education'. This research includes a historical analysis within 1939–2019 as the base period of analysis. This article is based on 108 different sources, which were carefully selected. The analysis was carried out with content analysis in our main sample. This paper contributes to our understanding of innovation more holistically, by discovering how innovation is understood and used, but also by looking at the different stages it has gone through in historical debates and evolutionary trends. This article presents different perspectives on innovation over time and helps to recognise the evolution of the concept of innovation and the emergence of social innovation as a field of its own. Furthermore, the relevance of innovation in the field of education is presented and current debates on the understanding of innovation are situated.

**Keywords:** Innovation; social innovation; innovation in education; paradigm; review; evolution trends

### 1. Introduction

The innovation paradigm has evolved in recent years worldwide. What used to be a rather narrow understanding of innovation as technological change became more diverse and specialised. Many of the recent literature focuses on the negative aspects of innovation, e.g. capitalist societies and firms motivated by an endless drive for innovation. However, there are also debates about both the positive and the dark sides of innovation (Dziurski 2021). Similarly, a stream of research tries to better understand the researchers' 'pro-innovation bias' (Godin and Vinck 2017), claiming that innovation has a tendency to be interpreted positively and therefore we need to change the focus on innovation (Godin and Vinck 2017). In future research, we may need to better differentiate public perception of the effects of innovation from the scientific evidence of innovation impacts. Some current research specialises in innovation policy (Edler and Fagerberg 2017), multilevel governance (Ciasullo et al. 2020) or sustainable innovation (Haxeltine et al. 2017).

---

\*Corresponding author. Email: [karina.maldonado@tu-dortmund.de](mailto:karina.maldonado@tu-dortmund.de)

However, how to understand innovation in different fields if we are still not sure what innovation really is and what its properties are?

We recognise today the current evolution of innovation (see [Figure 1](#)), where there are multiple interpretations rather than a single understanding of innovation as technology. This indicates a path of scientific discussion as a necessary debate to advance the field. Similarly, more debates on how to provide a holistic view of innovation with its pros and cons is showing a strong progress in innovation studies in recent years. However, more studies are still needed, since we need more evidence of innovation in a historical perspective and with interdisciplinary perspectives. This may allow us to develop better analytical tools to understand, define and measure innovation in our societies today.

The motivation for this research was originally born after a literature review for a doctoral research was conducted, in which one of the authors was able to identify some gaps in the literature on innovation and especially on innovation in education (Maldonado-Mariscal 2017). This research identified different geographical perspectives of innovation as well as historical perspectives that influence innovation theories in specific directions, as well as similarities and differences and how innovation theories have influenced the fields of social innovation and innovation in education (Maldonado-Mariscal 2017). Building on this and more recent research, this article represents an in-depth study of the evolution of innovation, in which we identify research gaps in explanations of whether innovation in education has adopted the same paradigms as innovation studies. This is relevant not only for understanding innovation in education, but especially for understanding how the understanding of innovation influences other fields and how the innovation paradigm has evolved. If we apply Kuhn's idea of the paradigm (Kuhn 1962), we can see that the paradigm represents a common understanding for specific communities. However, there are different scientific communities with different paradigms, which still need to communicate. We can say here that there are different innovation paradigms for certain communities, e.g. social innovation community, innovation in education community. What we need, in order to better understand innovation, is to communicate between all these communities and identify the similarities and differences of each understanding of innovation. If the ultimate goal of innovation research is not to create a single understanding, which seems not possible, then understanding the findings of each innovation community and applying them to advance our own fields is a crucial task.

This paper aims to provide the result of a historical and systematic analysis of innovation in general, social innovation and innovation in education. This paper consists of an analysis of theoretical perspectives on innovation by drawing on the most relevant literature of the last eighty years. This article proposes an understanding of innovation that embraces not only a technological perspective, but also a social one. The originality of this work lies especially in the analytical perspective used, where innovation is studied in different fields, such as social innovation and innovation in education, but within a common historical framework. This contributes to our understanding of innovation more holistically, by discovering how innovation is understood and used, but also by looking at the different stages it has gone through in historical debates and evolutionary trends. This article contributes especially to the disciplines of sociology, education and innovation studies. Previous historical analysis has been done, especially by scholars like Godin. However, this article includes three main concepts in its analysis and performs the historical analysis not only from innovation studies but also from the fields of social innovation and innovation in education. This effort aims to provide a better understanding of how the concept of innovation has evolved in these three branches and how they differ in time and understanding.

The research questions (RQ) that led this article are:

- (1) In which ways has the innovation paradigm changed in the last eighty years (1939-2019)?
- (2) Are there specific patterns that define the evolution of the innovation paradigm?
- (3) To what extent does social innovation and innovation in education reflect the evolution of the innovation paradigm?
- (4) Are there specific features that define innovations in education?

This article is structured as follows: first, we present the methods used; second, we introduce the evolution of the innovation paradigm by decade including social innovation; third, we introduce the understanding of innovation in education by decade; and finally, we draw conclusions and provide an outlook for further research.

## **1.1 Method**

The methodology carried out for this study consists of a qualitative literature review that includes the concepts of innovation, social innovation and innovation in education. The starting point of this literature review was the experience and knowledge from a doctoral thesis of one of the authors. This literature review is a qualitative review, which consisted of digital and paper sources. For this review, we included the most relevant literature available online and in print during the period 1939–2019. As some sources were not available in digital format, they were collected in paper form from the libraries of three different universities. Therefore, the search for sources was conducted both in digital sources (web of science) and in paper sources from three university libraries specified in this section and using literature cross-referencing. A summary of the samples analysed in the literature review is given in [Table 1](#).

### *1.1.1 Criteria*

With relevant literature, we mean literature that covers at least one of the following criteria:

- a. Theoretical research that discusses the paradigm of innovation in society and education in the selected period;
- b. Research that explains different stages related to the paradigm of innovation;
- c. Research that explains the application or consequences of innovation in a society; and
- d. Theoretical and empirical research that explains the understanding of innovation, social innovation and innovation in education.

### *1.1.2 Framing the review*

We use the period from 1939 to 2019 because it is during this period that the most influential sources on innovation were found. These sources have shaped the innovation debates of later years and are in relation to the research questions defined in this paper. We have used 1939 as a starting point, since Schumpeter's landmark work on innovation was published in that year. However, we saw the need to include relevant works before 1939 to better understand the context of Schumpeter's writings and later works from 2019 to cover some of the most recent research from 2020 onwards to keep up to date. This article includes relevant works from the past that has influenced innovation studies and the innovation paradigm. At the time of the search, we recognised some historical

Table 1. Summary of reviewed literature.

Main literature		
Innovation	Social innovation	Innovation in education
Braun-Thürmann 2005	Maldonado-Mariscal 2017	Bambach 1979
Crosscombe 2018	Cajaiba-Sanatana 2014	Bormann and Rückert 2011
Dosi 1982	Franz et al. 2012	Cerna 2014
Downs and Mohr 1979	Fontan et al. 2008	Durando 2017
Edler and Fagerberg 2017	Fujisawa et al. 2015	Dykes et al. 2010
Gillfillan 1935	Gohn 2011	Fernandez 2006
Godin and Vinck 2017	Green and Vergragt 2002	Fullan 1972
Hussein et al. 2018	Godin 2012	Ghanem 2013
Kuhn 1962	Haxeltine et al. 2017	Halasz 2018
Lewin 1947	Howaldt and Schwarz 2010	Havelock 1973
Merton 1938	Howaldt and Jacobsen 2010	Hubermann 1973
Mohr 1969	Howaldt et al. 2013	Kirk 1986
OECD/Eurostat 1992	Howaldt et al. 2014	Kleifgen 1990
OECD/Eurostat 1997	Howaldt et al. 2016	Martin 2010
OECD/Eurostat 2005	Kesselring and Leiner 2008	Miles 1964
OECD 2010	Kohlgrüber et al. 2019	Miller and Olson 1994
OECD/Eurostat 2018	Krlev et al. 2014	Nisbet and Collins 1978
Ogburn 1922	Merton 1957	OECD 2014
Ogburn 1937	Moulaert et al. 2005	O'Neil 1971
Rammert 1997	Moulaert and MacCallum 2019	Papagiannis et al. 1982
Schumpeter 1939	Mulgan 2006	Schröder and Krüger 2019
Schumpeter 1943	Mulgan et al. 2007a	Serdyukov 2017
Windeler 2018	Mulgan et al. 2007b	Sidorkin and Warford 2017
Ziemnowicz 2013	Mulgan 2012	Silberman 1970
	Mumford 2002	Smith 1971
	Neumeier 2012	Watson 2006
	Nilsson 2003	Whiteside 1978
	Phillips 2011	
	Pol and Ville 2009	
	Rammert 2000	
	Rammert 2010	
	Rey de Marulanda and Tancredi 2010	
	Rodríguez Herrera and Alvarado 2008	
	Rogers 1971	
	Schubert 2018	
	Schweitzer et al. 2015	
	Taylor 1970	
	Zapf 1969	
	Zapf 1989	
	Zapf 1991	
	Zapf 1994	
	Ziegler 2017	

*(Continued)*

Table 1. Continued.

Main literature		
Innovation	Social innovation	Innovation in education
Additional literature		
Maldonado-Mariscal 2020		
Behrend et al. 2022		
Maldonado-Mariscal and Schröder 2023		
Caro-Gonzalez and Anabo 2020		
Ciasullo et al. 2020		
Dziurski 2021		
Galego et al. 2021		
Filatotchev et al. 2020		
Pel and Kemp 2020		
Pel et al. 2020		
Prud'homme van Reine 2017		
Schröder 2021		
Strambach and Pflitsch 2020		
Terstriep and Wloka 2020		
Wittmayer et al. 2020		

analyses and included them (Godin 2012), in order to check for consistency between our findings and previous historical analyses.

The main sample of this literature review was 93 sources, whereas a broader sample of 108 articles was included. This means that this article builds on 108 different digital and in-print sources discussing at least one aspect of the criteria presented before. Of these 108, 93 articles were the main focus of this review and the remaining articles were further analysed to cover preceding and current debates around the understanding of innovation, specifically in the three concepts studied here. Our main search tools were web of science, google scholar, and libraries of the University of Zurich, the Humboldt University of Berlin and the TU Dortmund University. The main concepts we used in our search were ‘innovation’, ‘social innovation’ and ‘innovation in education’, and we also used literature cross-referencing. These concepts were searched primarily in English. However, we included a smaller search in German, Spanish and Portuguese to identify key literature in these languages, in order to avoid a focus on the English literature. Although we analysed literature in different languages, we recognise that the literature may not include all regional perspectives. Nevertheless, we have provided an overview of other regional perspectives derived from different languages.

### 1.1.3 *Analysis*

The analysis was carried out with content analysis, organised in a larger table, in which we cross-checked the research questions with all sources in our main sample. This means that we read the full articles and searched for definitions and key concepts, specifically the three key concepts analysed, and looked for trends in the authors’ discourse over a specific period of time.

### 1.1.4 *Limitations*

Some of the limitations of this work are that, in terms of time and resources, we of course did not include all the existing literature in the period mentioned. However, to compensate

for this limitation, we defined the selection criteria for the literature analysed, and based on the innovation research experience of one of the authors and to the best of our knowledge, included the most relevant literature within our defined scope. At the same time, to avoid bias, we tried to include the relevant literature in the period analysed regardless of the number of citations.

## 2. Analysis and results

We analyzed the changes of the innovation paradigm from a historical perspective and present here the most important changes per decade.

### 2.1 Preliminary remarks

Schumpeter's work has played a major role in our current understanding of innovation (see Bormann, John, and Rückert-John 2011; Dosi 1982; Fontan, Klein, and Tremblay 2008; Franz, Hochgerner, and Howaldt 2012; Fujisawa et al. 2015; Godin 2012; Kesselring and Leitner 2008; Kohlgrüber et al. 2019; Moulaert et al. 2005; Mulgan et al. 2007a; Neumeier 2012; Rammert 2010; Schubert 2018; Sidorkin and Warford 2017; Windeler 2018).

A significant aspect of this research is that much of the literature on innovation has a strong focus on technological and economic innovation or shows a preference for discussing technological innovation, even when it comes to social innovation (Godin 2012; Neumeier 2012; Rammert 2010). More recently, the social aspects of innovation have been highlighted, rendering visible the need for more research in this direction. In this process, a new field of study, social innovation, has been developed as an independent field of research (Howaldt and Schwarz 2010; Howaldt, Kopp, and Schwarz 2013; Howaldt et al. 2014; Zapf 1989; Zapf 1991).

### 2.2 Innovation and social innovation

In this section, we analysed the historical change of the innovation paradigm and present the most important changes for each decade. This allows to investigate in which ways the innovation paradigm has changed in the last eighty years (RQ1), to find out if specific patterns define the evolution of the innovation paradigm (RQ2) and to what extent the general innovation paradigm relates to social innovation (RQ3).

#### 2.2.1 Relevant works prior to the period analysed

In this decade, authors such as Ogburn, Gilfillan, Merton and Schumpeter contributed much to the discussion of innovation in society in different ways and perspectives. The work of Ogburn in the 1920s and 1930s was much aligned with Gilfillan's and Merton's work.

Ogburn's work (1922, 1937) had an important impact on the innovation paradigm in the US and worldwide. Ogburn investigated social evolution and social change already in the 1920s, referring to a cultural change in a process of new forms and inventions (Ogburn 1922, 75). In the 20s he wrote about innovation, social change and its links with cultural changes in his work *Social Change – With Respect to Culture and Original Nature* (1922). Whereas in the 30s, he focused on the national policy of innovation in the work *Technological Trends and National Policy* (1937). In this last work, he suggested that inventions

are caused by other inventions (Ogburn 1937). An invention refers to a new creation or a new device, a definition of a dictionary explains it as ‘a device, contrivance, or process originated after study and experiment’. Ogburn, for example, meant that in order to create a new invention, certain infrastructure is needed, infrastructure which offers a platform for creativity and acceleration of change. He made two important arguments in relation to the innovation paradigm: first, that there is a persistence of specific cultural forms in societies; and second, that new cultural and general paradigms are added by new inventions, as ‘new forms may be created by means of inventions’ (Ogburn 1922, 75). Ogburn (1937) recognised that the acceleration of change in societies, e.g. social change, is linked to the exposure of societies to inventions, or even the opposite, that the isolation of societies from inventions can slow down social change.

Gilfillan (1935) talked about technical innovations that are related to social inventions, he called them social institutions. As an example, he wrote about the construction of the ship, with different parts of wood and metal, but also with its strong social commitment: ‘the ship [...] is not just a lifeless thing of wood and metal, but a vast complex [...] of which most elements are social thoughts of man, a set of social institutions [...]’ (Gilfillan 1935, 17).

Merton’s (1938) work was very relevant in this decade not only for the understanding of innovation but also for the understanding of science. He wrote many of the current foundations of the sociology of science and innovation. For example, he recognised in Durkheim’s work the dimension of efficiency towards innovation and crime. He contributed to innovation especially with an analysis based on social structure, with ideal types of societies and behaviours. His analysis suggests how people adopt roles to fit into different situations. These roles are mainly related to cultural and institutional goals and people react with acceptance or rejection in different ways. He mentioned innovation as a form of reaction. Innovations arise when people accept cultural goals but reject institutional means to achieve them. This means that a ‘society does not accept the institutions and norms established, and so it has to innovate in the search for new institutions better fitted to the society concern’ (Maldonado-Mariscal 2017, 43). As a result, he noted that institutional means act as a kind of engine of innovation (Merton 1938, 676).

### 2.2.2 *In the 1930s*

Schumpeter’s work centered on innovation in markets and production. He studied how markets and production can be more efficient. Despite Schumpeter’s work is mainly concentrated on innovation in markets by analysing business cycles (Schumpeter 1939), he recognised that innovations contribute to institutional change and do not represent isolated events, but are part of cycles and needs for change (Schumpeter 1939, 94–98). Schumpeter’s work was one of the first to introduce innovation as a central element to economic change in the decade of the 30s and 40s (Ziemnowicz 2013). He introduced new ideas on business cycles and innovation where he recognised that improvement of production, reduction of costs and implementation of new technologies foster economical productivity (Schumpeter 1939). In his book *Capitalism, Socialism and Democracy* (1943) he included the concept of an innovation economy. In the same book he also analyzed changes within capitalism and introduced the term ‘*creative destruction*’ (Schumpeter 1943, 81–86), referring to a process that creates a new structure by destroying old structures. Some authors recognised in Schumpeter’s work not only the economic innovation but also a social aspect of innovation (Howaldt and Schwarz 2010, 102), especially when it



comes to non-technological innovation (Rammert 2010, 21) or to organisational innovation (Kohlgrüber et al. 2019, 3). Whereas other authors only recognised the introduction of economic innovation (Mulgan et al. 2007a).

Some more contemporary authors suggest that Schumpeter's definition of innovation is still used not because it is the best definition, but because a better definition does not yet exist (Bormann, John, and Rückert-John 2011, 12). Also, it has been said that after Schumpeter's work on innovation, there is a research gap, especially related to the social aspects of innovation (Howaldt and Schwarz 2010, 9–10). But is this true?

### 2.2.3 *In the 1940s*

In this decade Schumpeter's approach seems to be strengthened, as innovation in companies are one of the main topics discussed in the literature at the time. Similarly, organisational change becomes a relevant research area. Lewin (1947), for example, observed that social life has an influence on organisational institutions: 'Social life proceeding on a certain level leads frequently to the establishment of organizational institutions' (Lewin 1947, 33). In that sense, Hussain et al. (2018) recognised in Lewin's work the basis for a theoretical approach to organisational innovation (Hussain et al. 2018, 124).

### 2.2.4 *In the 1950s*

One of Merton's most important works is set out in his book *Social Theory and Social Structure* (1957) in this decade, with a refined typology of his previous work of individual adaption (*Social Structure and Anomie*, 1938). He suggested that innovation refers to 'the rejection of institutional practices but the retention of cultural goals' (Merton 1957, 230). For him, it was important to find out the relationships between social status and coping habits, i.e. to understand which social status is more predisposed to which type of adaption. In the case of innovation, he recognised that lower-middle class individuals may be less predisposed to adapt through innovation because of their attachment to institutional norms and of the way they were socialized (Merton 1957, 204–205).

### 2.2.5 *In the 1960s*

The introduction of the paradigm concept by Kuhn in his book *The Structure of Scientific Revolutions* (1962) was an important step in innovation research in the 1960s. This author not only introduced the concept of paradigm, but also distinguished between the concepts of discovery and invention (Kuhn 1962). Kuhn explained that paradigm refers to a universally recognised scientific agreement, which for a certain time and a specific community serves as a model to solve problems (Kuhn 1962). In that sense, a new paradigm is needed to solve 'the problems that have led the old one to a crisis' (Kuhn 1962, 153).

At this time, the scientific discussion that innovation is not only technological but also organisational was taken to a new level. For example, Mohr (1969) focused on the main factors of innovation in organisations. He refers to the elements which make innovation more likely in an organization, such as technological changes, labor market pressure and demands from clients, but also a social environment inclined to change (Mohr 1969, 112). Despite Mohr's work has a strong link to Schumpeter's work, he discussed the social dimension of innovation with more intensity. He made a distinction between the

innovation and invention concepts, where innovation has a stronger link to social dimensions than inventions: '[...] the concepts of innovation and social deviance are closely allied' (Mohr 1969, 125). In this decade the discussions about the social dimensions of innovation seem to be stronger. That can also be seen in Zapf's writings in 1969. Zapf (1969) speaks of social change as the interruption of stable situations whose stability needs to be known in order to recognise the potential for change (Maldonado-Mariscal 2017, 5).

#### 2.2.6 *In the 1970s*

In this decade, innovation research has taken on a more critical perspective. Rogers (1971) recognised how the concepts of innovation and technology were often misused as synonyms. The study of organisational innovation grew as a continuation of Lewin's work (1947) and innovation in organizations became very popular in research (Mohr 1969; Downs and Mohr 1979). Mohr observed how an appropriate environment can drive organisational and individual innovation (Mohr 1969, 112). Together with Downs, he highlighted the links between technological and organisational innovations, as 'the impact of organizational expertise will depend on how great [...] the technical requirements of the innovation [are]' (Downs and Mohr 1979, 382). Although some authors stressed the importance of the social dimension in innovation processes, research on that dimension remained limited. It is in this environment that the new field of research on the diffusion of innovation emerges (Rogers 1971). In this relatively new debate on organisations, the diffusion of innovation became important, and according to Rogers, it is a very relevant contribution to educational research (Rogers 1971, 62). This field tried to find a new understanding of at least two concepts: reinvention and innovation. Rogers' perspective suggests that educational research can offer a relevant contribution to the investigation of the diffusion of innovations, as the variety of educational organisations adds complexity to the adoption of educational innovation (Rogers 1971, 62).

In addition to the scientific debate on technological and organisational innovations, Taylor (1970) introduced the concept of social innovation in 1970. This author not only underlined the relevance of social innovation, but also saw a link between social innovations and social movements (Taylor 1970, 70). He suggested that social inventions or social innovations are new social practices or forms which are difficult to introduce, meaning that such practices are more challenging to be disseminated than other innovation types (Taylor 1970, 70). This author recognised social innovation in many ways, some examples he provided are: an innovative school model, a new way against poverty, new procedures and perspectives for working, new working relationships with different organisations, new techniques for inclusion or social improvement (Taylor 1970, 70–73). Similarly, in a project of a governmental institution in the US, he identified five elements of social innovation: (a) new patterns of service; (b) new ways of agency; (c) new dynamics of community organization; (d) new working relationships with different community agencies; and, (e) training as a new agency (Taylor 1970, 73). To the best of our knowledge, Taylor's work in 1970 is the first that introduced the concept of social innovation.

#### 2.2.7 *In the 1980s*

This decade is characterised by a growing debate on the social dimension of innovation. Dosi (1982) asserts that once the technological paradigm shifts, the understanding of technical and social issues must evolve in parallel. Historically, a successful economic market has been considered a successful innovation (Dosi 1982). However, this author underlined

three important factors of an innovation (economic, institutional and social) and explained how the social dimension is underrepresented in the innovation discourse (Dosi 1982, 155). Similar to Dosi, authors such as Zapf and Taylor explored the concept of innovation in the social sciences from both technological and social perspectives. Zapf acknowledged that there are ‘socio-technical innovations’ and ‘social innovations’ (Zapf 1989, 177) and asseverates that concepts of social innovation may be the result of the lack of a theory of development (Zapf 1989, 1991).

Earlier work on social innovation summarised by Godin (2012, 10) shows a negative connotation of the idea of social innovation, where authors including William Lucas Sargant suggested that the ‘social innovator’ had strong socialist and welfare doctrines.

In the German literature of innovation, many studies suggest that Zapf first introduced the concept of social innovation in 1989. But, as we have just seen, Taylor already introduced the concept of social innovation in 1970 in his paper *Introducing Social Innovation*. However, Taylor did not give a complete definition, he wrote about ‘new ways of doing things, [...] new social inventions’ (Taylor 1970, 70). Zapf, on the other hand, provided in 1989 a definition of social innovation as follows:

‘new ways to reach goals, new ways of organization, new regulations but also new ways of life style that impact social change, that solve problems in better ways than before, and are therefore worthy of being imitated and institutionalized’. (Zapf 1989, 177, own translation from the original Text in German)

### 2.2.8 *In the 1990s*

The concept of modernisation was a very popular one in this decade. Modernisation was not only understood as economic productivity and economic growth but also as an improvement in the construction of better states, societies and institutions (Zapf 1994). At this point, innovation in the literature was more naturally linked to concepts such as social change (Zapf 1969), social movements (Taylor 1970) and modernisation (Zapf 1994).

In this decade, the Organization for Economic Co-operation and Development (OECD) (1992, 1997) issued the first versions of the Oslo Manual. The Oslo Manual proposed guidelines for collecting and interpreting data on technological innovation (1992, 1997, 2005, 2018). For example, the 1997 Oslo Manual addresses technological innovation within a broader approach to business innovations (OECD 1997, 8), also refers to the work of Schumpeter (OECD 1997, 16) and introduces a distinction between product and process innovation (OECD 1997, 80).

### 2.2.9 *In the 2000s*

Nilsson (2003) suggested that ‘non-technological innovations [...] are usually viewed from the perspective of technological innovations’ (Nilsson 2003, 8). However, it is from this decade onwards that the concept of innovation begins to take on a new face (Howaldt and Schwarz 2010). In this decade, it can be observed in the literature that a kind of consensus is established among researchers that the concept of innovation before the 1990s was mainly used for technology (Fontan, Klein, and Tremblay 2008, 17). A number of scholars strongly encouraged more research especially on a new understanding of the concept of innovation, a ‘renewal’ of innovation studies (Fontan, Klein, and Tremblay 2008, 22-23). This change represented a post-Schumpeterian era in

innovation research (Rammert 2000). Some research began to focus on differentiating business innovation from social innovation (Pol and Ville 2009). This differentiation has not yet been fully successful, as even today business innovations and social innovations are often (mis)understood as synonyms. While the main objective of a business innovation is to improve financial profits in a more efficient way, the objective of a social innovation is to achieve social goals (Pol and Ville 2009, 24; Mulgan et al. 2007a, 8). In addition, research on innovation within organisations became even more common and a field of research on innovations in organisations or organisational innovation was properly established (Mumford 2002; OECD 2005). Some authors and international institutions started to differentiate types of innovations, e.g. technological, economic, normative, cultural (Pol and Ville 2009) or marketing innovations (OECD 2005).

Also in this decade, United Nations organisations, such as the Economic Commission for Latin America and the Caribbean (ECLAC/CEPAL), published for the first time papers on social innovation: one on the keys to social innovation in Latin America (CEPAL 2008) and another one with examples of innovative practices with social impact in the region (Rey de Marulanda and Tancredi 2010)

#### 2.2.10 *In the 2010s*

In this decade researchers agreed on the need for a paradigm shift (Franz, Hochgerner and Howaldt 2012). This means that the current paradigm of innovation as a technological and economic understanding of innovation, or a Schumpeterian understanding of innovation, was insufficient for the needs of today's societies (Rammert 2010, 21–22). In other words, the innovation paradigm fits no longer the current reality of our societies. Therefore, the need to open up innovation to society was inherent. Some researchers observed that the technology-oriented paradigm, inherited from industrial societies, was also formed in a context of industrial societies, whereas today's societies are more service-oriented (Franz, Hochgerner and Howaldt 2012, 2).

During these years, much research emerged discussing the need for a new direction of innovation. On the one hand, a classical conception of innovation saw technology as an enabler of innovation (OECD 2010). On the other hand, a new conception of innovation saw technology only as an enabler of other innovation types (Rammert 2010, 23). However, in the same year 2010, the OECD recognised that human capital, and thus education, is crucial for innovation: 'Human capital is the essence of innovation. Empowering people to innovate relies on broad and relevant education as well as on the development of wide-ranging skills that complement formal education' (OECD 2010, 11).

Research on social innovation increased significantly in this decade, but still represented a relatively unknown field (Mulgan 2006; Mulgan et al. 2007b; Howaldt and Schwarz 2010; Howaldt and Jacobsen 2010; Howaldt et al. 2014). Some researchers noted the rise of research on social innovation and how the term social innovation became a key buzzword not only for research but also for policy-making (Howaldt et al. 2016). Other authors merely emphasise the social aspects of innovations more appropriately rather than calling them social innovations (Fujisawa et al. 2015; Wittmayer et al. 2020). The prediction of the research at this time was that social innovation will become more important in the coming years (Howaldt and Schwarz 2010, 61; Mulgan 2006, 145), not only for research, but also for industry and policy-making. A new research direction identifies that both technological innovation and social innovation are relevant, that there

should be more contrast between them and that each should be given equal weight (Braun-Thürmann 2005; Rammert, 2010; Rammert 1997; Kesselring and Leitner 2008). Some authors recognised that this new research field actually emerged in the 80s already by linking technological change and social innovation (Mulgan 2006, 158; Phillips 2011).

New perspectives on social innovation suggested to study new combinations of innovation, such as social, technological, and cultural (Green and Vergragt 2002), whereas other perspectives suggest that technological changes have definitely a social impact (Schweitzer et al. 2015).

Neumeier's (2012) social innovation model sets out to delve deeper into social innovation. As part of this, he looked into the different types of innovation, and gave special weight to the processes that underpin innovation (Neumeier 2012). This author stated that 'in contrast to technological and economic innovations, social innovations are not teleological and may not necessarily have an economic impetus' (Neumeier 2012, 58). Based on his research, he developed a model of social innovation with three stages: problematisation, expression of interest, delineation and co-ordination (Neumeier 2012, 58)

Beyond the debate on what is meant by social innovation and the need for a paradigm shift, this decade also saw the development of a natural connection of social innovations with sustainability and environmental research (Howaldt and Schwarz 2010; Howaldt and Jacobsen 2010).

### 2.2.11 *Currently*

One of the issues in innovation research that stands out is the positive connotation of innovation especially when related to technology, market and capitalism (Rammert et al. 2018). After reviewing more than eight decades of innovation research, we can observe a clear evolution from a technological approach, towards a differentiation of types of innovation. This means that technological innovation is still a relevant approach, but it is not the only relevant one, since social innovation became a field in its own that has also influenced education and other fields of study to understand today's societies.

Likewise, research has become more specialized by investigating social innovation in specific fields. At the same time a more critical view of innovation studies is demanded (Pel and Kemp 2020; Moulaert and MacCallum 2019). In addition to that, research that differentiates between the various concepts of the social dimension of innovation more clearly has emerged, for example, between concepts such as social innovation, social movements and social change (Maldonado-Mariscal 2020).

In the last decade, we also find key concepts as specific fields of social innovation, such as institutional innovation (Cajaiba-Santana 2014; Strambach and Pflitsch 2020), indicators of social innovation (Terstriep and Wloka 2020; Krlev, Bund and Mildemberger 2014), transformative social innovation and sustainability (Pel et al. 2020; Ziegler 2017), innovation in energy systems (Wittmayer et al. 2020) and innovation governance (Galego et al. 2021; Filatotchev, Aguilera and Wright 2020).

## 2.3 *Innovation in education*

In this section, we analysed the historical change of the innovation paradigm in education and present the most important changes for each decade. This allows to investigate to what extent social innovation and innovation in education reflects the evolution of the general

innovation paradigm (RQ3) and to observe whether there are specific characteristics that define innovation in education (RQ4).

### 2.3.1 *Relevant works prior to the period analysed*

Similar to the general paradigm of innovation, Ogburn (1937) plays an important role in discussing innovation in education. He suggested that educational innovations have been left behind in order to bring further technological and technical inventions (Ogburn 1937, 31).

### 2.3.2 *In the 1930s*

In this decade, we find almost no literature specifically related to innovation in education, apart from the aforementioned work of Ogburn (1937).

### 2.3.3 *In the 1940s and the 1950s*

In these two decades, as far as our literature review is concerned, no specific literature on innovation in education was found. This differs greatly from the literature on the general innovation paradigm. In the following decades, the literature on innovation in education grew considerably.

### 2.3.4 *In the 1960s*

Miles made several contributions to the understanding of innovation in education in this decade. His contributions are especially relevant to the analysis and understanding of innovations from a systemic perspective, and as part of a greater change, such as a social change and change in social institutions (Miles 1964, 15–18). He emphasized that there is an important relationship between the system and the innovator person or group. According to Miles' research, one problem of innovation in education is the lack of evaluation and measurement at a system level, as he stated that '[e]ducational innovations are almost *never* evaluated on a systematic basis' (Miles 1964, 657). This suggests that innovation in education requires more evaluation to demonstrate the progress and improvement innovations bring in a specific system. Miles not only focused on the need for evaluation but also identified different types of innovation in education, such as: (a) changes in teacher certification; (b) experimental urban university; (c) flexible use of building space in schools; (d) meeting the needs of underprivileged children, among others (Miles 1964, 15–18).

### 2.3.5 *In the 1970s*

In this decade, innovation research in education was more extensive. Like in general innovation research, the study of organisational innovation and the diffusion of innovation were an important part of innovation research in education as well. According to Rogers (1971), research of innovation was also relevant for education research (Rogers 1971, 62). In this decade, a perspective to improve educational systems and structures prevailed. Also, efficiency in education was an important priority. Innovation should contribute to making a system, a process, and a product more efficient. Therefore, a lot of research was concerned with the question: How can we do what we are now doing

more effectively? On the other hand, there was a strong concern about the transformation of the system, in this case the educational system (Silberman 1970, 4). Therefore, innovation as a systemic change and as organisational change was very relevant in the field of education, referring to school organisations but also to the training of teachers in a new environment (Smith 1971, 7). Smith saw open space school architecture as an innovation, and therefore pointed out the importance of new spaces for new forms of education (Smith 1971).

Similar to Smith, Fullan (1972) recognised the need for a systemic change or structural change instead of superficial innovations in education. Some of the most relevant dimensions for innovation in education he recognised in this decade were: (a) conditions and processes of change; (b) user level in education; (c) quality of innovation process; and (d) not only school innovation but structural innovations (Fullan 1972, 1–2). Some examples of innovation in education and its characteristics are outlined in his work of 1972:

‘Most significant educational innovations – nongrading, team teaching, the open school, flexible modular scheduling (to refer to some of the more widely known ones) – tend to be at the ‘difficult to adopt’ end of the continuum for each of the five attributes; that is, more often than not, significant educational innovations do not have clear-cut relative advantage, are usually not easily compatible with existing social systems of adopting units, are relatively complex in that they require social system changes, are not that triable in realistic situations, and the results are not clearly observable and measurable.’ (Fullan 1972, 6)

Like Fullan and Smith, Huberman (1973) began to recognise that a shift in attitude and paradigm was needed to understand change and innovation in education. In his work in 1973, he criticized the tendency in the US in the 1970s to understand change and innovation in education as an industrial process, where childrens’ learning is a product (Huberman 1973, 4).

Since many authors in this decade recognised the need of innovation research for a systemic approach, a new concept of innovation in education appeared. They stressed the relationship between innovation and society and not just the need for something new in education (Huberman 1973; Nisbet and Collins 1978). One aspect often emphasised by the authors of this decade is that the demands of society must be reflected in schools and in the forms of teaching (Whiteside 1978, 30–31). For some authors innovation in education is ‘any new policy, syllabus, method or organizational change which is intended to improve teaching and learning’ (Nisbet and Collins 1978, 5). Other scholars strive to better differentiate between change and innovation in education (Huberman 1973; Havelock 1973). For them, change is understood as something spontaneous, while innovation is perceived as ‘deliberate, willed and planned’ (Huberman 1973, 6) or as offering ‘something new to the people being changed’ (Havelock 1973, 4).

Huberman made several contributions in this decade for the understanding of innovation in education. For example, he identified different types of changes and levels of analysis of innovation in education. First, there are hardware, software and interpersonal relations (Huberman 1973, 9). Second, changes usually come from outside of education systems (Huberman 1973, 41). Third, there are three levels to study innovation in education: individual, institutional, and communitarian (Huberman 1973, 91). Fourth, he introduced the concept of social technology with a sense of change coming from society: ‘To conceive of change in education as a sort of social technology, is, however, impractical in present conditions. Even in periods of accelerated social change, schools change very slowly and often require a great deal of pressure from

outside to modify existing practices' (Huberman 1973, 91). Like Huberman, Havelock (1973) provides different tools to study and understand innovation. He identified different actors, processes and levels of innovation as dimensions of analysis. For example, he identified six different stages of planned change: relationship (build trust), diagnosis (identify problem), acquisition (obtain resources for solution), choosing (choose solution), acceptance (adopt innovation), self-renewal (maintain innovation without outside help) (Havelock 1973, 11). These stages are similarly built into Neumeier's social innovation model in 2012 as problematization, expression of interest, decision points, thus if the decision is accepted it succeeds, if not it fails (Neumeier 2012, 57). Following the development of tools for the analysis and study of innovation in education, some scholars realized that innovation creates uncertainty (Fullan 1972; Nisbet and Collins 1978) and therefore new roles of stakeholders need to be played (Havelock 1973).

By the end of this decade, experimentation in education was the next step. Bambach (1979) for example saw the importance of experimentation within schools in Australia, not only as an isolated model of schools but as 'community school experiments' involving educational and communitarian actors (Bambach 1979, 23). At that time, special experimental innovation programmes were implemented in Australia. This has been done by combining school infrastructure for the community and some of the typical communitarian issues were brought inside schools. Reports from this programme put at the center the need for 'a climate for educational changes which incorporated school and community interaction as an essential element' (Schools Commission, 1978 cited by Bambach 1979, 26). Innovative schools were strongly supported not only in Australia but also in other continents. Similar to the experimental schools in Australia, in Brazil, O'Neil (1971) discovered how several innovations have emerged in difficult political times in Sao Paulo and asserts that this is one of the country's most innovative decades in terms of education.

### 2.3.6 *In the 1980s*

The 1980s saw the emergence of the discussion of an innovation paradigm with education and social change, which means that prior to this decade there was a parallel debate. On the one hand, the debate on innovation. On the other hand, the debate on educational change and social innovation. However, these two did not used to be in dialogue. This transition may suggest that the innovation paradigm based on Schumpeter's ideas was not transferable to the education paradigm. Therefore, an alternative paradigm was needed (Papagianis et al. 1982, 248). In this decade, the need for this alternative paradigm of innovation in education was strengthened and the ideas of educational and social innovations were addressed:

'We contend that the dominant paradigm [...] is an inadequate and inaccurate conceptual framework for understanding educational innovations, or social change generally. We will discuss why we believe this and will suggest how an alternative, radical paradigm offers a much better basis for understanding, and even developing, educational and social innovations.' (Papagianis et al. 1982, 248).

Since the topic of innovation in education seemed in this period still very broad, authors such as Kirk (1986) focused specifically on teachers within innovation in education. He considered teachers' autonomy, participation, collective work and involvement to be very important for innovation to take place and saw teachers as key actors of innovation in education (Kirk 1986, 211).



### 2.3.7 *In the 1990s*

In this decade, the use of computers in classrooms was more present and there was a tendency to understand educational innovation as computers in classrooms (Bormann et al. 2011). With the rise of new technologies and the use of the Internet, some platforms were created to exchange educational innovations between different governments (e.g. European Schoolnet in 1997). In this decade the understanding of innovation focused strongly on the use of information and communication technologies (ICT) in education (Durando 2017, 10). In addition, some studies looked deeper into the cultural impact of the use of ICT on learning. One of the conclusions was that for innovation in education new classroom dynamics and new ways of teaching were more relevant to learning than the increase of computers (Kleifgen 1990). Therefore, some authors see a risk of associating new technologies with innovation in education (Miller and Olson 1994, 121).

### 2.3.8 *In the 2000s*

In this decade, scholars like Pol and Ville (2009) and Mulgan et al. (2007b) identified different fields of social innovation, one of them being education. These authors provided several examples of innovation in education and defined them as social innovations: ‘Examples of innovations that fit nicely with this definition abound: innovations conducive to better education, better environmental quality and longer life expectancy [...]’ (Pol and Ville 2009, 15). In this sense, Pol and Ville (2009, 26) emphasised the need to distinguish between business innovation and social innovation when it comes to innovation in education, while authors like Mulgan et al. (2007b) investigated case studies on education.

In these years, Watson (2006) set out to better study the relation between technology and education in the context of change and innovation. She elaborated several aspects that are important for the understanding of innovation in education. First, the importance of technology in education is closely related to globalisation and the shift of society towards the information society (Watson 2006, 204). Second, the way technology in education was discussed was not stable throughout these years, there was a radical shift in the educational discourse from focusing on the technology used to the learning process (Watson 2006, 199). Third, there seems to be a gap between how changes actually occur in schools and the underlying theory of such changes (Watson 2006, 212). Watson claimed the need to close this gap and that paying more attention to theories of innovation and change could help to better understand the field. She also highlighted the need for a new epistemology of change and innovation in education and of the technological context in schools. Finally, teachers are often perceived as resistant to change, which relates not only to education but also to technology, and such resistance may prevent innovation (Watson 2006, 212). Watson concludes that change concerning society, technology and education interact with each other, so this complexity needs to be taken into account from a theoretical point of view (Watson 2006, 214). In sum, technology is only one part of the change in schools. It is certainly related to social adaptations, organisational change and a parallel process that occurs ‘both inside and outside schools’ (Watson 2006, 211).

Also in this decade, research in Latin America aimed to better understand the links between social movements in education and innovation (Ghanem 2013; Gohn 2011), as well as social innovation in political education (Martin 2010). In this period there was a debate among academics about the difference between crises and change. Some authors spoke of the emergence of crises before relevant change in education can occur

(Fernandez 2006). Research in this region also showed that innovations in education emerged at the margins of the formal system (Fernández 2006, 198; Maldonado-Mariscal 2017).

### 2.3.9 *In the 2010s*

Since 2010, one of the problems pointed out by some scholars is the lack of definition of educational innovation, whereby some of these authors have moved back to Schumpeter's definition (Bormann, John, and Rückert-John 2011). The gap of a definition of innovation in education has been a relevant topic for research. In this regard, international institutions such as the OECD, while previously focusing on innovation in business and technology, showed an evolution in the understanding of innovation in education. The institutional discourse suggests recognising the importance of human capital through education and skills, as well as the importance of reforms in education and teachers training to adapt to current needs (OECD 2010, 11). For example, OECD in a publication of 2010 suggested that new pedagogies or new adaptations of curricula should be offered and that educational institutions should be a crucial part of the innovation system (OECD 2010, 11).

According to Cerna (2014), innovation can be observed not only in educational institutions but also in any other public organisation. Cerna (2014) recognised that 'public organisations are [...] under pressure to improve efficiency, minimise costs' (Cerna 2014, 7). However, innovation in education is quite challenging and rarely pursues a change in the system due to a 'preference for status quo' (OECD 2010, as cited in Cerna 2014, 8). The education sector as a public sector is quite special in terms of innovation due to the high resistance of different actors to reforms (such as teachers, unions, political cycles, elections) (OECD 2010; Cerna 2014, 11). Cerna summarized that 'innovation is often not a systemic feature of education' (Cerna 2014, 11). There is nevertheless innovation happening in education and there is potential to model education in this century in order 'to respond to societal needs' (Cerna 2014, 7). Examples of changes needed in education to respond to societal needs are suitable governance structures (Cerna 2014, 11), a better understanding of the complexity in terms of innovation, adapting teaching, learning and organisational practices, meaning with this to foster 'skills for innovation' (Cerna 2014, 11). Moreover, in this decade there are also new tendencies to better understand innovation in education through measurement of innovation in education (OECD 2014).

The 2010s has been a decade in which technological innovation in education has caught the attention of companies. The company HP, for example, introduced technologies for education and talked about social innovation in education, but they understand it as the need to 'transform teaching and learning through innovative uses of technology' (Dykes et al. 2010, 28). Thus, there seems to be a clear focus on educational innovation as technological. At the same time, policy effort has concentrated on the development, measurement and application of new technology-based teaching and learning scenarios (OECD 2014). While according to other scholars, innovation in education should be a collective matter with responsibilities not only for educational institutions but for the whole society (Serdyukov 2017, 28). Therefore, a new approach to innovation in education should include students, teachers, parents, community, society and its environment and cultural values (Serdyukov 2017).

In this decade, authors recognised the need for understanding the impact of technology not only on teaching and learning but on schools in general, including communication with parents, assessment of students and staff, or the integration of newcomers and migrants (Durando 2017, 9–10). Thus, a new debate on 'digital skills' and 'digitalisation'

in education emerged. However, academics argue that innovation in education requires ‘not only to focus on the digital skills of teachers and students, but also on supporting citizens in a digital society, more holistically’ (Durando 2017, 5). There is an unquestionable influence of technology in education. But it is also the starting point of recognising that ICT in education is not equal to innovation in education. This process was made clear in the work of the European Schoolnet (Durando 2017). It is acknowledged that technology plays a ‘critical role [...] in terms of designing and implementing future classroom scenarios and supporting new forms of learning both in and out of school’ (Durando 2017, 4). However, there is also a crucial widening of the understanding of innovation in education (Durando 2017, 4).

In 2017, other authors recognised that the focus on large scale technological innovations in education may lead to overlooking the small-scale innovations from teachers, students and schools: ‘Many of us educators naively believe grand reforms or powerful technologies will transform our education system’ (Serdyukov 2017, 9). Serdyukov (2017) identified that there is an emphasis on the tools as innovation in education instead of intangible innovations. This emphasis on tools, or better said on technological tools, might give the impression that it is these tools that drive modern learning. Serdyukov (2017) addresses a problem of the use of the term ‘innovation’ in education.

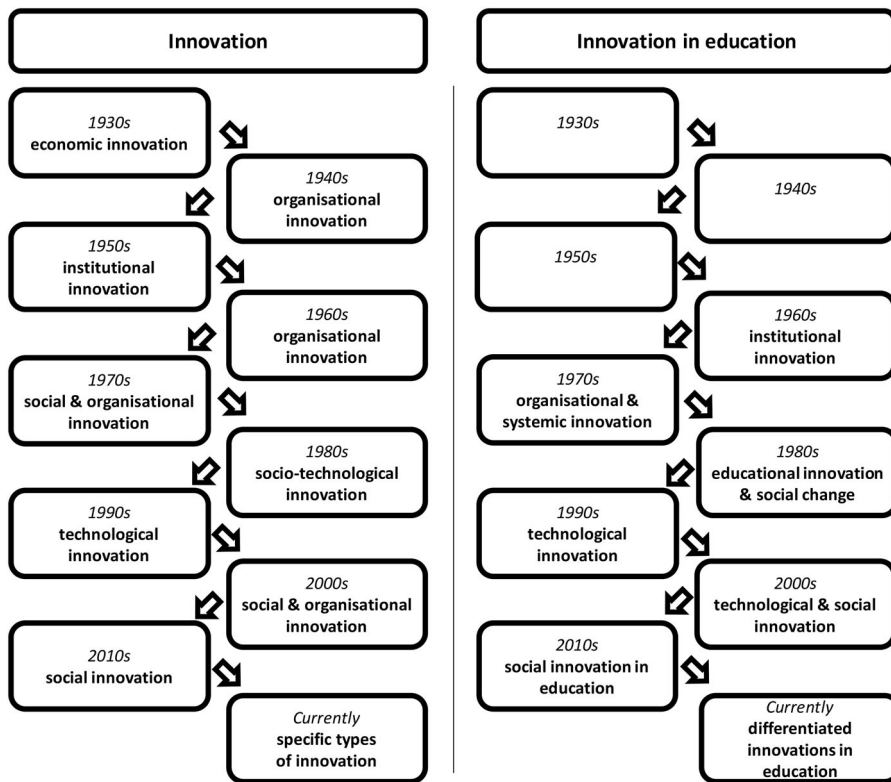


Figure 1. Source: Authors’ illustration. Note: This figure presents a visual overview of innovation and educational innovation in different historical periods and provides key words for the main trends in the decades presented. Although this article provides a broader and more complex picture than could be captured by a simple illustration, we aim here to give a compact overview of the key points. However, for detailed information, we recommend reading the information per decade.

According to him all improvements in education are usually referred to as ‘innovation’, which is not appropriate: ‘The distinction between innovation and improvement is in novelty and originality, as well as in the significance of impact and scale of change’ (Serdyukov 2017, 10). According to Serdyukov (2017), innovation in education can concern two different aspects: (1) technical aspects of education (curriculum, teaching and learning, policy, technology, institutions and administration, institutional culture, and teacher education); and (2) stakeholders (learner, parents, teacher, educational administrators, researchers, and policy maker) (Serdyukov 2017, 8).

Some contemporary definitions of innovation are problematic for education due to their lack of clarity (Crosscombe 2018). Therefore, some researchers try to create clearer definitions and refer to innovation in education as new solutions in education (Halasz 2018, 560). According to Crosscombe (2018), there are two different elements of innovation in education: new methods for classrooms and a change of paradigm for changing old systems: ‘[E]ducational innovation has two main components: a novel new product for classrooms, and a belief by adopters that the tool will radically change education’ (Crosscombe 2018, 49). However, due to the pressure of technological markets, big software and technology companies sell the idea to schools and educators that with their technology the classroom experience will be new (Crosscombe 2018, 50). This author sees technologically focused innovation in education, for example new products or services, as a risk that may not give schools the solutions they need, rather they need better pedagogical solutions more broadly (Crosscombe 2018, 51).

### 2.3.10 *Currently*

Social innovation in education and its properties has a clear gap of theories and concepts and need to be better defined. There are attempts to better differentiate the concepts of innovation, reforms, and social movements (Maldonado-Mariscal 2020). More recent research suggest social innovation in education as ‘new social practices (Howaldt and Schwarz 2010), new practices in education (Schröder and Krüger 2019), new forms of collaboration (Maldonado-Mariscal 2017), the creation of new institutions, the creation of new networks of actors or alliances of different actors (Kesselring and Leitner 2008, 18; Neumeier 2012, 54) that change not only educational institutions but also the role of actors in the education system and in society (Maldonado-Mariscal 2020)’ (Maldonado-Mariscal and Schröder 2023, 5).

We noted that the field of innovation in education seems to evolve more slowly than social innovation and innovation in general. On the one hand, we observed global mapping of social innovations in education suggesting that there are different types of innovation in education and actors involved, of which universities show a low engagement in the implementation of social innovations in education (Schröder and Krüger 2019). On the other hand, there is research that seeks to differentiate between different levels of innovation in education, such as macro, meso and micro, which refers to a systemic perspective with a national legislative framework, but also educational models and community-based innovations in education (Schröder 2021). This education-specific research can, however, be applied to the field of social innovation.

Currently, higher education institutions are more aware of the active role of universities as agents of change, to provide infrastructure and spaces for innovation (Behrend et al. 2022), and therefore curricula on innovation and social innovation are now being included in such institutions (Caro-Gonzalez and Anabo 2020).

### 3. Conclusions and outlook

The innovation paradigm has significantly changed over the last eighty years. The main changes lie in the understanding of innovation at different stages of this period. The decades between the 1940s and the 1980s represented strong pillars for the creation of today's understanding of innovation. One can observe evolution patterns from technological and business innovations (Schumpeter) to organisational innovation (Lewis and Mohr) and from the 1980s onwards a stronger voice for social innovation (Taylor and Zapf) and the creation of differentiated types of innovation and specific fields.

Some of the main approaches we observed show that innovation was originally perceived as new inventions (Ogburn 1922). This perception continued for many years. In the 1930s there was an intention to differentiate technical inventions from social inventions (Gilfillan 1935), but also a new perception on innovation in markets and economic innovation emerged with Schumpeter in 1939. This perception continued for many years and has influenced the understanding of innovation for many decades, since in 1940 the main focus was on understanding innovation in organisations, i.e. innovation within firms or other organisations (Lewin 1947) and continued with Mohr (1969) decades later. At this time, it became increasingly important to differentiate the concepts of innovation and invention, and in the 1970s the diffusion of innovation was explored. From the 1980s onwards, the paradigm shifted from a focus on technological innovation to a focus on combining the technological and social dimensions of innovation. Scholars spoke of a post-Schumpeterian era from 2000 onwards, time where social innovation gains importance. Today, there is a call for a more critical view of innovation and the need to differentiate innovation in society from other related concepts, such as social movements or social change.

The evolution of the innovation paradigm in the last eighty years seems to be closely aligned with society. Thus, the patterns that define the paradigm have their counterpart in societal processes more generally. For example, the rise of the economy and of technology in society can be seen in the evolution of innovation towards an economic and technological understanding respectively. Also, the innovation paradigm evolved in parallel with the evolution from industrial to service societies. The same can be observed with the rise of social innovation.

Comparing the evolution of the general innovation paradigm, social innovation and innovation in education, we observe that social innovation was born from the general innovation paradigm once this paradigm became more focused on social dimensions and created a new field. Therefore, social innovation shared its origin with the general innovation paradigm as part of a natural evolution.

Similarly, innovation in education reflects strong similarities with the general innovation paradigm, namely by patterns of evolution from efficiency or organisational educational improvement to systemic innovation (by Miles, Smith, Fullan and Rogers). In contrast to the general innovation paradigm, innovation in education in the 1970s made a major contribution by identifying types of change in education and types of innovation and from the 1980s onwards by introducing innovation in education as social change (Papagianis), but fewer studies followed these contributions and documented experimentation and innovation in education done after 1980s.

From the 1990s onwards, we observe two divergent evolutionary trends in innovation in education. On the one hand, innovation in education clearly regressed in the 1990s, returning to a technological understanding of innovation in education with the introduction of ICT (Miller and Olson 1994). On the other hand, in this same decade, there is greater scientific

recognition to differentiate between technological innovation in education and (systemic) innovation in education, as a result of a clear gap in definitions and theories.

The paradigm of innovation in education reflects many of the general paradigms of innovation in the period under review. Some of the main approaches we observed show that educational innovation has been left behind to take technological innovations further. In contrast to the general paradigm of innovation, in educational research, innovation was not much researched between the 1940s and 1950s. While innovation research in the 1960s focused on innovation in organisations, innovation in education researchers argued that a systemic perspective on innovation in education was needed, a perspective that did not focus only on schools but on both educational and social systems. Research on innovation in organisations also influenced the study of innovation in educational organisations, especially in the 1970s with Rogers' work on innovation diffusion and system transformations. The 1970s was a decade in which much research on innovation in education emerged and experimentation in education was supported in many countries. This research aimed to change the paradigm of innovation in education, to understand innovation in education by including all actors in society and not only actors in schools. While the general innovation paradigm in the 1980s research was directed towards a more social understanding of innovation, in education there was a stronger focus on the study of alternative forms of education. In the 1990s there was a strong influence of information and communication technologies on education and the understanding of innovation in education. It is from the year 2000 onwards that research on innovation and on innovation in education became more aligned in the quest to distinguish between types of innovation. Although the definition of innovation in education has come a long way, current research insists on the need to include different actors to understand innovation in education as a key issue.

We observe different stages of innovation evolution in which social innovation follows the general innovation paradigm and later created a field of its own, while innovation in education had a strong field of experimentation but lacks definitions and theories of innovation in education based on its experience. Currently, the search for tools to improve innovation culture in society and education may suggest design thinking as a tool to reduce tensions between different or opposing ways of thinking (Prud'homme van Reine 2017). At the same time, more and more universities are choosing to offer design thinking courses. However, more evidence-based research in this direction needs to be developed to see concrete benefits.

We encourage further studies on innovation with specific fields such as education or sustainability, to create more evidence of valid paradigms for each community and to compare the historical evolution of innovation understandings, definitions and analytical tools to better understand innovation today. Especially, some of the key questions for researchers to better understand innovation are: Why do people innovate? What are the incentives to innovate in specific time periods and regional contexts? What are the drivers of innovation? and What are the obstacles to innovation?

### **Acknowledgments**

We presented an earlier version of this paper at the IV ISA Forum of Sociology 2021 and we welcome feedback from the commentators. We also thank two anonymous reviewers for their relevant comments to improve this manuscript.

### Disclosure statement

No potential conflict of interest was reported by the author(s).

### Notes on contributors

**Karina Maldonado-Mariscal** is a senior researcher at the TU Dortmund University, Social Research Centre. She holds a PhD in Sociology from the Humboldt University Berlin and was postdoctoral researcher at the ETH Zurich, where she led projects on social innovations in education and on vocational education. She led research projects for sustainable development at a Mexican Ministry and co-founded a governmental start-up initiative in Mexico “Reto Zapopan”. She works on several projects funded by the European Union and is a member of the European School of Social Innovation and co-chair of the Europe and Latin America Section at LASA. Her past research projects were about social innovation in education in Brazil and Mexico, innovation policy in Mexico, social inequality in Germany, vocational education and training, and innovation in science, through science shops and research transfer between university, government and civil society.

**Iwan Alijew** is a PhD student at the University of St.Gallen, Switzerland. He received a bachelor’s degree in business from the University of St.Gallen, a bachelor’s degree in philosophy from the University of Zurich and a master’s degree in philosophy from the University of St Andrews. He is interested in moral and political philosophy, business studies and business ethics.

### ORCID

Karina Maldonado-Mariscal  <http://orcid.org/0000-0002-4670-1182>

### References

- Bambach, J. D. 1979. “Australia in the 1970s: A Fertile Context for Educational Experimentation and Innovation.” *Australian Journal of Teacher Education* 4 (1): 22–29. doi:10.14221/ajte.1979v4n1.3.
- Behrend, C., K. Maldonado-Mariscal and A. Schröder. 2022. “Bridging Social Innovation in Education and Organisational Learning.” *European Public & Social Innovation Review* 7 (1): 17–29.
- Bormann, I., R. John, and J. Rückert-John. 2011. *Innovationskraft Lokalen Nachhaltigkeitsengagements in Bildung, Kultur und Wirtschaft*. Berlin: ISInova.
- Braun-Thürmann, H. 2005. *Innovation*. Bielefeld: transcript.
- Cajaiba-Santana, G. 2014. “Social Innovation: Moving the Field Forward. A Conceptual Framework.” *Technological Forecasting and Social Change* 82: 42–51. doi:10.1016/j.techfore.2013.05.008.
- Caro-Gonzalez, A., and I. F. Anabo. 2020. “Beyond Teaching and Research: Stakeholder Perspectives on the Evolving Roles of Higher Education.” *Economic and Social Changes: Facts, Trends, Forecast / Экономические и социальные перемены: факты, тенденции, прогноз* 13 (6): 252–266. doi:10.15838/esc.2020.6.72.15.
- Cerna, L. 2014. *The Governance of Innovation in Education*. Paris: OECD Publishing.
- Ciasullo, M. V., O. Troisi, M. Grimaldi, and D. Leone. 2020. “Multi-level Governance for Sustainable Innovation in Smart Communities: An Ecosystems Approach.” *International Entrepreneurship and Management Journal* 16: 1167–1195. doi:10.1007/s11365-020-00641-6.
- Crosscombe, N. 2018. “Innovation.” *Brock Education Journal* 27 (2): 48–52. doi:10.26522/brocked.v27i2.576.
- Dosi, G. 1982. “Technological Paradigms and Technological Trajectories.” *Research Policy* 11 (3): 147–162. doi:10.1016/0048-7333(82)90016-6.
- Downs, G. W., and L. B. Mohr. 1979. “Toward a Theory of Innovation.” *Administration & Society* 10 (4): 379–408. doi:10.1177/009539977901000401.
- Durando, M. 2017. *Driving Innovation in Education. How far we Have Come and Where we are Going*. Brussels: European Schoolnet.

- Dykes, G., J. Groff, H. Renfrew-Knight, and D. Sutch. 2010. *Driving Social Innovation in Education*. Palo Alto: Hewlett-Packard.
- Dziurski, P. 2021. *Critical Perspectives on Innovation Management: The Bright and Dark Sides of Innovative Firms*. 1st ed. New York: Routledge. doi:10.4324/9781003203841
- Edler, J., and J. Fagerberg. 2017. "Innovation Policy: What, why, and how." *Oxford Review of Economic Policy* 33 (1): 2–23. doi:10.1093/oxrep/grx001.
- Fernández, L. M. 2006. "Crisis y Dramática del Cambio. Avances de Investigación Sobre Proyectos de Innovación Educativa." In *Pensando las Instituciones. Sobre Teorías y Prácticas en Educación*, edited by I. Butelman, 183–240. Buenos Aires: Paidós.
- Filatotchev, L., R. Aguilera, and M. Wright. 2020. "From Governance of Innovation to Innovations in Governance." *Academy of Management Perspectives* 34 (2): 173–181. doi:10.5465/amp.2017.0011.
- Fontan, J. M., J. L. Klein, and D. G. Tremblay. 2008. "Social Innovation at the Territorial Level: From Path Dependency to Path Building." In *The Challenge of Social Innovation in Urban Revitalization*, edited by P. Drewe, J. L. Klein, and E. Hulsbergen, 17–28. Amsterdam: Techne Press.
- Franz, H.-W., J. Hochgerner, and J. Howaldt. 2012. *Challenge Social Innovation*. Heidelberg: Springer.
- Fujisawa, Y., Y. Ishida, S. Nagatomi, and K. Iwasaki. 2015. "A Study of Social Innovation Concepts: A Japanese Perspective." *Japan Social Innovation Journal* 5 (1): 1–13. doi:10.12668/jsij.5.1.
- Fullan, M. 1972. "Overview of the Innovative Process and the User." *Interchange* 3: 1–46. doi:10.1007/BF02137634.
- Galego, D., F. Moulart, M. Brans, and G. Santinha. 2021. "Social Innovation & Governance: A Scoping Review." *Innovation: The European Journal of Social Science Research* 35 (2): 265–290. doi:10.1080/13511610.2021.1879630.
- Ghanem, E. G. 2013. "Inovação em Escolas Públicas de Nível Básico: O Caso Redes da Maré (Rio de Janeiro, RJ)." *Educação & Sociedade* 34 (123): 425–440. doi:10.1590/S0101-73302013000200006.
- Gilfillan, S. C. 1935. *Inventing the Ship: A Study of the Inventions Made in Her History Between Floating Log and Rotorship*. Chicago: Follet.
- Godin, B. 2012. Social Innovation: Utopias of Innovation from c.1830 to the Present (Working Paper No. 11). Project on the Intellectual History of Innovation.
- Godin, B., and D. Vinck. 2017. *Critical Studies of Innovation Alternative Approaches to the Pro-Innovation Bias*. Cheltenham: Edward Elgar Publishing.
- Gohn, M. G. 2011. "Movimentos Sociais na Contemporaneidade." *Revista Brasileira de Educação* 16 (47): 333–361. doi:10.1590/S1413-24782011000200005.
- Green, K., and P. Vergragt. 2002. "Towards Sustainable Households: A Methodology for Developing Sustainable Technological and Social Innovations." *Futures* 34 (5): 381–400. doi:10.1016/S0016-3287(01)00066-0.
- Halász, G. 2018. "Measuring Innovation in Education: The Outcomes of a National Education Sector Innovation Survey." *European Journal of Education* 53 (4): 557–573. doi:10.1111/ejed.12299.
- Havelock, R. G. 1973. *The Change Agent's Guide to Innovation in Education*. Englewood Cliffs, NJ: Educational Technology Publications.
- Haxeltine, A., F. Avelino, J. M. Wittmayer, I. Kunze, N. Longhurst, A. Dumitru, and T. O'Riordan. 2017. "Conceptualising the Role of Social Innovation in Sustainability Transformations." In *Social Innovation and Sustainable Consumption: Research and Action for Societal Transformation*, edited by J. Backhaus, A. Genus, S. Lorek, E. Vadovics, and J. M. Wittmayer, 12–25. Abingdon.
- Howaldt, J., A. Butzin, D. Domanski, and C. Kaletka. 2014. *Theoretical Approaches to Social Innovation - A Critical Literature Review. A Deliverable of the Project: "social Innovation: Driving Force of Social. Change": SI-DRIVE*.
- Howaldt, J., and H. Jacobsen. 2010. *Soziale Innovation. Auf dem Weg zu Einem Postindustriellen Innovationsparadigma*. Wiesbaden: VS Verlag für Sozialwissenschaften.
- Howaldt, J., C. Kaletka, A. Schröder, D. Rehfeld, and J. Terstriep. 2016. *Comparative Analysis (Mapping 1). Mapping the World of Social Innovation: A Global Comparative Analysis*



- across Sectors and World Regions. A deliverable of the project: "Social Innovation: Driving Force of Social Change" (SI-DRIVE).
- Howaldt, J., R. Kopp, and M. Schwarz. 2013. *Social Innovations as Drivers of Social Change. Tarde's Disregarded Contribution to Social Innovation Theory Building. The Next Edge of Social Innovation Research*. Social Frontiers Research.
- Howaldt, J., and M. Schwarz. 2010. *Soziale Innovation' im Fokus: Skizze Eines Gesellschaftstheoretisch Inspirierten Forschungskonzepts*. Bielefeld: transcript Verlag.
- Huberman, A. M. 1973. *Understanding Change in Education: An Introduction*. Paris: International Bureau of Education.
- Hussain, S. T., S. Lei, T. Akram, M. J. Haider, S. H. Hussain, and M. Ali. 2018. "Kurt Lewin's Change Model: A Critical Review of the Role of Leadership and Employee Involvement in Organizational Change." *Journal of Innovation & Knowledge* 3 (3): 123–127. doi:10.1016/j.jik.2016.07.002.
- Kesselring, A., and M. Leitner. 2008. *Soziale Innovationen in Unternehmen*. ZSI-Zentrum für Soziale Innovationen. [https://www.zsi.at/object/publication/1444/attach/3Soziale\\_Innovation\\_in\\_Unternehmen\\_ENDBERICHT.pdf](https://www.zsi.at/object/publication/1444/attach/3Soziale_Innovation_in_Unternehmen_ENDBERICHT.pdf).
- Kirk, D. 1986. *Researching the teacher's world: A case study of teacher-initiated innovation* (Unpublished doctoral dissertation). Loughborough University. <https://dspace.lboro.ac.uk/dspace-jspui/handle/2134/7490>.
- Kleifgen, J. 1990. "Review of Bowers, C.A (1988) *The Cultural Dimensions of Educational Computing*. New York: Teachers College Press, 1988. Pp. x + 152." *Language in Society* 19 (2): 280–287. doi:10.1017/S0047404500014457.
- Kohlgrüber, M., A. Schröder, F. Bayon Yusta, and A. Arteaga Ayarza. 2019. "A new Innovation Paradigm: Combining Technological and Social Innovation." *Matériaux & Techniques* 107 (1): 1–17. doi:10.1051/mattech/2018065.
- Krlev, G., E. Bund, and G. Mildnerberger. 2014. "Measuring What Matters—Indicators of Social Innovativeness on the National Level." *Information Systems Management* 31 (3): 200–224. doi:10.1080/10580530.2014.923265.
- Kuhn, T. S. (1962) [1970]. *The Structure of Scientific Revolutions*. Chicago: University of Chicago Press.
- Lewin, K. 1947. "Frontiers in Group Dynamics." *Human Relations* 1 (1): 5–41. doi:10.1177/001872674700100103.
- Martin, J. C. 2010. "Las Innovaciones de la Educacion Popular en el Mundo Jerarquico de las Politicas Publicas." In *Innovacion Social en Educacion: Una Base Para la Elaboracion de Politicas Publicas*, edited by B. Barba, and M. Zorrilla, 46–76. Cerro del Agua: Siglo XXI Editores.
- Maldonado-Mariscal, M. K. 2017. *Subsystems of Social Innovation in Brazil: The Society of So Paulo as a New Actor in the Education System and Innovation*. Dissertation for Doctoral Degree of Philosophy. Faculty of Culture, Social Sciences and Education, Humboldt University of Berlin. doi:10.18452/18568
- Maldonado-Mariscal, K. 2020. "Social Change in Brazil through Innovations and Social Movements." *J. Dev. Soc.* 36 (4): 415–438. doi:10.1177/0169796X20963332
- Maldonado-Mariscal, K., and A. Schröder. 2023. *Encyclopedia of Social Innovation*. Cheltenham, UK: Edward Elgar Publishing.
- Merton, R. 1938. "Social Structure and Anomie." *American Sociological Review* 3 (5): 672–682. doi:10.2307/2084686.
- Merton, R. K. 1957. *Social Theory and Social Structure*. Rev. ed. New York: Free Press.
- Miles, M. B. 1964. *Innovation in Education*. New York: Teachers College Press.
- Miller, L., and J. Olson. 1994. "Putting the Computer in its Place: A Study of Teaching with Technology." *Journal of Curriculum Studies* 26 (2): 121–141. doi:10.1080/0022027940260201.
- Mohr, L. B. 1969. "Determinants of Innovation in Organizations." *American Political Science Review* 63 (1): 111–126. doi:10.2307/1954288.
- Moulaert, F., and D. MacCallum. 2019. *Advanced Introduction to Social Innovation*. Cheltenham: Elgar.
- Moulaert, F., F. Martinelli, E. Swyngedouw, and S. Gonzalez. 2005. "Towards Alternative Model(s) of Local Innovation." *Urban Studies* 42 (11): 1969–1990. doi:10.1080/00420980500279893.
- Mulgan, G. 2006. "The Process of Social Innovation." *Innovations: Technology, Governance, Globalization* 1 (2): 145–162. doi:10.1162/itgg.2006.1.2.145.

- Mulgan, G. 2012. "The Theoretical Foundations of Social Innovation." In *Social Innovation*, edited by A. Nicholls, and A. Murdock, 33–65. London: Palgrave Macmillan.
- Mulgan, G., S. Tucker, R. Ali, and B. Sanders. 2007a. "Social Innovation: What It Is, Why It Matters and How It Can Be Accelerated." Skoll Centre for Social Entrepreneurship Working Paper.
- Mulgan, G., S. Tucker, R. Ali, and B. Sanders. 2007b. *In and out of Sync – The Challenge of Growing Social Innovations*. London: National Endowment for Science, Technology and the Arts (NESTA). [https://www.nesta.org.uk/documents/267/in\\_and\\_out\\_of\\_sync.pdf](https://www.nesta.org.uk/documents/267/in_and_out_of_sync.pdf).
- Mumford, M. D. 2002. "Social Innovation: Ten Cases from Benjamin Franklin." *Creativity Research Journal* 14 (2): 253–266. doi:10.1207/S15326934CRJ1402\_11.
- Neumeier, S. 2012. "Why do Social Innovations in Rural Development Matter and Should They be Considered More Seriously in Rural Development Research? – Proposal for a Stronger Focus on Social Innovations in Rural Development Research." *Sociologia Ruralis* 52 (1): 48–69. doi:10.1111/j.1467-9523.2011.00553.x.
- Nilsson, W. O. 2003. *Social Innovation: An Exploraiton of the Literature*. Montreal: McGill University.
- Nisbet, R. I., and J. M. Collins. 1978. "Barriers and Resistance to Innovation." *Australian Journal of Teacher Education* 3 (1): 2–29. doi:10.14221/ajte.1978v3n1.1.
- O'Neil, C. 1971. "Educational Innovation and Politics in São Paulo: 1933–34." *Luso-Brazilian Review* 8 (1): 56–68.
- OECD. 2010. *The OECD Innovation Strategy: Getting a Head Start on Tomorrow*. Paris: OECD Publishing. doi:10.1787/9789264083479-en
- OECD. 2014. *Measuring Innovation in Education: A New Perspective, Educational Research and Innovation*. Paris: OECD Publishing. doi:10.1787/9789264215696-en
- OECD/Eurostat. 1992. *Oslo Manual 1992: Guidelines for Collecting, Reporting and Using Data on Innovation. The Measurement of Scientific, Technological and Innovation Activities*. Paris: OECD Publishing.
- OECD/Eurostat. 1997. *Oslo Manual 1997: Guidelines for Collecting, Reporting and Using Data on Innovation. The Measurement of Scientific, Technological and Innovation Activities*. 2nd ed. Paris: OECD Publishing.
- OECD/Eurostat. 2005. *Oslo Manual 2005: Guidelines for Collecting, Reporting and Using Data on Innovation. The Measurement of Scientific, Technological and Innovation Activities*. 3rd ed. Paris: OECD Publishing.
- OECD/Eurostat. 2018. *Oslo Manual 2018: Guidelines for Collecting, Reporting and Using Data on Innovation. The Measurement of Scientific, Technological and Innovation Activities*. 4th ed. Paris: OECD Publishing. doi:10.1787/9789264304604-en
- Ogburn, W. F. 1922. *Social Change with Respect to Culture and Original Nature*. New York: B. W. Huebsch.
- Ogburn, W. F. 1937. *Technological Trends and National Policy: Including the Social Implications of New Inventions*. Washington: US Government Printing Office.
- Papagiannis, G., S. Kless, and R. Bickel. 1982. "Toward a Political Economy of Educational Innovation." *Review of Educational Research* 52 (2): 245–290. doi:10.3102/00346543052002245.
- Pel, B., A. Haxeltine, F. Avelino, A. Dumitru, R. Kemp, T. Bauler, I. Kunze, J. Dorland, J. Wittmayer, and M. Søgaard Jørgensen. 2020. "Towards a Theory of Transformative Social Innovation: A Relational Framework and 12 Propositions." *Research Policy* 49 (8): 1–13. doi:10.1016/j.respol.2020.104080.
- Pel, B., and R. Kemp. 2020. "Between Innovation and Restoration; Towards a Critical-Historicizing Understanding of Social Innovation Niches." *Technology Analysis & Strategic Management* 32 (10): 1182–1194. doi:10.1080/09537325.2020.1750588.
- Phillips, F. 2011. "The State of Technological and Social Change: Impressions." *Technological Forecasting and Social Change* 78 (6): 1072–1078. doi:10.1016/j.techfore.2011.03.020.
- Pol, E., and S. Ville. 2009. "Social Innovation: Buzz Word or Enduring Term?" *The Journal of Socio-Economics* 38 (6): 878–885. doi:10.1016/j.socec.2009.02.011.
- Prud'homme van Reine, P. 2017. "The Culture of Design Thinking for Innovation." *Journal of Innovation Management* 5 (2): 56–80. doi:10.24840/2183-0606\_005.002\_0006.
- Rammert, W. 1997. "Auf dem Wege zu Einer Post-Schumpeterianischen Innovationsweise: Institutionelle Differenzierung, Reflexive Modernisierung und Interaktive Vernetzung im

- Bereich der Technikentwicklung." In *Technikentwicklung und Industriearbeit*, edited by D. Bieber, 45–71. Frankfurt: Campus.
- Rammert, W. 2000. *Technik aus Soziologischer Perspektive 2*. Opladen: Westdeutscher Verlag.
- Rammert, W. 2010. "Die Innovationen der Gesellschaft." In *Soziale Innovation: Auf dem Weg zu Einem Postindustriellen Innovationsparadigma*, edited by J. Howaldt, and H. Jacobsen, 21–51. Wiesbaden: VS Verlag für Sozialwissenschaften.
- Rey de Marulanda, N., and F. Tancredi. 2010. From social innovation to public policy. Success stories in Latin America and the Caribbean. Comisión Económica para América Latina y el Caribe (CEPAL). URL:<http://hdl.handle.net/11362/3795>.
- Rodríguez Herrera, A., and H. Alvarado. 2008. Claves de la innovación social en América Latina y el Caribe. Comisión Económica para América Latina y el Caribe (CEPAL). <http://hdl.handle.net/11362/2536>.
- Rogers, E. M. 1971. *Diffusion of Innovations*. 3rd. ed. City: Free Press.
- Schröder, A., and D. Krüger. 2019. "Social Innovation as a Driver for New Educational Practices: Modernising, Repairing and Transforming the Education System." *Sustainability* 11 (4): 1–25. doi:10.3390/su11041070.
- Schröder, A. 2021. "Social Innovation in Education and Social Service Organizations. Challenges, Actors, and Approaches to Foster Social Innovation." *Frontiers in Education* 5: 1–8. doi:10.3389/educ.2020.555624.
- Schubert, C. 2018. "Social Innovation." In *Innovation Society Today*, edited by W. Rammert, A. Windeler, H. Knoblauch, and M. Hutter, 371–391. Wiesbaden: Springer.
- Schumpeter, J. A. 1939. *Business Cycles. A Theoretical, Historical and Statistical Analysis of the Capitalist Process*. New York: McGraw-Hill.
- Schumpeter, J. A. 1943. *Capitalism, Socialism and Democracy*. New York: Harper and Brothers.
- Schweitzer, F., C. Rau, O. Gassmann, and E. A. van den Hende. 2015. "Technologically Reflective Individuals as Enablers of Social Innovation\*." *Journal of Product Innovation Management* 32: 847–860. doi:10.1111/jpim.12269.
- Serdjukov, P. 2017. "Innovation in Education: What Works, What Doesn't, and What to do About it?" *Journal of Research in Innovative Teaching & Learning* 10 (1): 4–33. doi:10.1108/JRIT-10-2016-0007.
- Sidorkin, A. M., and M. K. Warford. 2017. *Reforms and Innovation in Education: Implications for the Quality of Human Capital*. Cham: Springer.
- Silberman, C. 1970. *Crisis in the Classroom*. New York: Random House.
- Smith, L. M. 1971. *Dilemmas in Educational Innovation: A Problem for Anthropology as Clinical Method*. New York: American Educational Research Association Annual Meeting.
- Strambach, S., and G. Pflictsch. 2020. "Transition Topology: Capturing Institutional Dynamics in Regional Development Paths to Sustainability." *Research Policy* 49: 1–14. doi:10.1016/j.respol.2020.104006.
- Taylor, J. B. 1970. "Introducing Social Innovation." *The Journal of Applied Behavioral Science* 6 (1): 69–77. doi:10.1177/002188637000600104.
- Terstriep, J., and L.-F. Wloka. 2020. Messung sozialer Innovationen: Ein Blick auf die organisationale Innovativität (Forschung Aktuell, No. 06/2020). Institut Arbeit und Technik (IAT). <https://www.iat.eu/forschung-aktuell/2020/fa2020-06.pdf>.
- Watson, D. 2006. "Understanding the Relationship Between ICT and Education Means Exploring Innovation and Change." *Education and Information Technologies* 11: 199–216. doi:10.1007/s10639-006-9016-2.
- Whiteside. 1978. *The Sociology of Educational Innovation*. London: Methuen.
- Windeler, A. 2018. "Reflexive Innovation." In *Innovation Society Today*, edited by W. Rammert, A. Windeler, H. Knoblauch, and M. Hutter, 65–105. Wiesbaden: Springer.
- Wittmayer, J. M., T. de Geus, B. Pel, S. Avelino Hielscher, T. Hoppe, S. Mühlemeier, A. Stasik, et al. 2020. "Beyond Instrumentalism: Broadening the Understanding of Social Innovation in Socio-Technical Energy Systems." *Energy Research & Social Science* 70: 1–10. doi:10.1016/j.erss.2020.101689.
- Zapf, W. 1969. *Theorien des Sozialen Wandels*. Köln: Kiepenheuer & Witsch.
- Zapf, W. 1989. "Über Soziale Innovationen." *Soziale Welt* 40 (1/2): 170–183. <https://www.jstor.org/stable/40878048>.
- Zapf, W. 1991. *Die Modernisierung Moderner Gesellschaften: Verhandlungen des 25. Deutschen Soziologentages in Frankfurt am Main*. Frankfurt: Campus.