

# Edith Stein and the Problem of Empathy: Insights for Responsible Innovation

Gabriel J. Costello

Galway-Mayo Institute of Technology, Galway Ireland

[gabrielj.costello@gmit.ie](mailto:gabrielj.costello@gmit.ie)

## Abstract.

This paper argues that the concept of empathy can provide a rich philosophical source for the nascent area of Responsible Innovation (RI). The lens through which this study looks at RI is that of phenomenology. The research question addressed is: What are the implications of Edith Stein's phenomenology of empathy for Responsible Innovation? The paper makes two contributions. It adds a new voice, that of the philosopher Edith Stein, to the debate on innovation and in particular the emerging area of RI. Second it proposes a synthesis of the innovation and empathy literature to facilitate dialogue between philosophers and both management academics and practitioners. One of the main arguments of the paper is that the concept of empathy can inform the quest to understand and explain what is meant by von Schomberg's definition of RI as a process of *mutual responsivity* of actors.

## Introduction

The role and importance of philosophy continues to be a matter of lively debate within the management disciplines (Davison and Martinsons 2011, Dobson and Love 2004, Baskerville and Myers 2004, Butler 1998). For example, the literature contains discussions on combining research methods (Lee 1989) that are traditionally associated with opposing philosophical positions or "world-views" (Mangan et al. 2004). Furthermore opinions have been presented in leading management journals that call for researchers to have a firm philosophical basis to justify their research strategies. It is now over ten years since Weber (2003) argued that there is a pressing need to improve theory-building skills and in doing so researchers must "reflect deeply on and understand the ontological and epistemological assumptions" and be true to their philosophical position. Therefore I argue, following Weber (2003), that the future of innovation research requires a firm philosophical basis. Blok (2014 p. 1) maintains that the grand challenges of these times warrants "extensive reflection of the impact of innovations" and the need to deliberate on the "different purposes of, and motivation behind, innovations" which is the subject of the nascent area of responsible innovation (RI). The main lens through which this paper looks at innovation is that of phenomenology. The research question addressed is: What are the implications of Edith Stein's phenomenology of empathy for Responsible Innovation? The paper makes two contributions. It adds a new voice, that of the philosopher Edith Stein, to the debate on innovation and in particular the emerging area of Responsible Innovation (RI). It proposes a synthesis of the innovation and empathy literature to facilitate dialogue between philosophers and the management academy. The paper proceeds as follows. First a very short

introduction to the theme of innovation is offered together with a review of literature on responsible innovation. The background to the paper is firmly placed in the area of philosophy known as phenomenology. The subject of empathy is then explored. Following this, an introduction is given to a major philosopher in the phenomenological movement, Edith Stein who, I argue, has much to offer in the current debate on the use the responsible utilisation of technological innovation. Finally conclusions and areas for further exploration are suggested.

## **Background: Innovation a Very Short Introduction**

The general innovation literature is voluminous and eclectic and a comprehensive review is beyond the scope of this study. However, this section will provide a short overview in order to provide a primer on the subject of innovation and to support the main argument of the paper; that the area is ripe for philosophical investigation (Costello et al. 2013). Many scholars trace the introduction of innovation into the realm of economic and social change to Joseph Schumpeter's seminal work (1934) *Theorie de Wirtschaftlichen Entwicklung (Theory of Economic Development)*. Schumpeter's writing spanned a period of forty years from his undergraduate days in the University of Vienna to his term as professor of economics in Harvard (Oakley 1990). According to Marz (1991) he is one of the few social scientists who bequeathed an "intellectual legacy that continues to attract new generations of students teachers, scholars and politicians" (p xv). Innovation together with bank credit, according to Schumpeter, are the economic mechanisms "that define a large part of the history of mankind" (Oakley 1990). In his *Theory of Economic Development* he classified innovation into five categories: new products (or goods), new methods of production (or processes), new sources of supply (or half-manufactured goods), the exploitation of new markets, and new ways to organize business. In Schumpeter's original schema, innovation is accomplished by "entrepreneurs" who developed new combinations of existing resources (Swedberg 1991). However, in his later works, he came to regard the large corporation as the innovative engine driving the development of leading economies (Lazonick 2005). The Harvard Business Review collection of seminal papers on enterprise innovation begins with the theme of creativity (Amabile et al. 2003). Here the authors suggest that time pressure affects creativity differently depending on "whether the environment allows people to focus on their work, conveys a sense of meaningful urgency about the tasks at hand, or stimulates or undermines creativity in other ways" (ibid. p14). Min Basadur endorses the creativity equation,  $C = K \times I \times E$ , developed by Parnes et al. (1977) which argues that creativity requires knowledge, imagination and evaluation. The equation proposes that in order to be creative in a particular situation, such as problem solving, you first of all need the appropriate knowledge (K). Then, you apply your imagination to the knowledge ( $I \times K$ ) in order to develop new combinations which can be classified either as ideas, as options or as points of view. The final process is to apply your judgment in order to evaluate (E) which of these ideas should be discarded and which should be developed further. The relationship between imagination and empathy will be explored in a later section of this paper as it is significant for its central argument: that empathy is important for the study of innovation. In order to manage creativity effectively Leavy (2005) proposes that organizations place people and ideas at the heart of management philosophy where people are given room to grow, try things out and learn from mistakes. Teams have been described as the fundamental learning units in the modern organisation (Pedler et al. 1991) and are being used effectively in areas related to innovation such as product development, process centered organizations and project management (Ulrich and Eppinger 2000, Cooper 2001, Pugh 1991, Otto and Wood 2001). As part of an

empirical research on innovation management the role of empathy and teamwork was explored in a study of a manufacturing plant of a multi-national subsidiary (Costello et al. 2007). Furthermore quality function deployment (QFD) is an established tool to integrate the “voice of the customer” into the design process. In particular the Kano model is used as a front end to QFD and can be used effectively to map customer satisfaction against the degree of function implementation (Ulrich and Eppinger 2012). Specifically on the subject of empathy, it is worth noting that Leonard (1998) proposes emphatic design as the best method to import knowledge from the market place which she defines as:

Empathic design is the creation of product or service concepts based on a deep (empathic) understanding of unarticulated user needs.

Leonard’s work is one of the motivating factors for this paper which investigates the role of empathy in the innovation process. Another important topic presently is the management of interpersonal processes in teams that communicate exclusively using information and communications technologies (ICT) with some research offering a model to match the ICT to the type of interpersonal interaction (Maruping and Agarwal 2004). According to Kumar and van Dissel “interorganizational systems exist to support and implement cooperation and strategic alliances between two or more organizations” (Kumar and van Dissel 1996) p 281. Furthermore for quite some time the dramatic growth of inter-organizational systems (IOS) have altered the way organisations conduct business and relate to each other (Premkumar and Ramamurthy 1995). The ever more important role of academia in supporting innovation in knowledge-based societies has led to the development of a number of models from national systems of innovation (Lundvall 1995) to the more recent Triple-Helix model of university-industry-government relation (Etzkowitz and Leydesdorff 2000). With regard to the level of societal influences on innovation, Florida’s 3-T model of technology, tolerance and talent argues that the rise of the “creative class” is a key factor in the new economy (Kakko and Inkinen 2004). Recently, Chesbrough (2003) argues that in many industries the centralized approach to R&D which he terms “closed innovation” has become obsolete. This paradigm, he contends, must be replaced by “open innovation” which adopts external ideas and knowledge in conjunction with the internal process. A number of factors are influencing this change such as: the mobility of skilled people; the increasing presence of venture capital, emergent high-tech start-ups and the significant role of university research. One of his principles is that “not all the smart people work for us” and he advocates that the smart people within an organization connect with the smart people outside. Embracing the ideas and inspiration in these external links, he contends, will actually multiply the advantage of internal efforts. von Hippel (2005) speaks about the democratization of innovation where product and services users increasingly have the ability to innovate for themselves with the resulting move from manufacturing-centric to user-centric innovation processes. Important for the argument in this paper Schweisfurth and Herstatt (2015) conclude that employees’ *use experience* (experience of actual using a product) and *lead userness* (persons who have lead user attributes) “have an effect on opinion leadership, which is mediated by their cognitive empathy towards external users (p. 166).” There continues to be a lively debate in the literature on the nature of the firm and sources of competitive advantage (Klein et al. 2010, Pitelis and Teece 2009). The area of management innovation is, according to some scholars, under-researched (Birkinshaw et al. 2008). Thus it requires a strong theoretical basis in order to develop a comprehensive and fruitful research agenda –the objective of this paper is to address this contention. Furthermore there has been a recent call for a more balanced view of innovation management that, for example,

applies both bottom-up and top-down philosophies (Birkinshaw et al. 2011). Now I will introduce the topic of responsible innovation as a recent development in the innovation literature.

## Responsible Innovation

According to Stilgoe (2013), the “broad aim of responsible innovation is to connect the practice of research and innovation in the present to the futures that it promises and helps to bring about”. Furthermore Owen, Heintz and Bessant (2013) argue that responsible innovation challenges us “to ask what kind of future we want from science and innovation and the values this is based on”. Additionally they insist that RI is not just a question of being another ethical review or bureaucratic hurdle but a positive realignment of innovation to socially desirable ends that is values-based rather than just rules-based. von Schomberg (2013) states that Responsible Research and Innovation (RRI) is becoming an increasingly important factor in European policy, in particular in the most recent EU research framework “Horizon 2020” which sets out the strategy for the EU to become an “Innovation Union”. He makes the case that RRI “should be understood as a strategy of stakeholders to become mutual responsive to each other and anticipate research and innovation outcomes underpinning the ‘grand challenges’ of our time for which they share responsibility (p. 1). He proposes the following definition for RI (ibid. p. 19)

**Definition:** Responsible Research and Innovation is a transparent, interactive process by which societal actors and innovators become mutually responsive to each other with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products (in order to allow a proper embedding of scientific and technological advances in our society).

One of the main challenges of von Schomberg’s definition is to elucidate what is meant by “societal actors and innovators *become mutually responsive* to each other”. A central argument of my paper is that the concept of empathy can inform the quest to understand and explain what is meant by *mutual responsivity* of actors. Furthermore it contributes to the development by Blok (2014) of the concept of “stakeholder dialogue” in RI and on his question regarding “the communication process” involved (p. 4). Blok and Lemmens (2015), in a far-reaching interjection into the literature, call for a radical transformation of the very concept of innovation in light of the emerging RI debate. They provide their definition of RI in the arrangement of a formula:

Responsible innovation = regular innovation + stakeholder involvement with regard to ethical and societal aspects

In an important support for exploring the theme of empathy, Blok and Lemmens state that in order to form these ethical and societal aspects stakeholders should be “empathetic with regard to the interests of others, to take the perspective or standpoint of the other” (ibid. p. 31). They also comment that “corporate innovation is underrepresented in current research on the concept of responsible innovation” (p.30).

Having briefly reviewed the innovation literature and the emerging area of RI, I will now place the debate in the context of the philosophical literature on phenomenology and Edith Stein’s works on empathy.

## A Brief Introduction to Phenomenology

The section will attempt to provide a brief overview of the development and tenets of phenomenology. It has been compiled to provide a primer for management researchers that are not familiar with the topic but would like to engage with the philosophical debates in the literature. Edmund Husserl (1859-1938) was the founding father of Phenomenology, regarded as one of the most important philosophical movements of the twentieth century (Grossmann 2005). The system has had an immense influence in Europe in areas spanning psychology, law, values, aesthetics and religion (Rescher 2005). He considered that philosophy should be carried out as a rigorous science using the structured methodology of reason and his vision was that the phenomenological approach (of bracketing the natural world and a reduction to pure consciousness) could overcome and synthesise the radical disagreements of contemporary philosophy. Husserl's original work was in the area of mathematics and his most influential teacher was the philosopher Franz Brentano. His work underwent a transition from his earlier studies on the "phenomenology of mathematical and logical concepts" to the "transcendental idealism" developed in his later major work "*Ideas: General Introduction to Pure Phenomenology*" (Elveton 1970). Lauer (1965) argues that with the passage of time a precise definition of "phenomenology" became more difficult but proposed that the term could be traced back to a "distinction made by Kant between phenomenon or appearance of reality in consciousness, and the noumenon, or being of reality itself". However, he points out that Husserl rejected what he perceived as the "dualism" of Kant. Lauer continues to explain the phenomenology of Husserl as both a method and a philosophy. Method in so far as it provides the steps that must be followed "to arrive at the pure phenomenon, wherein is revealed the very essence not only of appearances but also of that which appears". In the realm of philosophy "it claims to give necessary, essential knowledge of that which is". Thus phenomenology advocates a "return to things because a "thing" is the direct object of consciousness in its purified form". This approach was in opposition to "illusions, verbalisms or mental constructions" implied by many contemporary movements. In connection with the philosophy of the mind, Horner and Westacott (2000) explain that phenomenology "tries to describe precisely what happens when someone is conscious of something" and that the approach typically begins by "describing the way things actually appear to us, rather than discussing the role of brain processes in causing consciousness, or whether mind is identical to the brain". Moran (2000) proposes that the major contribution of phenomenology to contemporary philosophy is its conception of "objectivity-for-subjectivity" and one of the aspects of the early work of Husserl was its grounding in realism.

Engaging with the world is part of a tradition that goes back to Aristotle "who made frequent reference to concrete examples to illustrate his theoretical points"(Kenny 2010). According to Merleau-Ponty (2002) the central theme of Husserl's later phenomenology was the notion of the *Lebenswelt* usually translated as "life-world". Historically its genesis can be traced back to the *Lebensphilosophie* (philosophy of life) movement pioneered by philosophers such as Dilthey and Eucken in the second half of the nineteenth century (Surber 1999). Husserl, in his work *Experience and Judgment* (1938) emphasized the importance of returning to the life-world, the world of our ordinary experience (Moran 2000). Furthermore in the *Crisis of European Sciences*, Husserl understood the *Lebenswelt* as encompassing the totality of human endeavour including the realm of scientific endeavour. Additionally he contended that philosophy in the early twentieth century "threatens to succumb to scepticism, irrationalism and mysticism" (p. 3) for which the antidote, following Kant, was a return to "things in themselves" (Husserl 1970). Moran (2000) explains that Husserl's early important work *Logical Investigations* was a

realist phenomenology that attracted many bright students to his classes in Göttingen such as Roman Ingarden, Hedwig Conrad-Martius and Edith Stein. The other main leader of the phenomenological movement in Munich, Alexander Pfänder, also proposed a realist outlook. The philosopher Peter Wust summarises the origins of discipline as follows “from the very beginning, there seemed to be in the intention of the new philosophical perspective something hidden which was completely mysterious, a searching back for objectivity to the sacredness of being, to the purity and chasteness of things, ‘of the thing in itself.’” cited in (Oben 1988 p. 12) The “goal of phenomenology is to clarify and thereby to find the ultimate basis of all knowledge” (Edith Stein 1989 p. 3 ) Now I will provide a review of literature on the topic of empathy; the main theme of the paper.

## **Empathy: a review**

According to the Oxford Dictionary of English (ODE 2006a) empathy is defined as “the ability to understand and share the feelings of another”. Furthermore it points out that there can be a great deal of confusion between the words *empathy* and *sympathy* (p. 569). Sympathy on the other hand means “feelings of pity and sorrow for someone else’s misfortune”. Gordon (1999) proposes that many of the concepts of empathy were in fact discussed under the general term “sympathy” by Hume, Adam Smith and other Scottish philosophers. Richmond (2005) states that empathy is sometimes prompted by imaginative exercises such as “stepping into someone’s shoes”. The word was introduced to the English language in the early twentieth century as a rendering of the German word *Einfihlung* (feeling into) in the literature on aesthetics. The concept was given its classical formulation in the work of Theodor Lipps who characterised it “as a process of involuntary inner imitation whereby a subject identifies through feeling with the movement of another body” whether that be real or illusory (Makkreel 1999 p. 255). Stein (1989 p. 12) explains that “Lipps depicts empathy as an ‘inner participation’ in foreign experiences”. Currently the concept is utilised in debates on moral psychology, the imagination and the simulation/theory debate. As we have seen above *imagination* is a major theme in the innovation literature and thus supports the argument for further exploration of the concept of empathy in this field. Gordon (1999), importantly for this paper, concludes that empathy “has been considered a pre-condition of ethical thinking and a major contributor to social bonding and altruism, mental state attribution, language use and translation” (p. 261). Darwall (1998) further divides the concept of empathy into three categories:

- i. **Emotional Contagion.** The most rudimentary form of empathy is “emotional contagion” or “infection” as when one “catches” a feeling or emotional state from another, not by imaginative projection, but more directly. Walking into a room filled with laughter and convivial conversation, we feel differently than when the room is filled with depression (or with tension). This is a form of what Hume called “sympathy,” which he defined as the “propensity we have...to receive by communication [the] inclinations and sentiments” of others, and when he said, quoting Horace, that “the human countenance...borrows smiles or tears from the human countenance.”
- ii. **Projective Empathy and Simulation.** Projective empathy is not simply copying others’ feelings or thought processes as we imagine them. Rather, we place ourselves in the other’s situation and work out what to feel, as though we were they. This puts us into a position to second the other’s feeling or dis-

sent from it. As [Adam] Smith puts it, we thereby express our sense of the “propriety” of the other’s feeling, whether, that is, we think it warranted or not.

- iii. **Proto-Sympathetic Empathy:** Like genuine sympathy, proto-sympathetic empathy has the other person and his plight as object. When we imagine what another person’s grief is like for him, we are focused on the other person and his grief. And this means that the distress we feel vicariously by projective identification can find a new target, namely his distress, thereby giving rise to sympathy.

Now I will introduce a major influencer on the development of phenomenology and on the theory of empathy, Edith Stein, with a view to gathering insights from her studies on the nature and application of technology.

### **Edith Stein (1891-1942)**

Edith Stein’s doctoral thesis “On the Problem of Empathy” was completed under Edmund Husserl in the University of Freiburg in 1916 and awarded “summa cum laude” (Waltraut Stein 1989). Stein was Husserl’s protégé but being a woman of Jewish origin was unable to obtain a University position because of the ideological intolerance of that time. Her doctoral thesis was written during the atheistic phase of her life but it is interesting that she analysed empathy in the context of the complete psycho-physical-spiritual person (Edith Stein 1989). Here is her own account of how her research on empathy (German *Einfühlung*) resulted from a lecture given by the “Master himself” (Teresia de Spiritu Sancto 1952).

Husserl in his course on Nature and Spirit had maintained that an objective external world can only be experienced inter-subjectively (i.e. by a plurality of individual knowing subjects) who are in a position to exchange information with each other; which means that such an experience presupposes other individuals. Husserl, following Theodor Lipps, named this experience “empathy”, but did not explain what it consisted of. Here was a gap which was worthwhile filling; I wanted to discover what empathy meant.

It should be noted that some commentators point out that the German word “*Geist*”, as used by these philosophers, is not accurately translated as “Spirit” which has a mainly religious semantic in the English language. W. Stein states that the German understanding of *Geist* is somewhere between the term Mind and Soul and its philosophical study deals with the creative human spirit. For example Scheler included such concepts as beauty in his examination of the spiritual. Edith Stein’s later life was dramatic both as feminist and as a Carmelite where she continued to correspond with leading Phenomenologists and to publish in the Journal of Phenomenology until her death in the gas chamber of Auschwitz in 1942. Martin Heidegger invited Stein to contribute to a special edition of the *Jahrbuch für Philosophie und phänomenologische Forschung* to mark Husserl’s seventieth birthday for which she contributed her famous paper “*An attempt to contrast Husserl’s Phenomenology and the Philosophy of St. Thomas Aquinas*”. For the comparison see (Stein 1993). Max Scheler was another important influence on Stein and she was indebted to his insistence on “bracketing”, the exercise of which challenged her to suspend every form of a priori prejudice and contributed to her *empathising* with other cultures and beliefs (Posselt 2005). Both of these philosophers were somewhat disappointed by the Master’s tendency towards Idealism in his later work and continued to identify themselves with the Realism of the early Husserl. In Stein’s political thought, “any state exists only for the benefit of human beings” and she was convinced that “humanity is

fundamentally one community, precious beyond measure (ICS 2007) . Stein's academic relationship with Heidegger and his philosophy is problematic and this is treated in some detail by Nota (1988). According to Ameriks (1977) "Stein produced a revised and coherent draft of Husserl's manuscripts on time-constitution, a draft that Heidegger later published in his own name as editor and no mention of Stein" (p104). See also note 14 on page 8 of *Philosophy of Psychology and the Humanities* (Stein 2000). Now I will examine Edith Stein's writings on empathy in more detail given its importance for the argument of the paper.

### **Stein on empathy**

Moran (2000) concludes that Stein's doctoral dissertation on empathy represents a dependable guide to Husserl's thinking on the subject which had been alluded to in his work *Ideas II*. Empathy for both of these philosophers was a "non-primordial experience which reveals a primordial experience. Empathy is not a matter of judgement, reasoning or ideation in general. It is a *founded* experience (p. 176)." Furthermore the concept was integral to Husserl's examination of inter-subjectivity and the experience of the other (*Freudeerfahrung*). According to Moran (2000 p. 176) he radicalized the problem in the *Fifth Cartesian Mediation*. "The problem is not: how do I understand the other? Rather Husserl's problem is: how is the other *constituted* for me?" Basehart (1989) speaks of Edith Stein's conviction that "phenomenology was the most appropriate approach to the investigation of the structure of the human person and she gave it her best efforts during her scholarly career (p. x)." But the act of empathizing with the other has also important consequences for understanding our own nature as well as that of others as we become "aware of the levels of value in ourselves by empathizing with persons of our own type (Waltraut Stein 1989 p. xxiii ). In her thesis *On the Problem of Empathy*, Stein explained her way of thinking: "The world in which we live is not only a world of physical bodies but also of experiencing subjects external to us, of whose experiences we know". Furthermore the "individual is not given as a physical body, but as a sensitive, living body belonging to an "I", an "I" that senses, thinks, feels and wills." (Edith Stein 1989 p. 5). However we should be aware of Sawicki's observation that the English word *empathy* has a narrower and somewhat different connotation than the German *Einfühlung* - see note 128 on page 93 of (Stein 2000) . This contention however is outside the remit of this paper but is worth examining in future work. Now I will discuss some implications of the phenomenological concept of empathy for the innovation debate and in particular the deliberation on RI.

### **Discussion**

Innovation is now a major focus for organizations, regions and economies and the topic is increasingly seen as being crucial not only to success but to survival. The topic of innovation is both multifaceted and wide-ranging with an eclectic and voluminous literature. There is almost universal agreement that innovation is a complex phenomenon to understand and manage (Allen 2004, Eppinger 2001, Goffin and Mitchell 2005, Katz 2004, OECD 2005, Poole and Van de Ven 2000, Rothwell 1994) while Storey (2004) points out that debate on the very meaning of the term has been controversial and problematical. Addressing this situation presents a number of challenges such as: agreeing a definition of the concept, making sense of the literature from wide-ranging sources, and examining technology both as innovations *per se* and as enablers of innovation. Many questions



increasingly exercise the minds of managers, entrepreneurs, policy makers and academics as they grapple with this perennially important topic. These include reasons why an innovation is successful in one organization and met with resistance in another and how it is that certain innovations diffuse easily through an environment while others do not. After almost half a century of intense research and theorizing, the academic contribution to answering questions such as these is less than convincing (Fagerberg 2005). Whatever difference of opinion exists on the nature, methods and our relationship with innovations and technology there is almost universal agreement that it is a very important topic. In the opening years of the third millennium innovation and technology is ubiquitous. Kline (2002) “suggests that we think of technology first and foremost as involving both ‘sociotechnical systems of manufacture’ and ‘sociotechnical systems of use’”. The role of technological innovations in society has gathered considerable momentum in the last sixty years in ways that, for example, Heidegger (1997) would not have dreamed of. Heise (2004) sees the progress in science and technology as “contributing to a sense of a new historical age” (p. 136).

According to the economist John Kenneth Galbraith (1967), technology means the systematic application of scientific or other organised knowledge to practical tasks. The Oxford Dictionary of English defines technology as the application of scientific knowledge for practical purposes (ODE 2006b). Technology is used “to represent things, action, processes, methods and systems” (Kline, 2000 p. 210). Innovation can have a wide range of meanings from innovations in physical objects to software to creative arts and to literature. There is widespread agreement that technology is now an integral part of human existence and crucial to the development and operation of a modern society. However a review of innovation definitions over the last fifty years indicates that technological innovation is almost exclusively researched without reference to ethics which is one of the three great pillars of philosophy (Costello and Donnellan 2008). As a result, any technological innovation is often assumed to be good, which is very problematic, when you consider the case of an innovative landmine! Technology influences every aspect of contemporary human life. It affects social and ecological systems and it is a “source of power, vulnerability, and inequality”(Sandler 2013). The fact that we spend little time reflecting on technology is surprising. How we relate to others as persons in a technological society is an important subject so again we look for some clues from the world of phenomenology. Edith Stein is a phenomenologist that I argue, can help us here. She analysed empathy in the context of the complete psycho-physical-spiritual person. As her work developed it became more and more focused on the human person, not as an isolated ontological individual, but relating to other people in a community. In her discussion of the essence of the acts of empathy, she treats empathy in terms of the constitution of the psycho-physical individual. She also argued that there is an important link between empathy and knowledge. However in this age of avatars and the internet of things (IoT), I believe, there is much work to be done on examining the implications for empathy from technology such as virtual worlds and social networks.

Recently the concept of empathy has come to the fore in a number of debates in what Jürgen Habermas (2001) might describe as the public sphere. Barack Obama’s challenge to Northwestern University graduates in the USA to cultivate empathy is an example (Obama 2006). In her research at Harvard, Dorothy Leonard proposes emphatic design as the best method to import knowledge from the market place (Leonard and Rayport 1997). There has been a significant move from product to service innovation over the last number of years and Pitt, Watson and Kavan (1995 p.177) claimed that empathy is one of “five dimensions that are used by customers

when evaluating service quality, regardless of the type of service”. Also the importance of empathy in customer care and the dangers of technology impeding such a relationship has been stressed by Gorry and Westbrook (2011). There is growing interest in the area of virtual machine interaction (Potapova and Rodionov 2014) and innovations such as Embodied Conversational Agents (ECAs) where “virtual agents expressing empathic emotions toward users have the potentiality to enhance human-machine interaction” (Niewiadomski et al. 2008 p. 37). This however is a controversial area requiring debate on the ethical issue surrounding avatars. The last point is of particular importance in research that involves vulnerable populations such as children and people with special needs (Pettersson 2002). In the area of human resource practices empathy was found to be important in the “communication of clear expectations and goal alignment throughout the organization” (Florea et al. 2013 p. 401). Czap et al. (2012 p. 642) in a macro-economic study propose that there is a “role for empathy–sympathy (the basis for an internalized, shared other-interest) in tempering and conditioning the more fundamental tendency to pursue self-interest”. This is surely of importance in the debate on the structures and interrelationships of the economic and social system in the wake of the demise of both Marxism and Neo-liberalism. Staying at the macro, even lofty level Zakaras (2004 p. 497) investigates Isaiah Berlin’s “conception of empathy and its close connection to his hopes for human freedom”. Now I will conclude the discussion by suggesting areas of further exploration on the importance of empathy in (post) modern society.

## **Suggestions for Future Exploration**

There are, I believe, a number of ideas in Stein’s PhD thesis that could contribute to the positivist-interpretivist debate in the management literature. Firstly, she contends that “mechanical causation as an explanation of physical phenomena is not appropriate for explaining spiritual phenomena” (Stein, 1989b p xxiii) - (see above comment on *Geist*).

The world in which we live is not only a world of physical bodies but also of experiencing subjects external to us of whose experiences we know.

However she distances herself from psychology’s tendency to subjectivism where

the explained phenomenon becomes a “subjective creation” without “objective meaning”. We cannot accept this interpretation.

Further on she proposes that empathy “proves to have yet another side as an aid to comprehending ourselves” since “people are generally inclined to ascribe to themselves better motives than they actually have and are not conscious of many of their emotional impulses at all” (ibid. p 33). This pertains to the problem identified by Scheler that inner perception “contains within it the possibility of deception”.

Empathy now offers itself to us as a corrective for such deceptions along with further corroboratory or contradictory perceptual acts. It is possible for another to “judge me more accurately” than I judge myself and give me more clarity about myself. For example, he notices that I look around me for approval as I show kindness, while I myself think I am acting out of pure generosity. This is how empathy and inner perception work hand in hand to give me myself to myself (ibid. p. 89).

According to Sawicki (2000 p. xi ) Edith Stein’s twin treatises penned shortly after the end of the First World War One entitled *Sentient Causality* and *Individual and Community* propose a theory of human creative achievement which is relevant to the discipline of responsible innovation given the importance of creativity to its process. “The ‘sentient causality’ which is operative within each human being is connected into the ‘individual and community’ power reservoirs to which all persons contribute and upon which all persons draw. In other words she connects psyche and mind (ibid. p. xiii)”. These concepts especially in the context of community can provide fertile ground for RI research. Edith Stein was an influential feminist in Germany between the two World Wars. Her writings on the role of women are significant and worthy of further investigation (Stein 1996). She proposes that empathy is especially a gift of women and enables “her to participate, understand and stimulate” in her role as worker, interpreter and teacher (p. 115). According to von Schomberg (2013 p. 8) “some philosophers of technology have recently argued that science should move beyond a contractual relationship with society and join in the quest for the common good”. The debate on the importance of the common good is an ancient one, with Cicero’s works being famous for their proclamation on human rights and the brotherhood of man (Gashin 2005). A major theme throughout the writings of Dante was that the person who does not contribute to the common good fails sadly in his or her duty. The philosopher Jacques Maritain was a leading architect of the United Nations Universal Declaration of Human Rights in 1948. He wrote that it is in the nature of things that a person, as part of society, should be bound to the common good. Maritain had a wide influence which extended to Martin Luther King Jr. who wrote an undergraduate paper on his work. “How should I live” is sometimes called the Socratic question and must be faced anew by each succeeding generation not least in this technological age. There is abundant opportunity to explore how the concept of empathy relates to the common good. Now I will present some conclusions from this meditation on empathy.

## Conclusions

There is concern among management scholars that the lack of philosophical engagement and conviction among the research community threatens the future integrity and creativity of the research process. This line of thinking is now applied to the innovation management discipline and through it to the emerging field of RI; and hence the motivation for this paper. Markus & Saunders (2007) in their call for more concepts and theories to stimulate research have specifically requested essays that explore the philosophical foundations on which management theory and research is built. This paper is a response to Weber’s call for researchers to address and reflect deeply on the ontological and epistemological assumptions underpinning their work. It also accepts Myers’ (1997) invitation for “further reflection and debate on the important subject of grounding research methodology”. Furthermore we must consider a phenomenon that is increasingly debated in the literature; that of “technological somnambulism”, the uncritical incorporation of technology into our lives with little reflection (Winner 2013). The paper responds to the challenge by arguing that innovation research now stands at a crossroads. Ultimately a discipline must be evaluated at a level of abstraction greater than itself. Engaging with concepts such as empathy facilitates the discussion and this study contributes to the discourse. It opens the scholarship of a leading phenomenologist, who had a significant influence on the impetus of the movement during its formative years, to the management discipline. Consequently the paper answers the research question posed at the beginning: how empathy can inform RI.

The paper has limitations; not least that it covers a broad area; but it has been the ambition of the author to span the philosophical and empirical worlds to create understanding and dialogue between them. Engagement in debates such as this has largely been the prerogative of scholars of philosophy. However this paper has attempted to synthesise the innovation and philosophy literatures to facilitate communication and address MacIntyre's major concern (2006 p.4):

Imprisoning philosophy within the professionalizations and specializations of an institutionalized curriculum after the manner of our own contemporary European and North American culture is arguably a good deal more effective in neutralizing its effects than either religious censorship or political terror.

I have also attempted in this paper to respond to MacIntyre's lament that in the case of Edith Stein "there is a general neglect of her work in the English-speaking world (ibid. p. vii). Finally, we should be cognisant of the reason why, according to Moran (2000 p.180), Husserl embarked on writing *The Crisis of European Sciences*. It was "an attempt to alert the world to the increasing danger of the collapse of the genuinely scientific and philosophical outlook which had marked out the progress of the West since the time of the Greeks".

## References

- Allen, T. J. (2004) 'Communication Networks in R&D laboratories' in Katz, R., ed. *The Human Side of Managing Technological Innovation: A Collection of Readings*, Second ed., Oxford: Oxford University Press.
- Amabile, T. M., Hadley, C. N. and Kramer, S. J. (2003) 'Creativity Under the Gun ' in *Harvard Business Review on The Innovative Enterprise*, Harvard Business School Press.
- Ameriks, K. (1977) 'Husserl's Realism', *The Philosophical Review*, 86(4).
- Baseheart, M. C. (1989) 'Foreword to the Third Edition' in *On the Problem of Empathy (The collected works of Edith Stein; v. 3) -translated by Waltraut Stein, Ph.D.*, Washington D.C. : ICS Publications.
- Baskerville, R. and Myers, M. D. (2004) 'Special Issue on Action Research in Information Systems: Making IS Research Relevant to Practice—Foreword', *MIS Quarterly*, 28(3), 329-335.
- Birkinshaw, J., Bouquet, C. and Barsoux, J.-L. (2011) 'The 5 Myths of Innovation', *Sloan Management Review*, 52(2), 43-50.
- Birkinshaw, J., Hamel, G. and Mol, M. J. (2008) 'Management Innovation ', *Academy of Management Review*, 33(4), 825-845.
- Blok, V. (2014) 'Look who's talking: responsible innovation, the paradox of dialogue and the voice of the other in communication and negotiation processes', *Journal of Responsible Innovation*, 1(4).
- Blok, V. and Lemmens, P. (2015) 'The Emerging Concept of Responsible Innovation. Three Reasons Why It Is Questionable and Calls for a Radical Transformation of the Concept of Innovation' in Koops, B.-J., Oosterlaken, I., Romijn, H., Swierstra, T. and Hoven, J. v. d., eds., *Responsible Innovation 2: Concepts, Approaches and Applications*, Springer.
- Butler, T. (1998) 'Towards a hermeneutic method for interpretive research in information systems', *Journal of Information Technology*, 13(4), 285-300.
- Chesbrough, H. W. (2003) *Open innovation: the new imperative for creating and profiting from technology* Boston: Harvard Business School.
- Cooper, R. G. (2001) *Winning at New Products : Accelerating the process from idea to launch*, New York: Perseus Publishing.

- Costello, G. J., Cresham, M. and Donnellan, B. (2007) 'Empathy and Teamwork: Reflections on the Legacy of Claudio Ciborra through the Phenomenology of Edith Stein', in *15th European Conference on Information Systems, St. Gallen, Switzerland, June 7-9, 2007*,
- Costello, G. J. and Donnellan, B. (2008) 'Seeking the Face of Innovation with the Ethical Compass of Emmanuel Levinas' in León, G., Bernardos, A., Casar, J., Kautz, K. and DeGross, J., eds., *IFIP International Federation for Information Processing, Volume 287, Open IT-Based Innovation: Moving Towards Cooperative IT Transfer and Knowledge Diffusion*, Boston: Springer, 97-117.
- Costello, G. J., Donnellan, B. and Curley, M. (2013) 'A Theoretical Framework to Develop a Research Agenda for Information Systems Innovation ; available at: <http://aisel.aisnet.org/cais/vol33/iss1/26> ', *Communications of the Association for Information Systems* Vol. 33(Article 26).
- Czap, N. V., Czap, H. J., Khachatryan, M., Lynne, G. D. and Burbach, M. (2012) 'Walking in the shoes of others: Experimental testing of dual-interest and empathy in environmental choice', *The Journal of Socio-Economics*, 41, 642– 653.
- Darwall, S. (1998) 'Empathy, Sympathy, Care', *Philosophical Studies*, 89(2), 261-282.
- Davison, R. M. and Martinsons, M. G. (2011) 'Methodological practice and policy for organisationally and socially relevant IS research: an inclusive–exclusive perspective', *Journal of Information Technology*, 26, 288-293.
- Dobson, P. and Love, P. (2004) 'Realist and Postmodernist Perspectives on Information Systems Research: points of connection', *Australasian Journal of Information Systems*, 12(1).
- Elveton, R. O. (1970) 'Introduction' in Elveton, R. O., ed. *The phenomenology of Husserl : selected critical readings / edited, translated, and with an intro. by R. O. Elveton* Quadrangle Books: Chicago
- Eppinger, S. D. (2001) 'Innovation at the Speed of Information ', *Harvard Business Review*, 79(1), 149-158.
- Etzkowitz, H. and Leydesdorff, L. (2000) 'The dynamics of innovation: from National Systems and “Mode 2” to a Triple Helix of university–industry–government relations', *Research Policy*, 29(2), 109-123.
- Fagerberg, J. (2005) 'Innovation: A Guide to the Literature' in Fagerberg, J., Mowery, D. and Nelson, R. R., eds., *The Oxford Handbook of Innovation*, Oxford: Oxford University Press, 1-26.
- Florea, L., Cheung, Y. H. and Herndon, N. C. (2013) 'For All Good Reasons: Role of Values in Organizational Sustainability', *Journal of Business Ethics*, 114, 393–408.
- Galbraith, J. K. (1967) *The New Industrial State*, Pelican Books (2nd Edition).
- Gashin, J. C. A. (2005) 'Cicero, Marcus Tullium' in Honderich, T., ed. *The Oxford Companion to Philosophy*, Second Edition ed., Oxford Oxford University Press.
- Goffin, K. and Mitchell, R. (2005) *Innovation Management: Strategy and Implementation using the Pentathlon Framework*, Houndmills, Basingstoke: Palgrave Macmillan.
- Gordon, R. M. (1999) 'Empathy' in Audi, R., ed. *The Cambridge Dictionary of Philosophy*, New York Cambridge University Press, 261.
- Gorry, G. A. and Westbrook, R. A. (2011) 'Once more, with feeling: Empathy and technology in customer care', *Business Horizons*, 54, 125—134.
- Grossmann, R. (2005) 'Phenomenology' in Honderich, T., ed. *The Oxford Companion to Philosophy*, Second Edition ed., Oxford Oxford University Press, 695-697.
- Habermas, J. (2001) *The liberating power of symbols : philosophical essays* Cambridge: MIT.
- Heidegger, M. (1997) 'The Question Concerning Technology', *Technology Studies*, p. 3-35.
- Heise, U. K. (2004) 'Science, technology, and postmodernism' in Connor, S., ed. *The Cambridge Companion to Postmodernism* Cambridge University Press
- Horner, C. and Westacott, E. (2000) *Thinking through Philosophy: an Introduction*, Cambridge: Cambridge University Press.
- Husserl, E. (1970) *The Crisis of European Sciences and Transcendental Phenomenology : An Introduction to Phenomenological Philosophy ; translated by David Carr* Evanston: Northwestern University Press.
- ICS (2007) 'On-line Review of "Edith Stein: An Investigation Concerning the State Translated by Marianne Sawicki "(available on line through <http://www.icspublications.org/> )' in.
- Kakko, I. and Inkinen, S. (2004) *netWork Oasis - Challenges of Regional Development: How to Attract the "Creative Class"*, translated by Bergamo, Italy.
- Katz, R. (2004) 'Introduction' in Katz, R., ed. *The Human Side of Managing Technological Innovation: A Collection of Readings*, Second ed., Oxford: Oxford University Press.
- Kenny, A. (2010) *A New History of Western Philosophy*, Oxford University Press.
- Klein, P. G., Mahoney, J. T., McGahan, A. M. and Pitelis, C. N. (2010) 'Toward a theory of public entrepreneurship', *European Management Review*, 7(1), 1-15.
- Kline, S. J. (2002) 'What is technology?' in Scharff, R. and Dusek, V., eds., *Philosophy of technology : the technological condition* Oxford: Blackwell.

- Kumar, K. and van Dissel, H. G. (1996) 'Sustainable Collaboration: Managing Conflict and Cooperation in Interorganizational Systems', *MIS Quarterly*, 20(3), 279-300.
- Lauer, Q. (1965) *Phenomenology : its genesis and prospect*, New York Harper & Row.
- Lazonick, W. (2005) 'The Innovative Firm ' in Fagerberg, J., Mowery, D. and Nelson, R. R., eds., *The Oxford Handbook of Innovation*, Oxford: Oxford University Press.
- Leavy, B. (2005) 'A leader's guide to creating an innovation culture ' , *Strategy & Leadership* 33(4), 38 - 45.
- Lee, A. (1989) 'A Scientific Methodology for MIS Case Studies', *MIS Quarterly*, March 1989, 33-50
- Leonard, D. (1998) *Wellsprings of Knowledge: Building and Sustaining the Sources of Innovation*, Harvard Business School Press.
- Leonard, D. A. and Rayport, J. (1997) 'Spark Innovation Through Empathic Design.' , *Harvard Business Review*, 75(6 November-December), 102-113.
- Lundvall, B.-A. (1995) *National Systems of Innovation: towards a theory of innovation and interactive learning* London: Pinter.
- MacIntyre, A. C. (2006) *Edith Stein: A Philosophical Prologue, 1913-1922*, Rowman & Littlefield.
- Makkreel, R. A. (1999) 'Einführung ' in Audi, R., ed. *The Cambridge Dictionary of Philosophy*, New York Cambridge University Press, 257-258.
- Mangan, J., Chandra, L. and Bernard, G. (2004) 'Combining quantitative and qualitative methodologies in logistics research', *International Journal of Physical Distribution & Logistics Management*, 34(7), 565 – 578.
- Markus, M. L. and Saunders, C. (2007) 'Looking for a Few Good Concepts...and Theories...for the Information Systems Field ' , *MIS Quarterly*, 31(1), iii-vi.
- Maruping, L. M. and Agarwal, R. (2004) 'Managing Team Interpersonal Processes Through Technology: A Task-Technology Fit Perspective', *Journal of Applied Psychology*, 89(6), 975-990.
- Marz, E. (1991) *Joseph Schumpeter : scholar, teacher, and politician*, New Haven, Conn. ; London Yale University Press
- Merleau-Ponty, M. (2002) *Phenomenology of perception translated by Colin Smith (first published as the Phénoménologie de la perception in 1945)*, London: Routledge.
- Moran, D. (2000) *Introduction to Phenomenology*, London ; New York :: Routledge.
- Myers, M. D. (1997) 'Qualitative Research in Information Systems', *MIS Quarterly* (21:2), June 1997, pp. 241-242. *MISQ Discovery, archival version, June 1997, [http://www.misq.org/discovery/MISQD\\_isworld/](http://www.misq.org/discovery/MISQD_isworld/). MISQ Discovery, updated version, last modified: [www.qual.auckland.ac.nz](http://www.qual.auckland.ac.nz).*
- Niewiadomski, R., Ochs, M. and Pelachaud, C. (2008) 'Expressions of Empathy in ECAs' in Prendinger, H., Lester, J. and Ishizuka, M., eds., *Intelligent Virtual Agents Volume 5208 of the series Lecture Notes in Computer Science pp 37-44*, Berlin Heidelberg: Springer-Verlag.
- Nota, J. (1988) 'Edith Stein and Martin Heidegger', *Carmelite Studies*, 50-73.
- Oakley, A. (1990) *Schumpeter's theory of capitalist motion : a critical exposition and reassessment (View details)* Aldershot, Hants, England: Edward Elgar
- Obama, B. (2006) 'Obama Challenges Grads to Cultivate Empathy :Remarks of Senator Barack Obama to Northwestern graduates at 2006 Commencement: (available on-line through <http://www.northwestern.edu/newscenter/stories/2006/06/barack.html> accessed May 2016)',
- Oben, F. M. (1988) *Edith Stein: Scholar, Feminist, Saint* New York: Alba House
- ODE, ed. (2006a) *Oxford Dictionary of English , Second Edition, Revised*, Second Edition ed., Oxford Oxford University Press.
- ODE (2006b) 'technology' in *Oxford Dictionary of English , Second Edition, Revised*, Second Edition ed., Oxford Oxford University Press.
- OECD (2005) *Oslo Manual: Guidelines for Collecting and Interpreting Innovation Data, 3rd Edition*, Paris: Organisation for Economic Co-Operation and Development, Directorate for Science, Technology and Industry.
- Otto, K. and Wood, K. (2001) *Product Design : Techniques in Reverse Engineering and New Product Development*, New Jersey: Prentice Hall.
- Parnes, S. J., Noller, R. B. and Biondi, A. M. (1977) *Guide to Creative Action*, NY: Charles Scribner's Son. .
- Pedler, M., Burgoyne, J. and Boydell, T. (1991) *The Learning Company -A strategy for sustainable development*, Maidenhead: McGraw-Hill.
- Pettersson, J. S. (2002) 'Visualising interactive graphics design for testing with users', *Digital Creativity*, 13(2), 144-156.
- Pitelis, C. N. and Teece, D. J. (2009) 'The (new) nature and essence of the firm', *European Management Review*, 6(1), 5–15 doi: 10.1057/emr.2009.1.
- Pitt, L. F., Watson, R. T. and Kavan, C. B. (1995) 'Service Quality: A Measure of Information Systems Effectiveness', *MIS Quarterly*, 19(2), 173-187.

- Poole, M. S. and Van de Ven, A. H. (2000) 'Towards a General Theory of Innovation Processes' in Van de Ven, A. H., Angle, H. L. and Poole, M. S., eds., *Research on the Management of Innovation : the Minnesota Studies*, Oxford ; New York: Oxford University Press, 637-662.
- Posselt, T. R. (2005) 'Edith Stein: The Life of a Philosopher and Carmelite' in Susanne M. Batzdorff, Koepfel, J. and Sullivan, J., eds., ICS Publications.
- Potapova, A. and Rodionov, S. (2014) 'Universal empathy and ethical bias for artificial general intelligence', *Journal of Experimental & Theoretical Artificial Intelligence*, 26 (3), 405–416.
- Premkumar, G. and Ramamurthy, K. (1995) 'The Role of Interorganizational and Organizational Factors on the Decision Mode for Adoption of Interorganizational Systems', *Decision Sciences*, 26(3), 303 - 336.
- Pugh, S. (1991) *Total Design : Integrated Methods for Successful Product Engineering*, Addison-Wesley.
- R. Owen, Heintz, M. and Bessant, J., eds. (2013) *Responsible Innovation: Managing the Responsible Emergence of Science and Technology in Society*, London: John Wiley.
- Rescher, N. (2005) 'pragmatism' in Honderich, T., ed. *The Oxford Companion to Philosophy*, Second Edition ed., Oxford Oxford University Press, 747-751.
- Richmond, S. (2005) 'empathy' in Honderich, T., ed. *The Oxford Companion to Philosophy*, Second Edition ed., Oxford Oxford University Press.
- Rothwell, R. (1994) 'Towards the Fifth-generation Innovation Process.', *International Marketing Review*, 11(1), 7-31.
- Sandler, R. L. (2013) 'Introduction: Technology and Ethics' in Sandler, R. L., ed. *Ethics and emerging technologies*, Basingstoke: Palgrave Macmillan.
- Sawicki, M. (2000) ' Editor's Introduction' in Marianne Sawicki (Translator) and Mary-Catherine Baseheart (Translator), ed. *Philosophy of Psychology and the Humanities, the Collected Works of Edith Stein* Washington D.C. : ICS Publications xi-xxiii.
- Schumpeter, J. A. (1934) *The theory of economic development: an inquiry into profits, capital, credit, interest, and the business cycle*, Cambridge, Mass. : Harvard University Press (1959 printing)
- Schweisfurth, T. G. and Herstatt, C. (2015) 'Embedded (Lead) Users as Catalysts to Product Diffusion', *Creativity and Innovation Management*, 24(1), 151-168.
- Stein, E. (1989) *On the Problem of Empathy (The collected works of Edith Stein; v. 3) -translated by Waltraut Stein, Ph.D.*, Washington D.C. : ICS Publications.
- Stein, E. (1993) 'Knowledge, Truth, Being :translated by Walter Redmond (The collected works of Edith Stein; v. 8)' in L.Gelber and Linssen, M., eds., *Knowledge and Faith*, Washington D.C. : ICS Publications.
- Stein, E. (1996) *Essays On Woman (translated by Freda Mary Oben) 2nd Edition, Stein, Edith//the Collected Works of Edith Stein* Washington D.C. : ICS Publications.
- Stein, E. (2000) *Philosophy of Psychology and the Humanities Stein, Edith//the Collected Works of Edith Stein* Washington D.C. : ICS Publications.
- Stein, W. (1989) 'Translators introduction' in *On the Problem of Empathy (The collected works of Edith Stein; v. 3) -translated by Waltraut Stein, Ph.D.*, Washington D.C. : ICS Publications.
- Stilgoe, J. (2013) 'Foreword: Why Responsible Innovation?' in R. Owen, Heintz, M. and Bessant, J., eds., *Responsible Innovation: Managing the Responsible Emergence of Science and Technology in Society*, London: John Wiley.
- Storey, J. (2004) *The Management of Innovation: Volume I*, Cheltenham, UK ; Northampton Edward Elgar.
- Surber, J. P. (1999) 'Lebensphilosophie. ' in Audi, R., ed. *The Cambridge Dictionary of Philosophy*, New York Cambridge University Press, 915.
- Swedberg, R. (1991) *Joseph A. Schumpeter: his life and work* Cambridge: Polity Press.
- Teresia de Spiritu Sancto (1952) *Edith Stein (translated from the German by Cecily Hastings and Donald Nicholl)*, London and New York: Sheed & Ward.
- Ulrich, K. T. and Eppinger, S. D. (2000) *Product Design and Development*, 2nd Edition ed., Irwin McGraw-Hill.
- Ulrich, K. T. and Eppinger, S. D. (2012) *Product Design and Development*, 5th Edition ed., Irwin McGraw-Hill.
- von Hippel, E. (2005) *Democratizing Innovation*, Massachusetts: The MIT Press.
- von Schomberg, R. (2013) 'A vision of responsible innovation' in Owen, R., Heintz, M. and Bessant, J., eds., *Responsible Innovation*, London: John Wiley.
- Weber, R. (2003) 'Editor's Comments : Theoretically Speaking', *MIS Quarterly*, 27(3), iii-xii.
- Winner, L. (2013) 'Technologies as Forms of Life' in Sandler, R. L., ed. *Ethics and emerging technologies*, Basingstoke: Palgrave Macmillan.
- Zakaras, A. (2004) 'Isaiah Berlin's Cosmopolitan Ethics', *Political Theory*, 32, 495-517.