

**Design leadership and communication:
Characteristics and abilities of design leaders
communicating design to non-designers during the
Fuzzy Front End of New Product Development**

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by

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Abstract

This research investigates the key characteristics of design leaders in the context of New Product Development (NPD) at the Fuzzy Front End (FFE) or early stage of this process. It particularly focuses on how design leaders communicate design to non-designers. It is often observed that designers struggle to communicate design to non-designers. Previous research has identified design leaders as competent design communicators. However, the definition and key characteristics of design leaders remain unclear.

By reviewing the literature on leadership studies, design leadership and project leadership, it is evident that no single universal definition of leadership exists. The most common definition is that leaders apply their knowledge and skills to conduct activities and use their traits to influence other people's actions. Leadership requires different characteristics for different tasks.

To understand the characteristics of design leaders, triangulated research was employed at a real-life NPD project involving young designers and non-designers at early stages of NPD as part of the first study. All participants (N=32) were directly observed, interviewed in semi-structured interviews and administered with assistive questionnaires to compare design and non-design participants' leadership and communication styles. The second study was in-depth, focusing on UK design leaders (N=11) through semi-structured interviews and based on deficiencies in leadership and communicating design, identified from the first study and the literature review.

Comparative studies indicate that designers and design leaders vary their attitudes towards non-designers, motivation and communication style. This study highlights the key characteristics of design leaders: an epiphany by experiencing the entire NPD process, interest in the benefits of NPD stakeholders, a good understanding of design competency, reflectively flexible working attitude and strong, active listening. Thus, a conceptual model was formulated and evaluated, able to guide designers who wish to become design leaders and help to enhance design communication and relationships with non-designers.

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Chapter 1 Introduction

This research aims to investigate and develop a conceptual model of the key attributes of a design leader in the context of the New Product Development (NPD) process, especially during the early stage which is known as the Fuzzy Front End (FFE). Furthermore, it explores the key characteristics of design leaders and focuses on how design leaders communicate design to non-designers.

The Introduction chapter presents an overview regarding the research background. Firstly, Section 1.1 provides a working definition of design and discusses its importance in business, particularly at the early stages (Fuzzy Front End) of New Product Development (NPD). Then, it provides a working definition of the professional figure of the designer and the role of the designer at NPD. Section 1.2 explores the other business units in NPD and discusses the different working preferences between the designers and other business units during an NPD project. It identifies the designer's challenges and difficulties regarding communicating design to non-designers during an NPD project, exploring theories and models of communication based on a working definition of communication. Section 1.3 subsequently presents the opportunity to conduct the research by first identifying good design communicators who have been acknowledged as successful design leaders. Then, it introduces the scope of previous research on improvement of communicating design and the role of design leaders which is addressed in detail in the subsequent literature review. Based on the emerging issues and the formulated definitions, Section 1.4 provides a summary together with the key research questions. Section 1.5 states the research aim and relevant objectives. Section 1.6 presents the contributions of this research. The final Section 1.7 illustrates the structure of the thesis.

1.1. The Designer in New Product Development

1.1.1. Design and its importance in business

The Oxford Dictionary (2013) defines “design” as both a noun and a verb. “Design” can be a plan or drawing to illustrate the look, function or workings of a building, garment, or other

object prior to being produced. It can also be a decorative pattern. As a verb, it is ‘to decide upon the look and function of a building, garment, or other object by making a detailed drawing of it.’

From the perspective of design practice, Simon (1969) defines “design” as transforming “the existing condition into preferred ones”. The Cox Reports (HM Treasury, 2005) defined design as the process which connects creativity and innovation. Thus, researchers have defined design as having capabilities to differentiate products and services and to add value which creates a unique selling proposition (Oakley, 1990; Bruce and Cooper, 1997).

In the last few decades numerous analyses have been conducted to quantify how much design contributes to business. Roy and Potter’s (1993) research into the commercial impact on Return on Investment in design, based on a survey of 221 small and medium-sized UK manufacturers found that just 60% of projects attain commercial success. Over 90% of design implemented projects were profitable within an average 15 month period and 28% of all firms entered new markets and increased 30% of their market share.

Also, the UK Design Council (2005; 2008) published reports showing that 63 design-led companies’ financial performances - in the FTSE 100 since 1993 - were better than ‘the Emerging Index’ and increased more than 200% (Design Council, 2005). Every pound sterling invested in design, created two pounds profit (Design Council, 2008).

Lastly, a business report from Jang, Yoon, Lee and Kim (2009) stated that Apple’s design driven approach not only boosted its market share and profits, but also started the trend in personal computers becoming fashionable. BusinessWeek, in the summer of 2005 published a special report on building innovative companies in which managers began to discover “design strategy”. Therefore, several researchers have suggested that design performance is critically connected to an organisation’s profits (Chiva and Alegre, 2009; Hertenstein, Blatt, and Veryzer, 2005; Moultrie, Clarkson and Robert, 2007) as well as revitalising brands (Berenson, Conrad and Mohr-Jackson, Iris, 1994; Danzing, 2002; Leonhardt, Ted, Faust and Bill, 2001 in Beverland, 2005).

According to the research of Chiva and Alegre (2009), investment in design generates more profit and enhances firms’ business performance. According to Labone et al. (2003), governments recognise the benefits of design. For instance, Finland’s national design strategy,

which was introduced in 2000, has positioned it as the most innovative nation in the world and supported Nokia becoming the world's biggest supplier of mobile phones with a 40% market share. Also, Labone et al. (2003) identify that Samsung from South Korea has benefited from the South Korean government's national design policy on building design infrastructure since the Asian financial crisis of 1997-98. Consequently, Samsung is one of the leading consumer goods producers in the global market. Bruce and Bessant (2002) indicate that design effectiveness does not appear by accident but rather as the result of a managed process. Thus, many analyses have stated that greatly increased profits through design are achieved when sufficiently supported by organisations (Bruce and Cooper, 1997; Design Council, 2005; Fraser, 2006; Hertenstein, Blatt, and Veryzer, 2005; Jang, Yoon, Lee, and Kim, 2009).

Therefore, for the purpose of this research, the working definition of design can be taken as *either an ability or a process to create a unique selling market proposition and achieve better revenue by connecting innovation and creativity effectively with appropriate financial and management supports.*

1.1.2. New Product Development (NPD)

The Product Development & Management Association defines the term 'product' as a product or service (Kahn, Castellion, and Griffin, 2005). Krishnan and Ulrich (2001) define product development based on literature reviews of marketing, operation management and engineering design as "the transformation of a market opportunity and a set of assumptions about product technology into a product available for sale. Similarly, Ulrich and Eppinger (2012) define product development as "the set of activities beginning with the perception of a market opportunity and ending in the production, sales, and delivery of a product". From a financial perspective, NPD is responsible for employment, economic growth, technological progress and high standard of living (Bhuiyan, 2011). NPD efficiency is the most important performance to determine firm's competitiveness and survival (Ernst and Young, 1997) because it positively relates to firm's financial performance (Anatana, Enkawa and Suzuki). Thus, NPD is a central business activity (Cooper, 2000) and "the development of new and improved products for the survival and prosperity of modern corporations" (Cooper, 2005).

Von Hippel (2005) argues that a successful product may be viewed as a solution to customers' demands. In order to develop elegant and efficient solutions to customers' needs, two different types of information have to be combined: 'need information' on what users need and 'solution information' on how products are built (von Hippel, 2005: 153). Mossberg (2007) found that the growth of industry through customer experience is reflected in the new pattern of consumption, new demands, and new technology. Also, Pine and Gilmore (1999) propose that NPD, with customer experience, creates more profit than only NPD because every touch point with the customer is identified as a market opportunity. Voss (2007) examines several successful organisations' provided customer experience as economic value. It is designed as a planned journey with multiple touch points. Kotler (2010) proposes that companies working with customers and business partners to produce co-created products, services, and differentiated memorable customer experience will survive and lead the market. Therefore, the packaged experience defines characteristics of product, service or brand (Press and Cooper, 2003).

Min et al. (2006) identify NPD as a high risk activity. NPD failure rates, depending on the industry, are reported as around one third (Griffin, 1997) or 40% (Adams, 2004). Causes of NPD failures have been identified including managerial behaviour (Biyalogotsky, Boulding, and Staelin, 2006), product proliferation and organisational failure (Barnett and Freeman, 2001). Also, other reasons for NPD failures include the wrong customer focus in product design (Berggren and Nacher, 2001) and lack of empowerment and cross-functional representation in the project team (Ulrich and Eppinger, 2012). Thus, Calantone et al. (2003) suggest that a key challenge for an NPD project is how to delegate in an unstable environment in order to reduce the risk of failure of either the project or of the resulting product.

In contrast, Ernst, (2002) recommends five NPD success factors such as the NPD process, organisation, culture, leadership and strategy. Several researchers identify NPD success factors including a project leader's rank in an organisation (Sarin and McDermott, 2003) and traits (Barczak and Wilemon, 2003), support from senior executives (Cooper and Kleinshmidt, 2004; Gomes, Weerd-Nederhof, Pearson, and Fisscher, 2001), an innovative organisational supporting culture which encourages creativity, risk taking, teamwork (Jassawlia and Sashittal, 2002), strategic internal and external alliance (Sivadas and Dwyer, 2000) and cross-functional team selection (Cooper, 1997, Crawford and Benedetto, 2006,

Kono and Lynn, 2007; Song and Perry, 1997, Schilling and Hill, 1998, Ulrich and Eppinger, 2012). Cooper and Kleinshmidt (2004) report that 51.7% of companies, having a committed Cross Functional CFC team, resulted in better NPD performance. The nature of the CFC team often reacts effectively to increasing business and market demands (Bernasco et al, 1999; Ulrich and Eppinger 2008).

Therefore, for the purpose of this research, the working definition of NPD can be taken as *a high risk business activity to produce compelling outcomes for competitive survival*. However, it has many considerations such as an organisation's temporary financial status, project leader performance, structure of the CFC team, and other related resources. The organisation and executives' NPD supporting culture and analysing market environments with meeting customer experience and demands are also factors.

1.1.3. Fuzzy Front End

Smith and Reinertsen (1991) named The Fuzzy Front End (FFE) stage as being considered the earliest stage of the NPD process. It is seen as the period to create and activate ideas prior to the first official group meeting where it decides upon a new product idea and whether to develop the idea further (Moenaert et al., 1995; Reid and Brentani, 2004). According to NESTA (2005), the so-called "front-end" research into technological development, market trends, and consumer needs is now a staple in the design industry operation. Cooper (1993) suggests that errors of project activities at the beginning of a project can result in disaster. Khurana and Rosenthal (1998) identify FFE activities prior to the development stages, based on Cooper's stage-gate process (1998) as communication, opportunity identification and assessment, idea generation, product definition and planning, product strategy formulation, and early executive reviews.

Several studies provide evidence that time spent on FFE has significantly supported NPD success (Cooper and Kleinschmidt, 1995; Kuczmariski and Associates, 1994; Reid and Brentani, 2004; Urban and Hauser, 1993). However, Khurana and Rosenthal (1997) suggest that clarifying the product's concept at FFE is complicated and difficult and most companies fail to have clear product definitions. NESTA (2008) has proposed that researching people's needs, tastes, and preferences is vital in shaping new products and services. Borja de Mozota

(2003) recommends employing user-centred and informed design research methods to support the development of products and services from the beginning of the investigation. NESTA (2005) identifies some larger design agencies, which engage in user-oriented research and have raised their profile, visibility, and credibility in target markets (cite in Design Council, 2008).

Other causes of failure include lack of vision (Murmman, 1994), inefficient communication processes (Abertet et al., 1992), and lack of project leadership (McDonough and Barczak, 1991; Mcdonough, 1993), lack of perceived urgency (Kessler and Chakrabarti, 1999), lack of formalisation (Choperena, 1996; Rosenau, 1998), and ineffective people conducting the FFE work (McDonough and Spital, 1984). Due to complex processes and uncertainties, managers often execute screening in uncertain environments based on incomplete information (Lin and Chen, 2004). The FFE of the design process can be rather daunting for more linear-minded people (Drews, 2009); however, understanding project requirements is vital based on Murphy and Kumar's empirical research (1997). Thus, communication is identified as being critically important because this phase allows modifications, reorientations and drastic changes in new product planning (Moernaert et al., 1995; Seidel, 2007) and it is the least expensive stage of a project (Moernaert et al., 1995).

Therefore, for the purpose of this research, the working definition of FFE can be taken as *the initial stages of NPD which are non-linear processes and decide whether a NPD concept progresses to the next development stage*. The deciding factors for the next stage of FFE are identifying market opportunities through user research, technology research and market trend research. Other considerations include assessing product definition and planning with aligning an organisation's internal resources and effective team communication for a shared NPD vision.

1.1.4. Designer

The Oxford dictionary (2014) defines a designer as 'a person who plans the look or workings of something prior to it being made, by preparing drawings or plans'. This definition explains a designer's trade, technically.

From the perspective of an organisation, the Design Council, UK, (2012) defines a designer as shaping aesthetically and effectively products, interface, service and information for organisations of all shapes and sizes and in different industries. The Design Council (2012) also proposes that designers plan enhanced working and living spaces and create public services and more efficient working processes. This definition explains what designers can do as professionals in different sectors and roles.

Neumeier (2009) defines the designer from a designer's perspective as improving life style by adding value through the creative process; they try to fill the gap between vision and reality by creative and imaginative thinking of 'what could be' because they are masters of heuristics which are not governed by fixed rules. According to Brown (2008), the methods and sensibilities of a designer match people's needs, feasibility of technology and visible business strategy to create customer value and market opportunity. Designers are empathetic, intuitive, imaginative and idealistic; nevertheless, these traits are "soft-hearted, illogical, and scatter-brained from a business perspective" (Neumeier, 2009). According to the Design Council (2012), designers' processes and activities, irrespective of their working sectors, are identified by using the 'Double Diamond' which consists of four distinct process phases of Discover, Define, Develop and Deliver. Therefore, designers are regarded by Neumeier (2009) as comfortable dealing constantly with uncertainties by analysing a problem from the inside and the outside. Then, they try to prototype ideas so that they can be tested.

From the researchers' perspectives, Borja de Mozota (2003) states that designers tend to define themselves by their professional achievements. Unlike an artist, they work for others as part of a multidisciplinary team in an organisation. According to Borja de Mozota (2003), designers are imaginative and take initiative to change a situation by producing ideas, thereby working as innovators and trendsetters. Press and Cooper (2003) suggest that designers are cultural creators who add meaning to all designed outcomes for human experiences and their activities are possible thorough design education which provides possibilities, challenges, skills and understanding.

Also, Borja de Mozota (2003) suggests that designers consider thoroughly all aspects of economic, aesthetic, technological, and commercial constraints that relate to strategic business goals to build a company's vision and identity. Then, designers create objects aesthetically based on reflections of people's needs and wants. Thus, a designer's role is

defined as a coordinator and is involved in the process of creation and decision making in an organisation, not a substitute for other business activities (ibid). Best (2010) indicates professional designers can be located within businesses either on the client side as an in-house team in an organisation or on the agency/consultancy side; thus, they bridge expertise in projects both inside and outside organisations.

Therefore, for the purpose of this research, the working definition of the designer can be taken as *the design professional based on proper design education and experiences who creates a new entrepreneurial opportunity by producing either intangible or tangible outcomes aesthetically and strategically*. Their holistic perspective and constantly challenging attitudes towards ready made products and current obstacles achieve their design purposes. Therefore, designers improve an existing situation for people's expected and unexpected needs as well as creating a new culture and trends.

1.2. Difficulties of communicating design to non-designers

1.2.1. The role of the designer in NPD

Veryzer (2005) indicates that design and marketing have been recognised as being key contributors to NPD and commercial success; however, less attention has been given to the relationship between marketing and design and their role in NPD. From the perspective of industrial design, Ulrich and Eppinger (2008) identify the primary responsibility of industrial designers for product design is to interact between product and users for better functional benefit, operational and ergonomic considerations, and aesthetics. Cagan and Vogel (2002) also indicate industrial design helps formulate product configuration, aesthetics and image considerations, feature integration and select material. Bruce and Bessant (2002) state that designers can bring a unique selling point to the market; yet the role of industrial design has been conceived in producing visual product representation (Herbst, 1996). The role of the designer in NPD has been identified mostly in the aspect of product design and its role is related to presenting aesthetic elements of NPD. On the other hand, Von Stomm (2008) emphasises that the design function adopts a more eminent role in the management of product development. Perks, Cooper and Jones (2005) categorise the role of the designer in NPD

based on mid-size to large UK manufacturing companies as three types: firstly as a functional specialist for the aesthetics in a fast moving business environment such as the apparel business; secondly as part of a multi-functional team in long development cycles and long product life cycles between five to six years; and, lastly, as a process leader where radical product development is under way. In all three cases designers are involved as internal designers or external agencies and consultants depending on the organisations' business structures. Veryzer's research based on discontinuous NPD (2005) recommends that it is important to involve industrial design with marketing function to validate uncertain information and product application directions. Also, involvement of industrial design earlier in the process can reduce time and cost and help to improve the opportunity for marketplace success.

1.2.2. Other Units in NPD

Sethi (2000) proposes that more firms require product development tasks for a team which has functional areas such as marketing, research and development, manufacturing and purchasing. Numerous researchers suggest forming a cross-functional (CFC) team for the NPD success (Bernasco et al, 1999; Cooper, 1997; Crawford and Benedetto, 2006; Cooper and Kleinshmidt, 2004; Kono and Lynn, 2007; Song and Perry, 1997; Schilling and Hill, 1998; Ulrich and Eppinger, 2008). According to Kumar and Gupta (1993), CFC teams need members from all levels of management, operators, technicians, and members from different organisations including vendors and customers. Parker (2003) defines a CFC team as “a group of people with a clear purpose representing a variety of functions or disciplines in the organisation whose combined efforts are necessary to achieve the team's purpose”. Borja de Mozota (2008) also indicates that a project team consists of representatives from each special discipline who share responsibilities for the project including other business units and a design manager.

Cooke and Tate (2005) typologically arrange project team members involved as in the below table.

Role/Player	Responsibilities
Sponsor (sometimes called project champion)	Accountable for overall project results Sells the project Has courage and clout
Project customers	Accepts final deliverable

Technical customer Economic customer User customer	Approves technical specifications Pays bills/ provides funding Represents users' needs if not the user
Project manager or project leader	Accountable for overall project results (share accountability)
Project team member	Accountable for his/her deliverables (share accountability)
Functional manager	Provides resources, team members (share accountability)

Table 1.1 Typical players/ roles needed for most projects. Source: Cooke and Tate (2005)

According to Krishnan and Ulrich (2001), involved business units in NPD are generally marketing, administration, engineering design and operation management. However, Parker (2003) states that team members from different functions are a group of various people such as strangers, colleagues, friends and enemies. Straker (2008) states that work teams consist of people from different functions having different working preferences, rules, beliefs and motivation. Krishnan and Ulrich (2001) provide different perspectives of product development from NPD team members based on the literature review on product development decision.

	Marketing	Organisations	Engineering design	Operation management
Perspective on product	It is a bundle of attributes	It is an artefact resulting from an organisational process	It is a complex assembly of interacting components	It is a sequence of development and/ or product process steps
Typical performance Metrics	“Fit with market” Market share Consumer utility (sometime profits)	“project success”	“Form and function”, Technical performance innovativeness (sometimes direct cost)	“Efficiency” Total cost, Service level, Lead time, Capacity utilisation
Dominant representational paradigm	Customer utility as a function of product attributes	No dominant paradigm. Organisational network sometimes used	Geometric models. Parametric models of technical performance	Process flow diagram, Parametric models of process performance
Example decision variables	Product attributes levels, prices	Product development team structure, incentives	Product size, shape, configuration, function, dimensions	Development process sequence and schedule, Point of differentiation in production process
Critical success factors	Product positioning, pricing and collecting and meeting customer needs	Organisational alignment, Team characteristics	Creative concept and configuration, Performance optimisation	Supplier and material selection, design of production sequence, project management

Table 1.2, Comparison of Perspectives of the Academic communities in Marketing, Organisations, Engineering Design, and Operations Management, Sources: Krishnan and Ulrich (2001)

Thus, many researchers emphasise repeatedly the need to have cross-functional team integration for NPD success (Kono and Lynn, 2007; Luo et al., 2005; Song and Perry, 1997; Bernasco et al, 1999; Ulrich and Eppinger 2008). In contrast, Beverland (2005) indicates that the relationship between design and marketing has been observed as a difficult integration. Voss and Zomerdijk (2007) state that managing the conflict between design and business management is vital to increase the success rate within the experience economy.

1.2.3. Differences between designers and non-designers

Blaszcyk (2000) and Leonard and Rayport (1997) state that marketing provides a constant customer interface and ensures that design innovation delivers value that customers find appealing. In contrast, Von Stamm (2008) states that delivering design and sharing information about customers is problematic between the marketers and designer. According to Perk, Cooper and Jones (2005), design brings new perspectives to a meeting whereas marketers become frustrated with new approaches. Peters (1989) indicates the barrier between the two is that marketers tend to measure everything whereas designers have to translate their concerns into facts and figures; thus, it can lead to complicate the decision-making process.

Bruce and Cooper (1999) and Dickson et al. (1995) identify that many companies do not take advantage of design benefits. Walsh and Roy (1985) state that an organisation often neglects the understanding of design activity. Indeed, Mynott (2000) indicates that there is a lack of awareness in the managers of what good design can achieve. Norman (1998) states that many designs are completed by engineers, programmers, and managers. This is called 'silent design' (Gorb and Dumas, 1987) which means the completion of design activities is accomplished by non-designers or people who do not have design training and education. Also, the lack of financial resources may cause silent design. The UK Department of Trade and Innovation (2005) reports that where there is no dedicated team in an organisation to create and research into the user experience of customers; it has mostly been completed by non-designers. 'Silent Design' still exists.

Drew (2009) states that there are differences, and a gap, between quantitative oriented business people and qualitatively oriented emotional creatives. In 1990, Walker analysed the differences between managers and designers.

Characteristics	Managers	Designers
Aims	Long term Profits/ Returns Survival Growth Organisational durability	Short term Product/ Service quality Reform Prestige Career building
Focus	People Systems	Things Environments
Education	Accountancy Engineering Verbal Numerical	Crafts Art Visual Geometric
Thinking styles	Serialist Liner Analysis Problem oriented	Holist Lateral Synthesis Solution led
Behaviours	Pessimistic Adaptive	Optimistic Innovative
Culture	Conformity Cautious	Diversity Experimental

Table 1.3. Managers-Designers polarities, Source: Walker, 1990

Indeed, various researchers have identified the deeply embedded tribal hostilities and resentment amongst designers, engineers, and marketers also create tensions in a multifunctional team (Moultrie et al., 2007; Cooper, and Press, 1995, Moody, 1980). After a few decades of problems pointed out by Walker (1990), Beverland and Farrelly (2011) use ‘the assumptions underpinning frame’ to compare the differences between designers and marketers.

Function	Design	Marketing
Core Metaphor	Shape	Fit
Assumptions underpinning frame		
The environment is...	Mutable	Fixed
Change is...	Radical Constant An opportunity	Incremental Irregular Problematic
Knowledge is...	Intuited	Measurable
Time orientation	Future guides present	Past guides present

Table 1.4 The Assumptions underpinning the frames of designers and marketers, **Source:** adapted from Beverland and Farrelly, 2011

According to the empirical research by Beverland and Farrelly (2011), a similar problem has emerged that designers are not satisfied with marketers concerning the working relationship and communicating difficulties of design in an NPD team. The differences and gaps between the two parties have not been resolved and have been stereotyped prior to working together (Beverland and Farrelly, 2011). Scollon and Scollon (2001) state stereotyping causes a reduction in people's views of the entire picture, in limiting understanding of human behaviour and of intercultural discourse. According to Scollon and Scollon (2001), it also provides a limited view of people and groups to justify biased or unfair treatment by others who hold stronger political power. Thus, Hakatie and Ryyänen (2007) indicate that only a few companies have taken advantage of industrial design to develop a distinct field of competence within their organisations. Therefore, many researchers have identified the difference between designers and marketers in the past few decades (Walker, 1990; Clark and Smith, 2008; Drew, 2009; Beverland and Farrelly, 2011).

However, Beverland (2005) identifies from a business perspective the recognition that designers and marketers need to integrate with other business functions. Jevnaker (2000) suggests considering design as part of a multidisciplinary team. Trueman and Jobbler (1998) indicate that design is more than a functional activity used by marketing, and design is linked to marketing in three different ways: enhancing good quality of service and product development; reducing time to market; and strategically building a brand. Kotler and Rath (1984) recommend using design as a strategic marketing tool to make an organisation stand out from its competitors; thus, it is suggested general managers, marketers, salespeople and engineers need to understand design.

According to Bruce and Cooper (1997), perception, attitudes, process, and skills are necessary for both parties. Walker (1990) claims that one person cannot have all the abilities of a designer and a marketer. Thus, researchers recommend integration of design into a firm is a competitive necessity (Joziassé, 2000; Sounder, 1998; Ulrich and Eppinger, 2004).

Jevnaker (2000) recommends leveraging design needs product champions, resources, constructive relationships between design and other business functions, communication, strategic input, and design-based culture. Kotler and Rath (1984) propose designers should be

aware of and understand the function of people in other business units. Perk, Cooper, and Jones (2005) suggest investing in requiring a designer to learn and experience other disciplines; in particular, to gain a broad knowledge of business. This has been a common recommendation since the 1970s (Topalian, 2002). Fraser (2006) recommends that design must be translated into an accessible and doable programme before design impacts on human and economic value to its maximum potential. According to Perk, Cooper and Jones (2005), designers are required to have a clear job description, observation, research and business analysis skills plus internal marketing skills such as persuasion, motivation, and relationship management. Therefore, many researchers have proposed, for decades, that designers have to become more conversant in the ideas and language of business (Clark and Smith 2008; Von Stamm, 2008).

1.3. Theories of Communication

Originally, the word ‘communication’ was derived from the Latin word "communis" meaning to share; however, communication can be exchanged not only from a person to another or a group, but also amongst animals, plants and microorganisms such as bacteria. The Oxford Dictionary (2014) defines communication as the exchange of information by speaking, writing and using some other mediums such as a letter, news containing information, and devices to send or receive information such as telephone lines or computers. Its definition includes the field of study concerned with the transmission of information. It also means “travelling or transporting goods, such as roads or railways”.

From researchers’ perspectives, Shannon and Weaver (1949) define communication as transmitting information to a receiver through the transmission stage. It explains that human communication can be interfered with by its environment or the receiver’s misunderstanding of the sender’s intention if both share uncommon information or purpose. Schramm (1954) defines it as a two-way exchange of messages receiving feedback which is the notion of a “field of experience,” or the psychological frame of reference. According to Schramm (1954), the sender’s experience needs to be decoded properly by the receiver because the message may have different meanings, depending upon the specific context or setting. However, Berko (1977) indicates that communication can be conscious or unconscious and an

intentional or unintentional process, to express thoughts and emotions verbally or nonverbally from one person to another. Thus, Barnlund (1970) defines communication by the Transactional Model in which both communicating participants simultaneously exchange the act of encoding as a sender and the decoding of messages as a receiver.

According to Theodorson and Theodorson (1969), it is defined as a process of transformation of information, ideas, attitudes or emotions from either one person to another or one group to another through symbols. Burgoon and Ruffner (1978) echo this definition as successful communication can be conducted through shared symbols between a sender and a receiver because information from the sender stimulates the mind of the receiver. According to Cobley (2001), communication is a form of semiotics that exchanges information in the form of a molecular code and the immunological properties of cells to vocal sentences; and, the outcome of message is meaning. Indeed, meaning is a combinative form of signs which is referred to as culture (Berger, 1991; Kendall and Wickham, 2001).

The National Communication Association (2014) defines communication as focusing on “how people use messages to generate meanings within and across various contexts, cultures, channels and media”. Carey (1989) defines it as the representation of the shared beliefs of the participants which extend to the maintenance of society in time. According to Foucault (1997; 1999), language is other forms of communicating acts by using the term discourse as the vehicle of social process. Scollon and Scollon (2001) state that the meaning of a person’s speech is based on the way the discourse system is interpreted within a particular culture. Kendall and Wickham (2001) explain that culture is one of the areas that influence the way people go about in the world and vice versa. Thompson, (2011) states that communication connects people with shared ideas, assumptions, beliefs, values and unwritten rules; thus, communication can be a social interaction through messages and relates to the concept of interaction; communication enables an individual to relate to other human beings (Garbner, 1967).

For the purpose of this research, the definition of communication is taken from Marsen (2006) who provides five definitions which explain what communication is involved in: ‘Social interaction through message’ (Fiske, 1990), a process of creating and sharing information by participants to reach a mutual understanding (Rogers, 1995), an activity of not merely transmitting the symbolic content between people, but interacted within in a shared

situation or discursive context (Price et al., 1997), “a process whereby people in groups, using the tools provided by their culture, create collective representations of reality” (Trenholm, 1999) and “a process in which there is some predictable relation between the message transmitted and the message received” (Graber, 2003).

1.3.1. Structure of communication

Berlo (1960) identifies the elements involved in communication by introducing the Sender-Message-Channel-Receiver (SMCR) model based on an adaption of the Shannon-Weaver model. While this model is built on a linear communication model without the element of feedback and noise as a message transmission barrier, this model identifies specific controlling factors for communication: source, message, channel and receiver. Channel is a means of communication such as speech, written language or using devices such as drums and smoke signals. Light and electronic communication includes all electromagnetic methods of representing and transmitting information (Lafrance, 1990).

The methods of message sending are verbal and non-verbal. Verbal communication is about language and listening. It consists of oral and non-oral parts. Vocal is an auditory channel which delivers speech (Devito, 1998). The areas of verbal communication are phonology, semantics, language and pragmatics. The non-oral part is written and sign language. Vocal behaviour in verbal and nonverbal communication includes all speaking activities such as language, tone of voice, rate of speech and accent and so on (Laver and Hutcheson, 1972). These features belong to the term “paralanguage” that can add additional meaning to what is actually spoken (Thompson, 2003). Adler and Roadman (2000) explain language is used among people through an agreed and rule-governed system of collective symbols to share meaning, not simply words.

According to the works of Austin (1955) and Searle (1969) regarding a more pragmatic approach to the notion of language based on “speech act theory”, they indicate that different forms of language generate different functions. According to this theory, some utterances can be explanations of an action and actually generate actions in their own right. Certain utterances are referred to as actions of behaviour and other utterances can be more than simply descriptions of meaning (ibid). Thompson (2011) states that speech act theory can be supportive, minimising miscommunication effectively and appropriately; additionally, Adler

and Rodman (2000) stated that communication is relational. Thus, communication is a process that makes common to two or several what was dominated by one or some (Gode, 1959).

Nonverbal communication is expressed communication via non-linguistic means (Adler and Roadman, 2000); it is bodily movement to accompany speech and meaning to interact with others (Thompson, 2003). As with paralanguage, components of nonverbal communication are gestures, movement, appearance, facial expression and so on (Stewart and D'Angleo, 1980/ 1993). Fiske (1990) states that non-verbal communication is partly cultural and personal; Sternglanz and Depaulo (2004) indicate that people in close relationships can read the nonverbal communication of emotion more easily from their partners than from those who are not close.

The role of nonverbal communication has been acknowledged in various professional practices (Hargie and Dickson, 2003) such as management (Hargie et al., 1999), education (Miller, 2000), nursing (Caris-Verhallen et al., 1999), law (Brodsky et al., 1999) and medicine (Roseblum et al., 1994). Research by Mehrabian (1972) analysed overall communication as being composed of body language (55%), paralanguage (the nonverbal aspect of speech) (39%) and verbal (7%). Another research found words shape less than 10% of communication whereas body language offers more than 50% (Straker, 2008). Burgoon et al. (1996) indicate that the favourite way of conveying a message nonverbally is a reliance on visual cues.

Therefore, for the purpose of this research, the structure of human communication can be taken as consisting of verbal and non-verbal elements which influence the success of communication between message senders and receivers. These elements can be applied in different contexts.

1.3.2. NPD communication during the FFE stage

Numerous researchers recommend that the early stage of NPD can be efficient and effective by developing and sharing a strong vision of the product concept across the organisation (Clark and Fujimoto, 1990; Nonaka, 1991; Dumas, 1994). This early period is often referred to as the 'fuzzy front end' (Smith and Reinertsen, 1991). According to von Krogh and Roos

(1996), communication management in NPD is a non-linear approach to sharing meanings, facilitating conversation and creating a lexicon. Within an NPD team, there are various types of communication methods. The experience of communicating can be divided into categories of intrapersonal, interpersonal, group and mass communication. According to Brooks and Heath (1993), interpersonal communication is the process of sharing information, meanings and feelings by people through the exchange of verbal and nonverbal messages and it can be conducted by face-to face or mediated conversations, interviews, and small group discussions.

Group communication means communication within groups of people. The characteristics and size of groups depend on different contexts. A group is a vital part of people's life spans (Heath and Bryant, 2000). Berry (2007) defines that a group is to provide companionship, support, and even a sense of identity, as well as helping us to perform people's jobs effectively. Hirokawa, Cathcart, Samovar and Henman (2003) identify the nature of a group: number, purpose, interdependence, perceptual boundary, and interaction. Numerous researchers recommend that communication is a means of discussion and a decision making process in a group and, most importantly, influences the group decision making performance (Gouran and Hirokawa, 1983; Hackman and Morris, 1975; Janis and Mann, 1977; Hirokawa, 1982). Bamlund (1959) states open discussion in a group is important for decision making. The effective centralisation of information helps people to arrive at high-quality decision making (Leavitt, 1951). Thus, it provides an opportunity to persuade and to convince the group members to accept available information and to arrive at an agreed choice (Riecken, 1958; Shaw and Penrod, 1962).

According to Pinto and Pinto (1990), a project team that has frequent meetings achieves better results; in particular, having informal communication to build trust is a key. It is suggested that mixing informal and formal methods for communication in a face to face team meeting and informal conversation after a meeting are the most effective methods. According to Allen (1970) formal communication involves written communication such as technical reports, memos, letters and communication that occur during scheduled meetings or appointments whereas informal communication means oral communication that occur over the telephone or in unplanned discussions. Larson and Gray (2011) suggest informal conversations between team members often generate for efficient team building. Thus, effective communication is identified as highly critical to an NPD team because miscommunication is linked to NPD and its failure (Souder, 1981).

Pearson et al. (1993) recommend effective and efficient communication requires sharing essential information. According to Moenaert et al. (2000), efficient communication can result in the lowest cost possible for maximum communication effect. Thus, Fentem et al. (1998) recommend that the project vision is constructed through a cross-functional dialogue around general values and its communicated dialogue leads to the product. This shared product vision coherently coordinates the different characteristics of the final product and acts as a platform to draw new ideas into the organisation.

Furthermore, Chiu (2002) proposes that, due to existing diverse cultures in the team, it is necessary for NPD members to spend time team building. Project team socialisation and team building at an early stage are important for a project's success (Pinto and Pinto, 1990). According to Straker (2008), emotion has been identified as the most powerful trigger for motivation which influences understanding and decision making. Emotion connects with the senses (Coren et al., 2003, Dunn, 2008); it supports building a rapport between communicators. Cialdini (2008) recommends that people collaborate more willingly with similar people who treat others as they would like to be treated. Thus, sharing knowledge and vision within the team is effective (Fentem et al, 1998). Conger (2008) suggests that a successful communication process consists of establishing credibility, framing common areas, providing vivid proof, and associating emotions. Ebadi and Utterback (1984) suggest that frequent communication is suggested to improve project success rate. Recently, due to the globalisation trend, web-based information technology and a virtual environment are recommended as communication tools (Schmidt, Montoya-Weiss, Massey, 2001). However, Brentani and Kleinschmidt (2004) indicate that lower social and internal team satisfaction are identified. Although NPD team members accomplish a successful NPD, they do not want to be involved virtually in future NPD projects.

Therefore, for the purpose of this research, a working definition of NPD team communication can be taken as *complex processes which need participative and frequent informal conversations by the right choice of communication channels among team members in order to build team rapport and to share project vision and knowledge.*

1.3.3. Communicating design and previous recommendations

According to Chiu (2002), “design communication is central to design development in the process” because its effectiveness influences designers to share information, make decisions and coordinate design tasks. Best (2010) states that design communication is to present the final design solution experientially, aesthetically, visually and functionally. Dumas and Fentem (1998) recommend using methods of delivering design such as the product strategy map, a visual mood board termed as “Totemics”, storyboards, or animated simulations. These are common methods for designers to present their design ideas and concepts.

In contrast, Borja de Mozota (2006) proposes delivering design values by applying feasible information to the Balanced Score Card (BSC), which is used commonly in marketing. BSC consists of four perspectives which need to be filled with design attributes to explain the design-led NPD approach. Customer perspective (design as differentiator) is how an organisation appears, through design, to its customers in order to achieve its vision. Process perspective (design as a coordinator) is to satisfy an organisation’s stakeholders through innovation, R&D, modular architecture, time to market and technology. Learning perspective (design as a transformer) is how an organisation can sustain itself through design to change and improve. Lastly, finance perspective (design as good business) is how to succeed financially, that is, meeting financial and accounting value, return of investment, value for society, and stock market value. This conceptual framework endeavours to facilitate the convergence of design and management. Thus, Borja de Mozota (2006) suggests that designers should speak in the language of non-design.

Beverland and Farrelly (2011) recommend using the method of ‘persona’, which is largely used by designers. It is a method of identifying target users by creating a representative person’s lifestyle and preferences for the new project. According to Beverland and Farrelly (2011), using persona to describe the lifestyle of the target market (segmentation) to the product category allows marketers to realise what they had not thought of before and to try to share their understanding. Thus, Topalian (2010) states the most common recommendation is to illustrate real life situations in detail to non-designers via vivid imagery; however, the design delivery success is still ultimately up to the ability of design professionals.

1.3.4. Good design communicators and previous academic research

Topalian (2010) indicates the most competent design practitioners have participated in analysing clients' business problems in order to solve design problems since the 1970s (Topalian, 2010). According to Topalian (2002), good design communicators have been considered as design leaders. The term leadership does not have one universal definition (Avery, 2004; Bass, 1990; Stogdill, 1948). However, many researchers indicate that regardless of the different perspectives of leadership, it has been generally conceived as one person's action in leading a group of people to achieve a goal or as the state of being a leader (Avery, 2004; Gill, 2006; Kakabadse and Kakabadse, 1999; Vroom and Jago, 2007). Jago (1982) identifies leaders generally as having process ability and influential characteristics. They apply their leadership knowledge and skills to carry out a process and their traits to influence others' actions. Also, Nelson (2003) proposes that people in effective design communication rather than in roles of authority have been considered as having distinguished design leadership qualities.

Designers in the leadership role have been identified as being able to deliver design to non-designers comprehensively (Cheung et al, 2001; Borja de Mozota, 2003). Hands (2009) states that leadership by design can drive innovation internally and externally with business partners. Simultaneously, design leadership behaviour helps organisations to envision the future and to ensure design is used to make those visions come true while design management delivers successful design solutions in an efficient and cost effective way (Turner, 2000; 2013). Much research has identified that envisioning a business's objectives turning into reality or intangible experience is a designer's principle activity (Best, 2006; Gloppen, 2009a; McCullagh, 2008; Borja de Mozota, 2003, Topalian 1990, and Turner, 2013). Roald (2006) proposes that design leaders improvise to achieve a synthesis between vision and reality. Design leaders energise knowledge processes and innovation by clearly articulating competitive reality, company values and vision or intent (Reinmoeller 2002).

On the other hand, Perk, Cooper, and Jones (2005) indicate that it is difficult to find a designer who wishes to become an NPD leader and has business experience because designers usually tend to remain traditional style designers. This may cause non-designers to be in decision making positions. Also, it has been identified that designers might not gain sufficient confidence in business circles (Eckersley, 2003; Friedman, 2004). NextDesign

Leadership Institute (2003) advocates a changing paradigm in design where designers need to be prepared to take on larger strategic responsibilities. Thus, Van Patter (2003) warns the design community that it will end up as “a field of labourers”.

From a research perspective, delivering design has been a particular interest area of research. DESMA (2012) - an Initial Training Network in the area of Design Management funded by the European Commission's Marie Curie Actions (FP7) - researches developing methodologies and research methods and clarifying what the design perspective entails in the context of management. Since 2000, the Design Management institute (DMI) has paid particular attention to the words ‘design leadership’; thus, a conference was held with the title ‘Leadership by Design’ in 2004 and also with the title ‘Collective Design’ in 2012 about how good design leaders communicate to achieve business and design success, at Helsinki, Finland. At the conference, conference presenters mostly focused on presenting case studies from practices regarding how designers applied design and design thinking aesthetically, emotionally and creatively to various NPDs in different sectors such as consumer electronics, customer home, furniture, healthcare, sport goods and website design. Thus, non-design stakeholders’ stereotypical perspectives considering design as visual or added on elements for NPD were challenged. However, rigorous academic research is sparse. Thus, Cooper, Junginger and Lockwood (2011) state leadership is “a relatively new research topic in design management”.

According to Friedman (2004), a substantial amount of design research has focused on how to quantify the effects of applying design early and throughout a product development process. A few pioneering researches within the topic of design leadership have addressed the definition and duties of design leadership based on top design-led companies (Lockwood, 2009; 2011), expected leadership principles of design managers from designers in Taiwan (Lee and Cassidy, 2006), design thinking, management, and leadership requirements for service industries in Europe (Gloppen, 2009), skill set of design leaders in the fashion industry (Miller and Moultrie, 2013) and relationship between a design team leader's behaviour and design team members' satisfaction in construction projects (Cheung, et al., 2001). However, it is rare to find studies about the profile of the design leader who is able to communicate appropriately regarding communicating design to non-designers, in particular at the level of NPD.

1.4. Problem Statement, Research questions

The chapter was initiated by reviewing the relationship between design and its importance to NPD success, in particular at the early stage where much information, the needs of customers and a new product definition are fuzzy and unclear. With the recognition that the role of designers can vary based on the understanding of design and NPD purpose in different sectors. In order to increase the success rate of NPD, using CFC teams is recommended because CFC teams react fast to unstable market conditions and market demands. In NPD projects, a problematic relationship between designers and non-designers has often been observed over many decades. Not only in relation to their different styles of thinking, working attitudes and preferences, and culture, but also as to misunderstandings of design, a lack of design resources, improper design decisions by non-designers and a lack of clarity in design delivery leading to ineffective use of design. Thus, many problems of sharing NPD vision, information and communication at FFE between the designer and non-designer are featured in the work of leading researchers. Based on reviews of models and theories of communication, research on FFE communication and recommendations on design communication methods, designers often face difficulty of communicating design to non-designers. Anecdotally, a designer, that is good at communicating design, is considered a design leader who can clearly analyse business context and present design concepts to the non-designer team members, particularly marketers. However, many designers prefer to remain in the role of visual and aesthetical presenter, rather than in the role of design leader position. There is little information and research about the profile of the design leader, who can communicate design to non-designers at the level of NPD. In order to avoid unfounded generalisations and anecdotal perspectives and also provide insight into a significant, but has not systematically explored area, this research aims to explore systematically the profile of a design leader, particularly during the early stages (FFE) of NPD. It specifically focuses on the designer aspect of communicating design within FFE during NPD where an organisation decides on NPD to go to the next development stages. Therefore, the key research question is:

What kind of leadership model is most effective for design leaders to communicate design to non-designers at the FFE stages of NPD?

And following sub-questions are:

- What kinds of characteristics do design leaders have?
- What kinds of leadership do design leaders practice in the NPD context?
- How do designers progress to become design leaders?
- What is the role of design communication from the perspective of design leaders during the FFE of NPD?
- How do design leaders communicate design to non-designers during the FFE of NPD?
- How can design leaders help designers to improve design communication abilities within the NPD context?

1.5. Aim and Objectives

This research aims to **investigate and develop a conceptual model of design leadership that illustrates the characteristics of design leaders and how they communicate design to non-designers at the FFE of NPD.**

The objectives are:

Objective 1: To investigate existing theories and models of leadership studies and communication from the leadership perspective

Objective 2: To identify design leaders' characteristics and leadership styles at the FFE of NPD

Objective 3: To investigate how design leaders successfully communicate design to non-designers at the FFE of NPD

Objective 4: To explore how design leaders became design leaders and how they learned to communicate design with non-designers at the FFE of NPD

Objective 5: To analyse similarities and differences in the characteristics and behaviours regarding leadership and communicating design between design leaders and designers

Objective 6: To illustrate a conceptual design leadership model that visualises the relationship between the leadership attributes of design leaders and their communication process for design and NPD issues to non-designers at the FFE of NPD

Objective 7: To evaluate and revise the conceptual model according to feedback

1.6. Research Contributions

This research aims to provide two key contributions:

- 1. A conceptual leadership model of a design leader, communicating design to non-designers in at the FFE of NPD.** This research proposes the conceptual model of leadership that design leaders communicate design to non-designers at the FFE of NPD. At the early stages of the project level, this explains design leaders' leadership styles, working attitude, and certain communication techniques and processes as a means/method to build a rapport with non-designers – not only to gain the clear understanding of NPD problem and its context, but also to encourage and help non-designers to understand how design can be positively applied in NPD. Thus, this conceptual model answers the above research questions.
- 2. Research within the specific context where designers and non-designers work for a NPD project at the Fuzzy Front End stage.** In order to formulate a conceptual model, it aims to conduct researches into the early stages of the NPD process - in particular, where the process involves designers and non-designers. Most of previous design leadership research studies focused on how design positively effects on business performance. Other researchers attempted to identify roles, expectations, and skill sets of design leaders. This research was systematically conducted from the perspective of the qualitative research in leadership studies. It empirically studied how

designers communicated with non-designers at the FFE of NPD and how designers had difficulties in communicating. It also compared differences and similarities between design leaders and designers. As Turner (2013) indicated, educating design leaders is an untouched area in practices, so potential beneficiaries of this research (i.e. design students and design educators) helped to identify gaps between recommendations from design leaders and academia. Moreover, the researcher suggests that this new conceptual model can be employed for 1) designers and design students who wish to become design leaders, 2) design educators who can integrate this model in curriculums such as communicating design, design leadership, or group projects, and 3) organisations which need to train designers to have better communication ability or build a better business relationship with other non-designers and clients. Thus, this study recommends what designers should practice to become design leaders at the project level.

1.7. Structure of the thesis

The thesis consists of eight chapters as shown below. The content of each chapter is:

- 1) **Introduction:** This chapter presents an overview of the research context including definitions of design, NPD, FFE, designer and communication. It also identifies key problems and states the purpose of this research, research question, aim and objectives.
- 2) **Literature Review:** This chapter explores leadership studies, design leadership, project leadership and communication from the leadership perspective. It synthesises reviewed subjects for the primary research criteria.
- 3) **Research Methods:** This chapter provides the plan of the primary research. It describes the criteria of the research tools, research samples and how all primary research is conducted. It also explains the methods employed to analyse findings.
- 4) **Pilot Study:** This chapter presents the result of the pilot research with designers and non-designers. The triangulated data is analysed and discussed in order to identify what designers facecommunicating difficulty of design. Also, it summarises the requirement for the conceptual model.

- 5) **Main Study:** This chapter presents the results of semi-structured interviews with design leaders. The data is analysed and discussed in order to answer the research question and objectives.
- 6) **Discussion and Model formulation:** this chapter compares and analyses findings of two studies from groups of designers and design leaders. It explains the formulation process, the relationship of key elements, the conceptual model and its implementation.
- 7) **Evaluation:** This chapter presents the evaluation methods, criteria, process and results regarding the conceptual model. The modified conceptual model is presented.
- 8) **Conclusion and Recommendations:** This chapter provides the summary of each chapter, key findings and outcomes, the usage of the conceptual model, research contributions, limitations of this research and recommendation for further researches.

Chapter 2 Literature Review

This chapter discusses the review of research in the field of leadership studies. It addresses research objective one ‘To investigate existing theories and models of leadership studies and communication from the leadership perspective’. This chapter consists of four parts. Firstly, in order to identify the key characteristics of design leaders, section 2.1 reviews the overview of leadership studies including theories about traits, styles, situations, theory based leadership assessments, and current leadership studies. Secondly, section 2.2 reviews project leadership. Thirdly, section 2.3 reviews communication assessment methods and related researches for leadership. Lastly, section 2.4 reviews the literature on design leadership and provides the working definition of design leadership. Section 2.5 presents a summary of the chapter. Throughout reviewing these areas, a specific context of leadership, of the designer at the Fuzzy Front End (FFE) of New Product Development (NPD), can be drawn. Thus, findings provide the preliminary answers to research objective one. As a result, the conclusion is extracted and directions for the primary research are proposed.

2.1. Leadership Studies

In order to define design leadership, it is essential to understand the definition of leadership first. The Oxford dictionary (2005) defines the term ‘leadership’ as a mass noun which is “the action of leading a group or an organization, or the ability and state or position of being a leader”. Leadership has been a vastly popular and emphasized topic since the ancient writers such as Aristotle, Confucius, Sun Tsu, Socrates, and Plato (Gill, 2006; Kakabadse and Kakabadse, 1999). However, numerous researchers have not agreed on a definition because every person defines it differently (Avery, 2004; Bass, 1990; Stogdill, 1948). According to Gill (2006), leadership has been differently defined by traits, process skills, competency, relationships and constructs. Thus, Bass (1990) has identified more than fifteen hundred definitions of leadership. Yet, many researchers have agreed that definitions of leadership have a few elements in common that are from the perspective of influencing others and having one or more followers (Avery, 2004; Gill, 2006; Kakabadse and Kakabadse, 1999; Vroom and Jago, 2007).

Furthermore, Bennis and Nanus (1985) identified a genuine confusion between leadership and management, stating “Managers are people who do the thing right; leaders are people who do the right thing”. Mintzberg (1994) defines leadership as “the pivotal role of managers”. Covey (1992) explains, based on the brain dominance theory, that a manager’s role mainly requires left-brain activity such as language, logic, analysis, and sequential thinking. In contrast, a leader’s role mostly needs more right-brain activity such as emotion, aesthetics, pictures, relating elements and synthesis, intuitive, simultaneous, and holistic thinking (Covey, 1992). The Work Foundation in the UK (2001) simply explains the difference between management and leadership as “Managers plan, allocate resources, administer, and control, whereas leaders innovate, communicate, and motivate” (Cited in Gill, 2006). Kotter (1979/2001) also explains the difference between leadership and management “What a leader really does is preparing organizations for change and helping them cope as they struggle through it. Management is about coping with complexity. Leadership, by contrast is about coping with change”. However, management and leadership are unlike but also complementary: one function cannot survive without the other in a complex and unstable business environment (Kotter, 1979).

According to the America Management Association (1994), there are five major factors for business success based on the change-survey of 259 senior executives in *Fortune* 500. Leadership is the top rank (92%). After that, corporate value 84%, communication 75%, teambuilding 69%, and education and training 64% follow which are critical factors for leaders to have as the current and emerging literature has dictated (cited in Gill, 2006). Thus, leadership is a key element of success as well as creating and sharing the vision. Kotter (1979) recommends that what the leader needs to do for survival is provide an organization’s vision and strategy, leading followers into the same direction, motivating and inspiring by satisfying basic human needs, and rewarding and empowering lower level managers.

According to Deetz (2000), vision is identified as one particular element which differentiates a manager and a leader. Gill (2006) states that leadership has evolved throughout history; from the industrial age to the information age, and now to the knowledge age, it will continue to evolve in to the age of understanding. Various researchers have suggested that creating and communicating vision needs to be translated into reality (Peters, 1989; Zaccaro and Banks, 2001 in Gill, 2006). If the vision is not translated, employees do not know the purpose of the company and will give different answers (Covey, 1992; Skapinker, 2002). Thus, it is

critically important for a leader to have good communication tools for internal staff and external stakeholders.

Therefore, regardless of a commonly agreed definition, leadership is one of the most important factors for organizational success (Cacioppe, 1998; Kanter, 1993; Kotter, 1990; Gill, 2006; Taj et al, 2010; Vroom and Jago, 2007). The following review explores different perspectives of leadership studies so that it can withdraw suitable research criteria of design leaders and their communication abilities at the FFE of NPD for primary research stages.

2.1.1. Trait, Classical, and Heroic styles

According to Carlyle (1907), ‘the history of the world was the biography of great men’. Galton (1869) defines that leadership is the unique property of extraordinary people and their traits cannot be developed, and their behaviour has also changed the stream of history. Carlyle (1907) indicates that the trait approach regarding leadership theory is the oldest and is known as ‘great man’ theories. Its hypothesis presumes that major events in the world’s history have been led by the upper class that inherited extraordinary leadership qualities (Gill, 2006; Kirkpatrick and Locke, 1991).

Oxford dictionary (2013) defines ‘trait’ as “a distinguishing quality or characteristic, typically one belonging to a person”. In addition, it defines personality as “the combination of characteristics or qualities that form an individual’s distinctive character” (ibid). Thus, both terms have a similar meaning as characteristically forming an individual uniqueness. Allport (1963) defines trait as a “neuropsychic structure having the capacity to render many stimuli functionally equivalent, and to initiate and guide equivalent (meaningfully consistent) forms of adaptive and expressive behaviour.” Jackson (1973) defines personality as a “unique combination of traits characterizing people, particularly leadership”. It distinguishes them and influences their interaction with their environment (ibid). According to Zaccaro, Kemp and Bader (2004), the term trait is ambiguous and confused in the literature, referring differently to personality, temperaments, dispositions, abilities and personal enduring qualities including physical and demographic attributes. Thus, the terms personality, characteristics, and traits are used interchangeably throughout this thesis.

According to Northouse (2010), some personal qualities are applied to identify leaders by unique physical features as height, personality features as extroversion and other characteristics like intelligence. Collingwood (2001) indicates that a leader's personality affects their ability to engage in actual leadership. Cowley (1931) states trait theory links to the trait theory of leadership which depends on personal qualities since many leadership studies have been through trait studies. Therefore, numerous researchers acknowledge that there is a relationship between leadership and traits; thus, they have researched to identify leaders throughout the lens of traits (Bass, 1990; Bennis and Nanua, 1985; Jago, 1982; Stodgill, 1974; Zaccaro, 2007; Zaleznik, 2004/1977).

Zaccaro, Kemp and Bader (2004) analyse key traits for effective leaders which have been identified by researchers from the trait approaches such as Stogdill (1948, 1974), Mann (1959), Lord, Devader and Alliger (1986) and Kirkpatrick and Locke (1991). Northouse (2010) synthesizes the most common leadership traits from others' trait leadership researches such as intelligence, integrity, self-confidence, sociability and determination. Judge, Ilies, Bono and Gerhardt (2002) examine the significant relationship between personality traits and leadership based on a five-factor model which consists of neuroticism, extroversion (surgency), openness (intellect), agreeableness, and conscientiousness (dependability). Previous meta-analysis was only carried out by Lord, De Vader, and Alliger (1996). However, their research was limited by using Mann's (1995) review of small groups. Judge et al analysed by using a five-factor model through 222 correlations from 73 samples. Based on the meta-analysis of qualitative and quantitative reviews about trait perspectives in leadership researches (2002), self-confidence is only one similar trait from the various researchers' perspectives.

Daft (1999)	Stogdill (1948)	R. Hogan et al. (1994)	House & Aditya (1997)	Mann (1959)
Alertness Originality, creativity Personal integrity Self-confidence	Dependability Sociability Initiative Self-confidence Alertness Cooperativeness Adaptability	Surgency Agreeableness Conscientiousness Emotional stability	Achievement motivation Pro social influence motivation, Adjustment Self-confidence	Adjustment Extroversion Dominance Masculinity conservatism
Northouse (1997)	Bass (1990)	Yukl (1998)	Kirkpatrick & Locke (1991)	Yukl & Van Fleet (1992)
Self – confidence Determination Integrity Sociability	Adjustment Adaptability Aggressiveness Alertness Ascendance, dominance Emotional balance, control Independence, nonconformity Originality, creativity Integrity Self-confidence	Energy level & stress tolerance Self-confidence Internal locus of control Emotional maturity Personality integrity Socialized power motivation Achievement orientation Low need for affiliation	Drive (achievement, ambition, energy, tenacity, initiative) Honesty/integrity Self-confidence (emotional stability)	Emotional maturity Integrity Self-confidence High energy level Stress tolerance

Table 2.1. Past Qualitative reviews of the Traits of Effective or Emergent leaders, Adapted from Judge, Ilies, Bono, & Gerhardt 2002

Significant findings from their meta-analysis are categorized by leadership emergence (who become a leader) and effectiveness (how leaders perform). Three traits, Extroversion (.31), Conscientiousness (.28) and Openness to Experience (.24) are the strongest and most consistent correlates of leadership. Firstly, Extroversion is related to dominance and Sociability, more highly related to leadership emergence than it was to leader effectiveness. Conscientiousness has been considered as achievement and dependability (Bass, 1990), initiative and persistence (Kirkpatrick and Locke, 1991), overall job performance and leader effectiveness (Barrick & Mount, 1991), and related to having more tenacity and persistence (Goldberg, 1990). However, Conscientiousness (.28) is identified as the second strongest correlation with leadership and related more to leader emergence than to leader effectiveness. Thirdly, Openness to Experience (.24) is related to originality, divergent thinking, and creativity which is linked to effective leadership in researches (Sosik, Kahai and Avolio, 1998; Feist, 1998; McCrae and Costa, 1997). Creativity is highly important yet is the least

understood trait (McCrae, 1996). Openness to Experience is also related to leadership emergence. Unlike these high level of traits, Neuroticism (-.24) is the only low level trait which is related to emotional stability and the low level is related to leadership emergence and effectiveness. Lastly, Agreeableness (.08) is related to being trusted, caring, and gentle. Bass (1990) indicates that this trait is needed but the stronger it is, the weaker the leadership tendency is. Being agreeable and nice are not necessary but are also not negatively correlated.

However, according to Judge et al (2002), it claims that predicting leadership by traits in different settings such as government, military, and business is consistent. Extroversion is the most consistent and is more related to leadership emergence than leadership effectiveness (Judge et al, 2002). Indeed, numerous researchers state that there are more researches about universal traits but any trait's effect on leadership behaviour will depend on the situation (Hugh et al., 1998; Yukl and Van fleet, 1992). Zaccaro (2004) proposes a conceptual model of leader attributes and leader performance which is influenced by the leader's operating environment. Thus, expertise, particular skills, and tacit knowledge are dependent on situational performance requirement (Yukl, 2006; Zaccaro, 2007).

Lastly, emotional intelligence (EQ) is the trait that has been analysed as an important leadership trait since the 1990s (Caruso and Wolfe, 2004; Goleman, 1995, 1998; Mayer and Salovey, 1995, 1997; Mayer, Salovey and Caruso, 2000; 2004). Mayer, Salovey and Caruso (2000) describe emotional intelligence as having two parts: emotions are about people's affection, whereas thinking and intelligence is concerned with peoples' ability to learn information and apply it to life tasks. Thus, emotional intelligence is the ability to perceive and express emotion, to think, understand and reason by using emotions, and to effectively manage emotions for themselves or relationships with others. Mayer, Salovey and Caruso (2002) also provide a test to measure emotional intelligence, termed as the Mayer-Salovey-Caruso Emotional Intelligence Test, which consists of 141 items, and examines the abilities to perceive, facilitate, understand, and manage emotions.

Moreover, Goleman (1995, 1998) recommended that EQ vitally influences people to be successful at school, home and work. EQ (Goleman, 1998) consists of

- Self-awareness- the ability to recognize and understand one's own moods, emotions, and drives, as well as leaders' impacts on others by using their gut feelings.
- Self-regulation- the ability to control and to redirect disruptive impulses and moods

and also to adapt to change circumstances.

- Motivation- an energetic and persistent passion for achievement based on reasons more than money or status.
- Empathy- the ability to understand other peoples' emotion and to treat them accordingly based on their emotional reactions.
- Social skill- the ability to manage and build relationships and rapport with others and also influence others to move and behave in a desired direction.

The following section explores the methods of trait leadership assessments. In order to identify leadership traits, personality regarding organizational and leadership studies has been defined by various methods (Hautala, 2005). For instance, the five-factor model (FFM) by the California Psychological Inventory, CPI by the Cattell's 16 personality factor questionnaire (16PF), Myers-Briggs type indicator (MBTI) and Fundamental Interpersonal Relations Orientation-Behaviour (FIRO-B) by Schutz (1958). According to Tuner and Müller (2006), psychometric instruments are frequently used to recruit managers and executives through analysing their personality and behaviours. Some researchers use more than two methods to obtain the data.

2.1.1.1. Fundamental Interpersonal Relations Orientation-Behaviour (FIRO-B)

First of all, FIRO-B was developed by Schultz (1958). It is an assessment regarding interpersonal behaviour. This method examines how people react with each other, particularly three types of work behaviour such as inclusion, control and openness (Schutz, 1978, 1992).

- **Inclusion** denotes social skills. It decides the degree of associating level of contact with other people, a particular group, or spending time alone.
- **Control** is leading behaviour. This gauges how much control one wants to exert over people or to receive control by others.
- **Openness** (previously **Affection**) is the attitude of openness in relationships. It measures positive and negative emotional aspects of relationships with people. Whether one wants to share personal feelings and emotions or whether a person wants to keep things impersonal and business-like.

According to the theory, the dimensions listed are fundamental to all social organisms, individuals, small groups or organizations. FIRO-B measures three dimensions from two perspectives with a 54 item scale and each question is completed on a six-point response scale (Schutz, 1978):

- **Expressed behaviour:** is that which a person feels most comfortable showing.
- **Wanted behaviour:** is which a person wants to be shown by others.

The benefit of FIRO-B is to examine relationship styles whereas others focus on personality (Schutz, 1978). Over the past fifty years, Schutz has expanded the FIRO-B assessment and developed additional instruments (Schutz, 1992, 1994). It measure new aspects of the theory including feelings, self, work relations, close relations, parental relationships, and organizational climate (Thompson, 2000). FIRO theory focuses on three major levels: behaviours, feelings, and self-concept (Thompson, 2000). Its appropriateness for measuring interpersonal dimensions was evaluated by Pfeiffer, Heslin and Jones (1976) by conducting a survey of seventy-five of the most widely used training instruments including MBTI. They concluded that “the FIRO-B™ was the most generally useable instrument in training” (ibid). In contrast, some researchers were unsuccessful in supporting a distinction between Inclusion and Affections (Gough and Bradley, 1996). Also, Hofstee, De Raad and Goldber (1992) have argued that there were failures to cross-validate personality or interpersonal measures in the actual structure of the language itself. Thus, it presented a failure in direct comparison of dimensions across linguistic communities. However, FIRO-B has been used widely in practices to analyse and support leadership and individual development as well as team building and relationship counselling (Schutz, 2009). Moreover, FIRO-B has been used in researches and development programs with the Big Five (Mahoney and Stasson, 2005) and MBTI (Furnham, 1990; Schnell and Hammer, 1997; Thompson, 2000).

2.1.1.2. 16 personality factor questionnaire (16PF)

Another instrument to measure personality in leadership study is the Sixteen Personality Factor Questionnaire (16PF) which was initially developed by Raymond Cattell in 1949. According to the Institute for Personality and ability Testing, Inc. (IPAT), the 16PF is a self-report questionnaire assessment that measures an individual’s personality against 16 factors. Hofer and Eber (2002) have indicated that a conservative estimation of research publications on 16PF research has been more than 2,000 since 1974. Cattell and Mead (2008)

have suggested that “16PF Questionnaire has a long history of empirical research and is embedded in a well-established theory of individual difference”. This provides a valid and accurate predictor of future behaviour. The 16 factors are as the below table.

Factor	Dimensions	Factor	Dimensions
Warmth	Cool vs Warm	Vigilance	Trusting vs Suspicious
Reasoning	Concrete thinking vs Abstract-thinking	Abstractedness	Practical vs Imaginative
Emotional Stability	Affected by feelings vs Emotionally stable	Privateness	Forthright vs Shrewd
Dominance	Submissive vs Dominant	Apprehension	Self-assured vs Apprehensive
Liveliness	Sober vs Enthusiastic	Openness to change	Conservative vs Experimenting
Rule-Consciousness	Expedient vs Conscientious	Self-Reliance	Group-oriented vs Self-sufficient
Social Boldness	Shy vs Bold	Perfectionism	Undisciplined self-conflict vs Following self-image
Sensitivity	Tough-minded vs Tender-minded	Tension	Relaxed vs Tense

Table 2.2 16 Personal Factors, Source: adapted from Hofer, Horn and Eber, 1997

16PF also has a broader range of five global factors (Cattell, 1970). According to Cattell (1970), 16 PF is a multi-level, hierarchical structure of personality: the primary 16 factors reveal the details and nuances that makes a person unique and predicts a person’s actual behaviours whereas the second-order of five global scale factors describes personality at a broader and conceptual level.

Global Scales	
Extroversion	Introverted, Socially Inhibited vs Extroverted, Socially Participating
Anxiety Neuroticism	Low Anxiety, Unperturbable vs High Anxiety, Perturbable
Tough-Mindedness	Receptive, Open-Minded, Intuitive vs Tough-Minded, Resolute, Unempathic
Independence	Accommodating, Agreeable, Selfless vs Independent, Persuasive, Willful
Self-Control	Unrestrained, Follows Urges vs Self-Controlled, Inhibits Urges

Table 2.3 Global Scale five factors, source: adapted and modified from Conn and Rieke (1994). 16PF Fifth Edition Technical Manual. Champaign, IL: Institute for Personality and Ability Testing, Inc.

Since the 16PF was released, it has been applied in various situations such as industrial, organizational, clinical and counselling, educational and research (Cattell, Eber and Tatsuoka, 1970; Conn and Rieke, 1994). According to Cattell and Cattell (2002), the instrument is recommended to predict potential problems which may occur for a person, thus it can be used

to determine individual occupation, to predict existing or potential problems regarding relationships, to assist clinical diagnosis, prognosis, and therapy planning and to identify students with potential academic, emotional, and social problems.

In the case of leadership studies, the 16PF questionnaire has been used to identify the personality traits of successful supervisors, managers, executives and other leaders for a long time (Cattell, Eber and Tatsuoka, 1970; Cattell et al, 1999; Christiansen et al., 1994; Conn and Rieke, 1994; Guastello and Rieke, 1993; John et al., 1980; Roy 1996; Schuerger and Watterson, 1998; Walter, 2000; Watterson, 2002). It has also been applied to predict potential leadership behaviours such as predicting potential possible leaders among students (Karnes, Chauvin and Trant, 1984), leadership style and associated personality traits of transactional and transformational leadership (van Eeden, Ciliers and van Deventer, 2008), the correlation between four scales of 16PF and transformational leadership (Hetland and Sandal, 2003) and the relationship between emotional intelligence, personality, cognitive intelligence, and leadership effectiveness (Rosete and Ciarrochi, 2005).

According to Cattell and Mead (2008), the most studies based on 16PF continuously have resulted in clusters of traits which are important for managerial success:

- Effective managers have a higher tendency for Global Independence and following this primary trait are Dominance, Social Boldness, and Openness to Change.
- Leaders have a lower tendency towards Anxiety and its traits of Apprehension and Emotional Stability. However, they have a higher tendency for Reasoning Ability and somewhat above average self-control traits.

Researches with different international samples have provided similar results on leadership, executives and manager studies (Cattell and Mead, 2008), “such as German managers, executives and consultants (Schneewind and Graf, 1998); Norwegian managers and executives (Institute for Personality and Ability Testing) (IPAT, 2004b); middle-and senior-level British managers (Bartram, 1992; Singh, 1989; Williams, 1999); high-performing Japanese managers (IPAT, 2006); autocratic versus democratic styles of managers in India (Singh and Kaur, 2001); and predictions of management level and income in Dutch samples (IPAT, 2004b)”.

2.1.1.3. Five Factor Model (FFM)

The Big five factors, also referred to as the Five Factor Model (FFM), are taken from the early psychologists such as), Baumgarten (1933) and Allport and Odbert (1936). The global five factors of 16PF, also originating from the Big Five, have been coalesced consistently into five broad dimensions by many researchers (Cattell and Mead, 2008). This similar set of the Big Five factors has been redefined and reorganized by numerous researchers (Costa and McCrae, 1992; Goldberg, 1990). Thus, Costa and McCrae (1976) propose a five-factor model by using cluster analysis to investigate correlations between items in Cattell’s 16PF. The below table is a description of Costa and McCrae’s five personality factors.

Trait	Description of someone scoring high
Openness	Imaginative, moved by art, emotionally sensitive, novelty seeker, tolerant
Conscientiousness	Competent, orderly, dutiful, motivated to achieve, self-disciplined, thinks before acting
Extroversion	Warm, gregarious, assertive, active, excitement seeker, positive emotions
Agreeableness	Trusting, straightforward, altruistic, cooperative, modest, tender minded
Neuroticism	Anxious, angry, hostile, depressed, self-conscious, impulsive, vulnerable

Table2.4 Costa and McCrae’s five personality factors (1978)

Numerous researchers have developed the FFM instruments, and the most highly regarded standard instrument for measuring five traits is Costa and McCrae’s (1992) NEO Personality Inventory-Revised, referred to as NEO-PI-R (Costa and McCrae, 2008). In addition a shortened version of NEO-FFI which consists of 60 items (Costa and McCrae, 1989) has been continuously revised and updated (Costa and McCrae, 2010; Spence, Owens and Goodyer, 2012). However, Rosellini and Brown (2011) state that the FFM may be the most widely used personality theory within academic settings and psychology, particularly by social, personality, and industrial/organizational psychologists. For instance, FFM has been used to examine individual differences in a variety of outcomes and processes, including attachment (Nofle and Shaver, 2006), career success (Seibert and Kraimer, 2001), and performance motivation (Judge and Ilies, 2002).

Indeed, a significant meta-analysis by Judge, Bono, Ilies and Gerhardt (2002) was conducted by using FFM. It found that extroversion was the most consistent and correlated factor in

leaders (Judge et al., 2002). However, Turner (2007) has indicated that FFM does not predict leadership in specific situations because different leadership positions in different sectors require different traits; thus, psychologists and others need to contribute to the analysis of position requirement. Therefore, Cattell and Mead (2008) indicate that the Big Five Factors examines personality theoretically with forced factor analysis, whereas the 16PF's approach is where leaders are located in a certain situation and all traits are inter-correlated in the real world. For example, two people may have the same score for extroversion but may have different social styles; one may have warmth, modest and empathy, but the other may be bold, talkative and attention seeking (Cattell and Mead, 2008).

2.1.1.4. The Meyers Briggs Type Indicator (MBTI)

Lastly, the Meyers Briggs Type Indicator (MBTI) is a highly popular personality inventory (Carlyn, 1977). MBTI is a self-report questionnaire designed to quantify non-psychopathological personality types by Carl Jung's (1921/1971) psychodynamic type theory, as interpreted by Isabel Myers and Katherine Briggs (cited in). However, the theory did not take into account all of Jung's theory. Jung's concepts of the unconscious and its relation to dominant and auxiliary functions are disregarded for the development of compensatory processes in the unconscious (Pittenger, 1993).

Myers and McCaulley (1985) indicate that these systematic differences result in corresponding differences in reactions, interests, values, motivations, skills, and interests. According to Myers et al. (1998), the MBTI's personality types measure a person's preferred attitude as perception, and judgement as decision-making functions in four dichotomous dimensions. Those four type dimensions for work style of preferences are as below (Myers et al., 1998, p.101):

- 1) Extraversion (E) / Introversion (I): "some people are oriented to a breadth-of-knowledge approach to quick action; others are oriented to a depth-of-knowledge approach, reflecting on concepts and ideas".
- 2) Sensing (S) / Intuition (N): "some people are attuned to the practical, hands-on, common-sense view of events, while others are more attuned to the complex

interaction, theoretical implications, or new possibilities of events. These two styles of information gathering, or perception, are known as sensing and intuition”.

- 3) Thinking (T) / Feeling (F): “some people typically draw conclusions or make judgements objectively, dispassionately, and analytically; others weigh the human factors or societal import and make judgements with the personal conviction as to their value. These two styles of decision making, or judgment, are called thinking and feeling”.
- 4) Judgement (J) / Perception (P): “some people prefer to collect only enough data to make decisions before setting on a direct path to a goal, and typically stay on that path. Others are finely attuned to changing situations, alert to developments that may require a change in strategy, or even a change of goals. These two styles are called the preferences of judgment or perception”.

Myers and McCaulley (1985) indicate that combinations of the above preferences can be classified in terms of one of 16 personality types by four letter codes such as ESFJ, ENFP, INTP and ISFJ. The manual for the test (Myers and McCaulley, 1985) and other accounts of the MBTI provide descriptions of the cognitive, perceptual, affective, and behavioural propensities of each of the 16 types (Bridges, 1992; Kroeger and Thuesen, 1988; Lawrence, 1982).

In an extensive review of the instrument by Carlson (1985), the MBTI has been applied unsystematically in a wide range of areas. Bjork and Druckman (1991) pointed out that the instrument's popularity is not consistent with research evidence. According to Pittenger (1993), MBTI has insufficient evidence to justify a specific claim about personality traits as a reliable or valid predictor of important behavioural conditions although it has measured several common personalities. However, if the MBTI is a measure of traits and does not make predictions about 16 independent personality types, the data obtained by MBTI theory is relevant and essential to understanding personality (Pittenger, 1993).

In contrast, Carlson (1985) highlighted that the MBTI is a generally favourable validity assessment. Gardner and Martinko (1996) have claimed that there are still some concerns regarding the reliability and validity of the MBTI; however, their critical review of literature concerning the use of the MBTI in the study of management behaviour at the individual level of analysis provided sufficient reliability and validity evidence. Thus, Myers et al. (1998)

have recommended using MBTI to analyse and define the current status of team members in an organization to a specific goal. Dilworth and Richter (1995) have claimed that diversity in perceptual preferences and cognitive orientations of cross-functional teams are critical in avoiding perceptual errors that may result from the underrepresentation of certain MBTI types. Indeed, over 2 million copies of the MBTI are sold annually (Hammer and Macdaid, 1992), and the MBTI has seen favourable and popular uses in a variety of settings such as corporations (Moore, 1987), academic settings (Provost and Anchors, 1987), and counselling settings.

Numerous researchers point out that there is a consistent relationship between MBTI and leadership (Fitzgerald and Kirby, 1997; Gardber and Martinko, 1996; McCaulley, 1990). Pearman (in Berens et al., 2001) provides 16 different types of leadership; demonstrated in the below table.

Type	Value	Appearance
ESTP	competition	Active, pragmatic, incisive, demanding
ISTP	efficiency	Active, capable, concrete, proficient
ESFP	realism	Energetic, inquisitive, encouraging
ISFP	cooperation	Flexible, synergetic, pragmatic
ESTJ	organization	Methodical, focused, planned
ISTJ	Productivity	Persistent, logical, practical
ESFJ	Harmony	Helpful, supportive, practical
ISFJ	Consideration	Cooperative, committed, understanding
ENTJ	Command	Analytical, blunt, planned
INTJ	Effectiveness	Analytical, tough minded, systematic
ENTP	Knowledge	Assertive, competitive, resourceful
INTP	Ingenuity	Conceptual, analytical, critical
ENFJ	Collaboration	Warm, supportive, inclusive
INFJ	Creativity	Inventive, idealistic, insightful
ENFP	Innovation	Imaginative, enthusiastic, expressive
INFP	Empathy	Passionate, intuitive, creative

Table2.5 . Psychological Types and leadership, Source: Adapted from Quick Guide to the 16 Personality Types in Organizations, by Berens, Cooper, Ernst, Martins, Myers, Nardi, Pearman, Segal and Smith, 2001

Pearman (2001) states that thinking (T) tends to be the best descriptor of at least the stereotype of an effective manager. Macoby (2003) extensively reviews the personality types of management and executives and has indicated that the narcissist type is best suited to lead modern organizations; however, some other types of personalities are appropriate for some particular positions and organizations. According to Carr, Garza and Vorster's research on personality traits and performance for engineering and architectural professionals providing

design services (2002), they find out the professionals with strong Sensing/ Intuition rather than decision making, who prefer perception and are able to change their strategy or a goal for new developments, would outperform in project planning. In contrast, during the design phase, professionals who have strong judgemental (J) personality factors would outperform (Carr, Garza and Vorster, 2002). Thus, each stage requires different personalities and abilities.

2.1.1.5. Summary

Throughout the review of this section, there are different instruments to measure personality and traits. Lord et al. (1986), state that measuring personality traits denotes predicting consistent performance. Yet, there is no one single method to analyse personality traits holistically. Thus, numerous researchers have applied more than one instalment to research personality traits: for example, the fakeability of the 16Pf, MBTI and Firo-B personality measures (Furnham, 1990), interpreting MBTI from the perspective of FFM (McCrae and Costa, 1989), an extensive review of leader traits and attributes by MBTI and FFM (Zaccaro, Kemp and Bader, 2004), different versions of MBTI for comparison of relationships between personality and performance of engineers and architects (Carr, Garza and Vorster, 2002), assessing leadership styles by FFM and leadership dimensions questionnaire (Dulewicz and Higgss, 2005) and quantitative analysis of transformational leadership by MBTI and Leadership practice inventory (Hautala, 2005). The below table is a comparison of the major personality trait instruments reviewed in this section for different purposes of analysis and research.

Instrument	Usage purpose
Fundamental Interpersonal Relations Orientation-Behaviour (FIRO-B)	Interrelationship analysis and measuring interactive behaviours in a team, an organization, and a society.
16 personality factor questionnaire (16PF)	Predicting personality by 16 detailed trait types with 5 broader personal characteristic tendencies
Five-factor model (FFM)	Theoretical analysis of personality traits by five main traits of personality.
Myers-Briggs type indicator (MBTI).	Measuring a person's preferred attitude as perception, and judgement as decision-making functions in four dichotomous dimensions.

Table 2.6. Personality measurement comparison

According to Pedler et al. (2004), the trait theory of leadership is criticized because effective leaders do not always have the same traits; so there is no definitive character or personality to

be an effective leader. Stogdill (1948) indicates that a leader in one situation may not be a leader in other situations. Dixon (1976) states that imbalances among traits were found as decision makers rejected new suggestions. Some leaders do not easily adjust to new environments. Lastly, if followers stop following, the emergence and effectiveness of this type of leadership will disappear.

2.1.2. Leadership Style Theory

Stogdill (1948) pioneered the identification of how leaders behave and lead in a group or organization. Unlike the trait approach, the style approach emphasises the leaders' capabilities in particular with tasks and relationship behaviour. A group of researchers at Ohio State built around 1800 behaviours describing leadership behaviour. These behaviours were condensed to 150 questions; this was named The Leadership Behaviour Description Questionnaire (LBDQ) which was administered to people in educational, military, and industrial settings (Hemphill and Coons, 1957). In the decades that followed, modified and shortened versions of the LBDQ, named as LBDQ-XII have been used in many studies to analyse two leadership behaviours which are initiating structure, such as task behaviour including organising work and its schedule, giving structure to the work context and defining role responsibilities; and consideration behaviours such as building camaraderie, respect, trust and connection between leaders and followers (Stogdill, 1974). LBDQ has been used extensively for research purposes since the 1960s (Northouse, 2010).

Another approach to styles of leadership was popular during the 1950~60s in the manufacturing period. Leadership style is mainly task oriented for better productivity and efficiency. For instance, the scientific method was applied in the factory of Henry Ford during 1950~60s (Gill, 2006). Action Centred Leadership was popular in the UK, which focused on the action of an effective leader who manages a relationship between task, team and individual to achieve a certain goal. Likert's (1961) and Tannenbaum and Schmidt's Continuum (1958) models are similar and categorize leadership style by choice of involvements.

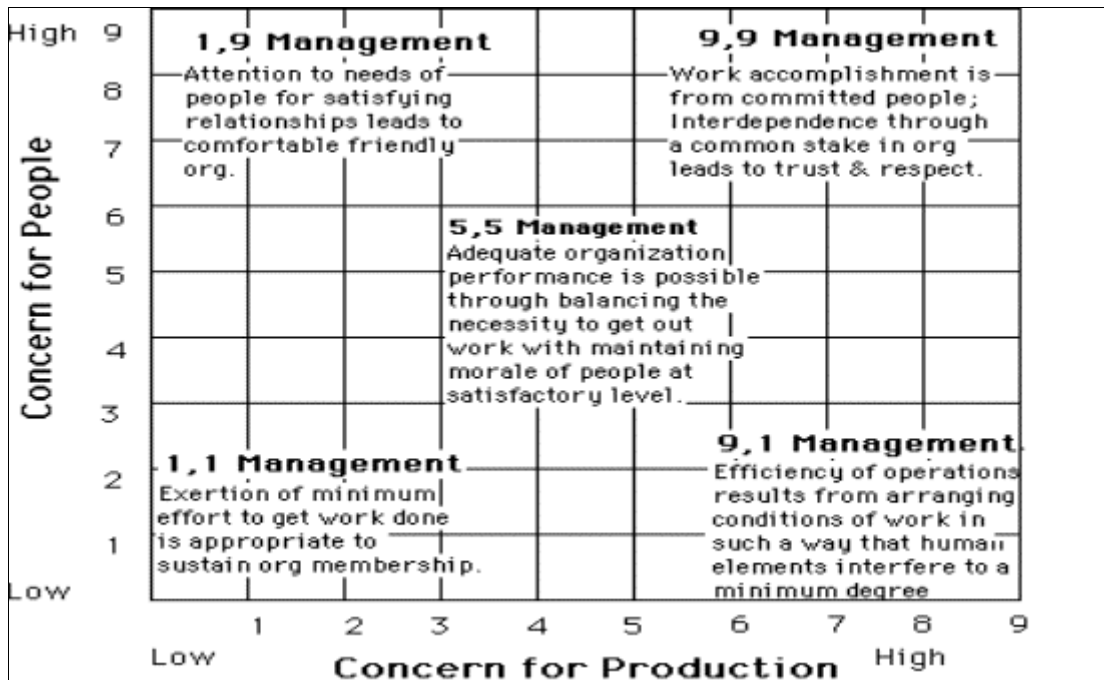


Figure 2.1 Managerial Grid adapted from Blake and Mouton (1964)

Similarly, Blake and Mouton's Managerial grid (1964 and 1978) analyses the preferential styles by dividing leadership styles into five styles using a nine by nine-points scale between task and people oriented. This managerial grid was renamed as the Leadership Grid ® and has been revised continually (Blake and McCauley, 1991; Blake and Mouton, 1964, 1978, 1985). This method was designed to explain how leaders in organizations achieve through two factors: concern for production and people. Blake and Mouton (1964) state that concern for production refers to how a leader achieves organizational tasks concerning all activities including attention to policy decisions, NPD process issues, workload and sales volume and so on. Concern for people is how a leader supports people to achieve organisational tasks; this includes building trust, rewards, providing good working environments and good salary structure, and promoting good social relations (Blake and Mouton, 1964). Unlike LBDQ, the leadership grid is originally designed and is continuously used to train and develop managers and supervisors in the leadership process (Northouse, 2010).

This type of leadership is criticized because it involves only the initial step of assigning a task to subordinates. It does not follow up the process that may determine the effectiveness of the outcome. In addition, this assumes the manager or the leader has sufficient knowledge and information to determine the disposition of the team (Zaccaro and Klimoski, 2001). This style

has a tendency of over simplifying complex decisions towards a simpler dimension. This theory fails to consider the contingencies in the leadership situation (Korman 1966; Kerr et al., 1974; Schriesheim, 1980).

2.1.3. Emergent and Servant (People and morality oriented) Leadership Theory

Introduced by Greenleaf in the 1970s, this theory emphasises the importance of the follower (House and Mitchell, 1974); great men serve other people. According to Greenleaf (1997), servant leaders help their own followers to develop their own values that support the organization's mission. As for instance, Mandela in South Africa, or ASDA in the UK were the only company which had the servant leadership (Arkin, 2004). The founder of SouthWest Airline, Herb Kelleher said that "Leadership is being a faithful, devoted, hard-working servant of the people you lead and participating with them in the agonies as well as the ecstasies of life". Dierendonck and Nuijten (2011) found eight factors that constitute the structure: standing back, forgiveness, courage, empowerment, accountability, authenticity, humility, and stewardship.

Leaders emerge when the ability and desire to serve meets the needs of people (Gill, 2006). Bass (1954) indicates that among participants in unstructured and ambiguous situations, a person considered as an emergent leader creates plans to direct others toward a problem's solution. Emergent leader's behaviours are studied and they have three traits; extroversion, openness to experience, and cognitive ability. This type of leader is willing to conceptualize novel approaches to a problem and demonstrate a solution in the process. According to Kickul and Neuman (2000), a leader's conscientiousness and cognitive ability are highly linked with team performance.

In contrast, this type of leadership is criticized because if leaders are going to be the servant, what are servants going to do, and who is going to do the leading? (Marchall, 1991) There is inconsistency with the leadership self-image and insufficient complete explanation of effectiveness about leadership, nevertheless these leaders address people's needs (Gill, 2006).

2.1.4. Contingency and Situational Leadership Theory

Contingency and situational theories are researched by the hypothesis that there is not a best way to lead; the optimal leadership, organization, and decision-making depends on various internal and external conditional factors. During the 1960s, Fiedler, a pioneer of this theory, suggests that the effectiveness of leadership style, either task or people oriented, is up to the favourableness of a situation. Fiedler developed “the Least Preferred Co-Worker” (LPC) scale to measure leader styles based on their motivational hierarchy. Leaders who score high on the scale are considered relationship motivated; leaders who score low on the scale are considered task motivated.

In the 1970s, Path-goal theory was developed further to support employee’s motivation by rewarding either materially or psychologically (Evans, 1970; House and Mitchell, 1974). The theory explains how leaders help subordinates along a path to goal accomplishment by selecting specific behaviours that are best suited to subordinates’ needs and to the situation in which subordinates are working.

Situational Leadership was initially developed by Hersey and Blanchard (1969, 1993). It is an extension of Blake and Mouton’s managerial grid model. This model expands the notion of relationships and task dimensions to leadership and a readiness dimension was added.

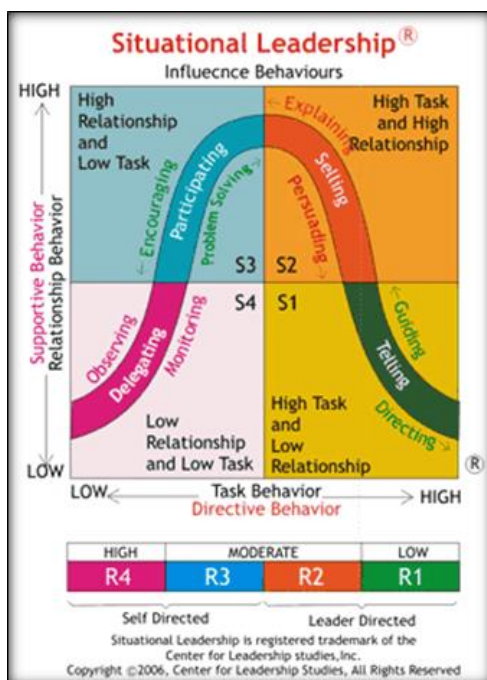


Figure 2.2. Situational leadership, Source adapted: Hersey and Blanchard, 1993

Situational leadership has four stages to follow, from position 1 ‘Telling’ to position 4, ‘Delegating’. According to Hersey and Blanchard (1982), it corresponds to degrees of competence and commitment from the subordinated people. Silverthorne and Wang (2001) have indicated that an Adaptive style brings more success and training followers until they have self-leadership, S4 (Yun, Cox and Sims Jr, 2006). According to Papworth et al. (2009), S1 and S2 are consideration aspects for NPD. Hersey et al. (2001) indicate that it has been mostly used for the current leadership training program, for over 400 of the *Fortune* 500 companies.

In contrast Nichololson (2001), states that this type of leadership is criticized because it fails to explain how a leader can change either their style or the situation. According to Papworth et al. (2009), there is a lack of empirical researches for this model; however, recent researches suggest that S2 and S3 are similar with the team outcomes. Too many contingencies in life inconsistently ask for change of leadership types (Goffee and Jones, 2000); thus, Vroom and Jago (2007) indicate these issues as a leadership paradox.

2.1.5. Transformation and Transaction Leadership Theory

Transformational leadership theory and studies have been initiated by Burns (1978). Burns claims that transformational leadership emerges as leaders raise their people’s motivations to act and create a sense of higher purpose (Gill, 2006). Bass (1985) expands and refines the works of House and Burns through the development of an assessment tool, the Multifactor Leadership Questionnaire (MLQ). The MLQ, which is also known as MLQ5X, measures transformational leadership factors, as well as transactional leadership factors and non-leadership factors (Bass and Avolio, 1994). Non-leadership factors, as the laissez-faire style, describes leaders who take a hands-off approach to subordinates, in effect abdicating responsibility by delaying decisions, avoiding feedback and making limited effort to help followers satisfy their needs. Other than MLQ, many researchers define this type of leadership and provided numerous assessments for transformational leadership such as the leadership behaviour questionnaire (Sashkin *et al.*, 1992), the leadership description questionnaire (Clover and Rosenbach, 1988), the leadership report (Burke, 1988), the leadership feedback questionnaire, (Roush, 1992) and the leadership practice inventory (Kouzes and Posner, 1988a).

The transformational leader creates a vision then powerfully projects their visions which are consistent, persistent and focused, in order to maintain momentum and empower others to take responsibility and become part of that movement (Bass and Avolio, 1994; Kakabadse, 1999). Avolio (1999) and Bass (1985) indicate that the Transformational approach provides not only exchange and rewards, but also leaders' attentions to the needs and growth of followers. Bryman (1992) states that transformational leadership is a process which occurs between leaders and followers because this process incorporates not only the needs of leaders but also the needs of followers; thus, followers' attributions are contributory in the evolving transformational process. Thus, Bass (1985) indicates that transformational leadership has four factors of I, such as idealized influence like charisma, inspirational leadership, individualized consideration and intellectual stimulation.

In contrast, transactional leadership is a traditional approach which rewards followers based on their skills and abilities to handle tasks (Taj et al., 2010). Transactional leaders tend to be strongly directive and do not use consultative, participative or delegative styles to any significant extent and offer contingent rewards to motivate (Gill, 1999, 2006). According to Kakabadse (1999), whereas transactional leadership is driven by context, transformational leadership restructures contexts, by removing the old and replacing it with the new. This transformational leadership's theoretical concept connects with the leadership models such as visionary, charismatic, organic and authentic leaderships.

- **Visionary:** Sashkin (1998) states that this style aims to transform an organizational culture in line with the leader's vision of the organization's future. Sashkin (2004) synthesizes the transformational leadership work of Bass, Bennis and Nanus (1985), Kouzes and Posner (1987), Jaques (Jaques and Clements, 1991), McClelland (1975), McClelland and Boyatzis(1982), House (1976) and others to come up with this theory. There are three personal characteristics: self-efficacy (self-confidence), using power in different ways, and cognitive capability that concerns understanding complex cause-and-effect chains; so, it can take action at the right time to accomplish the desired outcome (Streufert and Swezey, 1986).
- **Charismatic:** great leaders are usually considered charismatic people who attract and inspire followers (Gill, 2006). According to Ciulla (1999), charismatic leadership shapes organizations. Bass (1985) indicates that it is associated with greater trust in leaders and achievement among followers. According to Waldman et al. (2001), in the United States,

this leadership generates higher net profit margins when it is only under conditions of environmental uncertainty. The contemporary perspective of charisma does not belong to a leader; but, this leadership is fashioned throughout the relationship between leader and followers (House 1997:189-207; Conger and Kanungo, 1987; Shamir et al., 1993).

- **Organic:** Unlike traditional and conventional management and leading styles and researches, the organization under organic leadership is a non-linear structure (Nahavandi, 1997). Avery (2004) suggests the future organization will have an organic form of transformational leadership. Characteristics of leadership are to create a mutual norm within the group, to emerge rather than being appointed as leaders, buy-in to the group's shared values and processes, emergence of vision from the group (rather than from a leader's vision), and vision as a strong cultural element. Organic leadership has varied styles. It deals greatly with uncertainty and accepts continual change and chaos (Avery, 2004; Blank, Weitzel and Green, 1990; Graeff, 1983, 1997; Vecchio, 1987). Indeed, it relies on self-managing and self-leading (Carins, Hallenback, Preziosi and Snow, 1998).
- **Authentic:** According to Avolio et al. (2009), it has a pattern of transparent and ethical leadership behaviour that encourages openness in sharing the information needed to make decisions while accepting followers' inputs. This is one of the emerging interests in the field of leadership. It also stems from transformational leadership. It is a process that draws from both positive psychological capacities and a highly developed organizational context. It concludes in both greater self-awareness and self-regulated positive behaviour on the part of leaders. Luthans and Avolio (2003) have indicated it is associated with encouraging positive self-development. Other researches have agreed four factors for this leadership: balanced processing, internalized moral perspective, relational transparency, and self-awareness (Cooper et al. 2005; Sparrowe, 2005; Walumbwa et al., 2008).

Yukl (1999) indicates that there is substantial evidence that transformational leadership is an effective form of leadership. Lowe and Gardener (2001), report that transformational or charismatic leadership style occupies 34% from 1990 to 2000 in Leadership Quarterly. It has been widely researched since the 1970s (Northouse, 2010). Hautala (2006) indicates that many leadership-training programs use transformational leadership assessment instruments and the approach is used extensively in organization vision development activities. The multiple models of transformational leadership provide a wide range of factors upon which aspiring leaders can focus and potentially develop. However, it is still considered by some to

be lacking in conceptual clarity due to overlapping parameters which are difficult to define (Northouse, 2010).

2.1.6. Leadership Competency Theory

According to Dulewicz and Higgs (2003), Leadership Competency theory encompasses all the previous theories. Researchers have defined competence as knowledge, skills, and personal characteristics which achieve superior consequences (Boyatzis, 1982; Crawford, 2003). Müller and Turner (2005) indicate this theory is a recent and dominant leadership research approach which focuses on the competence of leaders and competencies that they indicate (Metcalf and Metcalf, 2000; Bass and Avolio, 1995; Bennis, 1989; Dulewicz and Higgs, 2003; Goffee and Jones, 2000; Goleman et al., 2002; de Vries and Treacy, 2002; Kotter, 1990; Kouzes and Posner, 1998; Marshall, 1991; Zaccaro, Rittman and Marks, 2001). According to Dulewicz and Higgs (2005), competency theory is built on the literature of Transformational Leadership and an extended range of context.

The approach to this theory is “sense making” rather than a discovery perspective (Weick, 1995). Goffee and Jones (2000) and Hogan (2002) recommend that leaders differentiate themselves from others by exercising skills and competencies. Collingwood (2001) indicates that a leader’s personality influences the exercise of leadership importantly. Dulewicz and Higgs (2003) specifies that competencies include personal characteristics as traits and emotional intelligence from trait leadership, knowledge, and skills as problem-solving and management skills, adaptable attitude from contingent leadership, and charisma and vision from Transactional and Transformational leaderships. Thus, competency leadership consists of four types of competencies that determine leadership performance (Müller and Turner, 2007; Turner and Müller, 2005).

In contrast, Dulewicz and Higgs (2003) combine and re-organise competencies based on their literature review of other researches (Metcalf and Metcalf, 2001; Bass and Avolio, 1995; Bennis, 1989; Dulewicz and Higgs, 2003; Goffee and Jones, 2000; Goleman et al., 2002; de Vries and Treacy, 2002; Kotter, 1990; Kouzes and Posner, 1998; Marchsall, 1991; Zaccaro, Rittman and Marks, 2001), into three types of competencies such as Intellectual (IQ), Managerial skills (MQ) and Emotional (EQ). They then identify fifteen leadership

competencies and three different leadership styles which are goal, involving and engaging and similar to the path-goal theory (House, 1971) and visionary from Transformational leadership (Bass, 1990) as the below box.

Group	Competency	Goal	Involving	Engaging
Intellectual (IQ)	1. Critical analysis and judgment	High	Medium	Medium
	2. Vision & Imagination	High	High	Medium
	3. Strategic perspective	High	Medium	Medium
Managerial (MQ)	4. Engaging Communication	Medium	Medium	High
	5. Managing Resources	High	Medium	Low
	6. Empowering	Low	Medium	High
	7. Developing	Medium	Medium	High
	8. Achieving	High	Medium	Medium
Emotional (EQ)	9. Self-awareness	Medium	High	High
	10. Emotional Resilience	High	High	High
	11. Motivation	High	High	High
	12. Sensitivity	Medium	Medium	High
	13. Influence	Medium	High	High
	14. Intuitiveness	Medium	Medium	High
	15. Conscientiousness	High	High	High

Table 2.7. Fifteen leadership competencies as suggested by Dulewicz and Higgs (2003), and the competence profile of their three styles of leadership, Source: Müller and Turner (2005)

These fifteen dimensions are organised and termed as the Leadership Dimensions questionnaire (LDQ) which has biographical variables in relation to respondents including age, level of qualification, gender, role, sector and qualification attained (Dulewicz and Higgs, 2003). According to Turner and Müller (2005), the fifteen leadership competencies and three leadership styles can be applied to explain project managers' performances on different projects. LDQ was validated (Dulewicz and Higgs, 2003) and also examined to analyse identifications of project managers who are suitable for different project types because they influence the project success (Müller and Turner, 2007).

2.1.7. Summary of leadership studies

Numerous researchers have an emerging consensus that there is a no single agreed definition of leadership and of a leader's effectiveness (Goffee and Jones, 2000; Gill, 2001; Higgs, 2003; Higgs and Rowland, 2003). Many different approaches have tried to define leadership in different contexts because every person defines it differently (Avery, 2004; Bass, 1990; Stogdill, 1948). Different definitions and types of leadership are as the below table.

Theory	Key Idea	Researchers
Trait	Effective leaders exhibit common traits, leaders are born	Carlyne, (1907), Kirkpatrick and Locke (1991)
	Emotional intelligence has a stronger influence than intellect	Goleman et al., (2002)
Behavior or style	Effective leaders adopt styles and behaviour and Leadership skills can be developed	Blake and Mouton (1978), Tannenbaum and Schmidt (1958)
Contingency or emergence	Different situations need different types of leaders or the needed leaders emerge from situations.	Fiedler (1967), Greenleaf (1970), Hersey & Blanchard (1982)
Transformation & transactional	Leaders influence and develop followers and reward. Mostly accepted theory in leadership and influence to develop related theories such as visionary, charismatic and organic	Bass (1990), Bass & Avolio (1994)
Competency	Effective leaders have certain competencies such as traits, behaviour, emotions, and intellect. Different styles are better in different situations	Dulexicz and Higgs (2003)

Table 2.8 Different type of leaderships

Trait and classical theories, which are the oldest theories, generally known as 'great man' theory, focus on personal qualities (Carlyne, 1907; Gill, 2006; Kirkpatrick and Locke, 1991); and they believe the major events in the world's history were led by the upper class that inherited extraordinary leadership skills. However, its style depends on the situation. In the 1950~60s, scientific leadership, Action centred leadership in UK, and leadership by Managerial Grid (Blake and Mouton, 1964) were popular due to their better productivity and efficiency during the manufacturing economy.

Due to an economic paradigm shift, various focuses on more different types of leaderships were researched, such as Servant leadership to serve followers of the leader by Greenleaf in 1970s (House and Mitchell, 1974), Emergent leadership believed a leader will emerge as the needs arise, of society, a group of people, or of a certain situation (Bass, 1954). That is, Transformation leadership is to meet a goal (Bass and Avolio, 1994) and Transactional leadership is a traditional approach of rewarding followers based on their skills and abilities to handle tasks (Taj et al., 2010), and Contingency by Fiedler in the 1960s and situational leadership by Hersey and Blanchard (1993) are adjustable styles to meet the situations that leaders face; leaders change their styles in different situations.

Each single definition has shortcomings and supports each other. According to Judge, Ilies, Bono and Gerhardt (2002), only one common characteristic is found via meta-analysis: self-confidence. As there are more than 1500 definitions of leadership, the current trend of leadership has been researched focusing on a visionary style (Sashkin, 1998), charismatic style that has the complete trust of its followers (Bass, 1992; Ciulla, 1999), an organic style mixing different types of leadership for better outcomes for an organization (Avery, 2004) and authentic leadership (Avolio et al., 2009) aiming to be more ethical and encouraging the sharing of information is needed to make decisions while accepting followers' input. Organic and authentic styles are developed from the transformation leadership. Yukl (2006) have indicated that leadership studies tend to identify the importance of sharing value and vision and emotional supports and to deal with multi-culture based on globalisation.

Lastly, Dulewicz and Higgs (2003) propose the Competency leadership approach which encompasses most theories to analyse the skills and styles of leaders. According to these authors, effective leaders have competencies which include traits, intellect, emotion, behaviours such as problem-solving and management skills, adaptable attitude contingently in different situations, and charisma and vision gleaned from Transactional and Transformational leadership styles. They developed a leadership assessment of leadership style Leadership Dimension Questionnaire (LDQ). This method provides the ability to analyse leaders' skills and leadership styles.

Therefore, for the purpose of this research, the working definition of leadership can be taken as *there is no single definitive type of leadership; however, leaders lead others with certain purposes and a direction to achieve a certain success. Yet, different leadership styles are*

appropriate including leader's trait, skill, intellect, and styles depending on contingent environments.

2.2. Project Leadership

The project manager has various roles in a project internally and externally (Cobb, 2006). Externally, the project manager is seen mostly as a figure head and a spokesperson working as a liaison, a monitor, and a negotiator who deals and communicates with stakeholders about the progress of the project and their interests (Cobb, 2006). Cobb (2006) also defines the internal role as a planner, a resource allocator, a problem solver with empowerment, and a team leader who confronts not only task delegation, but also social and psychological issues.

The role of leader is not only restricted to the project manager, but also leadership is a fundamental building block of project management (Cooke and Tate, 2006). Every project's leadership is contingent due to various projects (Strang, 2007) because based on different cultures, *leading* means different things to different people. An effective project leader within a "modern" context adapts to the needs of the immediate project (Cooke and Tate, 2006). A leader can assess the circumstances, consciously selecting skills to apply to the situation, and "act out beneficial project leadership behaviour without necessarily having a contextually-advantageous personality and propensity to behave in a supportive way" (Strang, 2007).

Generally researched factors that make a good project manager are (Cook and Tate, 2006; Pennypacker and Cabanis-Brewin, 2003; Project Management Institute, 2000) knowledge about various project management skills including cost, risk, quality, and human resources, technical and administrative credibility, and sensitivity about member relationships, leadership behaviour such as communicating vision, creating the environment and direction, strong interpersonal skills and the ability to engage the management culture's support, and integrative problem solving skills to apply within multiple areas related to the project internally and externally. In addition, NPD preparation needs capabilities of skills and knowledge, managerial systems, technical systems and values and norms. These are required to fit within an internal and external company's culture via R&D. It will decrease the friction of change in creating NPD (Leonard-Barton, 1992).

According to Ochieng and Price (2009), using a multicultural team for projects is common in recent years so that communication is vital and can be effective when project managers demonstrate an awareness of cultural variation. The role of project leadership requires effective cross cultural collectivism, trust, communication, and empathy in leadership to build a multicultural project team. Moreover, NPD has been considered as the process of learning (Takeuchi and Nonaka, 1986; Leonard-Barton, 1992; Moorman, 1995; Madhavan and Grover, 1998; Nonaka, 1991; Dougherty, 1992; Sarin and McDermott, 2003). In particular, recent studies recommend that the team leader's characteristics robustly influence the work culture and learning in the team (Madhavan and Grover, 1998; Edmondson, 1999; Norrgren and Schaller, 1999, Hult, Hurley, Guinipero, and Nichols, 2000). Another recent research recommends that democratic leadership styles, initiation of goal structure by the team leader, and leader's position in an organization, are positively related to NPD's innovativeness (Sarin and McDermott, 2003).

Furthermore, the research of Sirias et al. (2007) regarding the generational effects on the teamwork of different generations from Baby-Boomers and Gen X knowledge workers reveals that focusing on organisational value first needs change, to let team member's individual value contribute to teams. Authentic leadership's traits regarding sharing agreed values, transparent manner, trust, ethical value, positive attitude, confidence and communication in alliance are proposed for project leaders (Lloyd-Walker and Walker, 2011).

Although Strang's empirical research (2004) was carried out within the technology and computer sector, and shows that all leaders exhibited different behaviour with different combinations of their dominant personality traits; however, they all accomplished deliverable production. In contrast, the success of every single project does not always continue. If there is less team satisfaction, the project team members will have lower future motivation to continue to perform (Larreche, 2008). According to the study of group composition effects, the personalities of team members have a substantial influence on group processes (Barrick et al., 1998; Barry and Stewart, 1997).

A research on project leadership based on multicultural project team members within Finnish-Chinese, Finnish-European, and Finnish-American companies indicates that trying to understand other cultures, leaders who are people oriented and who have more empathy towards others seem more successful when coping with multicultural projects because they

support team members and people centred leadership maintains team cohesion (Makilouko,2004). Becoming reflective practitioners for project managers is recommended in order to position themselves to effectively influence sponsors as well as being considered as better performers in the eyes of the general community. Therefore, project leadership is contingent and mixing different leadership traits and abilities including emotional (EQ), intellectual (IQ) and managerial (MQ) competences are appropriate for different types of projects (Müller and Turner, 2007; 2010). Their researches recommend that if a project manager's leadership style fits with the project context, it will highly increase the chance of achieving project success.

2.3. Communication Behaviour and Style

This section reviews a leader's dimension of communication styles and behaviours and effective communication process. A synthesised conclusion is presented at the end for the primary research direction.

Several researchers indicate that effective communication is an essential component of effective management and leadership (Awamleh and Gardner, 1999; Den Hartog and Verburg, 1997; Flauto, 1999; Frese et al., 2003; Kirkpatrick and Locke, 1996; Riggio et al., 2003; Shamir et al., 1994; Spangler and House, 1991; Towler, 2003; Snavely and McNeill, 2008). Hall and Lord (1995) indicate that the message sent by leaders includes affective and cognitive strategies. Pavitt (1999) and Madlock (2008) recommend that effective communication between leaders and subordinates is highly related to the work satisfaction.

Many researchers have attempted to understand communication behaviour by the notion of styles such as leadership styles (Fiedler, 1968; Hersey and Blanchard, 1969; Black and Mouton, 1974), relation styles (Schutz, 1992; Bales and Cohen, 1979), social style (Buchholz, 1976; Buchholz, Lashbrook and Wenburg, 1976; Merrill and Reid, 1981) and communicator styles (Norton, 1978, 1983). In contrast, Vries, Bakker-Pieper and Oostenveld (2009) state that although the core element of leadership is interpersonal communication, there are few researches which try to operationalize leaders' communication styles in their daily transactions with subordinates.

According to Spitzberg (1983), communication competence has been conceptualized by including elements of knowledge, motivation, skill, behaviour and effectiveness. McCroskey (1982) defines communication skill as the individual ability to perform the appropriate communicative behaviour in a given situation; thus communication competence is within the perspective of behaviour. Stohl (1984) recommends encompassing communicative resources such as language, gesture, and voice for competent communicators. According to Cushman and Craig (1976), the ability of competent individual's to communicate involves listening and negotiation. Indeed, due to the fact of contemporary employee's higher education and intelligence than the past generation, negotiation is recommended in the working environment (Salacuse, 2007). In order to manage multidisciplinary people, it is important to be aware of cultural differences first (Camprieu, Desbiens, Feixue, 2007). It frequently causes frustrating management dilemmas thus, the team leader must be aware of involved team members and when to communicate directly and indirectly, language barriers, differing attitudes toward hierarchy and authority and the conflict norms for decision making (Brett et al. 2006).

A group of people is more difficult to change than a person since each person is cautious about being expelled through breaking unwritten group rules; thus, diffusing new ideas into a group of people requires a tactical approach as if each person speaks with each other (Straker, 2008). He suggests tricks, as 1) people need to relate to either economic or social advantages as benefits, 2) new ideas are compatible to people who can be motivated based on their previous experiences 3) new ideas should not be too difficult to try.

In order to diffuse and switch the environment for people to behave and to be motivated, Heath and Heath (2010) from *Switch* explained how to manage and manipulate conversational and environmental elements to lead, instead of focusing too much on changing individual behaviour. They recommend 1) Suggesting the optimum direction to follow specifically, 2) Applying the model of seeing -> feeling-> changing (Schmit, 1999; Kotter and Cohen, 2002) and 3) Developing good habits for a small positive change with a follow-up checklist.

This is known as "Positive deviance" which is mostly applied to improve health via locally available, sustainable, and effective approaches (Marsh, Schroeder, Dearden, Sternin, and Sternin, 2004). This method and approach is conducted through observation of a few

individuals who exhibit uncommon beneficial practices. Consequently they experience better benefits than their neighbours who are in the same situation (Berggren and Wray 2002; Dorsey, 2000, or 2007). The main advantage is even people in the poorest communities can improve their risks at low cost quickly. Once observation is finished, the insight from the observation is applied to design a behaviour changing activity programme which can be rapidly spread for implementation. The only disadvantage of this approach is to discover uncommon positive examples which are on an average of 1-10% of people (Marsh, Schroeder, Dearden, Sternin, and Sternin, 2004). Thus, Conger (2008) has recommended that learning from others and negotiating mutual solutions are defined as persuasion, which requires four essential steps as shown in the table.

1. Establishing Credibility	Expertise on works, and trustworthy and fair Relationships with others
2. Framing Common areas	Leading to a goal via showing the shared benefit as if a parent leads a child to a grocery shop by showing a candy being there.
3. Providing vivid proof	Not just ineffective numerical presentation but telling a story with its vivid research and information to impact Emotions of audience
4. Emotional association	Showing your commitment to a goal: not only your mind but in your hearing and gut. Identifying your colleagues emotional states: matching your emotional passion to your audience's level of message acceptance.

Table 2.9 Four steps to being persuasive, *source:* Conger, Jay (2008), *The necessary Art of Persuasion* in Harvard Business Review on The Persuasive Leader, originally published in May 1998, Harvard Business Press, Boston MA USA

According to Penley and Hawkins's (1985) review of the relations between interpersonal communication behaviours and different leadership types of consideration (human-oriented) and initiating structure (task oriented), consideration or human-oriented leadership is mainly communicative whereas initiating structure or task oriented leadership is to provide the actual content of the information instead of the style of communication. An experimental study on the effects of vision content and delivery style on perceptions of charismatic leadership and effectiveness by Awamleh and Gardner (1999) has identified that an expressive or enthusiastic delivery style had a much stronger effect than the content of the speech. Also, Cheung et al. (2001) have identified that there is a strongly correlated link between charismatic and participative leadership behaviours of design team leaders, and the team members' satisfactions.

Shaw (2005) has recommended that if supervisors want to be conceived as competent communicators, they should positively listen to other's perspectives, share information and react with their subordinates, clearly and successfully communicate with all levels of an organization and utilize different communication channels. Cialdini (2008) has suggested that there are several principles for leaders to study and practice to persuade others effectively:

1. *People prefer to follow a person who has similarity with them*
2. *People collaborate more willingly with a person who is similar*
3. *People treat others the way others treat them: if you help someone, they will help you in need*
4. *People try to keep their words when they volunteer: Placing emphasis on employees' general values in the workplace will lead them to work constantly and spontaneously.*
5. *People respect experts so a leader needs to show ability and experience*
6. *People want more of what they have less of: showing exclusive benefits and information*

Several researchers have proposed different models to measure communication competence. Leary (1957) originally provided an interpersonal reflex model, referred to as the interpersonal circle, which consists of the vertical axis of dominance, power, or control, and the horizontal axis of friendliness, affiliation, and dominance. Yet, others have recommended that there are more than two communication style dimensions and Monge et al. (1982) proposed the two-factor model of communication competence. It consists of twelve items to describe other people's communication behaviour and style by a 5-point Likert type scale.

Wiemann (1977) developed the Communicative Competence Scale (CCS) to measure communicative competence which is an ability to choose among available communicative behaviours for the interpersonal purpose with fellow people within the constraints of the situation. CCS consists of 36-Likert items to assess five dimensions of interpersonal competence; General Competence, Empathy Affiliation/Support, Behavioural Flexibility, and Social Relaxation and a dependent measure as interaction Management. Wiemann (1977) reported a .96 coefficient alpha (and .74 magnitude of experimental effect) for the 36-item revised instrument. Numerous researchers have applied CCS to identify the evidence of a strong correlation between communication adaptability and trait self-rated competence (Cupach and Spitzberg, 1983), a moderate relationship between communicative competence

and both ontological knowledge about interpersonal communication and interpersonal communication apprehension (Hazleton and Cupach, 1986) and a strong correlation between social insight and open-mindedness (Backlund, 1978). However, Backlund (1978) indicates little correlation between peer-perceived competence and expert-perceived competence when using the CCS because it has been used only with college student populations.

Another assessing method of communicator style is Norton’s (1978) Communicator Style Measure (CSM). Norton (1978) conceptualized communicator style as "the way one verbally and para-verbally interacts to signal how literal meaning should be taken, interpreted, filtered, or understood". CSM consists of nine independent variables of Dominant, Dramatic, Contentious, Animated, Impression Leaving, Relaxed, Attentive, Open, and Friendly, and one dependent variable which is Communicator Image. The independent variables are descriptive of one's style; the dependent variable is the evaluative consequence of the independent variables.

Dominant	A tendency to take charge in social situations
Dramatic	Communicating in a way that highlights or understates content
Contentious	Communicating in a negative combative fashion
Animated	Physical and nonverbal cues
Impression Leaving	Defining a person who manifests a visible or memorable style of communicating
Relaxed	An absence of tension or anxiety
Attentive	Involving to make sure others know that they are being listened to
Open	Conversational, expansive, affable, convivial, gregarious, unreserved, unsecretive, somewhat frank, possibly outspoken, definitely extroverted, and obviously approachable
Friendly	Ranges in meaning from being unhostile to deep intimacy
Precise	Accuracy and correctness. Communicator Image, the dependent variable, refers to whether someone is a "good communicator."

Table 2.10 Variable descriptions of CSM, Source: modified from Norton (1978)

CSM (Norton, 1978) is a self-report Likert-Scale, for participants are requested to assess their own communicator style by responding to 51 items, of which 45 are scored. The last six items are filler items which are intended to be ignored (Snaverly and McNeill, 2008). According to Norton, the construct validity and content validity of the CSM have been determined by comparing the structure of the questionnaire in different studies such as positive association with a host of communication behaviours and perceptions such as attractiveness (Brandt, 1979; Norton and Pettegrew, 1979), communication apprehension (Porter, 1982), communication competence (Eadie and Paulson, 1984), and relationship

disengagement strategies (Hailey, Daly and Hailey, 1984). The Internal reliabilities for the CSM variables have coefficients which range from 0.37 to 0.82. Various researchers have reported similar results (Duran and Zakahi, 1987; Hailey et al., 1984; Lamude and Daniels, 1984).

The CSM has been used in various setting and areas. Buller and Buller (1987) and Buller and Street (1991) have found that physicians' communicator style has an effect on patient satisfaction. Infante and Gorden (1989) reported that superiors were most satisfied with subordinates who expressed friendly, relaxed, and attentive dimensions. In the instructional environment, teachers' communicator style was positively associated with student learning (Nussbaum and Scott, 1979) as well as ratings of teaching effectiveness (Norton, 1983; Scott and Nussbaum, 1981). However, Sypher (1980) has questioned the validity of the CSM because it is a representative of self-report measures of behaviour which is memory based; therefore, it is not a true indicator of actual behaviour. Sallinen-Kuparinen (1992) has also stated that the CSM needs to be more sensitive to how different cultures enact communicator style.

However, according to De Vries et al. (2009), some of the scales based on these factors do not relate to interpersonal communication styles, but to intrapersonal cognitions and feelings with respect to communication, and consequently may be less useful in assessment situations or in cases in which an observer has to rate somebody else's interpersonal communication style. McCroskey et al. (1998) have indicated that there is lack of parsimony and integration in the growing area of communication style studies in measuring instruments of somebody's interpersonal communication style.

Researchers have explained that the basis of a lexical study is encoding in language what is said about a construct, such as somebody's communication style (Galton 1884; Goldberg 1990). Factor-analysis of a sample of all dictionary words which pertain to communication should provide the best description of the nature, number, and size of the principal communication style dimensions. According to a lexical study of DeVries et al. (2009), they have indicated seven main communication style dimensions: Expressiveness, Preciseness, Niceness, Supportiveness, Verbal Aggressiveness, (Expressed) Emotional Tension (or, reversed, Assuredness), and Argumentativeness.

In a research by Paton and Dorst (2011) about experienced designers' reframing problematic situations throughout the interview and grounded theory, their research suggests that experienced designers successfully communicated by using co-creation of a language through the interpretive process of building a shared understanding. It also suggests negotiating as mutually agreed by de-constructing the situation first and providing more desirable and workable project outcomes (Paton and Dorst, 2011). Indeed, various researchers have recommended presenting visual and tangible items or prototypes to have effective design communications with non-designers (Wylant, 2008; Clarkson and Eckert., 2010; Gerber and Carroll, 2012). Therefore, competent individuals achieve goals effectively and appropriately (Harris and Cronen, 1979).

Throughout this section, leader's communication styles and behaviours were reviewed as well as effective communication processes. In addition we explored different types of assessing communicator styles. For the purpose of this research, a leadership communication competence is a part of leadership behaviour in a given situation. The recommended communicating behaviours are to provide visual and tangible items for the other side of involved message receivers, building rapport and reframing conversations to the potential benefits of involved communicators. All communicated messages can be analysed within various dimensions by either factor analysis for communicator styles and competences or lexical studies to identify the competence and styles of communicator styles in a certain situation.

2.4. Design Leadership

This section explores the definition and the role of design leadership. As mentioned in the introduction to this chapter, the topic of design leadership has been a buzz word for the last decade. From the perspective of the organisation, Lockwood (2009) from the Design Management Institute states that 'Design leadership and design strategy can be viewed as outputs of effective design thinking and design management'. According to Gloppen (2009), design leadership is used to describe a more strategic level related to the vision of how design could be used within an organization to achieve corporate goals. From a practice perspective, Turner (2002) states design leadership behaviour helps organizations to envision the future and to ensure design is used to make those visions come true while design management delivers successful design solutions in an efficient and cost effective way. According to Manu (2007), design attitude not only envisions an organization's future, but it also allows to the

organization to create innovation. Clipson (1990) states design activity is considered to have a responsibility for the success of the whole enterprise.

According to the latest IBM CEO survey (IBM Global Business Survey, 2006), design attitude is an important quality for innovation. Lockwood (2009) indicates the attribute of design leadership is to build a competitive advantage for the organization by using design to measure customer satisfaction, usability, and brand values which are often attributes of superior design. Indeed, the Design Council in the UK (2013) has been launching the programme called “Design Leadership Programme” to non-design related organisations and businesses. This concerns how design can contribute to a business’s success with proven evidence. Unlike leadership studies, which have been studied on an individual level, design leadership is identified as a powerful means to generate new ideas, make tangible market expectations revealed through researches and demonstrate added values and differentiating in a cost effective way (Gloppen, 2009).

Yet, there are few researches and assertions to identify the role and activities of design leaders. Designers have been quicker than other discipliners in aligning their particular skills with the innovation process due to their characteristics such as innovation, creativity, invention and problem solving: these are the words commonly found in the literature of design (Gorb, 1990) and equally design leadership, as proposed by Turner and Topalian (2002), explores the values that designers uniquely introduce to this area. Design leaders’ main characteristics, based on literature reviews and insights from practitioners, can be listed as that of effective design communicator, envisioning a business objective as a pathfinder and an organization transformer based on design attitude and integrated thinking (Lockwood, 2009).

Envisioning a business’s objectives turning into reality or intangible experience is a designer’s principle activity (Topalian, 2002). The strategic creator has the capability to reveal the ‘*why*’, joining the ‘*how*’ with the ‘*what*’ and the means with the meaning in the organized exploration of possibility (Manu, 2007). Gaynor(2002) states ‘Leadership in innovation does not require being a multi-disciplinary specialist but it requires listening to what other specialists bring to the table, as innovation does not take place in isolation’. Qualities of design leaders have been identified as listening and looking, emotional bonding, awareness, doing, empowerment, responsibility, and synchronicity (Jozaisse, 2011). This is

reminiscent of a statement from Kotter (1996) which describes leaders as ‘people who can create and communicate visions and strategy’.

Furthermore, Manu (2007) states that new types of leader emerge in the process of fitting business to imagination, who knows how to discover and learn, and how to manage and inspire discovery and learning in others, to identify and validate ideas, and transform them into growth opportunities. Borja de Mozota (2006) indicates that maximizing this type of benefit requires penetrating design into every aspect of an organization. As the value of design changes, the business climbs, the ‘learning leader’ reaches a strategic level of design leadership based upon the respect of the design system in an organization which considers management as an art of collective action (Borja de Mozota, 2006). Thus, ‘design leadership lies in the areas of integrating design into business for continuous improvement.

Lockwood (2009) argues that a design leader is involved with the planning, processes, resources, and staff in building a culture for design. According to Siegel, “integrating the design thinking process into the other strategies by which an organization plans to achieve its goals will improve its competitive position” (in Best, 2006). According to Borja de Mozota (2006), a leader who “nourishes and triggers the imagination of individuals in teams, can transform the result into strategic capital- innovations that benefit business, culture, and society.” According to Jenkins (2008), to be successful, a design leader has to do a lot more than introduce design thinking and practice it within the corporate world. It means cultural transformation which makes sure the role of the design leader is the catalyst for transformation. Being a design leader means reshaping the organizational ecosystem (Jenkins, 2008). Thus, the design leader needs to create the right environment for design.

Obtaining the position of design leadership often involves both internal and external design resources (Lockwood, 2009). That is, alignment is the emergent quality arising from the integration of design leadership with design communication (Gloppen 2009a). Design leadership is not so much about leading the design discipline as about leading the organization through design thinking as a leadership philosophy (Gloppen 2009b). Thus, a designer in this role critically needs to convey design to non-designers (Cheung et al, 2001; Borja de Mozota, 2003).

In recapitulating the design leadership, McCullah (2008) proposes that design leaders tend to share three qualities: they are good at envisioning the future, thinking strategically, and

leading others. They master their professional craft and understand their fields as well as being driven by a restless challenge against the current social phenomena. McCullah (2008) taxonomically explains the 10 faces of design leaders from many styles. Some leaders share several categories but there are no common templates; Maestros, visionaries, managers, entrepreneurs, ambassadors, entertainers, scholars, provocateurs, scribes, and curators.

According to Lee and Cassidy (2006), the important factors and principles of better design leaderships are focused on a design team in Taiwan.

- Firstly, relationship is a key word that understands and respects people; so the leader must be reliable. The required personality is open-minded, tolerant, generous, ethical, considerate, and enthusiastic.
- The leader's attitude and values are objectiveness, sufficient knowledge, empowerment, challenging regulations creatively, exploring new solutions, valuing innovation, appreciating multidisciplinary backgrounds, being passionate in design and rewarding contributions from the team.
- Their behaviours are to facilitate encouragement as well as motivate team members, to communicate, to manage knowledge, self-development, and to set up a standard, systematic and joyful working environment.

Thus, the design leader's role is recommended as a ready consultant, a negativity killer, and a resource provider (Lee and Cassidy, 2006). Another research by Cheung et al. (2001) suggests that charismatic and participative leadership styles present the most successful design leadership for the design team. This empirical research also shares similar results of important design leadership factors such as being good at design communication and being ethical, the key responsibility of a project's success. These are similar to the leadership requirements in the current leadership research trend. Self-confidence trait (Hill and Ritchie, 1997:499; Judge et al., 2002) is the only agreed trait among the leadership definitions and is also identified in the researches and literature of design leadership (Cheung et al, 2001; Lee and Cassidy, 2006).

Lee and Cassidy (2006) recommend that it is important to recognize that a design leader has to have a different mix of leadership behavioural characteristics to those of linear-minded and attitude leaders. Their research recommendations align with the approach of leadership competencies which endorses the appropriateness of different project leaders for different

types of project (Müller and Turner, 2010). Besides, a designer in NPD has three different styles such as a functionalist, a CFC team member and an NPD leader depending on an organization's different business tasks and understanding of design capacity (Perk, Cooper and Jones, 2005). Nevertheless few researches and some assertions on design leadership have been studied; but synthesized design leadership elements are identified as:

- Being a craft (aesthetics) master (McCullah, 2008; Neumeier, 2009; Walker, 1990).
- Having a good design communication ability to share vision with internal colleagues and target users (Peters, 1987 in Gill, 2006: 100, 106; Zaccaro and Banks, 2001:190-191 in Gill, 2006:106; Voss, 2004; Lockwood, 2009; Turner, 2002).
- Thinking strategically (Gloppen, 2009) and adding unique value through a designer (Gorb, 1990; Oakley, 1990; Topalian, 2002) who is good at innovation, creativity, invention and problem solving; and, also at being a pathfinder who envisions a business objective.
- Not a position of authority but a process leading ability by design communication (Nelson, 2013; Jenkins, 2008; Gloppen, 2009; Von Stemm, 2003). Design Management Institute (DMI) defines 'design leadership' as the outcome of design management and design thinking.
- Not only introducing design thinking but transforming the organization to create an ecosystem that is "conductive to design, not antagonistic to it" (Jenkins, 2008). That is, being an organization transformer based on design attitude and integrated thinking (Lockwood, 2009; Gloppen, 2009).
- Managerial ability of internal and external resources (Lockwood, 2009). The design leader is involved with planning, process, resources, and staff in building a culture for design. The role expands more as interpreter, coordinator, and facilitator to support the whole NPD effort (Turner, 2003).

The above abilities entail mixed managerial and leadership skills. There is not yet any clear difference between design leadership and management (Gloppen, 2009). Recently, Miller and Moultrie (2013) have indicated the different and required skills for design leaders and managers in the fashion industry. The keyability to distinguish design leaders from design managers is to envision. Therefore, design leadership is acknowledged as envisioning a future for design that includes managerial activities. This is in accordance to what Kotter (2001) mentioned; that leadership and management are complementary because one function cannot survive without the other in the current economy.

Therefore, for the purpose of this research, the working definition of design leadership can be defined as *not an authoritative position but an emerging quality of leading the design process activity by a designer who is involved in NPD and who has certain characteristics such as reliability, open-mindedness, tolerance, generosity, ethical consideration, and enthusiasm; a charismatic, participative or any appropriate leadership style; and abilities such as exceptional design communication ability, holistic approach to project problems, envisioning a NPD direction, good aesthetic skills, and organisation transforming abilities based on their design attitude and resourceful managerial ability.*

2.5. Summary

The researched design leadership characteristics are almost similar to the current leadership requirements and researched successful leadership behaviours. Although there are too many different definitions caused by different perspectives, it has been agreeably conceived that a leader applies leadership knowledge and skills to carry out a process and uses their traits to influence others to achieve a goal (Avery, 2004; Gill, 2006; Vroom and Jago, 2007). Recently, suggested leadership characteristics are ethical, adaptive, good communicators and support the emotions and needs of team members. However, leadership style can be different for different types of project and sectors (Müller and Turner, 2007; 2010). Indeed, the role of a leader is usually seen as the figurehead of a project; however, a design leader has been seen as a process leader who can deliver design effectively not as positioning a leader (Turner, 2013).

Several researchers have indicated that effective communication is an essential component of effective management and leadership (Awamleh and Gardner, 1999; Flauto, 1999; Kirkpatrick and Locke, 1996; Snively and McNeill, 2008). Pavitt (1999) and Madlock (2008) have recommended that effective communication between leaders and subordinates is highly related to work satisfaction. Both design leadership and leadership researches share the fact that effective leaders are those who can ensure their teams are working cohesively and receiving the support they require in satisfying their personal needs to operate effectively. If a worker has derived satisfaction from his/her work, an increase in productivity can be expected (Locke et al., 1976). Similarly, project leadership requires both abilities. The required abilities are communicating project vision, creating the environment and direction,

strong interpersonal skills, the ability to engage the management culture's support and integrative problem solving skills to apply them in multiple areas in related projects internally and externally (Cook and Tate, 2006; Pennypacker an Pennypacker and Cabanis-Brew,2003). Therefore, the table below presents common successful leadership styles in leadership studies, project leadership, and design leaderships.

	Design Leadership	Leadership Studies	Project Leadership
Key characteristics	Designers are not positioned as a leader. It is recommended to envision a business objective in communicating design.	Leaders are in higher positions in an organization. Recently, mixing IQ, EQ and MQ for different projects and sectors are recommended.	A project leader is considered as a figure head for a project.
Similarity	<ul style="list-style-type: none"> ● Characteristic: Self confidence ● Style: aiming to achieve project goals, charismatic, providing emotional support and being participative from situational leadership ● Different styles are appropriate for different types of project and situations. 		
Leadership requirements	Coaching with empowerment, vision conveyer, good listener, ethical, emotion and empathy support, dealing with complexity, adaptive for new approach, and providing satisfaction for future momentum.		

Table 2.11 Common elements of leadership studies

Vries, Bakker-Pieper, and Oostenveld (2009) have stated that although the core element of leadership is interpersonal communication, there are few researches which have tried to operationalize leaders' communication styles in their daily transactions with subordinates. Besides, recent leadership studies acknowledge that different mix of leadership attribute including emotional, intellectual and managerial competences are recommended for different types of projects and sectors (Müller and Turner, 2007; 2010). Previous studies and assertions about design leadership have tended to focus on the role of design and design leaders in organisations, and the positive business impact made by design. A very few design leadership studies have focused on expectations about the role and leadership style of design managers from designers and organisations, and the different skill sets between design managers and design leaders. However, it is rare to find studies about the profiles of design leaders able to communicate appropriately in communicating design to non-designers, in particular at the level of new product development. Therefore, this research focuses *on exploring the leadership competencies and characteristics of design leaders who can competently communicate design during new product development (NPD)*.

3. Research Methodology

In this chapter, the methodology of this research is discussed. It presents the overall research methodology and methods employed to address research objectives two to six:

- Objective 2: to identify design leaders' characteristics and leadership styles at the FFE of NPD
- Objective 3: to investigate how design leaders successfully communicate design to non-designers at the FFE of NPD
- Objective 4: to explore how design leaders became design leaders and how they learned to communicate design with non-designers at the FFE of NPD

In order to achieve the above research objectives, Section 3.1 reviews research paradigms, strategies, and methods to identify the appropriate research methodology and methods for this research. Section 3.2 explains how the pilot study was designed. It explains the sampling strategy and multiple research methods used to understand designers' characteristics, leadership style, how they communicate design, and their struggles in communicating design at the FFE of NPD. It also explains the analysis of triangulated research methods. Then, Section 3.3 explains the research design used in the main study. This study used semi-structured interviews based on the literature review and findings of the pilot study. It also states how research findings are analysed. Section 3.4 explains the rigorous approaches involved in the chosen research methods. Lastly, Section 3.5 provides a summary of the chapter.

3.1. Research Paradigm

Methodology influences the choice of methods and data interpretation and is based on the worldview of a researcher; it can be divided into two different views: **positivist and constructionist** epistemology (Wisker, 2008). "Epistemology is the study of the nature of knowledge" (Potter, 2006). According to positivist epistemology, knowledge can be obtained only by gathering facts about the world through a systematic observation of the world. Positivism views the world objectively, and knowledge can be discovered by testing a hypothesis gradually to refine the universal "laws of nature" (Potter, 2006). Mostly,

quantitative approaches are preferred (Creswell, 2009) in this view. This paradigm was dominant in the social sciences from the 1930's to the 1960's (Gray, 2009).

On the other hand, the constructivist epistemology uses a different method for gathering knowledge. It has three key views: knowledge is constructed, not simply discovered; knowledge is multiple not singular and knowledge is contingent (Potter, 2006); thus, qualitative approaches are preferred in this view (Creswell, 2009). Per the constructivist view, knowledge creators gain power that offers control over what is and what is not defined amongst people. The figure below compares the two epistemologies.

Positivism	Constructionism
Regards the world as objectively 'out there', real and completely separate from human meaning-making	Claims that the only world we can study is a world of meanings, represented in the signs and symbols that people use to think and communicate
Asserts there is only one true, objective knowledge that transcends time and cultural location.	Accepts that there is multiple knowledge, and that knowledge is highly contingent on time and cultural location.
Views knowledge as based on facts that are 'out-there-in-the-world' waiting to be discovered.	Views knowledge as constructed through people meaning-making
Asks of knowledge 'is it true?'	Asks of knowledge 'what does it do?', 'how can it be used- by whom, and to what ends?', 'whose interest does it serve?', 'what does it make possible?'

Table 3.1 Comparison of Positivism and Constructionism, Source: adapted from Potter (2006) (2nded) doing postgraduate research

According to Wisker (2008), with continuous improvement in the research paradigm, more than two main "isms" have arisen in social research. The table below presents the different "isms" in social science research.

Positivism	<ul style="list-style-type: none"> ● Positivism depends on belief that: human society, like the natural world, is subject to fixed laws; behavior can be determined; and there is little room for choice or multiple interpretations ● Is associated with 'empiricism', 'behaviorism', 'naturalism', or the scientific approach', and tends to attribute 'scientific' status to social research ● Is most often used in research in economics, psychology, management studies, marketing, some health related (non-clinical) research ● Argues that knowledge and truth exist insofar as they can be proved.
Interpretivism	<ul style="list-style-type: none"> ● Human beings are subjects and have consciousness or a mind; human behavior is affected by knowledge of the social world, which exists only in relation to human beings

	<ul style="list-style-type: none"> ● The mind interprets experience and events, and constructs meaning from them- meaning does not exist outside the mind and the agreement of human beings.
Constructivism	<ul style="list-style-type: none"> ● Based on similar beliefs as interpretivism, believes that human beings construct knowledge and meaning from experience and from relationships between things, people, events
Structuralism	<ul style="list-style-type: none"> ● All knowledge is historically and socially contingent- that is, based on its context and mediated by power relations, law and language, ● Objective, rational laws inform human activity, the mind, language, behaviours, identify formation and interpretations.
Poststructuralism	<ul style="list-style-type: none"> ● Like structuralism, sees language as divorced from things and events; relations agreed on by human beings (or not) in a context where there are no stable meanings, reality or laws ● All knowledge is constructed, interpreted, in a system of relations.
Postmodernism	<ul style="list-style-type: none"> ● Similar assumptions to poststructuralism ● Knowledge and experience are fragmentary, and humans impose meanings and order upon them ● There is debate between beliefs about the construction and control of subject in context or the existence of a decision-making human subject.

Table 3.2 Different research paradigms, Adapted source: Wisker (2008) The postgraduate research handbook, p.69

Unlike the above worldviews, *Pragmatism* does not belong to only one perspective. It originates from the works of Peirce, James, Mead, and Dewey (Cherryholmes, 1992). The worldview of pragmatism is informed by “actions, situations, and consequence rather than antecedent conditions (as in post positivism)” (Creswell, 2009). The uniqueness about this approach is that it focuses on the solutions to the problems and research problems instead of focusing on the method (Patton, 1990; Rossman and Wilson, 1985). According to Goldkuhl (2012), pragmatism involves action, change, and the interplay between knowledge and action so that it forms an appropriate basis for research approaches intervening in the world and not merely observing the world. Thus, pragmatism uses all available approaches to define the problem (Creswell, 2009), and the type of knowledge used is termed ‘constructive knowledge’ (Goldkuhl, 2012). In particular, Lee and Nickerson (2010) indicate that pragmatism is a more adequate research paradigm than positivism for designing research. Practice-based research approaches are applied to create not only new artefacts but also additional knowledge of artefact characteristics (Goldkuhl, 2012; Gray and Malins, 2004). Numerous researchers consider intervening to be the building of artefacts in design research; thus, both action and design research are natural, as per the pragmatism perspective (Cole et al., 2005; Järvinen, 2005; Livari and Venavle, 2009).

In addition, other types of research designs are proposed. According to Frayling (1993), research design can be classified according to three areas: 1) “research into design”, with design as the very subject of research; 2) “research through design”, with design as a means for performing the research and communicating the results; and 3) “research for design”, with design as the end product through research and investigation. Moreover, Cross (1999) proposed a design research taxonomy which states that design knowledge exists in people, processes, and products: 1) design “epistemology” looks at people and is about studies of ways of knowing and working in the field of design; 2) design “praxiology” refers to processes and the study of design methodologies, strategies, and techniques applied to the process of design; and 3) design “phenomenology” refers to products and explicit knowledge embodied in artefacts. However, Gray and Malins (2004) point out that there is no single definitive research method in art and design, so qualitative methods from social sciences are used often and considered useful.

Goldkuhl (2012) stated that pragmatism and interpretivism share an orientation toward understanding; however, there are dissimilarities in their epistemological orientations. Below is an ideal-typical differentiation between pragmatism and interpretivism.

	Pragmatism	Interpretivism
<i>Ontology</i>	Symbolic realism	Constructivism
<i>Empirical focus</i>	Actions and changes	Belief (socially constructed cognition)
<i>Type of knowledge</i>	Useful for action	Interesting
<i>Type of investigation</i>	Inquiry	Field study
<i>Data generation</i>	Data through assessment and intervention	Data through interpretation
<i>Role of researcher</i>	Engaged in change	Engaged in understanding

Table 3.3 Pragmatism vs interpretivism: ideal-typical differentiation; Source: adapted from Goldkuhl (2012)

Pragmatism is instrumental in relation to the change of existence (Dewey, 1931) and interpretivism involves field study and is informed by the view that knowledge is understanding (Klein and Myers, 1999). Therefore, the nature of this research is constructionist. There is a growth in research within art and design by pragmatism; and, it is to create a new artefact. However, the aim of this thesis was to identify and understand the leadership of design leaders at the FFE of NPD, in particular regarding the process they use

to communicate design to non-designers. *Interpretivism is therefore the appropriate research paradigm for this thesis.*

3.1.1. Research Approach and Purpose

According to Dewey (1933), a general paradigm of inquiry supports the scientific approach, consisting of **inductive** discovery and **deductive** proof. Nachmias and Nachmias (1996) indicated that inductive approach is a “research-before theory” strategy which allows new problems or phenomenon to emerge from empirical research. “Induction is a process of drawing inferences from observation in order to make generalizations” (Potter, 2006). It consists of four main stages:

- Observation and recording all facts objectively for data gathering
- Analysing, comparing, and classifying all facts to identify regularities, without references to any hypothesis
- Based on the analysis, inferring generalizations about the relations between the facts
- Producing a general law of cause and effect then testing it through further observation

On the other hand, deduction collects data explicitly with preconceptions (Potter, 2006). Nachmias and Nachmias (1996) pointed out that the deductive approach involves the construction of a hypothesis before the research takes place, also called hypothetico-deduction. In other words, it is an experimental approach that uses either a research question or a hypothesis to be tested (Gray, 2009). Therefore, the nature of this research tends towards an inductive approach first and then a constructing theory approach, thereby allowing the researcher to explore the subject of leadership at the early stage (FFE) of NPD with regard to design leaders who are competently communicating design to non-designers and designers who face difficulty in communicating design to non-designers. *The inductive approach is used to facilitate a new understanding to emerge from empirical research.*

According to Neuman (2006), with regard to purpose, i.e. what the researcher wishes to achieve, research can be classified as: exploratory – exploring a new topic, descriptive – describing a social phenomenon, or explanatory– explaining why something occurs. Firstly, Gray (2014) explains that exploratory studies explore what is happening and ask questions to

study an unknown phenomenon. This can be done via a literature search, talking to experts in the field, and interviewing a focus group (Saunders et al., 2011). Secondly, the purpose of a descriptive study is to provide a detailed picture of a phenomenon which could involve a situation, people, or event and to show how all these aspects are interrelated (Hedrick et al., 1993). Therefore, it creates a set of categories or classifies reports on the basis of background or context of a phenomenon (Neuman, 2006). Thirdly, explanatory studies ask “why” and “how” questions whereas descriptive studies ask “what” questions (Gray, 2014). In addition, explanatory studies test a theory’s predictions or principle so that a theory can be extended to new issues or topics (Neuman, 2006).

This research used an inductive approach directed towards addressing research questions and understanding leadership, communication of design, and competencies of design leaders and designers. *Thus, the purpose of this research is exploratory.*

3.1.2. Qualitative Research

According to Creswell (2009), the research method is primarily classified into three types: qualitative, quantitative, and mixed methods. The table below highlights the three approaches.

Qualitative, Quantitative, and Mixed Methods Approaches			
Tend to or typically	Qualitative	Quantitative	Mixed Methods
Philosophical assumptions	Constructivist, advocacy, participatory knowledge claims	Post-positivist knowledge claims	Pragmatic knowledge claims
Research methodology	Phenomenology, ground theory, ethnography, case study, and narrative	Surveys and experiments	Sequential, concurrent, and transformative
Employing methods	Open-ended questions, emerging approaches, text or image data	Closed-ended questions, predetermined approaches, numeric data	Both open- and closed-ended questions, both emerging and predetermined approaches, and both quantitative and qualitative data and analysis
Research practice by researchers	<ul style="list-style-type: none"> ● Positions him or herself ● Collects participant meanings ● Focuses on a single concept or phenomenon ● Brings personal 	<ul style="list-style-type: none"> ● Tests or verifies theories or explanations ● Identifies variables to study ● Relates variables in questions or hypotheses 	<ul style="list-style-type: none"> ● Collects both quantitative and qualitative data ● Develops a rationale for mixing ● Integrates the data at different stages of inquiry

	<ul style="list-style-type: none"> ● Studies the context or setting of participants ● Validates the accuracy of findings ● Makes interpretations of the data ● Creates an agenda for change or reform ● Collaborates with the participants 	<ul style="list-style-type: none"> ● Uses standards of validity and reliability ● Observes and measures information numerically ● Uses unbiased approaches ● Employs statistical procedures 	<ul style="list-style-type: none"> ● Presents visual pictures of the procedures in the study ● Employs the practices of both qualitative and quantitative research
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Table 3.4 Different research approaches, Adapted source: Creswell (2009) (3rded) Research Design: Qualitative, Quantitative, and Mixed Methods Approaches

Punch (2000) recommends that it is important to revisit the research questions to understand the implications they have for a research design. The research approach has a significant influence on the choice of data gathering methods and approach to data analysis (Creswell, 2014). Following on from the discussion on research paradigms, **interpretivism**, with the approach as **inductive** and purpose as **exploratory**, is appropriate with **qualitative research**. Oakley (1999) stated that qualitative research is process-oriented, grounded, discovery-oriented, exploratory, expansionist, descriptive, and inductive. Qualitative data can be collected by observation, interviews, documents, and audio-visual materials (Creswell, 2009). In addition, the data can be derived from field notes of observation in ethnographic work, visual images, or transcripts of conversations (Seale, 2004).

However, qualitative methods are recently being used in conjunction with quantitative methods, depending on the nature of the research, research problem, or research subject (Creswell, 2009). Besides, the underlying philosophical positions do not need to be separated stereotypically because both (quantitative and qualitative) approaches can use the same methods; however, qualitative research tends to concentrate on in-depth exploration as much as possible, with a small number of instances or examples seen as interesting or illuminating, meaning it aims to achieve “depth” rather than “breadth” (Blaxter, Hughes and Tight, 2010).

Furthermore, Klenke (2008) stated that leadership research has been grounded in the objectivist, positivist, and quantitative paradigm; however, quantitatively generated leadership descriptions usually fail to provide a deeper understanding of the structure of the phenomenon studied. In addition, it is difficult to understand and interpret the results of leadership studies with large sample sizes and complex quantitative methods (Cepeda and

Martin, 2005). Numerous researchers argue that qualitative studies must play key roles in management and leadership research (Bryman, Stephens and à Campo, 1996; Conger, 1998; Steiner, 2002). A leadership study is context dependent and well suited for qualitative analysis because of its multidisciplinary nature, and the qualitative research in the study captures “the subjective experience of leaders and followers, its slippery nature, and the local context in which leadership takes place” (Klenke, 2008).

3.1.3. Role of the Researcher

According to Denzin and Lincoln (2011), “the qualitative researcher is not an objective, authoritative and politically neutral observer standing outside and above the text”. Alvesson and Skoldberg (2000) mentioned that a researcher interprets the research subject with his or her judgement and intuition and has the ability to “see” things. Besides, the researcher is a key instrument because the qualitative researcher collects data by observing behaviour, interviewing participants, and examining documents (Creswell, 2014). Thus, numerous authors (Creswell, 2013; Hatch, 2012; Marshall and Rossman, 2011, cited in Creswell, 2014) recommend “reflexivity” to be introduced in qualitative research. The inquirer in a qualitative research reflects on the researcher’s role in the study and his/her personal background, culture, and experiences that may hold the potential for shaping his/her interpretations, such as the themes advanced in and the meanings ascribed to the data (Creswell, 2014). On the contrary, qualitative researchers attempt to develop a holistic view of the problem or issues under study by involving multiple perspectives, thereby identifying the various factors involved in a situation (Creswell, 2014). The researcher involved in this research has 16 years’ experience in visual art, a degree in industrial design and design strategy, and experience as a practiced designer as well as marketing and events head coordinator. The researcher has lived, studied, and worked in various countries like S. Korea, Canada, the USA, and the UK. In order to

achieve a holistic view of the problems or issues under study, the research is planned with multi-research methods and different studies which will be explained in Sections 3.2 (Pilot study)) and 3.3 (The Main Study).

3.2. Research Design for the Pilot Study

In the previous section, a qualitative methodology was identified as an appropriate approach. In this section, the design and processes used for the pilot study, including data collection and analysis, are discussed.

According to Gray (2014), the piloting of research instruments is essential to achieve research that is accurate and unambiguous. From the perspective of social science researchers, the term ‘pilot study’ refers to feasibility studies – small-scale versions or trial runs – that prepare the researcher for the major study (Polit et al., 2001). A pilot study can also be used to try out a particular research instrument (Baker 1994). Gillham (2007) recommends using an initial list of questions with one or two people who are not part of the target group. While piloting, a researcher can receive feedback about the research instruments, where the main research protocols may not be followed or responsive and whether proposed methods or instruments are not appropriate or very complicated (De Vaus, 2014). They can also observe how the pilot-study participants react; thus, the research instrument can be revised in order to produce appropriate responses and clarify the research aims (Gillham, 2007).

The nature of design is contingent and flexible to every project because each project is unique. A process can be applied differently to different individuals, different industry sectors, and different organisations (Blessing and Chakrabarti, 2009). Simon (1981) claimed that design is a mixture of knowledge-intensive activity and purpose-, social-, and cognition-oriented activity, which attempts to change the existing status to an ideal situation. Hovrath (2001, 1) defined design research as “generating knowledge about design and for design”. However, Blessing and Chakrabarti (2009) indicated that design research had limited applicability because academia does not work according to industry’s needs. The US National Science Foundation (Shah and Hazelrigg, 1996) suggested more effective integration between industry and academia within engineering design by assessing industry needs for tools and technology and applying research results to the related area. In particular, the results of a

survey on UK industry conducted by Upton and Yates (2001) indicated that the major shortcomings of design research are often that it is incorrectly formulated and not directly applicable. Although there are a few reports related to engineering design, there is a need for further academic research within the industry (Shah et al., 2004). Understanding the real situation is critical for research initiation. The validity of qualitative research is essentially connected to the fact that constructs are closely aligned to the research respondent's real-life context (Ruyter and Scholl, 1998).

Therefore, prior to researching and understanding design leaders' leadership characteristics, communication behaviours and abilities, the pilot study is planned. As presented here, it was conducted in a real-life context to explore the problems faced by designers, especially in communicating design to non-designers at the FFE of NPD. For the purpose of the pilot study, what was specifically researched was how designers communicate design, why and when they face difficulties in communicating design to non-designers at the FFE of NPD, and how designers communicate to resolve miscommunication about design with non-designers at the FFE of NPD. Thus, findings from the pilot study were used as the basis for the main study with design leaders who have overcome the difficulties that designers have in communicating design to non-designers. The details of the real-life setting will be described in the next section.

3.2.1. Triangulation

Campbell and Fiske (1959) initiated the methodological concept of triangulation in social science. It was developed by Webb et al. (1966), elaborated by Denzin (1978), and has received much attention in current qualitative studies (Flick, 2004). Denzin (1978) defined it as "the combination of methodologies in the study of the same phenomenon" and outlined four types of triangulations: a) data triangulation with various data sources used in a study, b) investigator triangulation with several researchers conducting research, c) theory triangulation with multiple perspectives and theories used to interpret the results of a study, and d) methodological triangulation with multiple methods used to study a research problem. "Triangulation" is a process of verification that increases the validity of a study by integrating various perspective and methods (Yeasmin and Rahman, 2012). According to Creswell (2014), "triangulating different data sources of information by examining evidence from the

sources and using it to build a coherent justification for themes. If themes are established based on converging several sources of data or perspectives from participants, then this process can be claimed as adding to the validity of the study” (p.201). Therefore, triangulation helps by cross-checking and confirming findings through the convergence of different perspectives, to strike a “balance” between two or more different types of studies, thereby increasing the credibility and validity of the final results (Yeasmin and Rahman, 2012).

With respect to the research problem, methodological triangulation was used. Therefore, the pilot study involved three data collecting methods: observation, semi-structured interviews, and questionnaires. The research triangulation (Creswell and Clark, 2007) approach is adopted because it allows cross examination of the results of the studies. Triangulation of research methods not only helps prevent the likelihood of bias from the perspectives of the participants or the researcher but also gives multiple perspectives to understand specific situations, e.g. how designers communicate design to non-designers, the difficulties they face in communicating design in the context of the FFE of NPD, and key points for improving communication. Therefore, the data collecting methods were selected for understanding the communication difficulties faced by designers. The findings were applied to formulate the plan for the main study involving design leaders.

3.2.1.1. Research Setting

According to Creswell (2014), “the idea behind qualitative research is to purposefully select



Figure 3.1 NPD setting- working site at St. Etienne, France

participants or sites which will best help the research understand the problem and research question”. In addition, Miles and Huberman (1994) recommend four aspects to consider when selecting participants and settings: 1) the setting is where the research takes place, 2) the actors are the ones who will be interviewed

and observed, 3) the event is the observation and interview, and 4) the process is the evolving nature of events undertaken by the actors within the setting. In order to find a real-life context project for the pilot study, a real project at the early stage which required the designers and non-designers to collaboratively design a concept was identified. The project is called “L*unch Box” which was initiated by Brunel University in the UK and Ecole des Mines, France in 2009. Over four days in spring, the project sponsors invite students from different disciplines, in terms of work experience or studies, such as design, engineering, and business, to collaboratively work to produce new project concepts. Every year, the programme has a different project. The researcher obtained permission from the main facilitators of the project to conduct the research. The project was to create a concept for a learning centre, called U-Zine, worth 12million Euros, spanning 5 hectares in St. Etienne, France. It was funded by the Department of Education, France.

The learning centre was to function as an academic, economic, and industrial realm that focuses on collaboration, innovation and teaching, and knowledge transfer. The brief stated required it to be a user-oriented product with accessibility, flexibility, and services for knowledge transfer. Four universities (Brunel University, the UK; Politecnico di Milano, Italy; Auburn University, the USA; and Ecole des Mines, France) collaborated for this project; the 29 participants were young designers from mixed disciplines and non-designers with engineering or business backgrounds and work experience ranging between 0 and 8 years.

The programme was conducted over four days and divided into two parts. For the first two days, all participants were divided into four groups of eight to ensure that each team had a balanced mix of participants from all disciplines and countries. For the first half of the programme, they were given time to generate ideas. Each team had a facilitator, who led the discussion and wrote down ideas and concepts. The first task was demanding that each team had to create 100 concepts in the first day. Then they were asked to synthesise 100 ideas into 2 ideas so that they presented the project idea. The idea with the potential for further development was chosen by the facilitators. For the second half of the programme, each group was divided into eight groups of four participants, and these groups developed the chosen concept further. On the last day, they were asked to prepare a presentation at the Biennale Internationale Design Saint-Etienne. The project concept was presented to the public, the programme participants, and project sponsors.

3.2.1.2. Sampling Method for the pilot study

A sample is representative of the population as a whole (Gray, 2009). Sampling methods can be divided into two categories: 1) **Probability** sampling usually refers to the gathering of data from the general population in one city – “Each member or item of population has an equal or known chance of being selected (Somekh and Lewin, 2011)”. It generalizes findings from the data analysis. 2) On the other hand, **non-probability** sampling deals with a group which is selected according to the researcher’s convenience, availability, and specific needs (Creswell, 2009; Somekh and Lewin, 2011). The table below explains each sampling method and the comparison between probability and non-probability sampling.

Probability	Non-probability
Random: it totally takes random sample of population. Each individual has an equal opportunity to be selected. It requires a complete list of population.	Quota: it is similar to stratified sampling; but, people are selected to fill quota for specific research purpose.
Systematic: similar to the random sampling but, it has an unordered list of complete population. The sample selection is by a systematically regular gap from the unordered list.	Available: the sample is a group of available people around a researcher. This method is usually used for a pilot test.
Cluster: the sampling choice to be like geographically spread: for example, “a number of hospitals could be selected from the list of all hospitals in a country and then the identified through a random sampling strategy”.	Purposive: the sample is chosen for a specific purpose
Multi-stage: this is an extension of cluster sampling in detail. For example of a country, the same percent of sample can be chosen by country, county, city, town	Snowball: small group of people are selected to represent a population with selected characteristics. Selected samples refer similar others for the research.
Stratified: it requires having one or more certain element choice from the same percentage of sub groups of either random or systematic sampling strategy.	

Table3.5 Sampling methods, Adapted sources (Creswell, 2009; Gray, 2009; park et al, 2010; Somekh and Lewin, 2011)

Sampling for the research depends on the goal of the research (Bloch, in Seale et al., 2004). The sample for Study I was obtained using **non-probability purposive sampling** because

the study aimed to obtain in-depth understanding and insight from the designers at the FFE of NPD through triangulated research methods. All participants applied for this four-day multi-cultural, national, and disciplinal programme to create a real concept for the project; however, each country's facilitators selected participants for the programme as per the selection criteria. The participants were expected to work collaboratively with different individuals belonging to different culture and disciplines at the FFE stage of NPD. Therefore, all participants, as per purposive sampling, were appropriate for meeting the research aims and objectives. The information about the participants will be given in Chapter 4 (The Pilot Study).

3.2.2. Observation

According to McBurney and White (2009), observation is divided into two types: participant and non- participant. Participant observation is carried out in the study setting, whereas non-participant observation is conducted such that it does not influence the behaviour or response of the participants, as the researcher does not influence the research environment. In addition, overt observation refers to a scenario where both participants and observers are aware that the observation is being conducted whereas covert observation refers to the scenario where both participants and observers are undercover so that the people may behave as naturally as they do in their daily lives (Gray, 2014). However, covert observation is often criticised for being unethical.

Observation not only includes noting down "the fact" but also interpreting the "meaning" of participants' behaviours and perceptions and research settings including sensations such as sight, sound, touch, smell, and even taste (Gray, 2014). The benefits of observation are having an opportunity to go beyond people's opinions and self-interpretations of their attitudes and behaviours, for evaluating their actions in practice. However, one drawback is the bias of the observer who may see what he/she wants to see and ignores other, possibly significant phenomena (ibid). Therefore, observation can be carried out structurally, focusing on the frequency of participants' actions, while participative observation is more qualitative, focusing on meaning that participants give to their actions (Saunders et al, 2012).

The purpose of the Pilot Study was to observe designers when they communicated design at the early stage of NPD. As the research setting was described in Section 3.2.1.1., the

participants in the research setting were busy producing an NPD concept in four days, so **overt and non-participative** approaches were used along with **participative and structured methods**. Unlike project facilitators, the researcher only observed and did not influence participants. In addition, the participants were aware of the presence of an observer, so they did not need to hide their concepts as they would from their competitors. The participants were able to talk to the researcher freely during the programme and after the daily programme about their experiences, feelings, and thoughts about the programme and their colleagues. Lastly, the participants were scheduled for semi-structured interviews.

Over the four days of the observational study, the researcher identified how designers actually behaved during their interaction and communication with other designers and non-designers. The researcher also observed how designers resolve miscommunication and lead team members to achieve the project brief. This type of study reduces the likelihood of assumptions being made by the investigator about the behaviour of real people (Keates and Clarkson, 2003). Observations were captured through notes and some photographs. Field notes are “the backbone of collecting and analysing field data” (Bailey, 2007). With regard to the quantitative aspect of the study, the time taken by the participants and each team for producing design concepts was recorded to understand the relationship dynamics among different cultural and disciplined designers and non-designers in a team. Lastly, insights from the facilitator about the behaviour of participants, noted daily after the programme, were compared with the notes taken by the researcher.

3.2.3. Semi-structured Interviews

According to Rowley (2012), an interview is a verbal exchange in which one person, the interviewer, tries to obtain information from and gain an understanding of another person, the interviewee. The interview in qualitative research is a critical one. It is more than simply a gathering of facts, as it tries to construct meaning and interpret the facts in the context of the conversation (Kvale, 1996). Silverman (2001) stated that “the primary issue is to generate data which gives an authentic insight into people’s experience”. In addition, interviewing allows researchers to access the context of people’s behaviours to understand the meaning of those behaviours (Seidman, 1998). Cohen and Manion (2000) pointed out the following three

unique purposes of interviewing: 1) gathering information about a person’s knowledge, values, preferences, and attitudes; 2) testing a hypothesis or identifying variables and the relationship between them; and 3) using other research techniques, such as surveys, to follow up any evident issues.

Further, there are three types of interviews: structured, semi-structured, and open-ended. Gray (2014) stated that structured interviews are often used to collect data for quantitative analysis, pre-prepared questionnaires, and standardised questions, with the same questions asked to all participants. Semi-structured interviews have a list of issues and questions to be covered but additional questions can be asked. Probing for perspectives and opinions is also acceptable, to encourage interviewees to expand on their answers. Lastly, open-ended interviews are used to explore an issue or topic in-depth in light of the objectives of the research, without the use of pre-planned questions (ibid).The table below provides a comparison of different interviews (Arksey and Knight, 1999).

Structured	Semi-structured	Unstructured (non-directive, focused and informal conversation)
Quick to data capture	Slow and time-consuming to data capture and analyse	As for semi-structured
Use of random sampling	The longer the interview, the more advisable it is to use random sampling	Opportunity and snowball sampling often used. In organisations, targeting of ‘key informants’
Interview schedule followed exactly	Interviewer refers to a guide containing mixture of open and closed questions. Interviewer improvises using own judgment.	Interviewer uses <i>aide-memoire</i> of topics for discussion and improvises.
Interviewer-led	Sometime interviewer-led, sometimes informant-led.	Non-directive interviewing
Easy to analyse	Quantitative parts easy to analyse	Usually hard to analyse
Tends to positivist view of knowledge	Mixture of positivist and non-positivist	Non-positivist view of knowledge
Respondents’ anonymity easily guaranteed	Harder to ensure anonymity	Researcher tends to know the informant.

Table3.6 Characteristics of structured, semi-structured and unstructured interviews, Adapted from Arksey and Kinght, 1999, cited in Creswell (2014), p.387

The semi-structured interview technique lies between those of structured and open-ended interviews. Semi-structured interviews are used mainly because they are flexible; a list of

questions is used, and the sequence and wording of the questions can be changed to help the interviewees expand on their answers where necessary (Bryman and Teevan, 2005; Gray, 2014).

In order to ensure consistency between all the interviews, the same set of questions was used for all the interviews.

- a) **Interviewee profile:** All the interviewees were asked to describe their educational background and work experience including roles and responsibilities within their organisations and product development teams, and the reasons they applied for the NPD project at St Etienne, France.
- b) **Leadership and communication in the FFE of NPD:** The interviewees were asked about their leadership preferences based on the literature review findings: 1) managerial (MQ), intellectual (IQ), and emotional (EQ) competencies; 2) understanding of self-confidence; 3) self-awareness of leadership and communication abilities; and 4) communication preferences.
- c) **Understanding of team structure and members and the project brief:** All interviewees were asked about their disciplines and the countries and nationalities involved in their projects, how their teams communicated or exchanged ideas, and how they chose the concept to be developed further among team members. They were also asked how they identified and understood the project brief.
- d) **Difficulty in communicating design and resolving miscommunication and misunderstandings:** All interviewees were asked if they had difficulty in communicating ideas, concepts, and opinions and how they resolved misunderstanding and miscommunication among members.
- e) **Experiences of the programme and recommendations:** All interviewees were asked what they learned from the programme and if they had any suggestions for improving the programme. This also helped the researcher to understand the experiences of the participants. The interviewees were asked whether they wished to develop certain abilities for their future endeavours.

All interview sessions were held face-to-face and recorded by a voice recorder, with consent obtained from the participants. The audio recording was accompanied with note-taking –this technique is used in social sciences to capture the essence of what was learned for future

reference (Henn, et al., 2006). All interviews were transcribed and sorted according to the topics for qualitative analysis, which will help to prepare for the next stage of Study II. The average time taken for each interview was 30 minutes.

The interviews helped the researcher in four ways: (1) understanding what designers feel about generating design concepts in the group work context, (2) cross-checking between their actual behaviour and what they thought they did in the team, (3) exploring where designers have difficulties in communicating design and sharing their ideas with other designers and non-designers, and (4) identifying what aspect they wish to develop with regard to communication and leadership.

3.2.4. Assistive Questionnaires

Questionnaires were used as an assistive method for collecting data to support and compare the obtained data with those from the observation and semi-structured interviews. According to Gillham (2000), questionnaires are rarely satisfactory as a research method on their own, but instead a range of methods needs to be used to construct a more complete picture. According to the literature review (Chapter 2) findings, the questionnaire was adapted from the Leadership Dimension Questionnaires (LDQ) (Dulewicz and Higgs, 2003) and communicator Style Measure (Norton, 1978). The aim of self-rating questionnaires about leadership competency and communicator style is not for statistical significance. Both are self-rated questionnaires to identify participants' preferences about leadership and communicator styles. Thus, the results of the questionnaire shed light on how designers become aware of their leadership and communicator styles. In addition, the data from the questionnaires answered by design and non-design participants was compared to identify the similarities and differences between designers and non-designers.

Both questionnaires were piloted with available sample method from non-probability sample methods – three designers. The first was the CEO of a small design agency with work experience of 10 years in graphic, package and web design, the second had 8 years of work experience in textile design and marketing, and the last one had work experience of 3 years in architectural design. The piloted questionnaires were completed in an average duration of 25 minutes. The pilot study recommendations were to reduce the number of pages in the

questionnaires (originally, 6 pages) and to add clear explanations for each question, in particular for the leadership questionnaire. Therefore, the number of pages in the questionnaire was reduced to 3 so that the participants were able to answer the questionnaire faster, thereby yielding a better response rate. The sections below explain how each questionnaire was adapted and designed.

3.2.4.1. Leadership Dimension Questionnaire (LDQ)

The LDQ from the Competency school of leadership study (Dulewicz and Higgs, 2003) is based on all the previous studies on leadership traits and behaviour because different competency profiles apply to different situations. After reviewing the literature on leadership, Dulewicz and Higgs identified 15 leadership competencies into 3 main competency types: intellectual (IQ), managerial (MQ), and emotional (EQ). They also identified three leadership styles such as a goal-oriented style for low-complexity projects, an involving style for medium-complexity projects, and an engaging style for high-complexity projects. The participants were asked to read the descriptions for the 15 competencies carefully and then rate the leadership competencies, as seen in Table 2, with 3 denoting high, 2, medium, and 1, low (Müller and Turner, 2007).

3.2.4.2. Communicator Style Measure (CSM)

Another assistive questionnaire used was the CSM developed by Norton (1978) and used for comparing the differences between design and non-design participants' communication styles. This was a self-reporting assessment, consisting of 51 items, of which 45 were scored using the Likert-type scale. CSM identifies ten communicator styles: friendly, impression leaving, relaxed, argumentative, attentive, precise, expressive, dramatic, open, and dominant. CSM has been validated and its reliability has been examined several times (Norton, 1978). CSM was used to understand how designers prefer to communicate.

3.3. The main study involving design leaders: Semi-structured Interviews

This study involving design leaders aimed to answer the key research question of this thesis: understanding the leadership of design leaders and how they communicate design to non-designers at the FFE of NPD. This study aimed to achieve the research objectives 2, 3, and 4.

- Objective 2: to identify design leaders' characteristics and leadership styles at the FFE of NPD
- Objective 3: to investigate how design leaders successfully communicate design to non-designers at the FFE of NPD
- Objective 4: to explore how design leaders became design leaders and how they learned to communicate design with non-designers at the FFE of NPD

In order to achieve the above objectives, in-depth exploration with research participants, i.e. the design leaders, is required. Thus, semi-structured interviews were employed because combining unstructured and semi-structured interviews represents the essence of in-depth qualitative interviewing (Klenke, 2008). According to Taylor and Bodgan (1984), in-depth interviews are “repeated face to face encounters between the researcher and informants directed toward understanding informants’ perspectives on their lives, experiences or situations as expected in their own words” (p.77). Although in-depth interviews are time consuming and extensive, it provides high credibility, face validity, and the opportunity to obtain an account of the values and experiences of the interviewees in terms of meaningfulness (Klenke, 2008). The results from the pilot study involving designers were used to formulate the interview protocols (Appendix D).

3.3.1. Sampling Method

Purposive and snowball sampling methods were used to identify design leaders. In particular, *criterion sampling* was employed for this study. This method required pre-determined criterion such as having had previous life experiences (Gray, 2014). Therefore, the following criteria were used to select the interviewees:

- 1) a designer who has been recognised as a competent design communicator
- 2) a design leader who has a record of project success with non-designers

- 3) a designer who has been recognised as a design leader by designers, non-designers, media, design companies, design organisations such as the UK's Design Council and Design Business Association, and academia.

To identify design leaders, a programme called the “Design Leadership Programme” was conducted by the Design Council, UK (2012). The programme aimed to introduce design to companies that are unaware of the value of design and how to use design appropriately, have had a bad experience with design agencies, or wish to expand their business positively through design. In this programme, the Design Council introduced design associates who are considered experienced design leaders and design champions in the UK. The design associates initiated workshops to analyse their clients' business environments to be able to work closely with clients with regard to establishing the value of design in a client's organisation and choosing the right design agency. The Design Council interchangeably uses the two terms ‘design leaders’ and ‘design champions’, and the design experts are referred to as ‘design associates’. In 2012, the council has provided 40 case studies of design leadership and design demand programmes (previous programme of design leadership programme) on the Design Council's website. They continually update their success stories about different business projects with design leaders.

The forty case studies highlight that the key qualities of design associates are communication competency and design expertise, including strategic thinking in their own discipline specialty like industrial and graphic design. The key qualities of the design associates were in line with the eligibility criteria of the study; therefore, the researcher contacted the people in charge of the design leadership programme. The organisers had the criteria and the process for selecting the design associates: 1) candidates of design associates should be recommended by design sectors, local business associations, or receiving applications from experienced designers, 2) the associates need to be available not only in central London but also all over the UK, and 3) the associates should be interviewed to determine their experience of working within the design sector, design abilities, and communicating abilities. The organisation introduced the researcher to two design associates out of fifty in the UK. The researcher also identified forty design associates by using the keywords “design leadership”, “design leader” and “design associates” at LinkedIn.com which is a professional network website. Eight design associates expressed their interests to be part of this research and they introduced two more associates, but only one was available for the study. Therefore, a total of 11 design

leaders were identified for the main study by the snowball sampling method. The details of the participants are presented in Chapter 5, i.e. the main study.

3.3.1.1. Research ethics

Research often involves collecting data from people (Creswell, 2009). Research ethics guidelines (Brunel University, London) were considered in this study. Prior to conducting semi-structured interviews, each participant was informed about the purpose of the research and informed that their information would be anonymous and not shared with other participants. Each participant consented to the use of their information in this thesis. The participants were also provided with the contact details of the researcher in case any questions or concerns arose.

3.3.2. Interview Material

In order to ensure consistency in the interviews, the same set of questions were asked for each interview.

- a) **Interviewee's profile:** All the interviewees were asked to describe their educational background and work experience including roles and responsibilities within their organisations, and why and how they become design leaders and associates.
- b) **Leadership and communication in the FFE of NPD:** On the basis of the literature review findings, the interviewees were asked about their leadership preferences with respect to the following: 1) managerial (MQ), intellectual (IQ), and emotional (EQ) competencies; 2) self-confidence; 3) self-awareness of leadership and communication abilities; and 4) communication preferences.
- c) **FFE and communicating process:** The interviewees were asked how they approached the FFE of NPD when they met non-designers as project sponsors or team members. They were also asked if they had a particular model they relied on for communicating or analysing business issues for NPD.
- d) **Learning business language or competent communicating abilities:** based on the literature review, all interviewees were asked how they learned business languages or

other discipline language, competent communicating abilities and if any particular event or moment enlightened them about particular communicating abilities.

- e) **Recommendations for designers who wish to become design leaders:** All interviewees were asked what they would recommend to designers or design students who wish to become design leaders.

A pilot study was conducted for Study II, as was in Study I. The available sample for the pilot study was a former design associate who had worked for 2 design demand programmes and now works as a part-time lecturer at Brunel University. Throughout the pilot study, most of questions were clear but some of the questions were reorganised and rephrased, leading to a possible meaning change. All 11 interview sessions were conducted face-to-face at the participants' work places or at a location in Birmingham, Cambridge, Richmond (Surrey), Shoreditch, and different areas of London; however, one interview was conducted through Skype (phone) –the participant lived in Plymouth in Cornwall and said that he preferred being interviewed through Skype rather than face-to-face. All interviews were recorded by a voice recorder, with consent obtained from the participants. Along with an audio recording of the interviews, notes were also made. All interviews was transcribed and arranged according to the topics of the qualitative analysis for establishing a conceptual model. The average time taken for each interview was between 45 and 90 minutes.

3.3.3. Qualitative Analysis

The process of qualitative analysis was initiated by describing social events and progressing towards developing and testing explanations or theories (Hammersley and Atkinson, 1995). According to Dey (1993), analysis involves the process of disassembling data into smaller units to facilitate classification into constituent parts and to find connections made between these concepts, thereby presenting the basis for new descriptions. Creswell (2014) suggests a process of six steps for data analysis and interpretation:

- 1) Organising and preparing the data for analysis
- 2) Reading through the data
- 3) Coding to break down and organise the data according to relevant categories
- 4) Using the coding process to produce a description of the setting or people as well as categories or themes for analysis

5) Representing description and themes in a qualitative narrative through visuals, figures, tables, a process model, drawing of the specific research site, or descriptive information about each participant in a table

6) Interpreting the findings or results.

The small unit of data, which is known as a code in qualitative inquiry, is “most often a word or short phrase that symbolically assigns a summative, salient, essence-capturing, and/or evocative attribute for a language based or visual data” (Saldaña, 2013). Charmaz (2001) stated that coding is the critical link between data gathering and explanation of the meaning of the data. Strauss and Corbin (1998) recommend analysing data by

- 1) Open coding: disaggregation of the data into units
- 2) Axial coding: recognizing relationships between categories
- 3) Selective coding: integration of categories to produce a theory.

In qualitative research, the impact of this process is to combine relevant data into a small number of themes, perhaps five to seven themes (Creswell, 2013). The analysis in the main study follows the analytic recommendations of Strauss and Corbin for semi-structured interview data. Besides, the inductive analysis process brings out patterns and themes from the qualitative data (Braun and Clarke, 2006). Five to seven themes are sufficient for presenting the qualitative research. Seale (2004) recommends that a systematic approach of organising and coding qualitative data and analysis methods could help to increase the validity of the qualitative data.

The analysis process was initiated by manually coding data from the interview transcripts followed by comparing the codes using computer-assisted qualitative data analysis software (CAQDAS, NVivo 10). This process helped to organise the codes and categories visually, thereby helping the researcher explore and connect categories in order to interpret the meanings. The detailed process of coding and data analysis is presented in Chapter 5 (the main study).

3.4. Validity and reliability

According to Creswell (2014), reliability refers to examining stability and generalisability while external validity refers to applying results to new settings, people, or samples in quantitative research. However, qualitative research is unique and specific (Greene and Caracelli, 1997). Qualitative validity is achieved by the researcher who checks the accuracy

of the findings by following certain procedures. Qualitative reliability refers to the researcher’s approach being consistent across different researchers and different projects (Gibbs, 2007, cited in Creswell, 2014). “Qualitative approaches to achieving rigor include building trustworthiness, authenticity, credibility, transferability, dependability and conformability” (Gray, 2009). Multiple validated data appears more accurate and convincing to the reader (Creswell, 2009). The table below presents the recommended methods for validating the qualitative research data.

Types of technique	Technique
Design considerations	<ul style="list-style-type: none"> ● Developing a self-conscious research design ● Sampling decisions (i.e. sampling adequacy) ● Employing triangulation ● Giving voice
Data generating	<ul style="list-style-type: none"> ● Demonstrating prolonged engagement in the field ● Demonstrating persistent observation ● Providing verbatim transcriptions ● Demonstrating sampling and data saturation

Table 3.7 Techniques for demonstrating validity in qualitative design, adapted from (Gray, 2009; Adapted from Whittemore et al., 2001)

Therefore, both Study I and the Study II incorporate multiple validity strategies (Creswell, 2014). Study I triangulates data sources, with more emphasis given to field work and detailed descriptions to convey the findings. The interview findings of Study I and II were rechecked with the interviewees for accuracy. The bias of the researcher is clarified in an open and honest narrative in the section on the role of the researcher, as reflexivity is a key characteristic of qualitative research (Creswell, 2014).

3.5. Summary

This chapter on study methodology presents the research objectives as regards research in the field. Various research paradigms were reviewed. **Interpretivism** was considered a suitable paradigm and the inductive approach was considered suitable for allowing a new understanding to emerge from the empirical research. Considering that the purpose of this **exploratory research** is to understand the leadership of design leaders and how they communicate design to non-designers at the FFE of NPD, **the qualitative research approach** was selected as the suitable research methodology for this research.

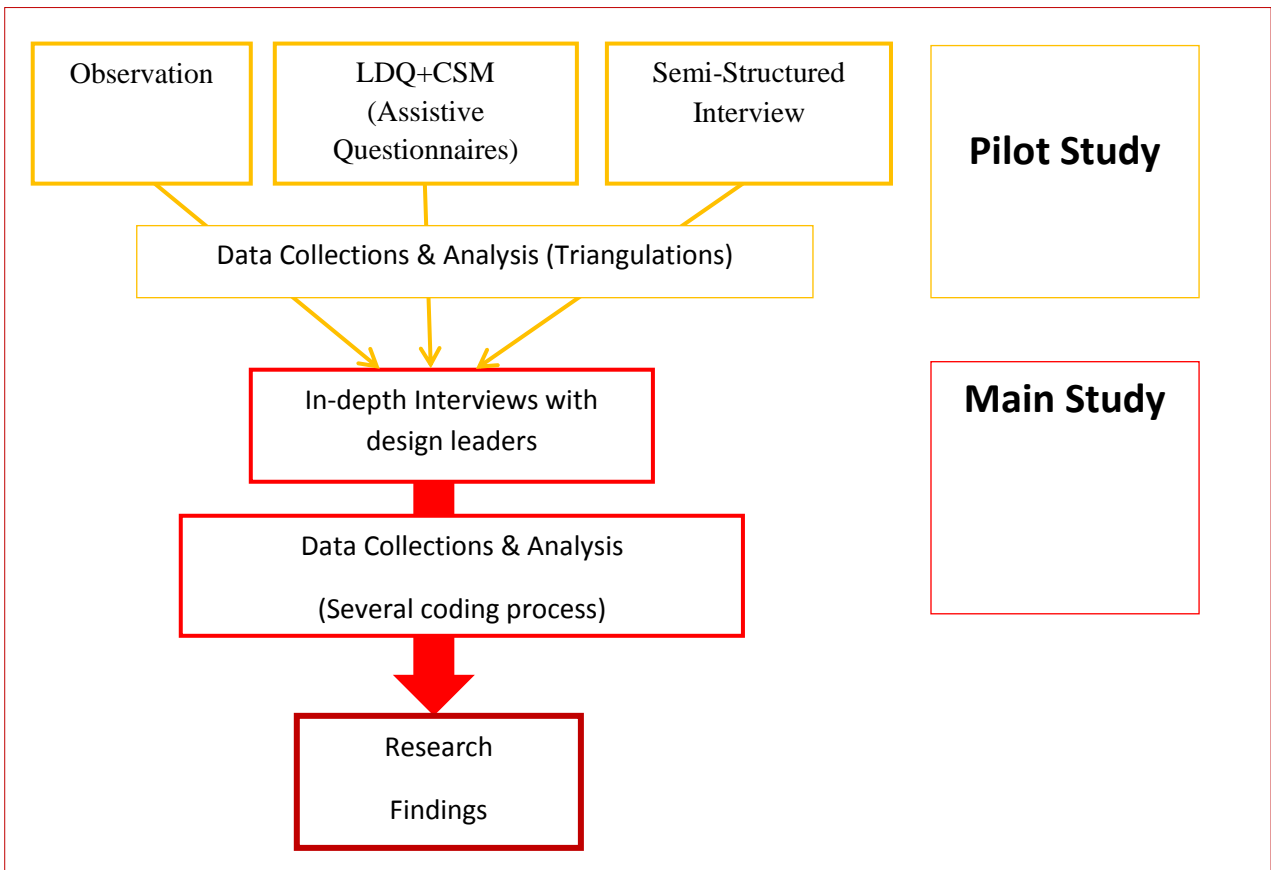


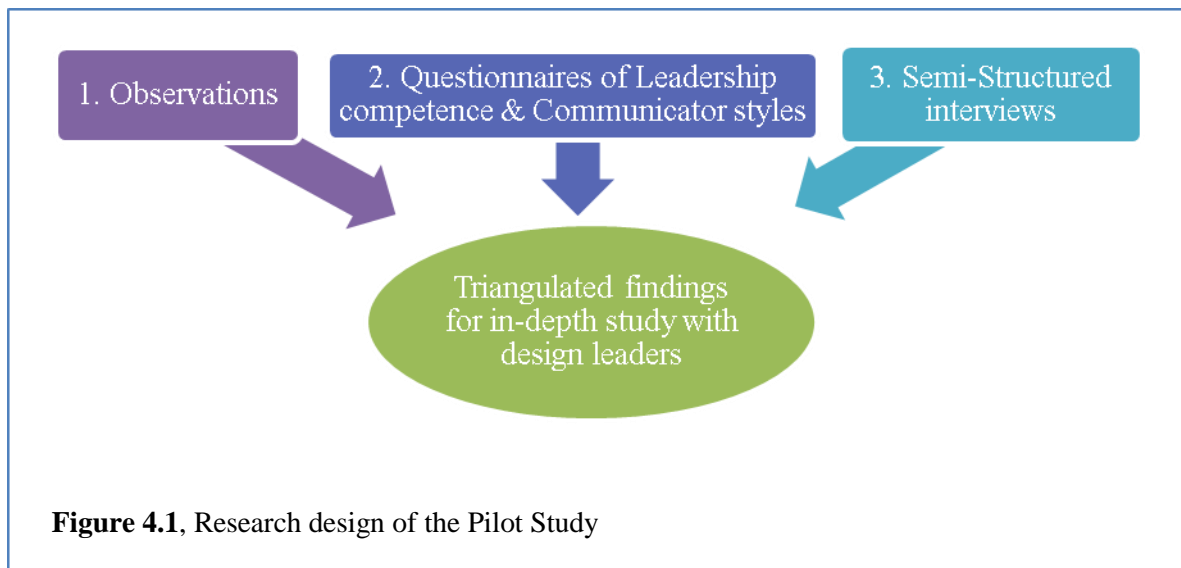
Figure3.2 Research Design

The primary research comprised two stages: 1) a study involving the designers and non-designers in a real-life context and 2) a study involving design leaders. The first study consisted of three qualitative tools: 1) observation, 2) a semi-structured interview, and 3) an assistive questionnaire. The findings of the qualitative research were triangulated for Study II. Study II was conducted using semi-structured, in-depth interviews. The findings of the qualitative research are interpreted by several levels of the coding process to answer the research questions. The results of the primary research will be demonstrated in Chapters 4 (pilot study) and 5 (main study). The findings will be discussed and compared to form a basis for the conceptual model formulation in Chapter 6.

Chapter 4 - The Pilot Study with designers

This chapter presents findings from the primary research from the pilot study. Prior to conducting main study regarding leadership characteristics, communication style and ability with design leaders, the pilot study was conducted in a real-life context to explore the problems faced by designers, particularly of communicating design to non-designers at the FFE (Fuzzy Front End) of NPD (New Product Development).

As explained in Chapter 3 (Methodology), this study is designed with triangulated research methods (Section 3.2.1.). Figure 4.1 illustrates how triangulated methods of research are planned.



Thus, section 4.1 begins with the profiles of 32 research participants at the St Etienne workshop (Section 3.2.1.1.). Each section within study I describes more details about the research process and results of each study. The following section (4.2) presents the results of the observational study. Section 4.3 provides the results of the assistive questionnaires regarding leadership competency at FFE of NPD and communicator styles. Lastly, section 4.4 presents findings from the interviews. Thereafter, section 4.5 compares and discusses all research results. Then, it indicates what to research at the next stage with design leaders.

4.1. Research Participants

As mentioned in section 3.2.1.2 (Sampling for Study I), the research participants for the purposive sample came from four universities. Details of all 32 participants are included in table 4.1

Country	University	Study level	Studying Course	Total Number	Note
France	Ecole des Mines	Post-Graduate	Engineering	6	
Italy	Politecnico di Milano	Post-Graduate	Engineering design & Service system design	6	Mixed background from business, design and engineering
UK	Brunel University	Post-Graduate	Design strategy	16	Mixed background from business, design and engineering, one person could not come because she did not receive the visa on time.
USA	Auburn University	Under-Graduate	Industrial design	4	No working experiences

Table 4.1 Information of the research participants for the pilot study

All participants came from four different countries (France, Italy, the UK, and the USA). However, their nationalities did not match the countries in which they are studying. Moreover, their work experience was different. Initially, there were supposed to be 32 participants; however, one person from the UK did not receive her visa on time and two people who applied from Ecole des Mines, France could not participate. Thus, there were 29 participants in this programme. Tables 4.2 and 4.3 below describe the details of the participants' work experience. It also illustrates the divisions between designer and non-designer participants.

Design Participants (D)	Nationality	University	Current Course	Work or UG Backgrounds	Years of working Experiences
D1	Netherland	Brunel University	Design Strategy	Architecture	2
D2	UK	Brunel University	Design Strategy	Graphic & Insurance	2
D3	Colombia	Brunel University	Design Strategy	Industrial design	2

D4	China	Brunel University	Design Strategy	Illustration	1
D5	Bulgaria	Brunel University	Design Strategy	Graphic design	4
D6	S. Korea	Brunel University	Design Strategy	Textile	8
D7	S. Korea	Brunel University	Design Strategy	Graphic design	0
D8	Turkey	Brunel University	Design Strategy	product design	0
D9	China	Brunel University	Design Strategy	Graphic design	0
D10	UK	Brunel University	Design Strategy	Graphic design	7
D11	USA	Auburn University	Product design	Product design	0
D12	USA	Auburn University	Product design	Product design	0
D13	USA	Auburn University	Product design	Product design	0
D14	USA	Auburn University	Product design	Product design	0
D15	Italy	Politecnico di Milano	Engineering Design	Industrial design	2
D16	Italy	Politecnico di Milano	Product Service System Design	Product design	0
D17	Italy	Politecnico di Milano	Product Service System Design	Product design	2
D18	Italy	Politecnico di Milano	Product design	Interior design	1
D19	Italy	Politecnico di Milano	Product Service System Design	Product design	1
D20	China	Politecnico di Milano	Engineering Design	Product design	N/A

Table 4.2 Information of the design participants for the pilot study

Non Design Participants (ND)	Nationality	University	Current Course	Work or UG Backgrounds	Years of working Experiences
ND21	Malaysia	Brunel University	Design Strategy	Business	8
ND22	China	Brunel University	Design Strategy	Business	5
ND23	S. Korea	Brunel University	Design Strategy	Business	3
ND24	S. Korea	Brunel University	Design Strategy	Business	4
ND25	S. Korea	Brunel University	Design Strategy	Business	0
ND26	France	Ecole des Mines	Engineering	Engineering	0

ND27	France	Ecole des Mines	Engineering	Engineering	0
ND28	France	Ecole des Mines	Engineering	Engineering	0
ND29	France	Ecole des Mines	Engineering	Engineering	0

Table 4.3 Information of the non-design participants for the pilot study

Four French participants (ND26, 27, 28, 29) were able to participate, but they did not attend all four days. Some came for one or two days but all four participants came on the last day when they made their concept presentations to the public audience. The participants from Brunel University, UK were the most multicultural, multinational, and multidisciplinary. Their course is design strategy which focuses on applying design to businesses from strategic perspectives. The 15 participants from the UK came from many different countries such as China, Malaysia, the Netherlands, South Korea, Turkey, and the UK. 10 out of the 15 participants studied design at undergraduate level. Three participants worked in marketing and business-related roles and had also worked in both design and non-design sectors. The other five participants majored in business and marketing in their undergraduate degrees and worked as marketers. Similarly, the participants from Italy, whose majors were industrial design at undergraduate level, study engineering design and service system design. The four participants from the USA had only studied design and have no work experience. This group of 29 participants was not dichotomously divided into design and non-design because most of them came from mixed multinational, cultural, and disciplinary backgrounds. Most of the design background participants, apart from those from the USA, studied and worked in both business and design. Although they have worked and studied non-design areas, they identified themselves as designers.

Also, there were several facilitators whose roles were to support the participants. The roles of facilitators were divided into two roles: head facilitator and facilitator. There were five head facilitators who brought students from their universities: two from France, two from the UK, and one from the USA. They did not facilitate the participants directly. They organised the entire programme and discussed daily tasks and delegated issues with facilitators. They only became involved on the third day to advise teams if they lost their focus on developing their project concepts.

There were four facilitators who were directly involved in facilitation. Each facilitator supported each team. They mainly supported for the first two days so that the participants

understood what to accomplish within four days. From the third day, they were less involved because each team was required to develop their own project concept further by themselves. Four facilitators came from the UK and had previous experience of the programme. The table below states the details of each facilitator.

Facilitators	Backgrounds
A. Iona	Graduated with an MA in Design Strategy from Brunel University. She participated in this workshop five years ago when it was launched for the first time. She is the most experienced facilitator (this was her third time). Currently, she works as a design strategist and researcher in London, UK.
B. Alina	Graduated with an MA in Design Strategy from Brunel University. She participated in this workshop last year. It was her first time facilitating for this workshop. Currently, she works as a design strategist and researcher in London, UK.
C. Rafael	Graduated with an MA in Design Strategy from Brunel University. He is currently a design PhD researcher at Brunel University. He participated in this workshop five years ago when it was launched for the first time. He is an experienced facilitator who teaches part-time for the postgraduate Design Strategy programme at Brunel University. However, it was his first time facilitating for this workshop.
D. John	MA student studying Design Strategy at Brunel University. He experienced last year's Launch Box workshop while attending Ecole des Mines. It was his first time facilitating for this workshop.

Table 4.4 Information of the facilitators for each team

4.2. Observation

The observational study aimed to observe the characteristics of designers who work with non-designers to communicate design at the early stage of NPD. In particular, it observed how designers lead and communicate design with other non-designers and designers to identify and understand their difficulties in communicating design. According to Cockton and Lavery (1999), “a problem may refer to both a cause or a difficulty and it is important to pay attention to the context in which difficulties arise.”

As mentioned in section 3.2.1.1 (Research setting for the pilot study), this study was conducted from Monday morning (18th March. 2013) to Thursday night (21st March. 2013). It took four days. Before the participants became involved in the programme at St Etienne, they received a project brief and knew a little about the project. The project was to create a concept for a learning centre, called U-Zine, worth 12million Euros, covering 5 hectares in St. Etienne, France. It was a funded by the Department of Education, France. The learning centre was to function as an academic, economic, and industrial realm that focuses on collaboration, innovation and teaching, and knowledge transfer. The brief required it to be a user-oriented space with accessibility, flexibility, and services for knowledge transfer. Indeed, the atmosphere of this site should encourage innovation and team work in casual and entertaining settings and moods, like having a meeting at a café. The programme was held in English. As section 3.2.2 (Research methods for the pilot study) explained the research process, the next four sections (from 4.2.1 to 4.2.4.) present the key findings from the observation of each day.

4.2.1. First Day

Key Task	Idea generation (Full day activity)
Activity	<p>Each team is required to generate 100 raw ideas freely without technological, economic, and political constraints. All ideas need to be in the format of ‘it would be cool if...’ or ‘I wish there was something like...’</p> <p>All ideas need to meet the theme of this NPD workshop. The aim is for these 100 raw ideas to be used as the foundation for two early concepts, which will be developed in day two.</p>

Table 4.5 Key task for day one

On the first day morning, everyone gathered at the school building at 9 am. The first task was given to the participants, was to set up tables, chairs and writing boards for the project and workplace.

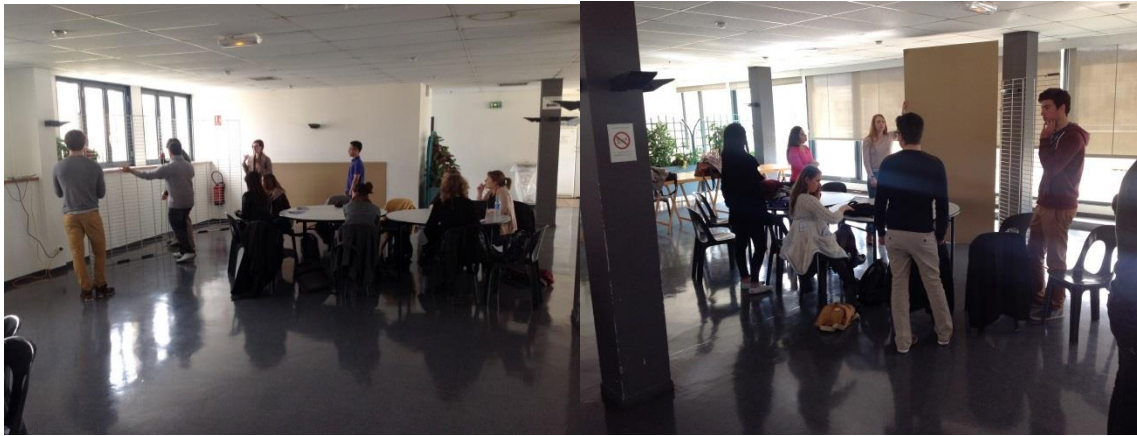


Figure 4.2 Day1-setting the work place

The head facilitators asked French students who study and live in St Etienne to lead the first task. All participants met for the first time. The French students did not fully explain how to set up the place. While they started setting up by themselves, the rest of the participants noticed that they needed to cooperate and started setting up the project space. The French students asked the male students from the USA and the UK to help carrying tables. Then, all members spontaneously grouped by their institutions and they did not introduce themselves to each other. Soon, undergraduate design students from the USA began to lead the setting of the work places and to ask people to help setting up tables. However, the French students just worked quietly. Students from the UK wandered around but later as they saw the French and American male students bringing tables, they started to cooperate. The Italian students seemed rather confused and tried to figure out what they should do by themselves. While the participants set up the place in an unstructured manner, the American students diligently moved and lead others to finish the task. They talked to nearby participants and gained feedback and modified the places. Then, everyone went to the lunch.

In the afternoon, the facilitators provided a briefing and all participants presented themselves in front of everyone. The task was to generate 100 concepts about the project. As section 3.2.1 described, all participants were divided into four teams with a balanced mixture of nationalities and disciplines. Each team comprised seven to eight people. Some of the four French students (ND26, 27, 28, 29) could not join the session fully because their course and examination schedules interfered with the entire programme schedule.

Team/ Facilitator	Team A/ Iona	Team B/ Alina	Team C/ Rafael	Team D/ John
Participants (Schools)	1.D5 (UK), D20(Italy), ND22 (UK), ND26 (France)	3.D2 & D3 (UK), D16 (Italy)	5.D6 & ND25 (UK), D13 (USA), D15 (Italy)	7.ND24 (UK), D14 (USA), D15 (Italy)
	2.D1(UK), D11 (USA), ND23 (UK), ND27 (France)	4.D4 (UK), D12 (USA), D17 (Italy)	6.D10 & ND21 (UK), ND28 (France)	8.D8 &D9 (UK), D19 (Italy)

Table 4.6 information and participants of 8 teams

Due to the different previous facilitating experiences of the facilitators, all four teams had a different working atmosphere. The role of the facilitators, who had experienced this programme previously, was to ask the participants to generate concepts and write their ideas on the boards. Only team A’s facilitator had experience of facilitating the workshop for the past three years, whilst for the others it was the first time they had facilitated the workshop. Thus, facilitator A used different techniques to keep her participants focused on the task by using ‘what if’ questions, giving breaks and asking questions to individual participants. However, team B finished earlier than the other teams because the facilitator accepted any types of concepts proposed by the participants.



Figure 4.3 Day 1 activity- generating 100 ideas

Furthermore, most participants were not native English speakers, which caused them to take longer to understand the brief and complete the task. On the contrary, this situation gave them an opportunity to use ‘plain’ English, which help them to understand others’ concepts. However, speaking the second language to communicate also made them tired. Initially, English native design (USA) and non-design participants (UK) influenced the group dynamics and offered more ideas and cooperated more positively. The participants, whose English is their second lanagugae, mostly design students from the UK and Italy, offered off-topic ideas. This was not because of their language. It seemed that most participants did not fully understand the brief and sometimes drew upon their previous experiences, or they were too serious and criticised ideas generated by others. However, it appeared that most participants’ motivation levels were high. All tried to be positively involved in generating the 100 ideas. After the first day’s task ended at 5 pm, all participants were told what they would do on the next day. All was invited to the dinner which was voluntarily cooked by French, non-design students.

It was observed that both design and non-design participants generated 100 concepts by following the lead of the facilitators. It was more of a two way communication between the facilitator and the participants. Most non-design and some design participants were not familiar with generating concepts freely. The facilitators had to lead them to finish the day one task. In the early period of the day one task, some of the design participants in each team came up with irrelevant or non-project thematic ideas because they did not follow the project brief. However, the facilitators explained the brief to them to enable them to focus on the topic. Due to the intense workload of generating 100 concepts, the facilitators concentrated on encouraging the participants and accepted the most relevant ideas.

4.2.2. Second Day

Key Task	Clustering (Morning activity)
Activity	The purpose of this activity is to enforce a holistic view of the workshop task. All ideas need to be put into clusters; no ideas should be left out. Each facilitator decides together with the participants what the categories for clustering are. Each Cluster should contain between be 5-8 categories. Examples of potential broad categories are: technology, market, consumer, business, online, and offline. However, these can be more specialised depending on the ideas generated on day two.

Key Task	Starter building (Afternoon activity)
Activity	<p>Each team is split into two smaller teams by a facilitator. Each team creates two project concepts - called as project starters. Two project concepts can be created from an idea cluster created previously. Facilitators encourage associating at least three ideas from two different clusters and combining/rephrasing them.</p> <p>Each team needs to present each project topic on each flipchart by using a personal photo, drawing, etc. Each flipchart must contain:</p> <p>a title, a single sentence addressing the who, when, where, and what (how is left for later), one scenario with one persona, two or three positives about the project topic, and one or two difficulties that were dealt with in a positive way.</p>

Table 4.7 Key task for day two

On the second day, prior to the morning programme, all participants hanged out with people from the same courses. The participants from the UK stayed at their team table, took some notes and shared ideas about the concepts from yesterday. The Italian design participants chatted and wondered around the work space. Francesca, an Italian participant, was more casual and had informal talks with other foreign students. The French participants did not join the morning programme. The American participants were quiet, talked among themselves, took some notes and shared some information.

The second day's task was to develop clusters out of the 100 ideas from the first day. Each team needed to choose the best two clusters for the presentation in the afternoon. Subsequently, members in each team were divided into two teams of four. Thus, eight smaller teams emerged from the big four teams. The task for each small team was to develop one cluster of ideas.

Each smaller team was created after the first day's session. All facilitators had a meeting to discuss which participants should work together. They tried not to group people with the same nationalities together. Although facilitators noticed clashes between certain participants, one of the programme objectives was to let participants experience and face different cultures and disciplines in a real working environment, in particular within the early stages of new product development.

When they were in four teams of eight, some participants relied on other team members. Thus, they did not all need to get involved in generating and clustering concepts. However, as they were separated into smaller teams, each member was more responsible for achieving the project task. It seemed to put the participants under pressure. They were less productive and efficient.

Because all participants worked on the same floor, the researcher was able to hear most of the conversations among the participants. When the researcher approached each team's working space, many design participants individually came to speak about their frustration. During informal conversation, the design participants often admitted that they had difficulty persuading or communicating their concepts to their team members, in particular talking with participants from other disciplines.

Indeed, most of the groups had difficulties synthesising and integrating all the different clusters for their project direction. In particular, most teams seemed not to consider what the project brief required for this particular project. Design participants seemed to have strong opinions and slightly self-centred ideas which were not related to the project brief. All USA design participants in each team mostly worked as a mediator. They did not generate creative ideas but organised all the ideas and pushed the team to meet the deadline; nevertheless, they were the youngest. They appeared to be worried about spending too much time on developing ideas. They seemed to focus on finishing the task on time. The Italian participants were lively but were often did not talk about the project brief and direction, but they were mostly team supporters.

At the end of the day, each participant at each team was supposed to present two tentative concepts for the next concept developments. While working on developing the project concepts, the head facilitator from the UK demonstrated how to present a service design concept which is not usually tangible. He began explaining about NPD structure. It was recommended to identify the internal and external factors of why and how end-users and customers would use a concept from each team. He then also recommended a design presentation method called 'body storm'. He suggested including details of the customer journey, which is one way to explain to an audience who have never seen the new concept before. The concept could not be shown visually all the time. He also insisted that the team should try to move away from their 'comfort zone' and be creative. One way was to put

challenges and randomness into the team to figure out the new concept. Thus, defining the library concept could be achieved by out-of-the-box thinking. However, no teams used ‘body storming’ techniques to explain their concepts to the audience. Also, they did not consider the project brief but their concepts. All participants were supposed to speak when they presented their project concepts. The table 4.8 below describes of each team’s project concept and noted about how team members presented their concepts.

Second day presentation for project concept selection	
A 1	<p>Project concept: snacking course, where a student can choose a course that they want to learn as if selecting a snack.</p> <p>A design participant, native English speaker was the only person introduced himself. He made eye contact with the audience.</p> <p>A female design participant made eye contact with the audience and used many gestures. Unlike other non-design participants in other teams, the female non-design participant did not engage with the audience. Also, the non-design engineering participant only looked at his team members.</p> <p>However, the concept itself was very interesting to the facilitator who seemed to be satisfied with the initial concept. However, the team did not manage the presentation flow well. They did not coordinate the order of presenting the content.</p>
A 2	<p>Project concept: a website works as ‘Facebook’, which lets different project participants collaborate and share their ideas and statements.</p> <p>A non-design female participant was the only person who greeted, guided the presentation, and divided the presentation content to other team members.</p> <p>A design female participant talked without making eye contact. However, she answered the questions from the facilitators well.</p>
B 1	<p>Project concept: learning from people who have passed away and have influenced the world, e.g., Ghandi, Napoleon, etc. Their aim was to link between the students and those famous people so that students could reduce the gap and learn from them.</p> <p>A design participant, native English speaker was the main presenter and he avoided some questions from the audience by using joke and humour.</p>
B 2	<p>Project concept: life coach, Hughub. Their concept was to coach students for life.</p>

	A design participant, native English speaker was the main presenter and he was the only person that said thank you for listening.
C 1	Project concept: B2B cluster, idea sharing, and getting feedback. All participants involved presenting their concept. However, they did not find stakeholders and beneficiaries for the project.
C 2	Project concept: changeable plan; idea sharing. A design participant, native English speaker, was the main speaker and supported other team members when they had difficulty explaining the concept. However, a non-native design participant was a good presenter. She made the audience and students focus when she spoke with gestures and eye contact. However, she chatted with other female design participants when she was not presenting. Generally, non-design participants had good eye contact and tone of voice. Design participants mumbled but tried to make a joke.
D 1	Project concept: space for learning. They repeated the title of the project brief. However, they all made a clear presentation. Design participants collaborated with a design participant from another team to demonstrate their concept of learning spaces.
D 2	Project concept: transformable spaces. Different areas of the library can be used for different events and places to be inspired by different types of collaboration, e.g., C2B, C2C, B2C, or B2B. All participants involved presenting their concept.

Table 4.8 Information on project concepts

At the presentation, the head facilitators acted as the judges to select the concept for each team. During the presentation, there was a lack of engagement between the presenters and the audience. The audience seemed not knowing whether the presentation was finished or not. Also, there was a lack of clarity in presenting the project concepts; thus, the audience did not raise questions regarding project concepts and provide the feedback. Almost all the teams said only what they needed to say and did not engage with the audience. Consequently, the concepts that the teams wanted to develop were not selected because some of the favoured concepts overlapped with other teams. Thus, some teams reluctantly accepted the results.



Figure 4.4 Day2 pitching idea for each team's NPD topic and direction - day2 activity

Throughout the day 2, it was evident that the most design participants behaved more toward their interests of 'I think this will be cool if the place is like...' than following the project brief. They appeared to be interested in generating ideas freely but also be expressive in communicating ideas. Also, most of them preferred to explain their ideas rather than receiving feedbacks by either their team members within teams or the facilitators at the presentation. Some design participants tried to lead their teams according to what they thought was the most important, e.g. finishing the task on time. Thus, they appeared to be less involved building on project concepts. Yet, the most design participants were more active and imaginative participants than non-design participants.

4.2.3. Third Day

Key Task	Idea building (Full day activity)
Activity	<p>Each team works on developing their project topic, which is chosen by the facilitators.</p> <p>Each team needs to consider five areas:</p> <ul style="list-style-type: none"> - User (who is the idea aimed at, who will use it) - Context (trends, insights from research) - Scenario (storytelling to explain how the ideas work) - Technology (show that it is possible)

	<p>- Business Model (who can pay/invest in this idea)</p> <p>It is expected that each team learns and understands how to develop their project further from the big starter idea (project concept). In the morning, facilitators can go around and support each team to consider five areas. After lunch, facilitators try not to over-facilitate and let the team build the idea.</p>
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Table 4.9 Key task for day three

In the morning, all participants visited the actual site where their concepts could be applied. This was aimed to help the participants develop their concept creatively and realistically. The task for the third day was that each small team would develop their concepts for presentation in the evening of the next day at Design Biennale in St Etienne. In the morning, the facilitators randomly visited each group with six different colours of instant coffee capsules which are similar to the six different colours of the six thinking hat, developed by De Bono (1985). As table 4.9 described the activity, the aim of this activity was to give opportunities for each team to review what they had developed before they finished developing their concepts. The activity asked the team to holistically review their project concept including project context, emotional perspective about the concept, identifying a beneficiary, beneficiary’s tangible and intangible benefits, and stakeholders.



Figure 4.5- Left: visiting NPD site, Right: capsule activity

Some of the teams took this activity as an opportunity to review their project concept development status. Some of them developed their ideas further after the capsule activities. However, over half the teams did not make use of this opportunity because they appeared to lose interest in the project. In addition, many teams wanted to finish this project soon because they had found it difficult to share their ideas since the second day. Most participants within

each team did not like their concepts, which had been chosen by the facilitators. The design participants often talked and suggested ideas based on their own experiences and the non-design participants rejected the designers' ideas. However, they could not persuade the design participants. Indeed, it was mostly observed that all participants did not consider the beneficiary of the project and the criteria of the project because they were too focused on leading the project concepts towards each one's favoured direction. Besides, it was often observed that the team members did not speak to each other. Sometimes some teams took a long break because they believed that they had already finished developing the project concepts. At the end of the day, most teams did not finish and still debated the choice of project concepts and concept developments.

On the third day of the programme, the facilitators did not over-facilitate their participants. It was the day that the participants were required to collaboratively build their project concept. Due to the nature of the third day's activities, the design participants appeared as if they were heavily driven by their desire to express their ideas. Also, they seemed to be interested in thinking of their preferred futuristic experiences about the project. Their individually preferred futuristic concepts regarding the project were oriented to what they seemed to consider to be 'cool' ideas and less about the project beneficiary, which was stated in the project brief. Also, some argumentative discussion on developing the project concept was often observed between design participants. However, it was also observed that the design participants emerged as the leading people in each group. Although they were off the brief most of the time, they were talkative, imaginative, and constantly suggested ideas to develop a project concept. Lastly, it was evident that the design participants lost motivation as time went by. This was true for non-design participants as well. It seemed to be caused by the difficulty of communicating ideas that were not accepted by the other team members and the facilitators. Both design and non-design participants did not seem to be satisfied; however, they compromised on the project concept at the end of the day.

4.2.4. Fourth Day

Key Task	Project presentation (Full day activity)
Activity	<p>Each team needs to finalise their project concept development and start preparing a presentation. Each team needs to prepare 10 minutes and 20 PowerPoint slides. Each team must submit their presentation by 4 pm.</p> <p>Each team presents their project concept at Citi du Design (design centre at St. Etienne). The audience is made up of facilitators, participants, and workshop funders or sponsors. It is also open to the general public at the design biennale.</p>

Table 4.10 Key task for day four

The last day's task was to prepare for the final presentation to the general public at the St Etienne Biennale. Each team could choose to work in any location that they preferred. They had to submit their final PowerPoint presentation file at 4 pm. Most of the team members seemed nervous because most of the teams had not finalised what they would present for their final project concept, except for Team A's two teams working on choosing a course like a snack, and social network software like integration of Facebook and library intranet. These two teams believed that they had finished the task. However, they did not seem to realise that they did not meet the project brief's requirements.

Most teams worked on the working site. However, Team D 1 did not communicate clearly; thus, a design participant waited for the others in the working space whilst the other worked together at the dorm flat.

Although most teams did not decide on their final concept, they divided the work. Most design background participants productively worked on preparing the visual part of the presentation. The non-design background participants seemed to be feeling the pressure which led them to be unproductive and inefficient. However, under pressure with time, participants with design background were the most effective and productive participants over the 4 days. They in particular showed that their strongest ability was providing visual design where it was needed. As time went by, the non-design-background participants seemed surprised at how the design-background participants worked and achieved the visual part of the presentation. As a result, the non-design background participants felt less nervous and prepared scripts. Also, although some of the English native participants were design-background participants, the team had enough design-background participants who could

work on the visual parts of presentation. Thus, those English native participants worked on preparing scripts.

Some teams did not have enough time to make the visuals pretty enough to meet their satisfaction; however, the content was considerably well organised. Thus, it also indicated that designers worked more than needed for their satisfaction. This characteristic was clearly different from the non-design participants who were satisfied finishing the presentation file on time.

In the evening, the presentation was held in St Etienne, Design Biennale. The participants seemed nervous. Also, more than half of the participants were not native English speakers; thus, the participants did not deliver their content clearly to the audiences who were participants, project sponsors, and some biennale visitors. The audiences, including head facilitators, did not ask questions. After the presentation, the participants received the certification of the programme and the dinner was provided by the Design Biennale organisation. Unlike previous lunches and dinners, many participants had dinners with other participants from other countries.

It appeared that the time pressure regarding finishing the presentation file on time reduced the miscommunication among the participants. The design participants heavily led the team's presentation file visually. Although most teams did not meet the project brief's requirement, the visual part of the presentation was done to a high standard and the design participants effectively and efficiently finished on time. At the presentation, only some participants seemed to realise after they saw the presentations of some other teams, which missed the criteria of the project. Most of the design participants appeared to be unsatisfied with their presentations. Yet, they did not seem to realise that they did not meet the criteria of the project.



Figure 4.6 Left:Preparing a presentation, Right: Presenting each team's NPD concept

4.2.5. Other activity

During the workshop, all participants were asked to become involved in visual mapping activities about their perceptions of themselves and their institutions. The rationale behind this activity was to show the participants how their thinking could be influenced or changed throughout the workshop. On the last day, all participants were asked to put a dot on a board, which asked how innovative their institution is. The same question was also asked on the first day before the workshop started. The images 4.6 and 4.7 below illustrate how the thoughts of the participants generally changed.

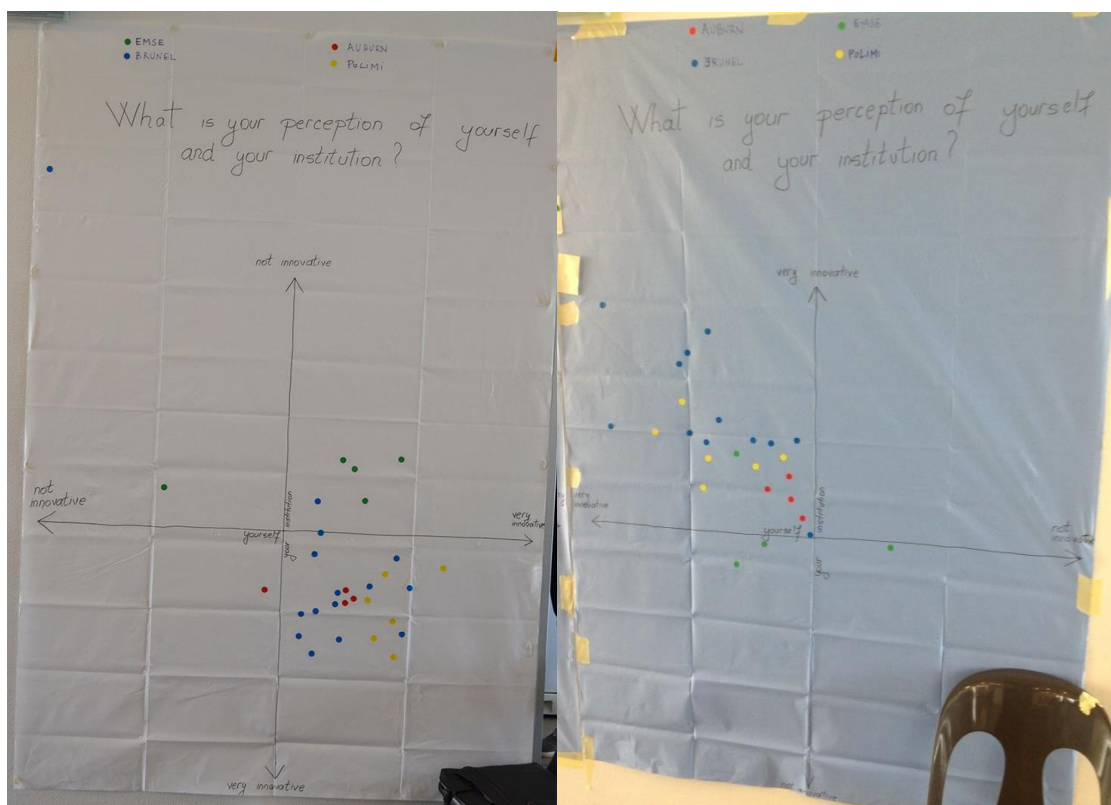


Figure 4.7 & 4.8 (left: first day, perceptions of students and their schools, right: fourth day, changed perceptions of students and their schools. Over the four days, the perceptions of their schools' dots moved towards 'more innovative' from 'less innovative'.)

The French head facilitator explained to the researcher that schools could not have changed over four days. What had changed were the perspectives of the participants. The head facilitators aimed to offer the experience of working with other disciplines and cultures

within the context of creating concepts for NPD. The participants did not compare the results of their mapping activity.

On the last day, the mapping activity (Figure 4.8) clearly indicated that the perceptions of the design participants regarding innovation became more positive. Throughout the workshop, the design participants seemed to realise that they were more creative and innovative than others and what they thought of themselves and their universities. During the interview, they did not mention the results of the mapping activity and did not know about it. However, the participants mentioned that they learned and experienced the importance of group working. Their interviews are presented in section 4.4.

4.3. Assistive Questionnaires

These questionnaires were collected during the programme. As section 3.2.3 (Methodology – assistive questionnaires) explained, due to the small number of the participants (23), the survey result (Leadership Dimension and Communicator Style) were not considered statistically significant. However, the results illustrated the different leadership and communicator characteristics between design and non-design participants. 23 out of 29 participants responded (79%) to the questionnaires. 16 design participants and 7 non-design participants completed these questionnaires.

4.3.1. Leadership Dimensions Questionnaire (LDQ)

The questionnaire asked the participants to rate the importance of their leadership capability (3: high, 2: medium, 1: low) during the early stages of NPD. Other research studies that employed LDQ (Turner and Muller, 2006; Shao and Muller, 2011) rounded off to the nearest tenth. However, in order to visibly compare the ratings of the two groups between design and non-design participants, the results rounded off the numbers to the nearest hundredths. Figure 4.9 below illustrates the design and non-design participants' ratings of leadership competencies, such as intellectual competence (IQ), managerial competence (MQ), and emotional competence (EQ).

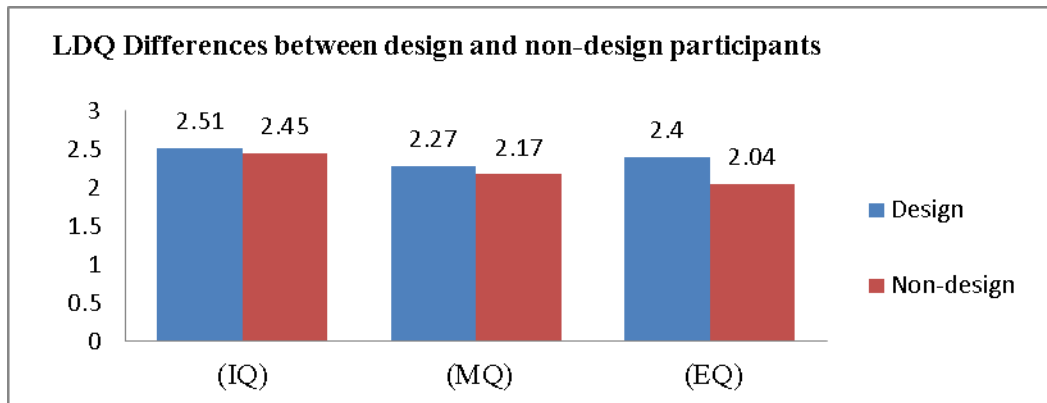


Figure 4.9 LDQ results of the participants

As figure 4.9 illustrates, the design participants rated all three areas slightly higher than the non-design participants. The design participants gave a medium rating for all competences. Similarly, the non-design participants gave a medium rating for IQ and MQ but a low rating for EQ. Both rated IQ as a more important leadership competence than the other two. However, the order of leadership competences was different. Design participants considered EQ more important than MQ and vice versa for non-design participants. The number of both parties was uneven; however, it illustrates the favoured leadership competences of each group. The three charts below (Figure 4.10- 4.12), divided into IQ, EQ, and MQ, present 15 leadership competences of both groups. They more specifically indicate each group's favoured leadership competences.

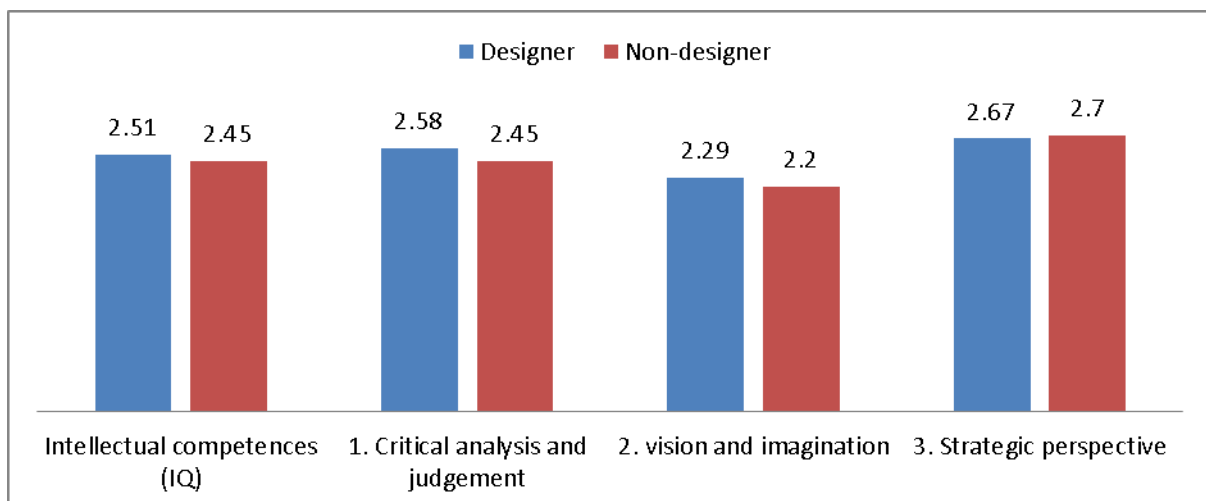


Figure 4.10 IQ results of the participants

In the IQ area, the numbers of both participants are uneven but their favoured leadership competencies are the same. Both participants rated strategic perspective as the highest

leadership competency. Also, they both rated vision and imagination as the lowest favoured leadership competencies.

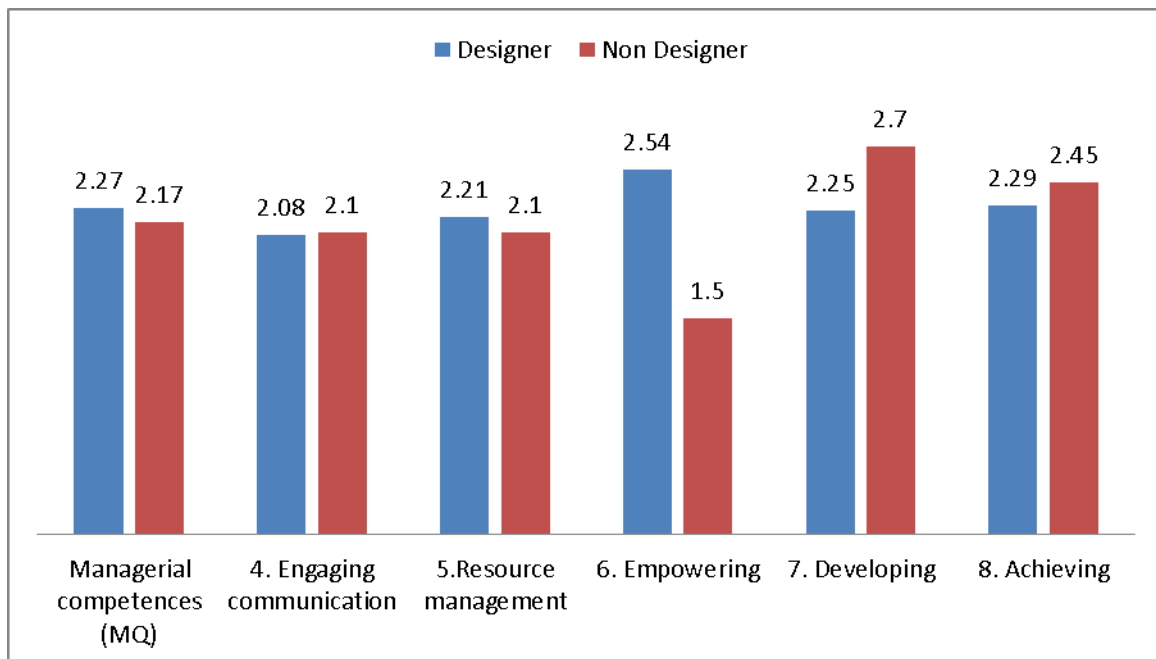


Figure 4.11 MQ results of the participants

In the area of MQ, designers rated empowering the highest. According to Dulewicz and Higgs (2003), being empowering is to give others authority, and to encourage others to take on personally challenging and demanding tasks. During the observation, this competency did not appear strongly while developing the project concept. However, they divided the task as they prepared the presentation on the last day. This result may indicate that the design participants may consider that being empowering is important only in the MQ area. On the other hand, non-designers rated developing as the highest. Developing is to believe that others have the potential to take on ever more demanding tasks and roles (Dulewicz and Higgs, 2003). This competence was echoed with the observation that non-design participants encouraged design participants to work on visual parts of presentations on the last day.

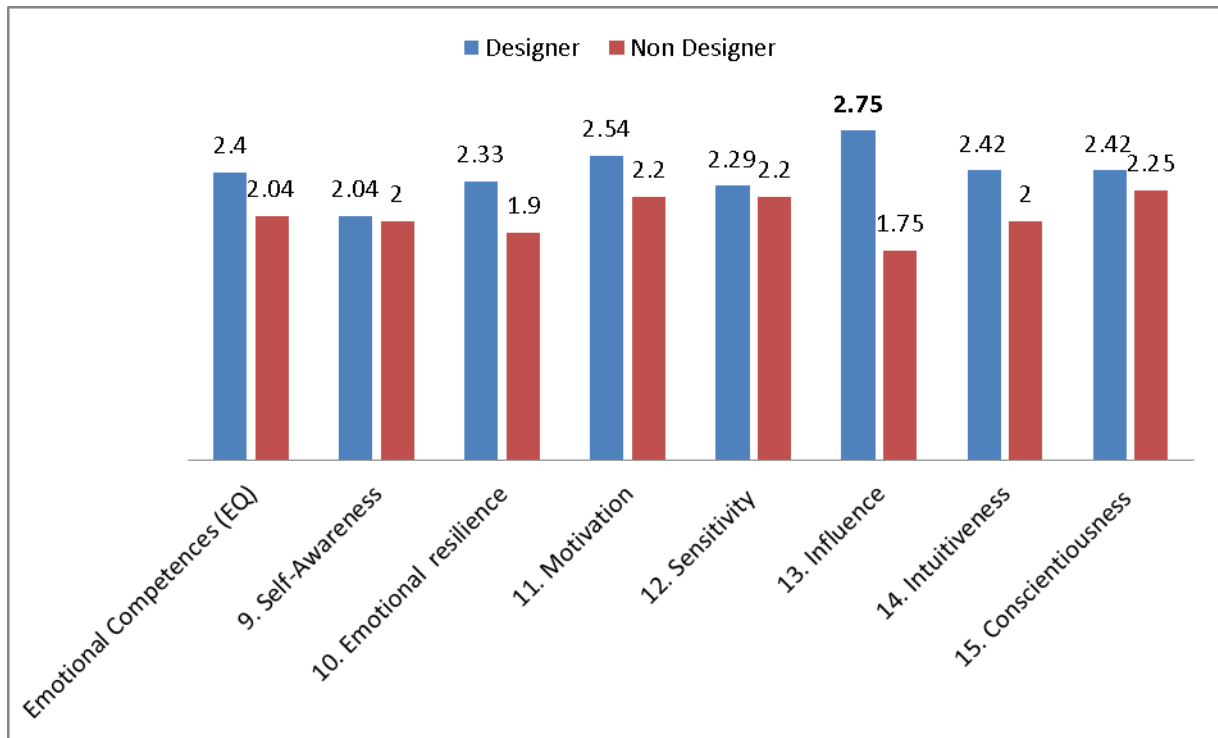


Figure 4.12 EQ results of the participants

According to Dulewicz and Higgs (2003), influence, which belongs to EQ, is about “persuading others to change views based on an understanding of their position and a recognition of the need to listen to this perspective and provide a rationale for change”. Even though design participants rated IQ the highest amongst IQ, MQ, and EQ, influence in EQ was perceived as the highest leadership competence. During the programme, it was often observed that design participants had difficulty communicating their ideas to their team members. This may indicate and reflect what they considered important in leading and communicating.

On the contrary, non-design participants rated conscientiousness as the highest trait in the EQ area. It is “the capability to display clear commitment to a course of action in the face of challenge, and to match words and deeds in encouraging others to support the chosen direction” (Dulewicz and Higgs (2003; 2005). Also it is “the personal commitment to pursuing an ethical solution to a difficult business issue or problem” (ibid). During the programme, they often rejected the ideas of the design participants. Many non-design participants did not generate a lot of their own ideas; however, they seemed to attempt organising ideas from within the team. Also, they did not involve preparing the visual part of their presentation file, which was the majority of the work on the last day. They knew what

they could do well and supported design participants to find presentation-related materials upon request. Table 4.11 below highlights the highest and the lowest three leadership competences to show the differences between design and non-design participants.

Leadership competences	Design participants	Non-design participants
Highly rated	1. Influence (2.75), EQ	1. Strategic perspective (2.7), IQ, and Developing (2.7), MQ
	2. Strategic perspective (2.67), IQ	2. Critical analysis and judgement (2.45), IQ, and Achieving (2.45), MQ
	3. Critical analysis and judgement (2.58), IQ	
Lowly rated	1. Self-awareness (2.04), EQ	1. Empowering (1.5), MQ
	2. Engaging communication (2.08), MQ	2. Influence (1.75), EQ
	3. Resource management (2.21), MQ	3. Emotional resilience (1.95), EQ

Table 4.11, highly and lowly rated leadership competences

Influence (2.75), strategic perspective (2.67), and critical analysis and judgement (2.58) were given the highest average scores amongst the design participants. Influence was the highest. Strategic perspective and critical analysis and judgement were the next highest leadership competences and were the highest leadership competences for non-design participants. Non-design participants gave the same score to strategic perspective (2.7) from IQ and developing (2.7) from MQ. Equally, critical analysis and judgement (2.45) from IQ and achieving (2.45) from MQ followed as the second highest competences. Both design and non-design participants acknowledged the importance of intellectual competences, in particular strategic perspective and critical analysis. Unlike design participants' preferences on leadership competences, non-design participants equally considered the importance of managerial competences.

Following leadership competence, achieving from MQ was also observed during the programme. Achieving is explained as "willing to make decisions involving significant risk to gain a business advantage. Decisions are based on core business issues and their likely impact on success. Selects and exploits activities that result in the greatest benefits to the organisation and that will increase its performance" (Dulewicz and Higgs, 2003). During the programme, non-design participants compromised the project concept direction within their own team. It seemed that their objectives and attitudes were to finish the concept development on time.

Lastly, strategic perspective and critical analysis and judgement were commonly perceived competences. This result could be interpreted as showing that both groups of participants considered these two to be important qualities. However, their behaviours were ironically different. Most participants created the project concepts without following the criteria of the project brief, which requires considering the beneficiaries and stakeholders of the building.

On the other hand, the lowly rated leadership competences also had different results. Self-awareness (2.04) in EQ, and engaging (2.08) and managing resources (2.21) in MQ were perceived to be the lowest by the design participants. Self-awareness is to manage one's emotions and to control their impact in a work environment (Dulewicz and Higgs, 2003). The results indicated that design participants acknowledged that they have difficulty in controlling their emotions in a work environment. Secondly, engaging communication (2.08) was marginally higher than self-awareness (2.04). This competence is to engage others to win support and establish clear objectives (Dulewicz and Higgs, 2003). The third lowest rated competence is resource management (2.21), which is planning ahead, organising all resources, and coordinating them efficiently and effectively (ibid). From the perspectives of design participants, these three competences were considerably less important than the rest. This could be interpreted as a lack of leadership competences amongst the design participants because it was often observed that they had difficulty in communicating their ideas to other team members. Also, they often faced emotional clashes with their team while they developed and discussed their project concepts. As a result, they wanted to finish the concept development towards the end of the programme. Besides, even though they performed effectively at preparing the visual parts of their concept presentation, they did not plan their time management. They developed their team concept and prepared the presentation at the same time. Thus, a low rating for resource management reflects on their behaviours.

On the contrary, non-design participants rated lowly on empowering (1.5) in MQ, and influence (1.75) and emotional resilience (1.95) in EQ. This result echoed the observational findings. According to Dulewicz and Higgs (2003), being empowering is to give others authority, and to encourage others to take on personally challenging and demanding tasks. The result of this competence was contradicted. Although they let others finish the presentation on the last day, they did not encourage their team members to challenge the created concepts. According to Robson (2002), it is difficult to identify if the respondents take the questionnaire seriously. Conducting self-administered questionnaires may not

exactly reflect how the participants behave in a real-life context. Also, the researcher cannot guarantee that all the respondents understood the questions clearly (Gillham, 2000; Bryman and Teevan, 2005). In particular, it is difficult to identify which participants may have misunderstood the questions when analysing the results (Robson, 2002). Therefore, the researcher carried out interviews with the participants regarding unclear areas of leadership competence. This will be presented in section 4.4 (semi-structured interview).

The other leadership competences with low ratings were influence and emotional resilience in EQ. UK non-design participants' highest competence was emotional resilience (2.8). However, the total score with French engineering students (1.0) made the score the lowest at 1.5. However, the results of these echoed how the non-design participants actually behaved during the programme. From the observational study, they attempted to organise and progress the task of concept development forward. While discussing and developing the concept, they often failed to persuade the design participants to agree and progress the project forward. Thus, their influence was less effective. Besides, due to the time limit and pressure on the last day, their emotional resilience was evidently low compared to the design participants. They did not seem comfortable with the fuzzy status of developing concepts and without knowing assuredly when their team could finish developing the concept. On the last day, they prepared the presentation speech text but relied more on the design participants who led to finish and polish the presentation of their concepts.

Therefore, the results of LDQ explain the different preferences of leadership competences of both design and non-design participants. It distinguished different favoured competences and showed that design participants slightly favoured EQ whereas non-design participants favoured IQ and MQ. At the same time, it indicated the differences between how they actually behaved within the programme and what they thought regarding their own leadership competences.

4.3.2. Communicator Style Measures (CSM)

This questionnaire asked the participants about their preferences of communicating styles. As section 3.2.4.2 explained about employing CSM, the data was not statically analysed but the words from the result were manually counted because it aims to identify the preferences of

the participants' communicator styles. CSM consists of ten communicator styles: friendly, impression-leaving, relaxed, argumentative, attentive, precise, expressive, dramatic, open and dominant. The table 4.13 below presents the first and second choices of all participants' communicator styles.

Design Participants' favoured communicator styles				Non-Design Participants' favoured communicator styles			
First Preferences	Count	Second Preferences	Count	First Preferences	Count	Second Preferences	Count
Argumentative	4	Friendly	6	Friendly	5	attentive	3
Friendly	4	Relaxed	4	Dramatic	2	Expressive	2
Attentive	3	Alternative	2	Open	1	Open	2
Dramatic	3	Attentive	2	Precise	1	Friendly	1
Expressive	3	Dramatic	2			Impression	1
dominant	2	Expressive	2			Leaving	1
Precise	2	Impression	2			Relaxed	1
Friendly	1	Leaving	2				
Open	1	Precise	2				
		Argumentative	1				

Table 4.12, Times of each category rated by the participants

Both participants shared friendly as the common communicator preference. However, it was the first choice for non-design participants and the second communicator preference for design participants. According to Norton (1978), friendly “ranges in meaning from being unhostile to deep intimacy”. Both participants prefer communicating with other people in a friendly manner. However, the design participants also equally favoured argumentative as a communication style. It represents communicating in a negative combative fashion (Norton (1978). This data represents how design participant communicated during the programme over the 4 days. They initially communicate in a friendly manner with their team members on the first day. However, their communicator style became more argumentative towards the end of the programme. Their argumentative manner in communication was often observed while they clashed with their team members when discussing and developing their project concept.

On the other hand, non-design participant's second preference in communication style is attentive which involves making sure others know that they are being listened to (Norton, 1978). It was manually counted as the second communicating style preference most for many design participants. Although both participants had difficulty in communicating with their team members, both participants tried to communicate their ideas to develop their project concept. Yet, it echoed with the data from the observational study which indicated that most non-design participants attempted to organise ideas and suggest concepts from their team members. As a result, participants preferred the friendly communicating style; however, the communicating preference of design participants was slightly more argumentative whilst non-design participants were a bit more attentive to organising and progressing the project forward. The results of this questionnaire also echoed with the results from the observational study. Thus, the researcher interviewed participants to compare the data from their preferences of leadership competences and communicator styles with the semi-structured interviews. Section 4.4 presents the findings of the semi-structured interviews.

4.4. Semi-Structured Interviews

The interviews were held after the second and third day's tasks were finished when all participants were divided into a smaller group of four people to develop a selected concept by the head facilitators. It was arranged for the UK participants to conduct interviews in UK after the programme. 24 participants took part in the face-to-face interview, except one UK design participant and four French engineering students who were unavailable to attend the interview due to their personal schedules.

As section 3.2.3 stated regarding the interview protocol, the following areas were questioned: 1) interviewee profile; 2) leadership and communication in the FFE of NPD; 3) understanding of team structure and members and the project brief; 4) difficulty in communicating design and resolving miscommunication and misunderstandings; and 5) experiences of the programme and recommendations. The question about interviewee profiles was already stated in sections 3.2.1 and 4.1. The results shown in this section have been already been processed and analysed. The raw findings are presented in the Appendix. Thus, the key findings of the interviews are interpreted and presented in the following categories:

1) Working attitude and leadership style;

- 2) Understanding the project brief
- 3) Communication difficulty
- 4) Ability development.

4.4.1. Working Attitudes and Leadership Styles

All participants were questioned on how they initiated their communication and how they worked with each other from the first day to the last day. Also, how their behaviours changed throughout the programme.

First of all, most of the design participants stated that they were passive at the first meeting. There were many factors influencing their working attitudes. The following are quotes from UK participants: “it depends on the project topic”, “uncertainty if their ideas were not accepted by others”, “I don’t trust anyone else’s quality” and “we don’t know each other”. In particular, the American participants, who were only undergraduate students, mentioned that “we are the youngest”, thus it made them feel intimidated at the beginning of the workshop. On the other hand, the Italian participants said that they always worked with different nationalities. During the programme, they were actively involved in the discussions and raised their opinions. However, all participants admitted that they preferred working individually first than getting together when their ideas were conceptualised in order to discuss. This echoed with the findings from the observation.

Secondly, the motivation of the participants decreased towards the end of the programme. All agreed that they were excited with a larger group of eight people to generate 100 ideas. However, as they were divided into smaller groups, their motivation began to go down because of team work. All design participants described the team work as “it was nightmare” and “it was really tough”. All design participants apart from the American participants had done group work at their school and workplace; however, they stated that group working was always difficult for them. They also mentioned that they tried leading and generating concepts; however, as their ideas were not accepted by the team members, they began losing their motivation. Also, it affected the design participants who mentioned that they did not do their best to achieve the project brief.

On the other hand it was the first time for the American participants to collaborate with people from other nationalities and disciplines. It influenced them to have emergent leadership qualities. “I am known as a quiet person but for me I feel like I mostly have to take the lead for most things. There are definitely some communication barriers, but I try to bridge those I guess.” “I would say kind of being, not the mediator, but the overall, overarching thinker and making sure that we still have that end goal I mind and bringing everyone back to we should keep this in mind.” They mentioned that they had to push team members even though their motivation levels were also low, that they tried to organise and push the team, and that it might be a cultural influence. However, other design participants mentioned that they did not understand why the American participants tried to organise instead of generating ideas and not looking for new ideas. Thus, it indicated that communication barriers did not only come from talking about ideas, but also from not accepting others’ working attitudes.

4.4.2. Understanding the Project Brief

During the interview, both design and non-design participants mentioned that it was difficult to understand the project brief. They mostly stated that “it was abstract”, “it showed (the brief) the purpose but I really did not know what the clients really want”, and “I thought it was not serious (real project) but it was really serious”. Thus, they were asked what they tried doing to understand the brief. All the teams mentioned that they talked to each other to understand the brief. Interestingly, no single person asked the head facilitators about the project brief during the programme.

They were also questioned about the success criteria of the project brief. Most design participants mentioned that “for me, team work is important for the project criteria”. Also, many design participants mentioned that they were lost and did not know what to do for the project and it was overwhelming for some of them, in particular the clustering and synthesising of ideas. Due to personal limitation in mental capacity (Simon, 1957) and external constrains on choice (Janis and Mann, 1977; Pfeffer, 1981), these causes influence decision makers who are not even trying to make optimal decision. Thus, Pugh and Moreley (1988) recommended following systematic methods in design and to form a team by choosing right members. However, most of the participants did not follow the systematic

method of developing the project concept from the brief and activities. Only one person from the USA mentioned that she realised the project criteria while preparing the presentation on the last day. Their understanding about the project brief during the interview explained why most teams did not consider the requirements of the project sponsors and meeting the needs of the customers and end-users for the library.

4.4.3. Communication Difficulty

In order to understand how the participants communicated, they were asked how they communicated to narrow down the idea. Most of them preferred to show visual images or examples to communicate their idea clearly to others. Sometimes, they mentioned that they drew some images on paper to explain their ideas. If they could not explain clearly in English, they used body language to make sure others understand. Thus, understanding others' ideas was not a miscommunication issue for the participants. However, most of them mentioned that they were lost in regards to the project direction. Also, several participants mentioned that lost focus because they said “we misunderstood criteria”, “we all went there with the same understanding, and lack of understanding about the project”, “we started with a really specific...and lost the focus”, and “my group we were kind of like ADD (Attention Deficit Disorder) so we started to work on one. Then we would never finish any of them”, “I did not know what we need to do for where and what”, “I can't understand...focus on what we should focus on, besides” and “It was frustrating”. Therefore, the communication barriers among team members came from misunderstanding of the project brief and criteria.

Secondly, narrowing down their project concepts was difficult. The participants asked the facilitator to choose the concept, or some asked their team members about selection of ideas for the project direction.

All participants mentioned that they did not like the final presentation on the last day. They stated that as “we prepared presentation. We have no time to talk, to rehearse it” and “it wasn't developed well, the presentation quality as well”. Due to the limited time, most participants mentioned that they could not talk thoroughly to each other to prepare the presentation. This was what the participants said about not being satisfied with their work. On the other hand, they mentioned several times that their satisfaction came from their ideas: “I

really did like the idea”, “it was crazy but I liked it”, and “I like the concept but not the presentation”. Thus, they also mentioned that presenting their ideas to the audience needed to be improved.

4.4.4. Ability Development

Lastly, they were asked what they wanted to recommend for the programme and which abilities to develop. They all mentioned that working with others is a “great experience”. They also suggested providing this type of programme more often or for longer than 4 days. They mentioned that they clearly understood the brief before the project began. However, in the course of the interview, they were asked what they considered the most in the project. They mostly stated their personal interests in potential experience of users in the project site. Thus, the researcher reminded them about what the brief really was. Then, most of them suggested making the project brief clearer so they could understand the project itself more clearly. Furthermore, they mentioned that they wanted to learn better presentation skills. Most of them found it difficult presenting their project concept at the final presentation. Thirdly, they all required better working facilities such as Wi-Fi internet. The working environment provided limited service on Wi-Fi internet; thus, they all complained that working without Wi-Fi internet made them less effective and efficient. The ages of the participants were from 20 to 35. This age group is familiar with working with the internet. It indicated that the design participants had difficulty adjusting to a new working environment. Also, this indicated that design participants preferred working in their own styles more. This explained why they did not use a suggested method of ‘body storming’ which is acting out thematic performances to explain a concept that people have not seen before. Lastly, there was a suggestion only from the American participants about teaching time management to participants before they come to work together. They believed that if they were reminded of the limited time more often, they could focus and work more efficiently.

4.4.5. Summary

The results of the semi-structured interview explained how and why the participants actually behaved. It also provided a cross-check between the three different research methods. The design participants explained that they have difficulties adjusting and working with an unfamiliar working environment. They preferred explaining their ideas clearly by showing visual images, using examples or showing a quick sketch regarding their ideas. Thus, communicating their ideas was smooth and clear. However, it was evident that they did not understand the project brief clearly before they actually began the project. Besides, the participants determined the project success criteria not from the project brief which included the element of NPD but from what they believed about the work, team communication and team working. Thus, it explained their behaviours of not accepting suggestions from the facilitators and making decisions about their project concepts which were not based on the project criteria.

4.5. Conclusion of Findings

The Pilot Study with designers and non-designers within a real context setting through triangulated research methods answered the above objectives. From the pilot study, the characteristics of designer are presented as being careful at the early stage. However, they are actively involved and suggest new ideas and use various visual media as a means of communicating to make others understand their ideas and concepts. Sometimes, they are argumentative in their communicating styles. However, they indicated themselves about engaging communication and understood others were emotionally difficult.

Furthermore, they have a lack of self-awareness in analysing the context of the project. They think that the critical analysing factors around the project are important leadership competences because some studied and worked in business areas. However, during the interview and observation, they revealed that they frequently ignored the project brief and criteria, which is where their communication difficulty started. Without a clear understanding of the project, the design participants generated many concepts; however, they had difficulty in narrowing down and developing their concepts. It also influenced them to lose their high motivation levels on the first day to become the lowest on the last day. Besides, it led them to work to their own preference of working individually first then gathering back to group work.

Lastly, they were the most effective and efficient under time pressure when they worked on visual tasks. They were the most productive and preferred working on visual tasks. On the last day, although each team's concept developments were in progress, the design participants managed to achieve the visual part of the presentation while developing the concepts with others or individually. The participants did not like the final presentation because they were not happy to present their concepts which did not satisfy their expectations. However, the design participants clearly indicated their strengths in presenting an uncertain and fuzzy status of an idea in visual forms and visualising is what they could do much better than other disciplined participants.

Throughout the pilot study, key findings such as designers' strengths of visual communication, self-centred thinking and working preference, and deficiencies in understanding and analysing project contexts were presented. It also showed how their deficiencies led to not only misleading the project process and development but also to ineffective team working. Therefore, these findings are integrated with findings from the literature review chapter to formulate the interview protocols for the in-depth interview study with design leaders in chapter five. The in-depth studies with design leaders investigated and evaluated how design leaders at FFE of NPD improved in communicating with others, understanding the project brief, leading team members to the right NPD direction and building leadership competences of IQ, MQ and EQ.

Chapter 5- the Main Study with design leaders

This chapter presents findings from the research with design leaders. It aims to explore how design leaders communicate design to non-designers at the Fuzzy Front End (FFE) stage of New Product Development (NPD) – in particular, their leadership and communicator styles, and how they came to work as design leaders. Thus, this chapter explores these areas by addressing the following three research objectives:

- Objective 2: to identify design leaders' characteristics and leadership styles at the FFE of NPD
- Objective 3: to investigate how design leaders successfully communicate design to non-designers at the FFE of NPD
- Objective 4: to explore how design leaders became design leaders and how they learned to communicate design with non-designers at the FFE of NPD

As section 3.3.2 (interview protocol) states, the interview questions for the semi-structured interview are formulated based on the findings from the literature review (Chapter 2) and the pilot study (Chapter 4). It consists of five areas as below:

- a) Profile:** education background and work experience of design leaders
- b) Leadership and communication in the FFE of NPD:** exploring design leaders' 1) managerial (MQ), intellectual (IQ) and emotional (EQ) competencies; 2) self-confidence; 3) self-awareness of leadership and communication abilities; and 4) communication preferences. These are the key findings from Chapter 2 (Literature review).
- c) FFE and communicating process:** approach of how design leaders communicate design to non-designers and analyse the context of NPD. This is where design-participants (Chapter 4) had difficulty in communicating design with non-designers at the FFE of NPD. It also explores how design leaders apply key elements of NPD, from chapters 1 and 2.
- d) Learning business language or competent communication abilities:** how they learned business languages or competent communication abilities, and if any

particular event or moment enlightened them on particular communication abilities.

- e) **Recommendations for designers who wish to become design leaders:** what they would recommend to designers or design students who wish to become design leaders

The map below illustrates how each interview category meets the research objectives, and interview questions can be found in Appendix.

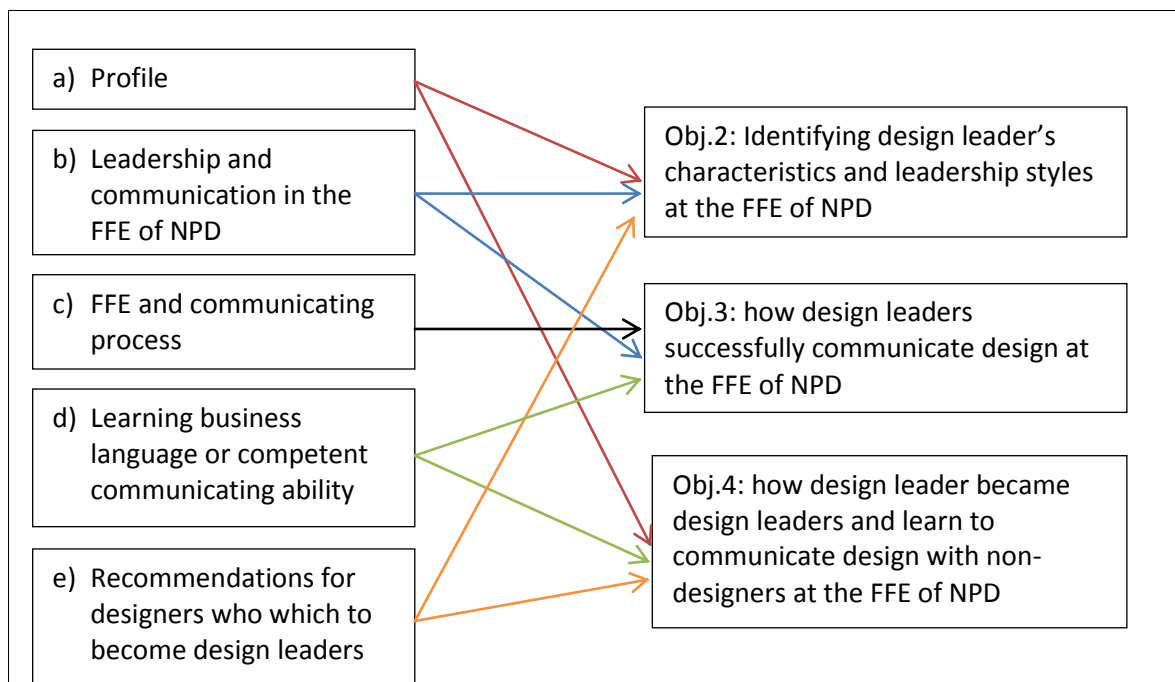


Figure 5.1 The map of interrelationship between research objectives and interview categories

Therefore, section 5.1 begins with the profiles of 11 interviewees for the main study. The following section (5.2) presents the results of coding process from the semi-structured interview as the in-depth study. Section 5.3 provides research results for objective 4 (characteristics of design leadership at the FFE of NPD) and Section 5.4 provides key findings regarding objective 5 (their communication process at the FFE of NPD). Section 5.5 provides the result of research objective 6, which explains how design leaders learn to communicate. Lastly, section 5.6 summarises the research findings and indications about forming the conceptual model of design leadership at the FFE of NPD in the next chapter (6).

5.1. Profiles of Interviewees

As mentioned in section 3.3.1 (sampling method for the main study), the purposive sample of the research participants are design leaders in UK. A total of 11 participants, who are categorised as design leaders for this study, participated in the semi-structured interview as the in-depth study. They all work in the design sector: 8 are working as Design Associates, appointed by the Design Council in the UK; the other 3 are snowball samples, who work in a company or agency with design associates. They are located all over England. As section 3.3.2 (Interview Material) explained, a majority of interviews were conducted face to face at convenient locations or where the participants work. Only one interview (participant no. 9 who lives in Truro, Cornwall) was conducted by Skype, a phone interview. The table below describes the details of all 11 participants, listed alphabetically.

Participant	Background education	Work experiences	Role	Location	Note
#1.	Furniture & product design (UG)	30 years+, consultancies (founding member of Fitch plc), corporates (worked in Philips, design director of Nokia)	Partner in his consultancy, consulting for corporate and SMEs	Shoreditch, London	Director of Design Business Association (DBA), working with design associate
#2.	Product Design (UG)	25 years +, ran his own manufacturing business for more than 10 years, worked in furniture and manufacture industry	Design associates for SMEs, business, manufacturing	Worcester	
#3.	Product Design (UG)	26 years, worked in Pentagram (design consultancy), corporate and own consultancy	Design associates for product	Richmond, Surrey	
#4.	Industrial design (UG, Saint Central Martin, MBA in USA)	35 years +, worked in product design agency, product company in US, own consultancy with technology companies	Design associates for product, technology and supporting engineering department in universities	London area and South East of UK	
#5.	Interior design (UG, cross-disciplinary)	10 years +, working in innovative strategy firm for corporates and SMEs in	Director	Shoreditch, London	Kevin McCullough, a designer, a

	design and interior design MA in Netherlands)	various sectors			writer for design magazines and journals, and runs this consultancy
#6.	Commercial arts major including product, graphic, system design, architecture and fine arts UG in US	30 years +, worked in US for few years and last 26 years worked in UK as a studio manager, production manager, and running her own design consultancy for product sector in UK	Design associates for product	Devon, South West area and Cornwall	
#7.	Fine art (Foundation), industrial design engineering UG and MA, MBA	30 years+, worked as design director for Xerox, in central heating product sector, as innovation engineer at Gillette, SME manufacturing company in Coventry and telecommunications sector	Managing consultant at HCL Technologies, R&D for Xerox, and other global product, service and IT companies	Welwyn Garden City, Hertfordshire	HCL Technologies is the first Indian service provider to enter the managed print service market
#8.	Business major with a marketing communication focus, Took an empathy training programme	25 years + in brand and communication design industry, worked as an advisor for creative business and digital business, running own design consultancy for SMEs	Design associates for brand and graphic sectors	South Yorkshire	Non-design background, but worked entirely in design sector
#9.	Graphic design UG (Middlesex Polytechnic), typography PG (London College of Communication)	35 years +, worked in design agency for BT, the Post Office and big national contracts and corporate design, British Airport Authority. Used to own the largest graphic design agency in South West of UK	Design associates for graphic and brand marketing sectors, director at WolfRock Marketing	Truro, Cornwall	Interviewed through Skype
#10.	Industrial Design, Human Factors and Ergonomics UG (Loughborough University), Industrial Design Engineering PG (RCA)	44 years +, 30 years in corporate, recent 15 years training and developing an appropriate working environment for designers	Joint founder of Quadro Design Ltf, previous design associate (until Feb. 2013)	Cambridge	Hired and trained Jonathan Ive, now at Apple Inc. in US, founder member at UK China Partners, National Director at British Industrial Design

					Association
#11.	Project Engineering UG (Nottingham University)	10 years, worked in manufacturing sector in UK, chemical company in Norway (Orkla) and at Volvo, worked as a management consultant and as a consultant for customer experience project (Haagen-Dazs) in UK	Design associate for non-profit companies, also own consultancy for public sectors and charity	London	Non-design but innovation background and changed his career path after work for customer experience project in UK

Table 5.1 Profile of interviewees for the Main Study

As Table 5.2 illustrates, all participants came from various regions and studied different disciplines. All mentioned that their leadership and communication styles may be different. One interviewee observed that ‘one size does not fit all’ (Phil G, #10). However, most mentioned similar elements of leadership quality and communicating process and styles. Thus, the next section presents the analytic coding process from the semi-structured interviews held with these design leaders.

5.2. Results of Analysis: coding progression

As section 3.3.3 (qualitative analysis) explained the analytic process, the analytic method of coding progression followed open coding, axial coding, and selective coding by Strauss and Corbin (1998). Also, as Creswell (2013) indicates, this process aimed to produce between five to seven themes. The analysis progressed through five levels of abstraction. In qualitative research, the impact of this process is to combine relevant data into a small number of themes (Creswell, 2013). The analysis in the main study follows the analytic recommendations of Strauss and Corbin for semi-structured interview data. Besides, the inductive analysis process brings out patterns and themes from the qualitative data (Braun and Clarke, 2006). Five to seven themes are sufficient for presenting the qualitative research.

A total of 152 pages of interview transcripts were coded sentence by sentence. As section 3.3.3 explained, the process of coding the interview transcripts involved coding them manually. Then, it went through the same process one more time by using computer-assisted qualitative data analysis software (CAQDAS, NVivo 10). With assistance by NVivo 10, it manually coded all transcripts. This process helped to draw the researcher into the text, making the researcher familiar with the text and coding process.

Open coding and notes on an interview script

So DL needs to explore different areas to let them see - uncovering

kind of explore the different areas and allow them to see it. It's like uncovering. It's like opening a present. It's like taking the layers away on something and saying, "Gosh, I never thought it about that. I never saw that."

Speaker 1: Is that how you build empathy or rapport with them?

Kathryn: Yes, also kind of showing them what's possible. You can say, "Listen, if you build a new website, it will cost you roughly this and your return on that, a realistic return, or you have one or two years because of this, that or the other, because you have to pay for it out of pocket, not turnover numbers but out of profitability, it's going to take" Then you say, "Actually, if you did this instead, you would double your ..."

Facility on outcome, Matching D Os

Which of the design projects is most appropriate for you to do now? Or there might be multiple projects, design projects that a company could do, but which is the one that you can do now and invest the resources to keep your time and money to actually make it successful? It's, again, focusing on the outcome of the business, matching your business objectives. That is the key.

Speaker 1: When you explain about outcomes, then do you properly explain or do you show some piece of results?

Kathryn: Yes. Sometimes I use case studies, sometimes I use big text and figures. You're kind of assessing whether the person is a visual one or a financial one. Are they analytical? Are they ... It's not a science. It is really not rocket science at all, because they're a person who's running a business and they're busy and they've got every pressure that comes with that.

Find the most appropriate D project.

depends on outcome (handwritten showing text or pix.)

What I always think about from their ptview is they have what I'd call a business imperative. There's some kind of imperative driving them, and I need to figure out what that is. What's the driver for this? What's the underlying driver? What's the imperative for doing it, like now? Why is it now?

However, they are people, not rocket science.

Speaker 1: In that case, do you change your leading style every time or is there a preferred style of leading ability?

Kathryn: I change it every time. Flexible Leadership.

DL always think the driver, why it needs now.

it's more like reflect

Actually, from a style point of view, I don't consciously shift it, but I think I subconsciously reflect back to them. Sometimes there's certain kind of people that do that. It's the kind of person that finds it easier, too, and I don't know why. I'm not, I would say, huge about psychology, but there are some people who are much more in-tuned to reflecting back the words and the language and the physical gestures and things that reflect [inaudible 00:35:12] teaches you so

Figure 5.2 Coding process-Stage 1. Example of Manual coding for Level 1 coding on an original interview transcript

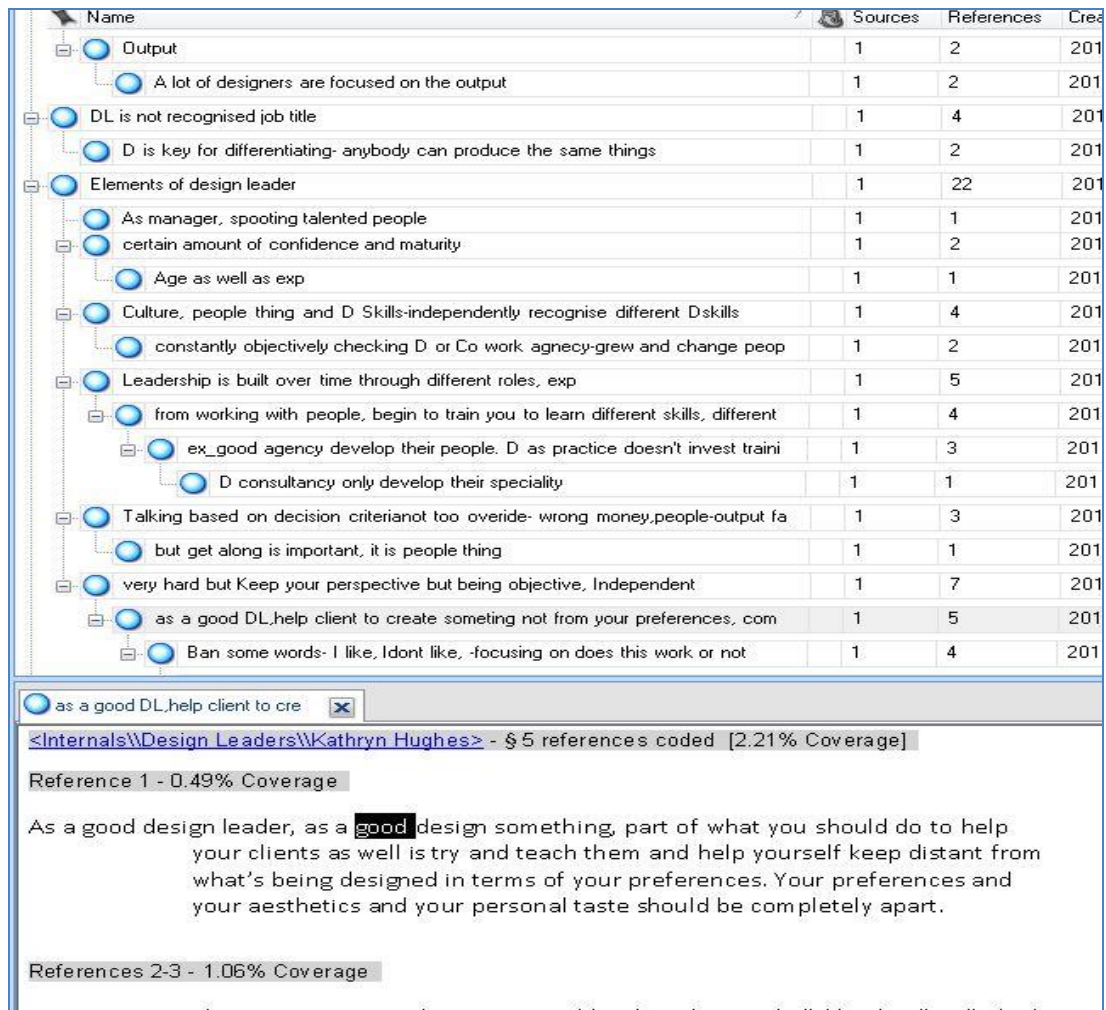


Figure 5.3 Coding process-Stage2. Example of 2nd open coding for Level 1 coding on an original interview transcript by using Nvivo 10

All codes were organised and written to Microsoft Excel 2010. This is attached in the Appendix E. These listed codes helped with organising the codes and categorising them visually, thereby helping the researcher to explore and connect categories in order to interpret the meanings. However, the total coding at Level 1 was 617. As table 5.2 presents, these Level 1 codes were grouped into naturally occurring families of codes under the interview questions. Also, the image below shows how a code was chosen from the interview transcripts.

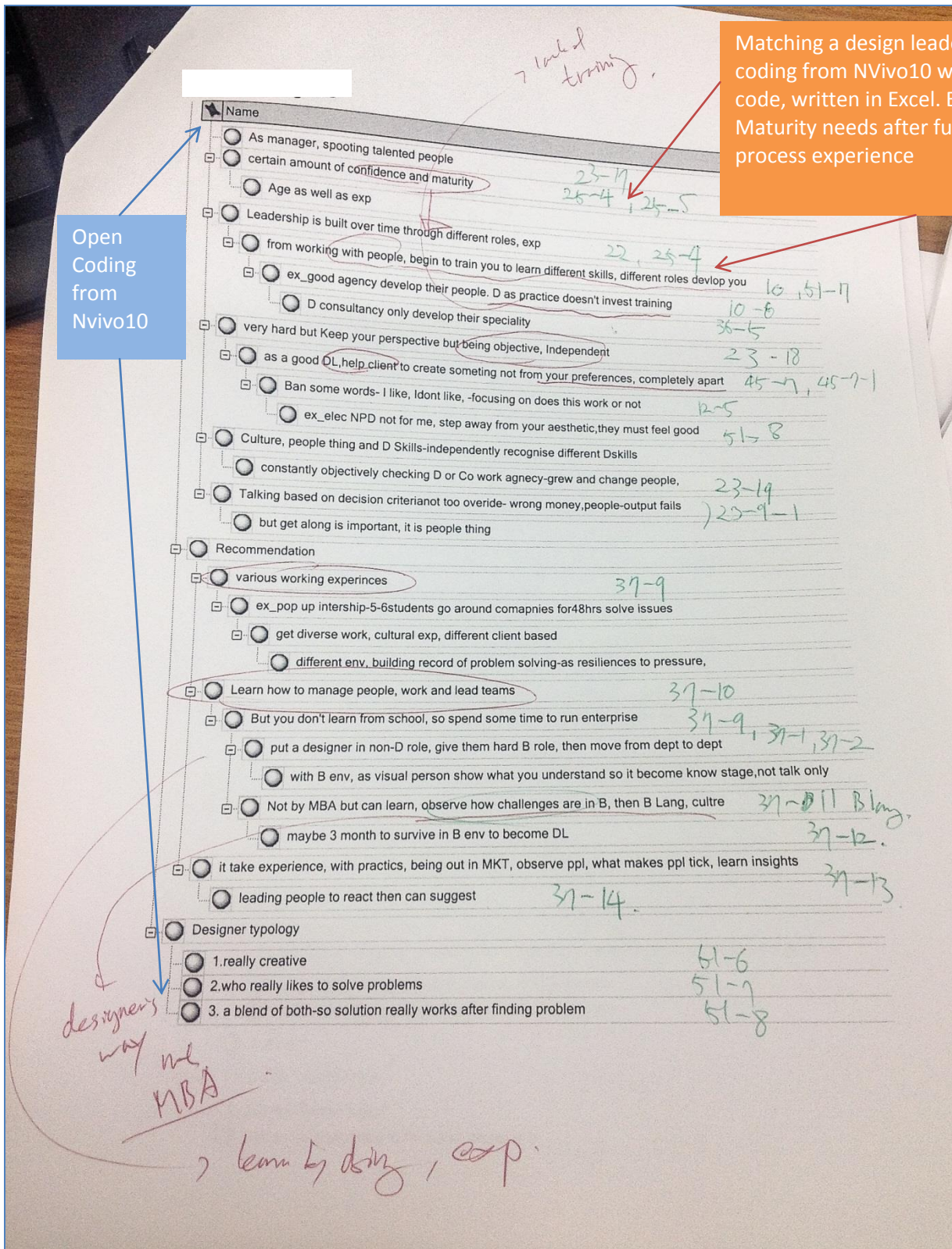


Figure 5.4, Coding process-Stage3. Example of matching individual design leader’s open coding from NVivo 10 with all code of the main study , written in Microsoft Excel, 2010 for Level 1 coding

25. Comfortable of delivering design
25-1 After 5yrs of company, begin to being confident
25-2 Late 30s (15+ yrs), knowing using all D competencies as well
25-3 after 10 yrs-having confidence
25-4 Maturity needs after full NPD process experience
25-5 Need confidence
25-6 lack of self-awareness
25-7 between 15-20 years' experience
25-8 Building trust, empathy first then design delivery
25-8-1 Then discussing other issues-money, people...
25-9 Design competency, information need
25-10 Empathy align with culture

Table 5.2 an example list of Level 1 code in Excel, which matches with other individual open coding from NVivo

However, there were still too many codes for theory building. This led to Level 2 coding. It grouped the list of Level 1 codes by similar topics or themes. It merged the similar names of codes under different topics. While interviewing design leaders, they were asked about one topic through different questions in order to do cross checking of their statements. For instance, the researcher asked about the aspects of design leadership, the types of activities that one engages in as a design leader, and recommendations on how to become a design leader. These aimed to understand what design leadership consists of at the FFE of NPD. Due to the different interview questions grouped under the same topic, Level 2 coding was able to reduce the number of codes. However, the total number of codes at Level 2 was 396. This was still too many for theory building again.

Level 2 code groups
1-1 diagnostic tool
1-6 Make a model(diagnostic formula) based on experience
1-9 Shifting culture by Design
2-3 (2) matching business objectives
3-1 confusion between design & innovation

3-2 don't know design usage
3-9 (8) Clients are different (aim ,style, objective)
3-14 No D term speaking, MKT term
3-17 They don't know they can do better
3-18 They don't know how to Fail, difficulty with uncertainty
3-19 they do not know what they really want
3-20 Client likes to talk more

Table 5.3 an example list of emerged Level 2 code into a similar topic from Level 1 code, for instance, code from 1-1 to 1-5 are group under the code 1-1 diagnostic tool because they have a similar topic

At Level 3, the same process of coding was conducted as at Level 2. While coding at Level 3, repeatedly occurring themes were identified. Thus, it reduced the total number to *155 codes*. Level 3 codes were able to cluster into inductively occurring families of codes that dealt with the same themes. Those code themes at Level 4 produced *28 codes* for exploration. These results began to reflect the key subjects in the aim of this research.

Theme of Level 4	Level 3 code
Group work	3-9 (8) Clients are different (aim, style, objective)
	26-13 It is a group work, not your own solo work
	40. we (designer) are not different
	45-21 working with different people
	45-22 part of group work
	53-9 NPD is people thing
Right team	53-9 NPD is people thing
	53-11 (10) right team is vital
Low Ego	3-14 No D term speaking, MKT term
	26-13 It is a group work, not your own solo work
	45-7-1 not leading by your preference
	45-23 low ego, not pushing my style, not centre of attention
Helping people	3-17 They don't know they can do better
	23-5 Mentoring Design through process
	45-7 DL helping others
	45-17 helping, taking care

Table 5.4 an example how Level 3 codes are grouped into Level 4 code

At the fourth level of coding, particular phenomena of design leadership at the FFE of NPD inductively started to emerge. The codes at Level 4 began to represent the specific characteristics of design leadership practice at the FFE of NPD. These topical codes (Level 4) were:

1) Group work, 2) Right team, 3) Strong self-awareness, 4) Interest in people and business growth, 5) Low ego, 6) Helping people, 7) Humble, not telling others what to do, 8) Understanding people, 9) Having confidence, 10) Self-taught, Life-long learning, 11) Diagnostic tool, 12) Lean, critical, creative, visionary thinking, 13) Selling your thought, 14) Fast analysis for vision, resources, aims, 15) Being objective and consistent, 16) Research-based, 17) Balance between intangible and tangible, 18) Design competency, 19) Design is a process, 20) Flexible (Leadership style), 21) Sensitive, influence of decision, 22) Acting as a GP, a solicitor, and a detective, 23) Observing, carefully listening, 24) Asking probing questions, 25) Not speaking in design terms, 26) Fine tuning conversation, 27) Explaining again and again, 28) Various experiences.

These Level 4 codes represent the important elements that design leadership consists of at the FFE of NPD. For instance, these codes indicate what design leaders are considered to have in their attitudes, such as helping others, interest in people and their business, and acknowledging that NPD is group work. Indeed, it illustrates their communication principles, such as acting as a GP or a solicitor, observing and careful listening, asking probing questions, and not speaking in design terms. Also, it characterises what design leaders emphasise in design thinking and how design can fit within the NPD process and meet business objectives. Even though these Level 4 codes delivered a more manageable number of codes, they did not grasp the essential concepts that define the general principles of design leadership at the FFE of NPD. Thus, another level of abstraction was applied to capture the defining features. This Level 5 of coding concentrated on key principles to form an informed theory of design leadership at the FFE of NPD. Level 5 coding produced nine codes, which are: 1) Low ego, 2) Independence, 3) Interest in people and their business success, 4) Design competency, 5) Careful listening, 6) Reflective flexibility, 7) Patience and consistency, 8) Helping others, and 9) Experience of various types of work and a full NPD process. The table below illustrates how Level 4 codes were clustered under the themes of Level 5 coding.

Group of Level 4 codes	Intermediate theme	Level 5 Key words
Group work, right team, low ego, Humble, not telling what to do	1. Low Ego (acknowledging difference, it is a work of people after all).	1, 3, 8 were merged as 1. Empathy (motivation)
Strong self-awareness, having confidence, diagnostic tool, selling your thought, Fast analysis for vision, resource, aim, Research based	2. Independence (analytic and diagnosing process, Self-awareness)	2. Independence
Interest in people, business growth, understanding people, Not speaking design terms, Fine tuning conversation	3. Interest in people & their business success, fine tuning conversation	
Lean, critical, creative and visionary thinking, Design Competency, Design is a process	4. Design competency-mastering design, a critical design thinker with business understanding	3. Design thinking
Self-taught, Lifelong learning, Flexible, Sensitive, influence of decision, Acting as a GP, a solicitor & a detective, Observing, carefully listening, Asking probing questions	5. Carefully listening & analysing.	4. Reflectively flexible (attitude)
	6. Reflectively flexible attitude	5. Active listening (carefully listening, analysing & asking probing questions)
Being objective & Consistent, Balance between intangible and tangible	7. Patient and consistent	6. Patience and consistency
Helping people, Explain again and again	8. Helping others	
Various experiences	9. Various work, life , a full NPD process experiences	7. Epiphany: Experience of various types of work and a full NPD process

Table 5.5 Principal Level 5 codes and their relationships with Level 4 codes

Each code at Level 5 characterises a specific essence of design leadership at the FFE of NPD. Yet, three codes at Level 5 (Low ego; Interest in people and their business success; Helping others) were similar; thus, they were able to be clustered in the theme of Empathy, which is a motivation of design leaders for NPD. The final coding process produces a total of 7 themes. Therefore, saturated principal codes are: 1) Empathy, 2) Independence, 3) Design thinking, 4) Reflective Flexibility, 5) Active listening, 6) Epiphany: Experience of various types of work and a full NPD process, and 7) Patience and consistency.

Fig 5.5 illustrates how the coding progressed from open coding at Level 1 to the most saturated code at Level 5. Each level of code is constructed upon the previous levels. As the coding progressed through higher levels of abstraction, clustered themes were informed inductively to characterise the leadership of design leaders and their communication process at the FFE of NPD. In next three sections (5.3, 5.4, 5.5), explain how the final codes relate to each objective 4, 5 and 6.

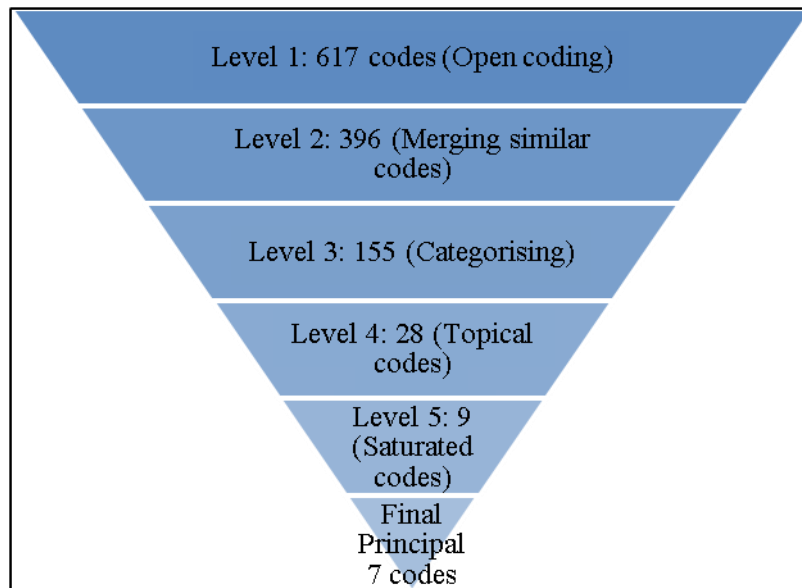


Figure 5.5 Coding process

5.3. 7 Principal codes

This section explains how the principal codes are interrelated with research objectives 4, 5, and 6. The next seven sections present how seven key principal codes meet the research objectives, which are leadership characteristics (objective 4), communication behaviour, process or methods (objective 5), and how they learned either leadership or communication attribute (objective 6). As listed in section 5.2., the order of the principal codes are explained by: 1) Empathy, 2) Independence, 3) Design competency, 4) Reflective Flexibility, 5) Active listening, 6) Experience of various types of work and a full NPD process, and 7) Patience and consistency. Then, it provides the table for each code as a summary at the end of each section.

5.3.1. Empathy

Leadership Characteristic: Design leaders indicate that the most important element of their role is an interest in people and people involved in business and NPD.

I think many companies, part of their humanity is at their door of their office, and they pick it up on the way out again. And while they're at work, they forget all the things that being a consumer, being a father, or son, or a mother, or a daughter, they suddenly become an employee. And you are working against that (#1).

Empathic I believe is very important...I have a real interest in person-centred psychotherapy (#8).

It's just I found it much more rewarding than styling.....You have to be a people person (#10). I'm fascinated by people (#11).

An interest in people and business leads to and helps to build relationships with other colleagues and clients. Design leaders strongly endorse the point that, without having empathy and building rapport, there is no next step forward in business. Thus, Empathy is one of the key leadership characteristics for design leadership at the FFE of NPD.

Moreover, design leaders indicate that their interest should be in achieving the NPD success that the other non-designer colleagues desire. As for building a rapport, they recommend maintaining the focus on the business objective of NPD.

We just think designers are different, but actually, it's not any different (#1).

The most important thing is how you make a relationship with business people (#2)

If you don't build rapport, they are not interested in having you back (#4).

Not turnover numbers but out of profitability.....*It's, again, focusing on the outcome of the business, matching your business objectives. That is the key (#6).*

Design leaders also distinguish between the different motivations of designers and design leaders. They state that the craft and aesthetic part of design is important; however, being in pursuit of aesthetic design alone would not be enough for designers to work successfully with non-designers as design leaders.

Designers often are too self-centred Designers are their own worst enemies. They're very inward-looking (#7).

So choose your battles very carefully, and recognize your own strengths, because pitch your battle against.....it is a battle, that's why we talk about those three things (diagnostic formula). And I think other people are just more smart are that, they realize that being a good marketer and doing a good campaign, doesn't mean that everyone will just agree. We have fantastic sales forecast, and really good delivery, doesn't mean that you will succeed as the best salesperson.....*But I think, the other thing is, I think many designers don't want to talk that challenge (business and marketing campaign) on, they just want to be creative geniuses (#1).*

Think about your customer base and you don't think about satisfying yourself which is the artist and the craftsman...*the whole point is you're designing things for people to use (#10).*

Therefore, Empathy was explicated as the key leadership element for engaging in design leadership activity. It influences their behaviour and thinking as design leaders.

Communication behaviour: According to design leaders, having empathy is imperative; thus, they try to use it in building a rapport with non-designers at the FFE of NPD. They insist on the importance of building a good relationship with non-designers.

I think where issues do come up is where they maybe don't want to follow that advice. You go in there in this little company, and they are saying we want to create a new product. *In reality you are going to come to the conclusion that they don't need a new product. They just need to market their existing products more effectively. Then that's the conversation you have, but you can't force them to take your advice.....*I think that's where the rapport comes in. *If you've got good rapport, you can have that conversation. It is equivalent call, and they just*

want something (#4).

If you haven't got empathy with alien cultures ... and that means geographical cultures, or engineering and discipline cultures ... *if you haven't got the empathy, you cannot do experiential design. You can't work with these other people (#7).*

All of this (past business results led by design) speaks for itself really, *but the person . . . the business owners that we sit in front of first have to believe us (#8).*

How they developed this leadership quality or characteristics: Design leaders understand strongly the nature of NPD. The interviewees clearly state that it is important to reinforce 'we' rather than 'I' within NPD process because, ultimately, it is your project and you will gain credibility in the eyes of your colleagues if it successful. Thus, design leaders constantly highlight the importance of team working.

Designers don't have a monopoly on ideas. Everybody can have an idea. Even granny can have an idea. What we do have are the skills to be able to take it from an idea to something real (#3).

You've got to be able to listen to what people are talking about and *be willing to have a conversation with them about it (#4).*

The notion that the best leaders make sure that credit is given to their team; an even better one, the team believe they did it all on their own. Never take credit, because in actual fact, if you take credit and don't give it to the team publicly, then in actual fact ... it works both ways. If you give credit to the team, most people go, "Yes, but he was managing them." You get the credit anyway. The team can grow, and the people outside the team recognize the people (#7)

Throughout the interviews, design leaders frequently emphasise empathy and an interest in people. Reinforcing teamwork comes by acknowledging the context and the nature of NPD, where people from many different disciplines are involved and their interests are in people and the success of NPD. Design leaders recommend not only having an interest in visual design and craft, but also having an interest in people, as well as stakeholders within business and NPD, if designers wish to become design leaders. The motivation of design leaders to develop an interest in people, stakeholders, the business objective, and end-users is a critical element of design leadership. It leads them to build empathy, which enables their roles as design leaders at the FFE of NPD.

1. Empathy	
Characteristics	Motivation, an interest in people and stakeholders within business and NPD.
Communication behaviour	Empathising with people, building a rapport.
How they learned	Acknowledging that NPD is the work of different people.

Table 5.6: Empathy in the context of Design Leadership, its influences on communication behaviours and how it can be developed

5.3.2. Independence: (Achieving business objective first)

Leadership Characteristic: Design leadership primarily aims to achieve business growth. The priority focus of design leaders is to consider this. Design leaders attempt to identify the real NPD challenges.

You need to *link all design suggestion with business growth* (#2).
The first bit is about really understanding their business (#4).

From the beginning of the meeting, design leaders analyse the context of NPD and related issues and resources. This clarifies what to do for NPD. Simultaneously, focusing on business growth enables them to build a rapport. It is a key activity to share understanding on both sides. Interviewees number 8 and 9 summarise this characteristic of design leaders as:

It's like with trust and success.....the ability to listen and interpret without being directive or pushing the client. It has to be the client that makes the sort of business decisions.
I think if you want to build relationships with clients and do the best job you possibly can, you have to absolutely understand *what the business is going and why. You have to think business. You have to think about the business first.* (#9)

Communication behaviour: Design leaders deliberately use their own formula to diagnose the context related to NPD so that they could help other colleagues and the client to understand the NPD context and direction. The reason for using diagnostic formulas is to have better communication with clients or non-design colleagues. Interviewee number 10 indicates that showing the diagnostic tool visually moves the conversation quickly. It helps to build a rapport.

the corner of things for reasons of I think kind of communication and clarity and also knowledge and empathy for the ends kind of brought up to the link, so we don't have to get too far soon as the life literally can't stop, really worrying about what the end product would be (#5).

"I always ask how your business is first? I am not talking about design word at all...I think if you want to build relationships with clients and do the best job you possibly can, you have to absolutely understand what the business is going and why. You have to think business. You have to think about the business first. In some ways, that's just about the humans being interested in other humans and basic empathy. If I'm not interested in you, how can I possibly do a good job for you? How can I care about you enough to want to do a good job for you?" (#9)

They do not depend only on their diagnostic formulas, however; they find hidden issues and

real NPD challenges by asking probing questions or suggesting better business approaches. All interviewees check out the current resources for NPD. For instance, interviewee number 9 indicates that asking obvious questions to check on financial resources, the right people, and distribution networks, etc., is important at the FFE of NPD because it is often missed out. Thus, design leaders can clearly point out what to do for NPD direction at the FFE. For instance,

what's possible. You can say, "Listen, if you build a new website, it will cost you roughly this and your return on that, a realistic return, or you have one or two years because of this, that or the other, *because you have to pay for it out of pocket, not turnover numbers but out of profitability, it's going to take ...*" Then you say, "*Actually, if you did this instead, you would double your ...*" (#6)

What I do, on an ongoing basis, is when somebody seems to do something ridiculously stupid, step back and go, 'Hold on'. If I assume for a second that they're right, what does that mean? Can they be right? (#7)

According to design leaders, their diagnostic formula aims to identify real NPD problems to solve. For instance, interviewee number 2 indicates that he always considers three points of business components as his diagnostic formula model; these consist of objective reasons for changing the design of NPD, the manufacturing process, and brand awareness because every NPD problem leads to different results. Similarly, interviewee number 1 states that:

Art of the possible, the science of the plausible, and the politics of the achievable... Because that sums up the three things we believe in. So it's design, sort of the art, you could say the science of the plausible is the technology, and the politics of the achievable is the business piece. And you need those three things to work, to optimize your chances of success, as a designer, and as a company, really. *So that's a three-bodied problem, but what we also do, is another one, which we called need-challenge-solution. Businesses often know about one of those three things, if not more, so they understand that they might have a need, or if there is a need, that they could address, that they either have a need for themselves, or they have a need for a customer, but they believe there is a need that they could redress.* Sometimes, that need means they also have the beginnings of an idea of a solution.

Interviewee number 3 calls his diagnostic formula '*design emotions*', which concentrates on the fact that people make decisions and run the project. Another interviewee (number 11) frames his diagnostic formula as '*innovation equals problem times solution times execution*'. Interviewees have their own methods for analysing the business context of NPD. Their strategic formulas for identifying NPD contexts and the right (real?) challenges are termed differently but possess similar elements, including identifying the most urgent and real NPD challenges, checking resources for NPD, and choosing the right people for NPD tasks. Some of the interviewees state that these processes are the same albeit with different names.

Innovation and design are a predictable process as much as they are a creative process.....getting good design through the ugly machine (#1).

All these different processes, they all call them different names, but generally they're the same stuff. Make sure you know what you're trying to achieve. Make sure you learn about the current state and analyse what you've got and gain understanding. Define what you want to achieve, gain understanding. Iterate some ideas as quick as you can. The next one is, choose which of all the work you've done has got the best chance of working, implement it and feed back into it (#7)

"It is a frustration because designing a user experience is no great difference from being a user centric designer which was no good from being an industrial designer. The whole point is you're designing things for people to use. If they don't, if they can't use it then you've failed and you've failed from an experience point of view, from user-centric point of view and from an industrial design point of view. These are all words" (#10).

How they learned or trained: It takes design leaders different amounts of time to become confident in communicating design and business as design leaders. Some feel confident after 10, 15 or 20 years of working experience. But they all agree that it requires time and repetitive practice. Interviewee number 10 states that he does not believe that recent graduates have the right mind-set. On the other hand, interviewee number 11 mentions that he was able to work as a design leader after a few projects. He comments that he was fortunate to work with a senior design associate from the Design Council. His interest in helping other projects from a design perspective, and the support that he received from a senior design associate, gave him confidence in delivering design after a few projects. However, all agree that design leadership abilities need maturity and practice. The interview quotes below present their perspectives on communicating design and design leadership, all of which require practice, experience, and maturity.

Well, I think it takes *a good 10 years to get confidence..... I think that there's nothing better than experience* (#3).

I think it takes time... I think that comes with good design practice and good ... being out in the market and really, really honestly being out in the market and observing people and how the market works, what makes users tick and insight into people and market, and then saying, "Well, look, we have a design strategy to exist in this marketplace and for this company." That is a different kind of learning as compared to the leadership kind of way (#6). When I became more interested in design management....then *11 years...* (#7).

I've kind of learned through my career. I worked in the consultancy business quite early. And so *I've been confident about talking about design for a fair number of years* (#8).

I started doing after about two and a half decades in the design industry. Could I have done it before that? Yes, probably. Two and a half decades it's working on something... probably being in the industry for at least 15 years (#9).

A long time ago, 20 years ago I would think. Probably 15 years, no 20 years ago....*Twenty years ago I realized that there were combinations of skills that I developed that put me in a better place. It was recognizing things like if you're going to talk to a company that doesn't understand design then you need to talk to them on their terms...* It was a halfway through my career...This is why I get very frustrated when I hear people talking about undergraduate courses doing design thinking. You need to have accumulated experience because you can do design thinking. In many instances you can't accelerate that (#10).

Yes, I definitely think it's something that's developed actually. It's definitely develop rather than I've always been fascinated by people. So yes, there's a whole nature and nurture argument. I think I have developed it.....*For me, it's about the execution of that. So you have to be on projects to be able to do it. Lots of different projects, different sectors* (#11).

Therefore, confidently communicating design and business takes time and requires practice. Interviewee number 8 phrased behaviours of analysing NPD context and communicating design and business as being independent, which is a key requirement for design leaders.

It's not really a personality trait, but I think it's a value...it's more of a trait of the project.....*need to be able to demonstrate being independent in consideration of businesses*.....we are able to be objective in our consideration of the business(#8).

2. Independence	
Characteristics	Business growth first.
Communication behaviour	Diagnostic Formula, holistically analysing NPD-related issues.
Learned	Maturity (10-15 years), work experience, studying business.

Table 5.7: Independence- a principal code represents that design leaders aim for business growth, identifying NPD issues holistically, and being independently stable to work with non-designers at the FFE of NPD

5.3.3. Design Competency

Leadership characteristic: Design leaders focus on business growth and, simultaneously, they are always aware of their positions as design leaders and their design backgrounds. They all recommend mastering competency in design thinking and visualisation abilities because they need to indicate to non-designers how design works within the NPD process. Basic drawing skills are still important for communication. For instance, the interviewees state that

I think sketching, hand sketching is still important... It's fundamental. It's fundamental for you to be able to communicate to yourself so you can explore. It is also...it's a very useful tool to talk with other team members and other designers, but also many other clients to be able to draw something even if it's a map. *You get some confidence. That's what you're trying to install in a client is that you have the confidence to deliver* (#3).

You have to know the design language inside out because you are the interface. You have to be able to talk to a business leader one day and then explain all that to a young design team the next day (#9).

It's understanding *designers have an ability to visualize and grasp intangible things and visualizing* that for now so that you could actually then start to examine them (#10).

Then, design leaders could decide where to put design, when to inject design into, which types of design to use, how to use design, and who could design within NPD or the business process. Their focus was to match design with NPD or business objectives.

Don't forget, design isn't just about or a product isn't just about tangible things. It's also about service and experience (#3).

Well you need to have a lot of technical knowledge about what design is and how it is positioned in business, and what the different approaches are. You certainly need to understand knowledge about how business works, how businesses operate..... You try to understand what some of the key challenges are. There're normally only two or three of them. If you can identify those key challenges you can then start trying to marry up what design can do to address those challenges (#4)

Then the third designer is a blend of both (creative + solving problem). ***I think that third designer is the best one because they like being creative but they also like to really solve a problem so that the solution really works, and it works well and people like using it (#6).***

Obviously we ***need to understand design strategy and how that matters.....The design objectives have to fit in the marketing objectives and the marketing objectives have to fit in business objectives.*** Now, you could say, "Well, you know what? As long as I understand the marketing objectives, that would do," but actually don't think you're ... then you're relying on somebody else to have done the critical piece of thinking (#9).

As a company trying to compete in that marketplace, the only differentiator is design (#10). Another reason to master design skills and expertise, including craft skills, visualisation, process, and thinking, originates from design backgrounds. This ability is what differentiates them from other specialists within NPD or business projects. They also acknowledge that 'design leader' is not a widely recognised job title. It is still relatively new. Therefore, they are required to have a strong sense of self-awareness.

You realize at the end of the day, which again is through experience that just because somebody can shout louder doesn't make them the loudest voice. ***You have to be confident and know where you're coming from (#3).***

It's still a very unrecognized ... I still have to explain to people what I do. ***It's not a readily recognized job title. You won't find it in the drop-down box of job titles. It's still a very unknown (#6).***

All these different processes, they all call them different names, but generally they're the same stuff. Make sure you know what you're trying to achieve. Make sure you learn about the current state and analyse what you've got and gain understanding. Define what you want to achieve, gain understanding. Iterate some ideas as quick as you can. The next one is, choose which of all the work you've done has got the best chance of working, implement it and feed back into it (#7).

According to design leaders, their roles are unknown so that it requires emotional reliance which maintains their emotions stable where they are surrounded by non-designers. Their job titles are most often design managers, design directors, and consultants, rather than design leaders. However, they consider their activities to be design leadership. Although design leaders are not project leaders, their self-awareness indicates to themselves what they are

capable of and what they should do as design leaders surrounded by non-designers at the FFE of NPD or the business process. Therefore, they recommend being aware of their capabilities as design leaders and being independent, with the knowledge and experience of design and how it fits within the process of NPD and business.

Communicating behaviour: While analysing the context of NPD with non-design clients and colleagues, most design leaders had similar preferences of communication methods. Mostly, they prefer using examples to explain design led NPD direction, as many clients and colleagues are not familiar with design-related terms and the way that designers prefer working. Sometimes they explain previous successes with other companies. For instance,

If we were talking to a food business it'd probably be quite useful to quote the business that's in the industry, particularly one that probably a lot of businesses in this field recognise. And the same with other sectors really (#8)

Sometimes non-designers do not understand or see how design could contribute to NPD success as design leaders do. In these situations, design leaders help them understand. For instance,

We might use examples of other business who've been first in the process of understanding the need or the solution of trying to find out where the opportunities lie. We will use the model, and we have templates that we can sort of challenge them (#1).

A similar challenge is maybe new, but you've got to remember that I've probably worked with, *over the last few years, three, four years, 150-200 businesses even so I see a lot of the same thing and a lot of the same challenges, whereas the company sat on the other side of the table – they probably only got there, even if it is visibility is their own problem and they think their problem is unique (#4)*

Design leaders state that they prepare information and research before the meeting. Interviewee number 7 always spends time to find examples to enhance his/her communication with non-designers.

You constantly have to keep looking for examples, all the time. They go out of date. If I tried the Shuffle one now, and I show them a Shuffle, they'd say, 'I don't know what that is'. It's out of date. I'd find a fake iPhone, or fake iPads. You've got to keep up to date with things like that. That's just one example.

The reason for showing examples to other non-designers is to encourage them to use design appropriately in NPD.

Engineers for example find it very difficult because it's not tangible, measurable material. They feel uncomfortable. Equally designers have responsibility and they're being forced in many instances to justify and the fact is it's difficult to put it out in the market and see whether people like it (#10).

The time spent in preparation varies depending on the amount of time available prior to the meeting. They all state that there is no right way to prepare for a meeting because if you prepare too much you may have a bias. They recommend being flexible and trying to identify the business imperatives for NPD.

Yes. Sometimes I use case studies, sometimes I use big text and figures. *You're kind of assessing whether the person is a visual one or a financial one..... What I always think about from their purview is they have what I'd call a business imperative. There's some kind of imperative driving them, and I need to figure out what that is.* What's the driver for this? What's the underlying driver? What's the imperative for doing it, like now? Why is it now? (#6)

Some design leaders demonstrate to non-designers see how and where the real products or service are sold or used; this may help non-designers to see real problems of their NPD and take them out of their usual ways of thinking and previous experiences. Design leaders also consider not only communicating the hard facts. They emphasise to understand the 'soft' aspects influencing their colleagues and clients' decisions. They define the soft facts as identifying different non-designers' different cultures and key elements to build a rapport. For instance,

It's the soft and more cultural things that you need to know about the client...How they think, how they operate, how they talk, the environment, the nest they build for themselves, the environment they create for themselves are all clues to how they are going to function (#9).

It's not a science. It is really not rocket science at all, because they're a person who's running a business and they're busy and they've got every pressure that comes with that (#6).

Design leaders use different examples with non-design clients and colleagues to lead them into an appropriate NPD direction by showing the hard facts and matching soft side, based on an understanding of their culture and natures. Interviewee number 7 indicates that communicating by providing examples works as a narrative method of visual storytelling. According to the interviewees, this type of process takes time and requires a lot of knowledge. It is important to let other non-designers understand about design and how it meets the business objectives within the NPD process.

You can start changing things. What you are really trying to do is get them to understand how design really works so they can make decisions for themselves, rather than getting me to make decisions for them (#4).

3. Design Competency	
Characteristics	Design thinking and strategy, understanding how design fits within NPD process. Also, they have visualisation ability.
Communication behaviour	Decision making about when, what, where, and how to input design within NPD process. Communicating hard and soft issues related to NPD. Also, they prefer showing visual examples.

Learned	Motivation of becoming design leader led. How they learned design thinking is described at section 5.3.6 learning and training
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Table 5.8 Design thinking is a design leader’s design competency at the FFE of NPD

5.3.4. Reflective Flexibility and Active listening

According to design leader, they recommend to have working attitude being reflective and being flexible. It is the attitude and leadership characteristic of design leaders at the FFE of NPD. Active listening is a key code that explains communicative behaviours of design leaders how they listen and speak about NPD related issues with non-designers at the FFE. It enables the attitude of being reflective flexibility for the design leadership. Also, active listening leads design leaders to speak a non-designer’s language, to identify their culture, and to know relevant information. Thus, section 5.3.4 illustrates leadership characteristics. Section 5.3.5 presents its behaviour. Lastly, section 5.3.6 describes how design leaders learn the attitudes of reflective flexibility and active listening.

Leadership characteristics: Design leaders explain their willingness to be reflectively flexible to different non-design colleagues and clients, as their interests are in people. An interviewee (number 1) defines a design leader as a leader of design in any sector and that it reflects the role of both noun and verb. He also states that both the dictatorial type of leadership and demonic type of leadership seem successful. It may require a person with good morality because this position is one of a decision maker.

Probably not as creative, but you can go from people, we'll identify Steve Jobs or James Dyson or Richard Branson. *They're demonic, in the fact that they are driven completely, they have some assessment of what the creative expression of their business is about.* They understand it very deeply. And they drive decisions, and so, it's not consensus, it's not cross-functioning, it's leadership leveraging. And that's the most extreme form of it, it's almost dictatorship. But the point is, *being dictatorships have been seen to succeed in the world. And if they have the right moral codes and the right kind of ethics and the right attention to,* people live with them comfortably, so I think in that sense...(#1).

Interviewee number 1 indicates that if design leaders do not have dictator style of leadership like Dyson or Branson, having flexible leadership is important. Interviewee number 7 also endorses with flexible leadership but insists on being a father figure for a design team. As a leader of the team, you should protect your followers or team members from other departments; thus, your team members will trust and rely on the team leader. Many

interviewees emphasise heavily the importance of having flexible leadership. They endorse thoroughly the fact that the context of every NPD, the people involved, and stakeholders and organisations is dissimilar. They explain the need for having flexible leadership as

You work with different people and projects so we always challenge but having flexibility and lead in different ways is important (#3).

I think you need good sensitivity to the type of person you are dealing with because you can't adopt just one approach or one style of dealing with an organization, but behind it if you adapt your style of working with the individual, company or group of managers or whatever, then behind that is the role of the most frightening work. (#4)

You have to absorb yourself in that culture, to understand how they think. You try to get into their mind-set. If you go to India, for instance, you've got to look at all the things. Think of the traffic in India. The way they drive, there are no rules at all. You can go down a dual carriageway, and there will be something coming the other way ... often, a cow. It's completely ... a huge volume of traffic, and yet it flows. If they played by the rules we do in England, it would be gridlocked within a few seconds, and the whole city would come to a ground (#7).

A majority of them note that sensitivity is required in order to be flexible. A flexible NPD approach helps one to adapt rapidly to the unique nature of each NPD. Therefore, flexible leadership is one of the key characteristics of design leadership.

5.3.5. Active listening

Communication behaviour In order to have flexible leadership, design leaders recommend having a reflective attitude with careful listening ability. Most interviewees state that non-design colleagues and clients often came to the first meeting with either misconceptions about design or not knowing what they want to do. Thus, it is important to identify their real intentions about NPD. Interviewee number 1 observes that:

You need to find out exactly what real issues are and it needs to be a meaningful challenge because if it is too easy, everyone else can do it

Also, a respectful attitude towards colleagues is important. Interviewee number 2 mentions that every non-design client or colleague has used design to the best of their ability; thus, it is important to respect their working history of using design. For instance,

I think personal qualities – you've got to be able to listen to what people are talking about and be willing to have a conversation with them about it. If you go in and just say I think you should do this, do that, do that, I don't think that sort of works very well really (#4).

Always try to work with some sympathy and empathy with the people you're designing for. Put yourself in their place. Imagine how they feel and it makes you much more sensitive (#10).

Participants, therefore, suggest not 'telling' your clients or colleagues what to do but to try to help them achieve the business objectives of NPD. To find out what the real challenge is, all

of them recommend listening carefully and asking probing questions ‘like a detective, a general practitioner, and a solicitor’ (numbers 1, 2, and 8). Thus, you can be reflective on NPD issues.

Two ears and one mouth, you should listen twice as much as you explain.

Interviewee number 9 emphasises careful listening. While listening carefully and asking questions to seek the ‘real challenge’ (number 1) or ‘the valuable problem to solve’ (number 11) for NPD, design leaders recommend speaking reflectively on using your colleagues’ language. For instance, interviewee number 8 mentions that:

I find I’ve developed an approach that means I will never speak to a customer, client or business owner in my language but always speak in their language. So they’re understanding from a benefits perspective, not a technical perspective.

According to interviewee number 7, speaking their language is also helpful to communicate efficiently and effectively; it helps the different cultures of your colleagues and clients to understand what design leaders are attempting to speak about. He states:

Even if you give three designs and *you ask a finance person, who has turned into a marketer maybe, to choose ... they are trying to judge it on the metrics they understand.* They’re looking at the three designs, and they’re going, “That’s got a big blue bit on it, and that one hasn’t. I bet adding colour costs money, so I really like the one without blue on it.” They won’t say that. They won’t say, “Because of the cost.” They’ll go, “Well, I’ve got to choose, and I like that one.” *Actually, even if it’s subconsciously, their background is making them see costs. They see cost....*I would never present three ideas. Why would I present three ideas? *I present one idea, and the rest is telling the story of why, to the finance people, it is the best option financially.* To the mechanical engineers, why it is the best option for mechanical design. For the logistics people, why it is the best design for them. I understand their language. *I present it in the language that they understand.....If you can show them one, and then show them why financially it’s right, they go, “Brilliant. I’m happy.”* You can tell. They’ll go, “Could you have not made that a bit cheaper?” You go, “No, because of this. But actually, it gives you a better price because of that.” They go, “Oh, OK then.” You have to talk in their language.

The flexible leadership of design leaders consists of listening carefully, asking questions, and speaking in non-designer language. Having a reflective attitude to different colleagues and clients and speaking their language are essential to clarify real NPD issues at the FFE. Speaking the other’s language is a requirement and heavily recommended as *‘being able to adapt the language for whoever the audience is’ (number 11)*. Therefore, a reflectively flexible approach is one of the key design leadership characteristics at the FFE of NPD. Active listening is the core ability needed in order to achieve a reflective approach. It supports not only the understanding of the context of the NPD problem but also colleagues

and clients.

5.3.6 Learning and training: Epiphany moments and learning methods

This section explains how previous section 5.3.4 (Reflective Flexibility) and 5.3.5 (active listening) are learned or trained. Interviewees were asked to describe what made them learn business language and knowledge and how they learned to communicate design to non-design colleagues or clients at the FFE of NPD. The next two sub sections look at when design leaders decide to study communicating business and non-design discipline language (5.3.6.1) and how they learn those skills (5.3.6.2). Thus, these sections explain how design leaders are enabled to have reflective flexibility and active listening.

5.3.6.1 Epiphany moments

According to design leaders, they had their own epiphany moment when they chose to learn other disciplines' language, culture, and information. All state that they were fortunate to have realised the importance of learning and speaking business language and culture. Their realisation regarding the importance of communicating in the language of others came from experiences of not only working as a designer but also from being involved in other activities outside of the role of designer early on in their careers.

After their undergraduate degrees, most design leaders had opportunities to be involved in not only the design aspect but also the entire NPD process. They were able to experience every different function of NPD. After experiencing different disciplines such as marketing and engineering, they realised how they should communicate with others to apply design more successfully. Furthermore, most design leaders experienced working at both sides of a design consultancy or agency, which helped them understand the different sides of working culture and what each side seeks in their work situations. Some design leaders had opportunities to manage people. Most, but not all, had experience of running a company.

According to design leaders, they are involved in a limited part of the entire NPD process. Recognising that every function, person, and working environment of NPD are dissimilar, they were led to learn the language, working culture, and knowledge of their colleagues and clients. The interview quotes below are examples of their epiphany moments.

I was lucky, in joining Philips, I very quickly learned about, I guess, about how corporate business, or even in-house design works, in its many different ways. Because I was in Philips

before it became well regarded for design... I was there when Bob Blaich was running the design group. I think he was chairperson of DMI, Design Management Institute, once upon a time..... *the experience I had at Philips allowed me to interact with engineering functions, working with marketing team, working with sales teams (#1).*

Every client is different. Every product has a different level of intensity. As a product designer, you're either ... there are different levels of innovation, so you can design products that haven't existed before, so you're sort of inventing, effectively, or you're, I suppose, updating products..... the business, in a way, isn't really part of being a designer. It's not something that's physically taught. I think it should be.... That's more about how you operate..... What they really should do is to teach you about business a little bit and how you then contextualize design, because as a designer...*sometimes you over-elevate your importance because you do think you're bringing creativity and something new, but having brought my own products to market and licensing and everything else, you realize how many different cons there are and how they need to all be working together to make a successful commercial design (#3).*

Move from being a junior up through the ranks, yes, and once you're given the first role where I had to actually manage people and projects in a serious way, that, to me, starts to understand how you can measure the outcome of a design project. We get the experience. We get to work at an agency, we get to get some cultural experience, we get to get behind different types of projects and different client bases..... What it doesn't give them is what I would call the experience of managing and getting to know people in a team on a longer-term basis. *I would encourage anybody who wants to be a design leader, you have to learn about people and learn about working in a team and leading a team. It is a very different kind of thing, particularly on a client team (#6).*

When did I realize I had to do all this, is when I realized ... I went into industry from college... The small SME was where I started to get an inkling that there was a different world than design. *Several years in small consultancies, reinforcing the wrong view that designers are separate. The problem is that designers only relate to designers, as does anybody...* Then I went to Nortel, and there was one guy who was the corporate vice president of design, John Tyson. He was a very clever guy. *He used humour, and he opened my eyes to the notion that designers aren't automatically right. The only reason we're not treated as the leaders, and in the position we face, because people don't understand it. It's not our fault they don't understand us, it's our fault.* He opened my eyes to say, "That's not true." It's actually both sides, and it's not the designers' fault. *From that point, that's when I became more interested in design management, in engineering management, in engineers; how different people see things (#7).*

Think about your customer base and you don't think about satisfying yourself which is the artist and the craftsman.....*I had an interest at a very early stage in Human Factors and Ergonomics, everything that we were designing as a product was going to be used by somebody* even in high tech areas like things like automation, there are still maintenance engineer that has to interact with the product. Therefore, there is always a huge physical interaction. You need to take that as the highest priority in terms of your design thinking (#10).

5.3.6.2 Self-teaching of other disciplinary language and culture: business language

After realising the importance of speaking the language of other disciplines, they taught themselves by listening carefully and observing how other disciplines and business-orientated colleagues spoke and reacted. Design leaders describe these methods of learning as 'self-

taught', in particular business language and knowledge. A few design leaders learned about active listening from various people they knew, such as senior designer colleagues or a barrister. Two interviewees (numbers 8 and 11) went to an educational institution to study about people and empathy. None of them went to business school to study business language and knowledge. However, three interviewees (numbers 1, 4, and 7) were sponsored to obtain MBA degrees when they achieved senior positions at their corporations. What they learned for the MBA was business models and some analytical methods. This helped them to work better with business colleagues; however, they also indicate that the foundation for business communication came from themselves. Thus, all interviewees indicate that their motivation to know other disciplines' culture, knowledge, and language led them to learn by listening carefully to how others talk. The quotes below are examples of how they learned business culture, knowledge, and language. These are also their recommendations on how to study them.

The experience I had at Philips allowed me to interact with engineering functions, working with marketing team, working with sales teams. ***So I rapidly had to learn multiple languages.....People think of business as business language. But it's not at all, there's dialect, there's the marketing language, there's sales language, there's engineering language.*** So you have to learn many kind of vocabularies and you kind of have to, I think you make a decision, ***"Am I going to actively engage and learn more? Or am I just going to sit back and do what I have to do?"*** "I'm going to lean forward." But I think it's a character thing. I don't necessarily think it's a design think, I think in all walks of life, some people lean forward, and some people lean back.....***I never had any leadership training education. I have only ever had training in terms of educational development through more creative skills and capability, and some degree, technology and other aspects. So my business skills have all come through, initially, just the context of my working experiences,*** but as I gained management, and then, some degree of leadership responsibilities, with that, my employers have provided me with fantastic learning opportunities(#1).

I think just the MBA helped me do design demands to some degree. I think you find the design studies tend to be quite experienced, so they worked a lot in design. They work with the clients a lot. ***I think if you are sensitive and you've got an interest then you can learn quite a lot about the business side of things.....***What the MBA will give you is just a few more models and maybe some of the language that if you haven't majored in one, you wouldn't really understand the language of management, the language of business. You understand how organizations work, and that could help you. You've got to remember that most MBAs are good throughout the leaders of large corporations however, not SMEs. SMEs are very different from large corporations. With SMEs, unless it's a large one, they tend to have less formal process for planning, for management (#4).

If you wanted to be selfish about it, I would say that as a designer, you need to treat all those people as, ***you're an artist, and they're the medium you have chosen to work in. You don't fight your medium, you learn how to get the most from it.*** Sometimes, you get things out of that medium that other people wouldn't have done, or wouldn't have thought possible. That's

when I believe that you become a great artist, i.e. a great designer, who can get amazing things through (#7).

I didn't and I don't. I was suppose just picking up little things along the way, (#9).

Twenty years ago, *I realized that there were combinations of skills that I developed that put me in a better place. It was recognizing things like if you're going to talk to a company that doesn't understand design then you need to talk to them on their terms.....Just exposure and experience and interest, you got the interest in there and reading.* Just read the connection times. For example, travelling is an enormous privilege that if you get a chance to travel but *when you travel take the opportunity to watch people, take the opportunity to understand what people do and in that way you gain lots of insights and knowledge that ordinary people don't often do.....*You've seen people do things, you've watched how people behave and that means your first thought when you start a design process is bringing all these information and thinking how people would behave (#10).

Probably actually when I started working for the first time. I did my degree at Nottingham and had a one year placement when I was on the IT support desk.....Again, all of that was working ... *so a lot of my work has always been working with people.* Very much delivering the service. Selling shoes. Serving people in the restaurant. Helping people in the IT help desk.....*I suppose I spend the time with people, I got interested in what makes people tick and why people are the way they are and that people are different, you see different styles with different people. That's something that's developed* (#11).

Therefore, how design leaders competently communicate design and business to non-designers at the FFE of NPD are accordingly explained in section 5.3.4 (leadership characteristic), 5.3.5 (communication behaviour), and 5.3.6 (experience of learning). Another key leadership element of design leaders is an attitude of reflective flexibility because every NPD and stakeholder is different. Having the reflective flexibility attitude influences active listening for design leaders to adapt to different NPD projects. It is to listen carefully in order to identify a real NPD challenge to solve and related and appropriate NPD sources. These particular leadership characteristics and communication behaviours were enabled after experiencing the entire NPD process and working in diverse roles in different sectors and organisations at the early career period. During that period, they realised the importance regarding the speaking of other disciplines' language and understanding of other's culture and information. These findings are summarised in the table below.

Competently communicating design and business	
Leadership Characteristics	4. Reflectively flexible: acknowledging that every NPD and involved person is different.
Behaviour	5. Active listening: to find out real NPD challenge, as well as non-design colleagues and clients' culture and

	information. Listening carefully and asking probing questions.
Learned (6. Epiphany)	Needs sensitivity. Realise the importance of learning and speaking non-designers' language after the entire NPD experience and diverse discipline working experience. Learn by careful listening and observation.

Table 5.9: Key characteristic of design leaders regarding working attitude as reflective Flexibility, their communicative behaviour about NPD issues with non-designers (Active listening) and how they progressed to design leaders from designers

5.3.7 Patience and Consistency

Leadership characteristic: Design leaders describe their personal characteristics dissimilarly. Unlike the above common elements of design leadership, a few variable personal characteristics were identified. The results suggested both similar and different characteristics among design leaders. Other than their reflectively flexible approach, active listening, empathising with and respecting other non-designers, they had agreed on common personal characteristics, such as a positive attitude toward teamwork and a willingness to explain again and again until their audiences fully understand their points. They encourage and try to help others build their confidence to contribute in the NPD process. They also are enthusiastic about their work and their roles as design leaders.

They need to believe they have more influence than they really do (#1)

I am willing to tell and explain more to customer.....I am approaching to clients and have enthusiastic attitude (#2)

I think there's a misconception that products come out might have ... from factories and there hasn't been somebody thinking about it. *The more we go on and the more products we love and represent good design, people recognize it as being a discipline* (#4).

I think it's important to give the client confidence and that's probably the single most important thing. *That confidence will be built on them knowing that I understand their business...* It will be dependent on me giving them a clear vision, having a clear plan to implement that vision, having access to the right people to implement that vision and that's all actually. I think that would be about it (#9).

I've been described as an enthusiast and a motivator. I think I love what I do. I've been very fortunate to work with some extremely good designers that I either recruited or I've worked with. I've always enjoyed coaching them in how to get the best from themselves and how to put themselves in the context of understanding other things and other people. *Always my starting point is imagine I'm you, right? Rather than me sitting her telling you what I think if I was sitting in your place what would I be asking?* Always try to work with some sympathy and empathy with the people you're designing for. Put yourself in their place. Imagine how they feel and it makes you much more sensitive (#10).

Communication behaviours: In particular, some interviewees (numbers 8 and 11) describe their personal communication style as being facilitative. What they describe is their preference for facilitative communication matched with a reflective and flexible attitude and careful listening.

My style is quite facilitative.....So generally I'm interested in listening to what the client has to say. There's two reasons for that: the first reason is the clients like talking about themselves, so they give me an opportunity to do that and I'm not being intrusive. And the second reason is by listening to them and questioning or challenging them at various points, *I get to learn quite a bit about their business in a short space of time.....*Through them speaking freely and openly it also enables me to get a feeling for them in terms of their personality style, maybe their leadership style, potential impact or success of the project, how they might interact with staff (#8).

Furthermore, some of the interviewees recommend the leadership characteristics of endurance and consistency. Several interviewees often indicate that a design leader should explain the design process within the NPD process to others again and again. Thus, it requires endurance or tolerance in their attitudes. Also, the design leadership process of being reflective and flexible, listening carefully and asking probing questions, and personal character style ought to be consistent. If a design leader changes one style too often, they warn, other colleagues and clients would be confused and might lose confidence in that design leader.

the element is persistence, endurance..... a design leader is there, constantly working at it every day, having to both protect the ideas, protect the business. You have a much bigger remit, in terms of your responsibility, than you can ever have as an external consultant (#1).

Be totally consistent. Consistency is huge. If you're a grumpy person, be consistently grumpy. Don't every now and again be really friendly; it confuses people (#7).

On the other hand, there were differences in their personal communication characteristics. Some of them emphasise the importance of humour. For instance,

I'm aggressive. If you can use humour to diffuse after you've been aggressive, you can probably get away with it. I get away with more than most people do, because of my personality. You don't consciously change your personality.....For somebody to be funny, I think, is the height of intelligence.....you'll find, I think, the best comedians, when you actually look at it, it's like they've got a masters in astrophysics. *They're really clever people. That's because they understand the notion of seeing other perspectives* (#7).

Some interviewees prefer to speak to the point what they want to communicate with other non-designers. Others mention that speaking in a straightforward manner helps the others

understand faster and more clearly. For instance,

I don't think I was ever one for talking about design in particularly obscured terms, in any case... *I'm quite a straight forward person.....*I remember particular instances of sitting down with, for instance, one of my first branding project, Will Fellows was with The London Law Firm and the project management star, Will Fellows, was very hands off. The designers were working very closely with clients and *I found myself having to sit down and explain to the client why I thought a particular font was better than a different particular font. My instinct it was to just rationalize in very straight forward terms and say,* look at this thing and that's this style of font, because of these curves, and those lines and so on, has a got a particular sort of tone of voice and this is appropriate for your organization because that kind of aligns with your brand values, blah, blah, blah (#9).

Interviewee number 8 states that '*we are probably different*'. All individuals are different and have different working and design backgrounds. However, throughout this section it is clearly stated that there are several common attitudes, characteristics, behaviours, design competencies, and a range of common business knowledge. These comprise design leadership, in particular during the FFE of the NPD process. Yet, all these elements aim to understand the context of NPD and involve people. It also helps to communicate and lead others empathetically and effectively. Design leadership builds a rapport by indicating what kinds of appropriate design should be applied to a NPD project. As section 5.3.1 (Empathy) and 5.3.2 (Independence) explicate, the patience of design leaders and their consistent communication behaviour were built over a decade. Table 5.9 below summarises this section and section 5.3.6.

6. Patience & Consistency	
Characteristics	Willing to explain again and again.
Communication behaviour	Design leaders have different communication styles but consistent characteristics of communication which aims to communicate their intended aims about design and business clearly to non-designers at the FFE of NPD.
Learned	After their own epiphany, they practiced (section 5.3.6.2 self-taught).

Table 5.10 Design leadership characteristic about being patient to explain repetitively to non-designers about design and NPD issues thus it aims to build a rapport and communicate design smoother with non-designers

5.4 Chapter Summary

The main study with design leaders aims to meet research objectives 4 (characteristics of design leadership at the FFE of NPD), 5 (their communication process at the FFE of NPD), and 6 (how design leaders learn to communicate). The main study with design leaders, the purposive sample, provides key characteristics of design leadership and their communication process and behaviour towards non-designers at the FFE of NPD.

In order to present the key findings, section 5.1 describes how the analytic coding process of the data was conducted to saturate seven principal codes. The corpus of research data itself inductively reveals valuable insights regarding the elements of design leadership practice at the FFE of NPD throughout several times of saturation coding. The inductive analysis process brings out patterns and themes from the qualitative data (Braun and Clarke, 2006). As section 3.3.3 (qualitative analysis) indicates the analytic process for the main study, the coding progression follows open coding, axial coding, and selective coding by Strauss and Corbin (1998). The early coding process reduced the number of codes from the Level 1 amount of 619 open codes to the Level 4 amount of 28 codes. The Level 4 amount of 28 codes identifies the context of what constitutes design leadership at the FFE of NPD. Indeed, it also shows specific elements that design leaders consider as motivation, leadership styles, communication preferences, and the communication process.

The analysis progressed through five levels of abstraction. Thus, this process produced seven themes (Creswell, 2013). The seven principal codes are empathy, independence, design competency, reflective flexibility, active listening, experience and epiphany moment, and patience and consistency.

Throughout the semi-structured interviews, the interviewees demonstrate that design leaders had studied different design disciplines or had worked in different design areas with various working experiences. However, the common patterns regarding their preferences in leadership and communication behaviours at the FFE of NPD are identified. The table below presents how these codes can be categorised by the research objectives. Also, the diagram below the table visually illustrates how each axis of the objective is related to the principal codes.

Leadership characteristics	Empathy as being interested in people and involved stakeholders within business and NPD, business growth first, mastering visualising skills and design thinking which is to understand how design fits and works in different NPD processes, reflectively flexible attitude, willingness to explain again and again.
Communication behaviours and process	Empathising with people, building a rapport, analysing holistically NPD-related issues with their own diagnostic formula, communicating hard and soft facts within the NPD process, finding appropriate NPD challenge, showing visual examples for better communication, active listening, patiently explaining again and again.
How design leaders learned and trained	Acknowledging NPD is the work of different people, maturity, motivation of becoming a design leader, having an epiphany moment after experiencing the entire NPD process or working in different sectors and organisations or in non-design roles, learning how to listen carefully, taught to adapt to different non-design language, culture and information.

Table 5.11 how each code from the Main Study matches with each objective

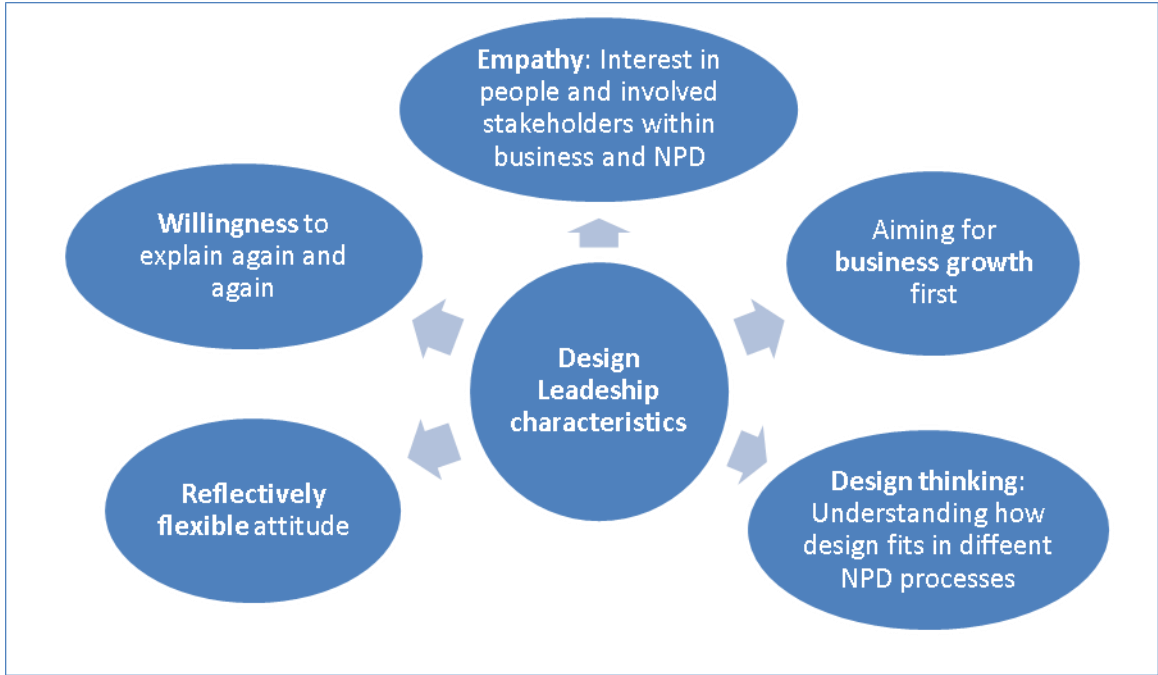


Figure 5.6 Characterising design leaders at the FFE of NPD

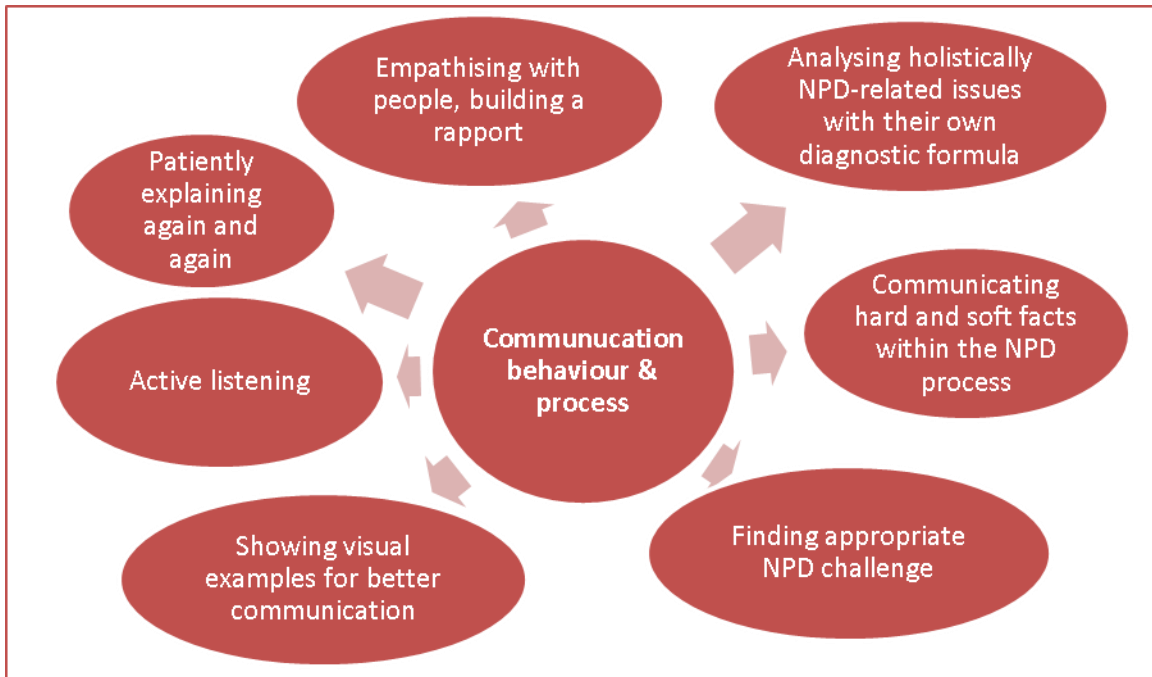


Figure 5.7 How design leaders communicate NPD issues with non-designers at the FFE of NPD

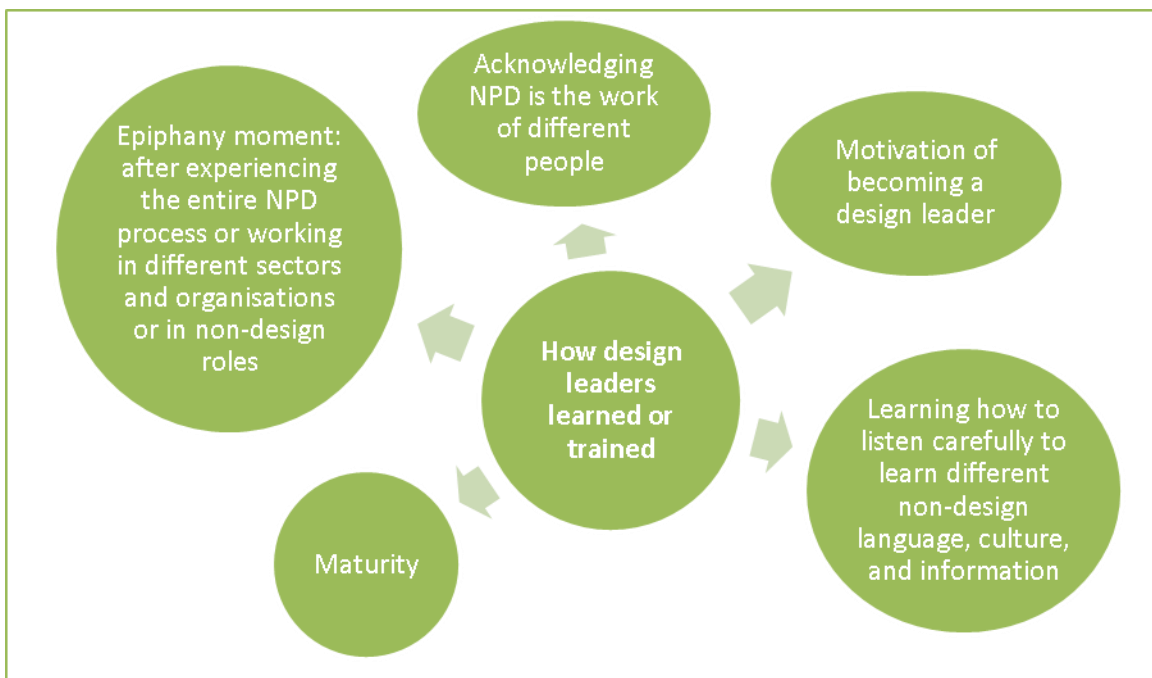


Figure 5.8 How design leaders progressed to design leaders from designers

As a result, this chapter provides the principal key codes to characterise the design leadership at the FFE of NPD. Thus, design leadership at the FFE of NPD consists of reflective and

flexible approaches because the context and the nature of each NPD and the involvement of non-design colleagues or clients are different. As each NPD is unique, preparation for early stage meetings varies; thus, design leaders listen very carefully and reflect on what they hear and ask probing questions. These activities aim primarily at identifying a real NPD challenge, appropriate resources, and business objectives because its aim and direction is unclear at the beginning. While identifying and analysing the context of NPD holistically based on active listening, design leaders simultaneously try to build a rapport with other non-design colleagues or clients. Then, they indicate which type of design to employ within the NPD process.

When design leaders communicate with other non-designers, they do not 'tell' them what to do but try to help them understand about design within NPD. If others do not understand, they are willing to explain it again and again. They prefer to communicate by using examples of previous successes, tangible objects or real situations; thus, non-designers can change their perspectives. They visualise the NPD process to match so that all are at the same level of understanding.

Although they are design leaders, they do not use design terms but rather employ the language of others; for example, speaking in financial terms with a financial perspective about NPD to an accountant. Design leaders recognise that NPD requires teamwork. In particular, their interests in people and in the success of NPD are key motivators to work as design leaders. At the same time, they are aware of their position in the NPD process and cannot ignore their own design background. Active listening, speaking the other's language, asking probing questions, analysing the business context, and communicating flexibly and reflectively all aim to input design appropriately within the NPD process.

Design leaders claim that having diverse working experiences of different disciplines and being involved in the entire NPD process in their early careers gave them opportunities to understand how other NPD-related colleagues from other disciplines, and business clients in particular, preferred to work, think, and behave. Hence, for most, their business language and knowledge were self-taught and some learned from people like a senior design colleague or a non-designer involved in NPD, such as a barrister. Some went to training facilities to learn about people and empathy. Others were sponsored to gain MBA degrees when they had reached senior positions in their corporations. However, during the early period of their careers, what they learned was that careful listening and observation improved their knowledge of others' culture, knowledge, and language. They all recommend practice, as

communicating design confidently and comfortably require maturity. For some this took only a few projects, but most of them spent at least 10 years at it.

The next chapter compares the data from research with designers (Chapter 4). Then, it explains the formulation of the conceptual model of design leadership at the FFE of NPD. Therefore, the conceptual model for this research is provided at the end of the next chapter.

Chapter6 Discussion and model formulation

This chapter presents the process of the conceptual model formulation, illustrating the leadership attributes of design leaders and how they communicate designs to non-designers at the Fuzzy Front End (FFE) of New Product Development (NPD). It addresses research objectives 5 and 6.

- Objective 5: To analyse differences in the characteristics and behaviours regarding leadership and communicating design between design leaders and designers
- Objective 6: To illustrate a conceptual design leadership model that visualises the relationship between the leadership attributes of design leaders and their communication process for design and NPD issues to non-designers at the FFE of NPD

In order to achieve the above research objectives, section 6.1 compares the different characteristics and methods of leadership and communicating designs between designers and design leaders at the FFE of NPD. Then, section 6.2 provides a summary. Lastly, section 6.3 presents the conceptual model, which is one of the contributions to knowledge of this design research.

6.1. Discussion

The Introduction identified that many designers in NPD face difficulties in communicating design to non-designers involved in the process (Walker, 1990; Beverland and Farrelly, 2011). However, Paton and Dorst (2011) indicated that some experienced designers successfully communicate by using the co-creation of a language through the interpretive process of building a shared understanding with non-designers. A competent design communicator is also recognised as a design leader (Topalian, 2002; Turner, 2013).

Different roles of designers in different NPD types (Perk et al., 2005) and their activities have also been identified (Bruce and Bessand, 2002; Ulrich and Eppinger, 2008). Every designer has different communication abilities. It is acknowledged that the spectrum of designers varies depending on their working experience and career positions. Indeed, this was observed

in the pilot study (Chapter 4). Novice designers and some design students had a difficult time of communicating design and leading the project. However, some designers with non-design work experience in the pilot study evidently showed that they communicated more smoothly with non-designers and other designers. Nevertheless, they noted that they had had a hard time communicating and wished to improve their communication and leadership abilities. Also, some design participants, with five to eight years of working experience as senior designers or managers in the pilot study, admitted their difficulty in communicating design to non-designers at the FFE of NPD. Nonetheless, a design leader has been acknowledged to be a competent communicator with business knowledge. The previous Chapter 5 (the main study) conducted an investigation from the perspective of leadership characteristics and communications ability and processes at the FFE of NPD.

It is acknowledged that there are different levels of designers based on different working experiences; however, from the perspective of design leadership, designers are going through difficulties in communicating design to non-designers at the FFE of NPD. Thus, this section takes ideal-typical comparisons (Watkins, 1952; Webber, 1947) between a designer (who is considered to be facing difficulties in communication) and a design leader (who is a competent design communicator). It aims to compare their differences in leadership and the communication ability and process at the FFE of NPD. Two groups of designers are compared based on the key research results of the pilot study (designers) and the main study (design leaders). Thus, distinctive characteristics of design leadership at the FFE of NPD are provided. Comparisons between two key research results are discussed according to the order of the key principal codes of design leaders from the main study.

1) Empathy

The Oxford English Dictionary (2014) defines empathy as “the ability to understand and share the feelings of another”. From the perspective of psychology, researchers have defined empathy as an affective trait, which is the capacity to experience the emotion of another (Bryant, 1982) or a cognitive ability, which is the capacity to understand the emotions of another (Hogan, 1969). Although there are various definitions of empathy, Cohen and Strayer (1996) defined it as “the ability to understand and share in another’s emotional state or context”. Empathy plays a key role in establishing interpersonal relationships (Rogers, 1951)

and also in producing change and learning (Rogers, 1975). Thus, Plutchik (1987) indicated that empathy is a sharing of positive and negative emotions so that it endorses a bond between people. In addition, Katz (1963) explained that an empathic response is initiated by cues in conversation or received impressions from our states of minds or emotions about the other person.

For management scholars, empathy is the central competence of social awareness and social effectiveness in one's working life (Goleman, Boyatzis and McKee, 2002). From the perspective of the recent leadership literature, empathy has been recognised as a contributing factor to leadership success (Cooper and Sawaf, 1997; Yukl, 1998). Indeed, Salovey and Mayer (1990, 1997) claim that empathy may be a central element of emotionally intelligent behaviour. It includes the ability to understand another's feelings and to re-experience them oneself. Also, several researchers have indicated that empathy is related to transformational leadership, and that understanding others' emotions allows a leader to achieve an aim effectively (Ashkanasy, Hartel and Daus, 2002; Bass and Avolio, 1990).

From the results of the main study (chapter 5), it can be seen that design leaders have claimed that their empathy is the initial motivation at the FFE of NPD. At the early stages of NPD meetings, their empathic interests in people, their non-design colleagues and clients and, in particular, the business success of NPD inspires their motivations, attitudes and communications with non-design colleagues and clients. At the meeting, design leaders attempt to have conversations without speaking in design terms, which only designers know and use. They speak a language that the other non-designers understand. The aim of design leaders is to build rapport, which is the first priority at the FFE of NPD. Several researchers have argued that effective leaders create a rapport with their followers; thus, it allows leaders to guide their followers to more productive emotional responses and work behaviours (Goleman, Boyatzis and McKee, 2002). Indeed, Bass (1999) stated that 'leadership is as much emotional and subjective as rational and objective in effect'. Thus, the empathic leadership attitude and the behaviour of design leaders aim to achieve an NPD task. These are similar to recent leadership research which found a positive relationship between empathy and task leadership (Kellet et al., 2006).

On the other hand, the research results of designers (the pilot study) indicated that the motivations of designers are also their interests. Yet, most of their interests are for achieving their ideas within NPD. Both designers and design leaders were led by their motivations;

however, designers were driven to pursuing their own design concepts or ideas. Also, their preferred communication styles (section 4.4) were argumentative. They were often observed having difficulty, and when interviewed they stated that they had such a difficulties, in not only communicating their ideas but also building good working relationships. Thus, designers showed a lack of empathy with non-designers within the NPD team. Therefore, both design leaders and designers were led by their motivation at the FFE of NPD. However, design leaders were driven by having an interest in understanding others, so they tried to empathise with others and spoke in the language of business for smoother communication and to build a better rapport. Designers had an interest in building their ideas. Pursuing their own ideas through team work was often criticised by design leaders in the main study. Therefore, the leadership characteristics and communication behaviours of both design leaders and designers can be distinguished from the beginning of the NPD process.

Leadership characteristics & communication behaviour	Designer	Design leader
Motivation for NPD	Interest in building their ideas	Interest in people in order to know and understand them, thus enabling the achieving of NPD collaboratively
Behaviour	Facing difficulty in building a working relationship with NPD team members	Aims to build a rapport

Table 6.1: Comparing leadership characteristic and communication behaviours about Empathy between designer and design leader

2) Independence

The next principal code is Independence, as termed by an interviewee (Design leader #8) during the interview held during the main study. Independence consists of strong self-awareness as a design leader, aiming at business growth first and independent capability regarding the holistic analysis of NPD issues.

According to the results from the main study, a person in a design leader position needs to be keenly aware of what a design leader should do at the FFE of NPD because the job title of

design leader is not a widely acknowledged position. Goleman (1998) stated that self-awareness belong to emotional intelligence within leadership. He explained that self-awareness consists of having a profound understanding of one's emotions, strengths, weaknesses, needs and drives. Indeed, individuals with strong self-awareness are neither overly critical nor unrealistically hopeful; thus, they are honest with themselves and others. Several researchers have recommended strong self-awareness as one of the core leadership traits (Avoilo et al., 204; Bass, 1990a; Stogdill, 1948; Yukl, 1998). Self-esteem is the only agreed leadership trait based on the meta-analysis of leadership research (Judge et al., 2002). In particular, transformational and authentic leadership put a heavy requirement on leaders to have strong self-awareness; however, charisma is not necessarily an attribute of authentic leadership (George, 2003). Authentic leadership consists of having confidence, optimism (positive emotions), hope, trust, self-efficacy and resilience (Avolio et al., 2004; Luthans and Youssef, 2004). Both designers and design leaders seemed be aware of their positions within the NPD. Whereas authentic leadership requires having a positive relationship with others based on strong self-awareness, the study indicated that designers had emotionally weak self-resilience as the project had not proceeded as they wanted, and they often were observed having argumentative discussions and a poor working relationship with non-designers. On the other hand, design leaders needed to have strong emotional resilience and looked for positive relationships with other non-designers at the FFE of NPD. Thus, design leaders' strong self-awareness, including recognising their publically unrecognised job title by others as a design leader, and emotional resilience are what makes them distinguishable to designers; and various leadership studies have indicated that these leadership characteristics are heavily required for trait, transformational and authentic leadership styles.

Another leadership characteristic within the code of Independence is to aim for business growth. Shenhar (2004) indicated that successful business results depend on having a strategic mind set during the project planning and execution periods. Several researchers have noted that people with greater cognitive ability are more likely to emerge as leaders (Atwater, Dionne, Avolio, Camobreco and Lau, 1999).

During the main study, design leaders stated that they must be able to analyse the context of NPD holistically, including business objectives, the resources needed to fulfil the NPD

objectives, and the role of NPD team members who are involved. Thus, they can identify a real NPD problem for solving and envision what type of design can be employed within the NPD process. This cognitive behaviour needs to be conducted by themselves independently where they are surrounded by non-designers at the FFE of NPD. Thus, design leaders insisted that finding ‘a real meaningful NPD challenge’ is a key activity at the FFE of NPD. Envisaging is a typical leadership trait identified in the leadership literature (Kotter, 1979; Zaccaro and Banks, 2001, in Gill, 2006) and in recent design leadership literature (Miller and Moultrie, 2013; Turner, 2013).

In order to understand the context of NPD issues at the FFE of NPD, design leaders had their own diagnostic process of objectively analysing fuzzy NPD issues. Usually they identify an appropriate NPD challenge, a unique NPD aim, accessible financial and human resources and a project time. This is echoed by what several researchers have required in project strategy, such as “the project perspective, position, and guidelines on what to do and how to do it, to achieve the highest competitive advantage and the best value from the project outcome” (Mintzberg et al., 1998). Also, researchers recommended that project managers need to enable both management and leadership activities which can transform new ideas into tangible results, and where the project vision can become a reality (Kotter, 1990; Shenhar, 2004). According to design leaders, they are not positioned as project managers; however, they, as involved design leaders, are fully aware of what is required of a project manager. Thus, their focus is on business growth and on analysing NPD issues to build a rapport with non-designers because NPD is a collaborative work. Team cohesiveness can make team members feel that they belong to the team and help them to remain in the team (Wang et al., 2005).

On the other hand, designers tended to jump onto a NPD solution by choosing an NPD concept too soon. During the NPD project (described in Chapter 4), it was often observed that designers preferred to develop their design concepts that are not necessarily reflecting the brief. They often moved away from the NPD project brief. The facilitators at the NPD programmes at St. Etienne also indicated that the design participants often spent time developing design concepts led by their personal interests and not by the requirement of the project brief. Most design participants insisted that the success criteria of the project were team communication and team work, which were not mentioned in the project brief. During

the interviews with design leaders, they advised not to jump to a NPD solution before sufficiently understanding the context of NPD. Therefore, Independence, as the leadership characteristics and communication behaviours of design leaders, involves enabling the holistic analysis of all NPD-related issues in order to build a rapport and to envision an NPD direction. It is how they are distinguished from designers who are highly imaginative in choosing an NPD direction but less aware of NPD criteria and contexts. This section is summarised in the table below.

Leadership characteristics & behaviour	Designer	Design leader
Characteristics	Interest in building their ideas	Aiming at business growth and thus building a rapport
Behaviour	Focusing on primarily building their ideas rather than trying to understand the project brief fully	Analysing all NPD-related issues objectively

Table 6.2: Comparing leadership characteristic and communication behaviours about different interest for NPD between designer and design leader

A comparison of how the independence characteristic is portrayed in design leaders and designers, as well as influences their communication behaviours

3) Design Competency

According to the triangulated research of the pilot study, designers showed a strong design competency in their visualisation ability. They were able to achieve a visual design presentation under the pressure of time constraints even with poor facilities, such as having no Internet access. They were the most effective and efficient team members to accomplish visual tasks among the NPD team members. Similarly, design leaders from study II required basic visualisation skills, such as the ability to sketch and draw, which are used to communicate design concepts or ideas effectively.

However, design leaders emphasised having a strong design competency, which is about how to employ design within an NPD process and meet business objectives. Also, they considered what kind of design and when to apply an appropriate design to the NPD process. As design leaders, they spend less time working on the visual and craft sides of design, instead spending it on what they indicated are ‘design thinking’. From the perspective of a practitioner, Brown (2008) claimed design thinking is ‘a system that uses the designer’s sensibility and methods to match people’s needs with what is technologically feasible and what a viable business can convert into consumer value and market opportunity’. From the perspective of research, Cross (2006) defined it as a ‘designerly’ way of knowing. Thus, it tackles ill-defined problems based on a solution-focused mode of problem solving. Indeed, Lockwood (2010) has explained design thinking as a human-centred innovation process that highlights “observation, collaboration, fast learning, visualisation of ideas, rapid concept prototyping, and concurrent business analysis, which ultimately influences innovation and business strategy”. The objective is to involve consumers, designers, and business people in an integrative process, which can be applied to product, service, or even business design. It is a tool to imagine future states and to bring products, services, and experiences to market”

What design leaders emphasize about design competence as design thinking extends to the above definitions. Design leaders are keenly aware of design capability and where and when to input appropriate design into an NPD process.

On the other hand, design leaders stated that many designers are not capable of using design thinking. This is what makes them distinctive from many designers. The concept of design thinking was introduced by *BusinessWeek* in 2003 and Tim Brown’s speech at the World Economic Forum in Davos in 2006. Lockwood (2010) indicated that design thinking is generally associated with designers’ sensibility and methods of problem solving regardless of the type of problem. However, just as design leaders have stated that there are not many design thinkers amongst designers, recently researchers and practitioners have similarly claimed that it is rare to find designers applying design thinking. Nussbaum (2011), who was an assistant managing editor of *BusinessWeek*, and has previously praised design thinking, claimed that it is rare to find a design thinker and ‘design thinking is a failed experiment...the success rate for design thinking processes was very low’. McCullough (2010, 2013), an experienced designer and a frequent writer in design journal and magazines, indicated that it is difficult to find a designer who engages in design thinking. Design thinking supports

designers to work at a more strategic role; however, design thinking is only used by some designers (ibid). Roger Martin who introduced the term ‘integrative thinking’ (2009), based on design thinking, has indicated that most designers do not think using design thinking (in McCullagh, 2010). They rely too heavily on their intuition. Thus, design leaders are design thinkers and this is what separates them from many designers. The characteristics of design leadership at the FFE of NPD are that design leaders are capable of utilising design thinking and know when to apply appropriate design within the NPD process.

Leadership characteristics & behaviour	Designer	Design leader
Characteristics	Creative thinking, but heavily relying on their intuition	Design thinking
	Design competency in strong visualisation ability	Design competency in understanding all design capability with visualisation skills. More reliant on thinking and deciding when and which is an appropriate type of design in an NPD process

Table 6.3: Comparing leadership characteristic about different design competency between designer and design leader

4) Reflective Flexibility

According to design leaders, reflective flexibility is a principal code, which represents the flexible attitude of design leaders whose leadership behaviours and communication processes are reflective of different non-design colleagues and clients at the FFE of NPD. A reflectively flexible attitude was enabled by their empathetic attitude and interest in NPD. Design leaders indicated the importance of acknowledging the fact that the nature of NPD is team work and that every NPD is different. They also know that every non-designer has a different understanding of design. Thus, design leaders try to be flexible in order to understand the position and situations of others first. It leads to them being reflective when communicating. Donald Schön (1983) describes the ‘reflective practitioner’ as one who is able to successfully negotiate situations of ‘uncertainty, instability, uniqueness, and value conflict’ to produce valuable and appropriate insights without being forced to rely upon predefined knowledge.

This leadership characteristic is referred to as situational leadership (Section 2.1.4) by Hersey and Blanchard (1969, 1993). Contingency and situational leadership theories claim that there is not a best way to lead; optimal leadership, organization and decision-making depend on various internal and external conditional factors. Fiedler (1964) suggested that the effectiveness of leadership style, either task or people-oriented, is down to the exigencies of a situation. The FFE stage of an NPD is unclear, and this stage is where an NPD defines its product definition and direction.

According to Papworth et al. (2009), the situational leadership consists of 4 stages (Section 2.1.4.). S1 (telling style) and S2 (selling style) of situational leadership are considered aspects of an NPD. What design leaders explained about their leadership characteristics regarding having reflective flexibility is similar to situational leadership's S2, where a leader explains, persuades and sells one's idea while maintaining a close relationship with followers, and also S3, where a leader participates, encourages and involves others in solving problems (Hersey and Blanchard, 1993). Silverthorne and Wang (2001) indicated that an adaptive style brings more success. Indeed, the perspective of applying a different leadership style in different situations has been mostly applied within the leadership training programmes of over 400 of the *Fortune* 500 companies (Hersey et al., 2000). Indeed, the competency leadership school recommends that different sets of leadership competencies be applied for different projects (Müller and Turner, 2007, 2011; Turner and Müller, 2005).

It can be seen from the pilot study that most designers were reflective but not flexible. Both designers and design leaders preferred communicating by giving examples. They provided examples to deliver their message effectively. The difference was that designers tended to keep their styles when communicating and leading, and their communication styles were more argumentative. However, design leaders indicated the importance of being flexible to lead non-design colleagues and clients differently for each NPD project. Therefore, having reflective flexibility is echoed within much of the leadership literature; however, this leadership characteristic can be differentiated from designers' characteristics at the FFE of NPD.

Leadership characteristics & behaviour	Designer	Design leader
Characteristics	Both Prefers communicating by showing examples with non-designers.	
	Being less flexible and prefers argumentative styles in communication	Reflective flexibility attitude with non-designer at the FFE Having different approach to different NPD

Table 6.4 Comparing leadership characteristic and communicative behaviour about different working and communicative attitude between designer (less flexible) and design leader (Reflective flexibility)

5) Active Listening

The results from the questionnaire (Section 4.4) show that designers preferred communicating in a friendly manner but also employed an argumentative style. During the observational study and the interviews, they reported their frustration in communicating with non-designers because they had a hard time delivering their messages. Miscommunications between design and non-design participants at the FFE of NPD often resulted in meetings being held up. After the programme, most of them wanted to improve their communication abilities.

Active listening is a principal code that represents how design leaders approach communicating designs with non-design colleagues or clients at the FFE of NPD. During the main study, design leaders put a lot of emphasis on the importance of listening carefully. Simultaneously, they suggested asking the right questions regarding the context of NPD and related unclear issues. A design leader (#6) summarised this communicating process as, ‘Two ears and one mouth’. How design leaders implement the communicating process and method at the FFE of NPD is through active listening. Rogers and Farson (1987) define active listening as carefully and sensitively listening to find the other speaker’s meaning, which helps to construct positive relationships and leads to bringing about changes in people.

Active listening is a fundamental communication process for design leaders and enables a reflective flexibility attitude. Donald Schön (1983) describes reflection as enabling one to uncover knowledge in and on action. This is how design leaders learn other disciplines’

language, culture and information, in particular regarding business. This communicating behaviour echoes recent research regarding a characteristic of experienced designers reconstructing given information by strategically questioning and creating a level of trust (Paton and Dorst, 2011). Several researchers have identified NPD as a process of learning (Takeuchi and Nonaka, 1986; Leonard-Barton, 1992; Madhavan and Grover, 1998). Actively listening with their diagnostic formula (as stated at (2) Independence) is how design leaders learn about NPD issues and various non-design team members' and clients' concerns and different NPD purposes. Thus, active listening characterises a unique communication process of the design leader at the FFE of NPD. Design leaders described their communicating process of deconstructing unclear and identifying valuable information at the FFE of NPD so that a rapport is deliberately built with non-designers. Identifying and co-evaluating the NPD issues with non-designers at the FFE is best achieved as a highly iterative exploration of the design situation (Dorst and Cross, 2001).

Leadership characteristics & behaviour	Designer	Design leader
Characteristics	Speaking in a friendly way but often showing argumentative communication styles. Also, often showing frustration if their ideas were not communicated; thus, the team had breaks	Carefully listening and ask probing questions to identify unknown information and appropriate designs for NPD, and also building a rapport

Table 6.5 Comparing leadership characteristic and communication behaviours about different communication style with non-designers between designer and design leader

6) Experience of various types of work and a full NPD process

According to design leaders, they had their own epiphany moments when studying other disciplines' language, culture and information, in particular, business language and information. Design leaders admitted that in the early stages of their careers, they realised the importance of speaking the language of colleagues or clients from other disciplines for developing effective and efficient communication at the FFE of NPD. Their realisation moments were varied. They realised how different functions within NPD work after experiencing the entire NPD process. They also experienced working on both the corporate

and consultancy sides or managing and running a company or working in non-design roles, for example, as engineers and marketers. In the pilot study, most designers, who even have worked for many years in their role in the design sector, were only partially involved in NPD projects. Some had not yet worked in the role or had only developed design concepts at university. However, some designers at the St. Etienne programme, who had work experience in non-design roles, such as in marketing and sales, comparatively had less difficulty in communicating their ideas.

Design leaders strongly recommended having work experience with different disciplines and sectors in particular, where designers do not feel comfortable. For instance, working in business sectors and surrounded by non-designers. Also, design leaders had in common experience in their early career period regarding how an NPD was processed from beginning to end. They observed how design can fit within different stages of NPD. Thus, they motivated themselves how they should apply different types of design within the NPD process. Their characteristic of self-motivating to lead their learning and achieving behaviour is conceptually reflected within self-leadership theory, which was developed by Manz in the 1980s (1983, 1986). Several researchers define self-leadership as a process in which people guide, lead and motivate themselves to behave and perform in desirable ways (Manz, 1983, 1986; 1992; Manz and Neck, 1999; Manz and Sims, 2001; Houghton and Neck, 2002). The concept of self-leadership is rooted in the psychology literature, in particular in self-influences, such as self-regulation (Kanfer, 1970; Carver and Scheier, 1981), self-control (Cautela, 1969; Thorenson and Mahoney, 1974), self-management (Andrasik and Heimberg, 1982), and self-learning (Bandura, 1977, 1997). Bandura (1997) indicated that people can influence their own cognition and motivation as well as their behaviours. Several researchers have also indicated that the intrinsic motivation of people arising from their personal feelings of self-determination and competence causes their behaviour (Deci, 1975; Deci and Ryan, 1985).

As design leaders mentioned, they motivated themselves in their working role as a design leader by moving from the traditional role of a visual designer. They began to appreciate the value of careful listening in order to learn about speaking others' language, culture and information within NPD and business. Active listening, holistic analysing the context of NPD and design thinking are what they trained themselves in or learned from professionals or senior colleagues; however, they knew what they needed to master and practise for a certain amount of time. They spent about 10 to 15 years doing this, with the exception of one design

leader, who spent only a few years after realising what he needed to learn about active listening, holistically analysing the context of NPD and design thinking. Self-leadership explains that the rehearsal or practice of desired behaviour prior to the actual performance enables problems to be corrected and costly mistakes avoided in advance (Manz, 1992; Manz and Neck, 1999; Manz, and Sims, 1980; Thoresen and Mahoney, 1974). Locke and Latham (1990) indicated that setting and accepting a challenge and certain objectives can have a dramatic effect in motivating individual performance. Thus, behaviour-focused self-leadership strategies (Houghton and Neck, 2002) are designed to inspire positive and desirable behaviours, which lead to successful outcomes. Design leaders seemed to have strong self-leadership, which enabled them to train in the requisite abilities of active listening, holistically analysing the context of NPD, and design thinking; thus, they distinguished themselves from the visual designers to work as design leaders. Being able to communicate design comfortably takes time and practice.

Leadership characteristics & behaviour	Designer	Design leader
Characteristics & Different working motivation	Most designers involve in a limited role of NPD; thus, they have a limited perspective on NPD. Most designers prefer working as visual designers	Strong self-leadership after experiencing a full NPD process and a different sector or non-design role

Table 6.6 Comparing different motivation for NPD and working experiences within NPD between designer and design leader

7) Patience and consistency

Patience and consistency is a principal code that represents the communication attitude of the design leader who is willing to explain about design again and again until non-design clients and colleagues understand. Where designers had difficulties in communicating designs during the St. Etienne programme, it seemed that there was friction in their communication through insisting on their own ideas at the FFE of NPD. Thus, each team often took a break due to experiencing feelings of frustration. The willingness attitude of design leaders, regarding the serving of others, is clear from the existing and emerging leadership literature on servant leadership theory (Section 2.1.3). Servant leadership theory emphasises the importance of the

follower (House and Mitchell, 1974). Great men serve other people. Greenleaf (1997) stated that servant leaders support their own followers in developing their own values that support the organization's mission. Also, servant leadership characteristics, according to Van Dierendonck and Nuijten (2011), constitute such qualities as standing back, forgiveness, courage, empowerment, accountability, authenticity, humility and stewardship. Leaders emerge when the ability and desire to serve meets the needs of people (Gill, 2006). Thus, design leaders' characteristic of patience and serving others to achieve a certain NPD objective are reflected in emerging leadership literature and servant leadership theory.

Also, consistency encompasses all codes of design leadership at the FFE of NPD. Design leaders have acknowledged the fact that information and NPD direction at the early period of an NPD are usually unclear. Thus, they underlined the need for empathy, a reflectively flexible attitude, active listening, analysing the NPD context to identify a real NPD challenge, speaking the other's discipline language, and deciding when and what type of design to have involved in the FFE of an NPD process. Bass (1954) indicated that a person considered as an emergent leader creates plans to direct others toward a problem's solution amongst participants in unstructured and ambiguous situations. Emergent leaders' behaviours have been studied, and they are seen to have three traits: extroversion, openness to experience and cognitive ability. This type of leader is willing to conceptualize novel approaches to a problem and demonstrate a solution in the process. Kickul and Neuman (2000) have indicated that a leader's conscientiousness and cognitive ability are highly linked with team performance. This characteristic of design leaders regarding the consistency of various abilities to clarify NPD issues strategically aims not only to suggest an NPD direction but also to build a rapport with non-designers or clients at the FFE of NPD. George et al. (2007) indicated that 'authentic leaders demonstrate a passion for their purpose, practise their values consistently, and lead with their hearts as well as their heads'. Supporting hope, trust and positive emotions are key elements of authentic leadership (Avolio et al., 2004). Therefore, as Stogdill (1974) asserted, there are many different leadership definitions. As a person tries to define a concept of leadership, design leaders' consistency can be explicated from different leadership theories. Yet, design leaders differentiate themselves at the FFE of NPD by not only their communication attitude in explaining about design repeatedly until non-design clients and colleagues understand, but also by encompassing all leadership principal codes to establish clarity about NPD issues and confidence with non-designers.

Leadership characteristics & behaviour	Designer	Design leader
Characteristics	Being friendly but often being frustrated if they face communication difficulty with non-designers	Different communicating styles: Facilitative, straightforward, humour. However, they have active listening as common communication behaviour. Commonly they are willing to explain again and again for others to understand about design opportunity and NPD issues and directions

Table 6.7 Comparing leadership characteristic and communication behaviours regarding facing difficulty in communication with non-designers between designer and design leader

6.2. Summary

In order to meet objective 5, the seven principal codes from the main study are discussed to identify the distinctive characteristics of design leadership at the FFE of NPD. Throughout the discussion section, by comparing the results of the pilot study and the main study and the theoretical concepts around design leadership's characteristics and communication behaviours at the FFE of NPD, this section provides an explanation of how design leaders differentiate themselves from many designers who face difficulties in communicating design and would rather work as traditional visual design specialists.

Table 6.8 below illustrates the differences between designers and design leaders under the topics compared in this section.

Principal code	Designer	Design leader
Empathy	Their design concept or ideas	Empathy, interest in people and their business context
Independence	Suggesting a desired status of their NPD results, jumping into NPD solutions quickly and frequently being off the project brief	Analysing the context of NPD and suggesting design decisions within the NPD process
Design competency	Visualisation	Design thinking
Reflective flexibility	Passive or self-centred	Reflectively flexible

Active listening	Conversation, showing visual examples to deliver their ideas	Active listening, showing previous NPD-related successful results or visual examples
Patience and consistency	Being friendly but often argumentative	Active listening. Different styles: facilitative, straightforward, humour
Experience of various types of work and a full NPD process	Most designers involved in limited role within NPD; thus, they have a limited perspective on NPD	Self-leadership after experiencing a full NPD process and different sector or non-design role; repetition allows them to master communicating design with non-designers

Table 6.8 Comparison of key findings from the leadership and communication perspectives between designers and design leaders at the FFE of NPD

As table 6.8 above shows, design leaders have leadership characteristics that can be distinguished from many designers at the FFE of NPD. Therefore, seven principal codes, which are compared between and discussed in the pilot study and the main study and explicated from various theories and previous studies, can be defined as follows.

- **Empathy:** It is their motivation in having an interest in people, non-design colleagues or clients and business growth. Design leaders at the FFE of NPD claimed themselves as empathic leaders. They deliberately do not use design terms to non-designers in order to build a rapport. Empathy is a central element of emotional intelligence (Salovey and Mayer, 1990, 1997). They acknowledge that NPD is a work with roles for a range of people, and design leaders believe that different people need to be gathered together for positive results. Their positive attitude, combined with emotional intelligence, is related to authentic leadership (Avolio et al., 2004).
- **Independence:** Due to their focus on the business objective, they show they have a cognitive ability to analyse NPD issues holistically; thus, they find an appropriate NPD challenge and envision an NPD direction. Envisioning is a typical leadership trait within the leadership literature (Kotter, 1979; Zaccaro and Banks, 2001).
- **Design thinking:** By analysing unclear information related to NPD and identifying the right NPD challenge, they are keenly aware of design capability and where and when to input

an appropriate design into the NPD process. Unlike the designers in study I, their design competency is design thinking (Borwn, 2008). Nevertheless, they still insist on having visual skills to communicate more smoothly by showing visual examples or sketches at meetings.

- **Reflective flexibility:** In order to enable design leadership characteristics regarding an empathic attitude, analysing NPD issues and design thinking at the FFE, design leaders strategically are reflective and flexible because every NPD has a different nature, such as a different aim, time and budget, and involves stakeholders and players (Ulirich and Eppinger, 2012). A reflective attitude successfully enables one to negotiate within situations of ‘uncertainty, instability, uniqueness and value conflict’ (Schön, 1983). Researchers (Fiedler, 1963; Hersey and Blanchard, 1993) have noted that effective leadership depends on how favourable a situation is.
- **Active listening:** The attitude of reflective flexibility is enabled by active listening (Rogers and Farson, 1987). This also underlines the empathic attitude of serving others, which can be explained by the concept of servant leadership (House and Mitchell, 1974; Greenleaf, 1997). Design leaders strongly emphasised listening carefully and asking probing questions to uncover knowledge and information about NPD. FFE is the NPD period, where exploring, identifying NPD issues and deciding to either develop the project or not are required (Moenart *et al.*, 1995; Reid and Brentani, 2004).
- **Experience of various types of work and a full NPD process:** Design leaders learned non-designers’ language, information and culture by active listening. They explained that they realised they needed to learn active listening after experiencing the entire NPD process and working either in-house or in an agency, managing and running a company or working in non-design roles. This is reflected by self-leadership (Manz, 1983, 1992; Manz and Neck, 1999). Self-leadership explains how people can influence their own cognition and motivation so that it improves their behaviours (Bandura, 1997). Also, self-leadership indicates that people practise before the actual performance to avoid costly mistakes (Manz, 1992; Manz and Neck, 1999; Thoresen and Mahoney, 1974). Design leaders motivated themselves to learn how to communicate with non-designers. Most design leaders spent a certain amount of time (10-15 years) learning active listening properly.

- **Patience and consistency:** Although design leaders are not positioned in a leadership position within NPD, their strong self-leadership characteristics enable them to conduct various tasks, such as actively listening, showing a reflective, flexible attitude, design thinking and conducting holistic context analysis of NPD at the FFE of NPD. They begin to fill a leadership role, and different leadership theories explain that an emergent leader is someone who plans to direct others toward a problem's solution among participants in an ambiguous situation (Bass, 1954). As authentic leadership emphasises supporting positive emotions and trust (Avolio et al., 2004), their design leadership behaviours build a rapport and confidence with non-designers. Design leaders lead through the authority of their communication, tasks and responsibility, not through their position (Turner, 2013).

Design leadership at the FFE of NPD does not belong to one leadership theory; however, the characteristics of design leadership at the FFE of NPD are explained partially through various leadership theories. Several researchers have identified that there are many different leadership definitions (Yukl, 1998). However, leaders for project contingencies need a distinctive set of leadership competencies (Turner and Müller, 2005; Müller and Turner, 2007, 2011). Design leaders at the FFE of NPD require leadership characteristics like empathy, strong self-awareness, the ability to holistically analyse the NPD context, design competency as design thinking, reflective flexibility in attitude and NPD language, active listening, patience and consistency in displaying the above design leadership competencies, and strong self-leadership. These characteristics differentiate them as design leaders at the FFE of NPD.

6.3. A conceptual model

This section aims to fulfil objective 6. The aim of objective 6 is to illustrate a conceptual design leadership model that visualises relationships regarding the leadership attributes of design leaders and their communication process around design and NPD issues to non-designers at the FFE of NPD.

Creswell (2005, 2014) explained that a conceptual framework comprises what a researcher thinks in planning to study about ongoing issues, settings, theories, beliefs and the prior research findings which will guide or inform the research. Also, it includes literature,

preliminary studies and personal experiences, which draw on one's understanding of people or issues. Thus, Creswell (2014) stated that at the beginning of a research project, a conceptual model is designed by conducting a thorough review of the literature, peer-reviewed journal articles, books/monographs, conference papers and other relevant reference material. Then, the literature is organized around the topic so that process of developing research questions or objectives based on the theory is initiated. A conceptual framework guides research by presenting a visual representation of theoretical constructs and the variables of interest.

Levering (2002) argued that a conceptual framework does not provide knowledge of 'hard facts'; rather, it is a 'soft interpretation of intention'. Jabareen (2009) stated that a conceptual frameworks aims to help us to understand phenomena rather than to predict them. Similarly, Sen and Vinze (1997) defined a 'model' as a structure that has been built purposely to exhibit features and characteristics of certain scenarios. Willemain (1995) stated that when constructing a model, 'modelling can be described as the process of developing an analogical system of relations, and the resulting model is comprised of entities and the relationships between them'. Harry (1994) indicated that the formulated conceptual model proposes to show a situation that represents an idea which is either real or may be a concept in the mind of the person making the model. Both the term 'conceptual framework' and 'model' are used to understand and explain a specific phenomenon. Thus, the terms 'conceptual framework' and 'model' are interchangeably employed when this research's conceptual model was formulated.

Miles and Huberman (1994) defined a conceptual framework as a visual or written product, one that 'explains, either graphically or in narrative form, the main things to be studied—the key factors, concepts, or variables—and the presumed relationships among them'. Mishler (1990) indicated that 'qualitative studies ultimately aim to describe and explain a pattern of relationships, which can only be done with a set of conceptually specified categories'. As section 3.1.1 (Research approach and purpose) outlines, the nature of this research is to take an inductive approach and then a constructing theory approach, thereby allowing the researcher to explore the subject of leadership at an early stage (FFE) of NPD with regard to design leaders who are competently communicating design to non-designers and designers who face difficulty in communicating design to non-designers. Therefore, the seven defined principal codes that emerged from the empirical research, study II, visually present how they are interrelated for explaining a specific phenomenon regarding the leadership attributes of

design leaders and their communication process about design and NPD issues to non-designers at the FFE of NPD.

6.3.1. Model formulation process

How seven principal codes interrelate with each other to explain the design leadership process at the FFE of NPD is illustrated in figure 6.9. The codes are: 1) Empathy, 2) Independence, 3) Design competency, 4) Reflective flexibility, 5) Active listening, 6) Experience of various types of work and a full NPD process, and 7) Patience and consistency.

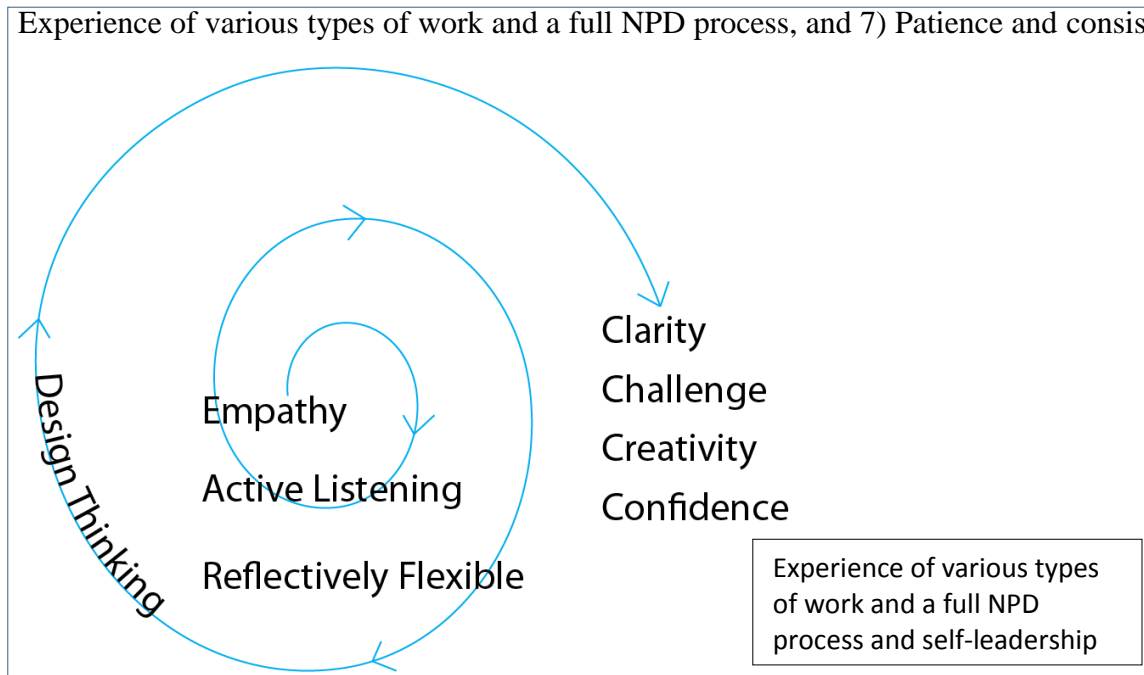


Figure 6.1 A conceptual model of design leadership at the FFE of NPD

The formulation of the conceptual model is initiated by putting (1) **empathy** as the start point because that is how design leaders initiate the NPD process with non-designers at the early stages. Then, design leaders begin the communication with non-designers through (2) **active listening**. They listen very carefully, and then ask probing questions in the other discipline's language. Thus, by showing a (3) **reflectively flexible attitude**, design leaders establish good conversations with non-designers, thoroughly analyse the context of NPD and identify real NPD issues to solve/address. This is conducted by using (4) **Design Thinking**, which combines design competency and independence. The design competency of design leaders is their thinking process, and also being able to independently make a decision regarding the timing of applying a design within the NPD process in order to meet the business objectives. Design leaders stated that their activities in leading and communicating design with non-

designers require patience. Their attitude is to help others, rather than telling them what to do. Thus, they are willing to explain their points repeatedly. Also, their approach needs consistency in applying the above elements in design leadership practice. Therefore, it is repetitive behaviour. It could be expressed as **a loop line**. A loop line starts from Empathy, and goes to active listening, and then on to reflective flexibility. The direction is expressed by showing arrows on the loop line. Design thinking is on the loop line and it follows the direction from the beginning to the end.

At the end, the 4 Cs of Design Leaders' Communication Practice can be defined. These are: **Clarity, Challenge, Creativity, and Confidence**. These four Cs are the key characteristics of design leadership's communication practice at the FFE of NPD. Throughout the semi-structured interviews, design leaders stated the aims of their activities at the FFE of NPD. **Clarity** is defined as an ability to tackle and simplify the fuzziness in the early stages of the NPD issues. The early stage of NPD is often unclear/ill-defined. The design leaders must be able to identify a real **Challenge** for an NPD because they indicated that if a NPD problem is too easy to solve, anybody can do it. Throughout the FFE decision-making, **Creativity** for NPD achieved through the design thinking of design leaders is needed. They suggest and envision the design and NPD direction for non-designers at the FFE stage. Therefore, these are the relationships of the principal codes. From the beginning, design leaders make an effort to build a rapport with non-design colleagues or clients. Without trusting each other, it is difficult to work together. Design leaders try to help non-designers build **Confidence** throughout communications at the FFE. Therefore, Clarity, Challenge, Creativity and Confidence are the outcomes of design leadership practice at the FFE of NPD.

These successful design leadership practices can be achieved after maturity and following an epiphany moment when they decided to train themselves to become design leaders. The epiphany moment of design leaders mostly came from experiencing and being involved in the entire NPD process, not just the visual design part. Being comfortable in communicating design to non-designers takes time and practice. It is marked by strong self-leadership. Thus, the key code of **Experience of various types of work and a full NPD process** and the term 'self-leadership' should be placed in the concept model box to form its basis.

6.4. Chapter Summary

This chapter aimed to fulfil research objectives 5 and 6:

- Objective 5: To analyse differences in the characteristics, abilities and leadership styles of design leaders in communicating designs between them and designers
- Objective 6: To illustrate a conceptual design leadership model that visualises the relationship between the leadership attributes of design leaders and their communication process for design and NPD issues to non-designers at the FFE of NPD

Each code based on the main study was compared with the results of the pilot study by designers in terms of how design leaders are distinguished in leadership and communication styles and the process at the FFE of NPD. These codes are also discussed using leadership theories to identify the unique features of design leaders at the FFE of NPD. Based on the analysis of the coding process, a conceptual model is proposed in figure 8.6, which illustrates how seven codes interrelate with each other. It characterises a specific context of design leadership practice at the FFE of NPD.

Next, chapter 7 explains the evaluation process of the conceptual model with design leaders (the interviewees in chapter 5), design management lecturers, leadership trainers and a design leadership researcher. Then, it presents a modified version of the conceptual model. Also, further research is recommended.

Chapter 7 - Model Evaluation and Modification

This chapter presents the evaluation methods, criteria, process and results regarding the conceptual model which illustrates the leadership attributes of design leaders and how they communicate designs to non-designers at the Fuzzy Front End (FFE) of New Product Development (NPD). It addresses research objective nine.

- Objective 7: To evaluate and revise the conceptual model according to the feedback

This chapter is divided into three parts. Section 7.1 explains an evaluation process of the proposed conceptual model. Section 7.2 presents the result of the feedback. Then, the modified conceptual model is presented at section 7.3.

7.1. Feedback Process

Due to different purposes for evaluation, there are summative and formative evaluations (Herman et al., 1987). According to Patton (1990), summative evaluation aims to examine and study specific programmes, policies, and products in order to generalise about the effectiveness of the human action under examination. Due to its interests in controlled comparisons, generalisations and relatively larger samples, summative evaluation rarely depends on qualitative data. Thus, in order to decide if that programme or policy is effective within its limited context or, with different conditions, could be effective in other situations or places, it examines the effectiveness of some human intervention or action. On the contrary, formative evaluation is limited to, and focused on, a specific context (Patton, 1990). Formative evaluation heavily depends on qualitative methods. It aims to improve a specific programme, policy, specific group of people or product, and it does not aim to generalise findings beyond the specific setting or situations studied. Thus, formative evaluation is suitable for this research.

This research employed experts' opinions to evaluate the proposed conceptual model. Its aim was to obtain feedback regarding the understanding of the proposed conceptual model. Also, if the illustrated model is difficult to understand, the experts may highlight potential problems and suggest appropriate improvements to the conceptual model. Thus, this research could convince other beneficiaries to adopt the modified model. The beneficiaries (section 1.6) are: designers who wish to become design leaders, academic educators who teach design

management, and certain organisations that aim to train designers to overcome communication difficulties with non-designers and wish to be in the role of design leader.

The opinions of the experienced experts were significant in evaluating and improving the proposed model, however, as section 1.4 (Research statement and question) indicated, it was rare to find design leadership experts. Thus, the purposive samples were carefully chosen according to the criteria set out below.

1. Insightful knowledge of practical design leadership and leadership at the FFE of NPD was important to justify the appropriateness of the conceptual model; thus, all the selected experts must have sufficient experience of practising design leadership or leadership at the FFE of NPD.

2. In order to ensure varied opinions, these experts were chosen from different educational backgrounds and worked in different organisations. One expert in design leadership was known globally for their design leadership expertise, four lecturers came from academia (the head of, or senior role in, MA design management programmes in the UK) and four design leaders had experience of working in industry and with previous research participants in Chapter 5; thus, they confirmed the conceptual model in order to build trustworthiness, authenticity, credibility, transferability, dependability and conformability (Gray, 2009). Lastly, two leadership trainers, who train senior officers, researchers and practitioners in various business sectors, provided the feedback about the conceptual model process based on their leadership training experience. Also, the researcher participated in their leadership training programmes and discussions about leadership. Table 8.1 below presents the details of the participants.

Classification	Participants	Background
Design Leaders (Interviewees from study II)	A. Interviewee #3	26 years, worked in Pentagram (design consultancy), corporate and own consultancy.
	B. Interviewee #6	30 years +, worked in US for a few years and last 26 years worked in UK as a studio manager, production manager, and running her own design consultancy for product sector in UK.
	C. Interviewee #9	35 years +, worked in design agency for BT, the Post Office and big national contracts and corporate design, British Airport Authority. Used to own the largest graphic design agency in south west of UK.

	D. Interviewee #11	10 years, worked in manufacturing sector in UK, chemical company in Norway (Orkla) and at Volvo, worked as a management consultant and as a consultant for customer experience project (Haagen-Dazs) in UK.
Academia	E. Associate professor in MA design strategy, Brunel University	He has been involved with the Brunel Design Masters Courses in Innovation and Branding, stretching back some twenty years to when the course first started. He runs taught modules and lectures. He is also a founder of a design consultancy and has worked globally as a design consultant since the 1980s.
	F. Programme director for innovation design engineering, Royal College of Arts	Since 1992, he worked as a designer for Sekisui in Osaka, Japan, developing a wide range of products from kitchenware to prefabricated housing and runs his own design firm in UK. He has been a programme head since 2009.
	G. Programme director for MA, innovation management, Central Saint Martin	Holds PhD in Philosophy. Worked in academia since 1995 and has led MA programme since 2008.
	H. Course leader for MA design management, Lancaster University	Holds PhD in design management. He has been teaching design and design management for 10 years.
Leadership training experts	I. Dr S. Leadership trainer	He is a founder of a leadership training company in UK. His training is based on authentic leadership. He trains academics, not-for-profit organisations, various sectors in UK and business internationally.
	J. Senior trainer, Metice development solutions	He has delivered numerous leadership and management programmes for the CIPD (Chartered Institute of Personnel Development) across Europe, Africa and the Middle East. He utilises creative learner techniques and creates the ideal training environment. He has a hands-on professional management approach and extensive experience in business and brings these skills to all his workshops. His leadership training is based on situational leadership theory.
Design leadership expert	K. Raymond Turner	He has worked in the design sector for over 40 years. He is an internationally recognised authority on design leadership and management and their strategic value to business, government, and society. He helps companies to secure strategic value from their design investment. He is one of the few design professionals who has held senior posts on

		<p>both sides of the client-designer divide, being Design Director of two large public and private companies and Managing Director of two international multidisciplinary design consultancies. He is a recognised authority on the strategic value of design to business and design management, and contributes to international conferences and design journals. He is a Fellow of the Chartered Society of Designers, a Member of the Design Management Institute and is qualified in mechanical and electrical engineering.</p> <p>He was willing to be identified.</p>
Total	11	

Table 7.1 the profile of participants

Semi-structured interview was employed as the evaluation method according to the aims of the study. Prior to the feedback process, one pilot interview was conducted with a design lecturer at Brunel University. He is a current lecturer in the postgraduate design strategy programme. He worked as a designer for over 30 years and also as a former head of design departments in corporations in the UK. The piloted interview recommendations were to explain specifically each key word within the conceptual model because each key word may be interpreted differently by different people. For example, some people may think that some people are born with leadership quality. Thus, the evaluation material is prepared to explain about the specific context of design leadership at the FFE of NPD. The final interview questions are shown below:

- 1) Does this model clearly illustrate the underlying process of design leadership at the FFE of NPD?
- 2) Does this model contain all essential elements for design leadership at the FFE of NPD?
 - “Empathy” (as Motivation), “Active Listening” (as Behaviour), “Reflectively flexible” (as Attitude), and “Design Thinking” (as Analytic tool) as component elements for the design leadership process
 - “Clarity” (of NPD issues), “Challenge” (as what to solve), “Creativity” (as Design-led differentiated value for NPD) and “Confidence” (about Design led NPD) as a result of this model process at the FFE of NPD

3) How do you rate the value of this model which can help designers to realise what they need to become design leaders at the FFE of NPD?

The evaluation material was divided into three sections as follows:

1. **Introduction:** This section explained the aim of the research and rationale behind the evaluation.

2. **Explanation of the key elements:** In this section, key constituting elements of the conceptual model were addressed and explained. Also, the process of the conceptual model was demonstrated either visually or verbally.

3. **Feedback and Suggestions:** Feedback of the proposed conceptual model was obtained. Thus, the suggestions for the conceptual model improvement were implemented.

The semi-structured interview was conducted face to face except for one design leader, in Truro, Cornwall, who was interviewed by phone. All interviews were recorded with permission and notes were taken.

7.2. Results and Analysis

To verify the conceptual model, the elements, the structure and the content of the model were described first to help the participant's understand before evaluating it and providing feedback. The results provided by the experts are summarised as key responses and divided into the four classifications of the participants. The order is as follows: design leaders (A, B, C, D), design educators (E, F, G, H), leadership trainers (I, J) and the design leadership expert, Raymond Turner (K).

1 Does this model clearly illustrate the underlying process of design leadership at the FFE of NPD?

After explanation about the research process and findings, this question aims to evaluate the understanding of the participants regarding the conceptual model process. The table below presents a summary of the feedback received regarding this question.

Participants	Summary of Feedbacks
Design leaders	<p>This is right (A).</p> <p>I like it in that it is very neat. In the period, it is about gaining full understanding. Sometimes you just share ideas or lead non-designers to see something new. It is just like helping them to see the new opportunities or another way to approach NPD problems. Challenge is not always the same; thus, it can vary (B).</p> <p>That is correct. This is the process that I adopt (C).</p> <p>Yeah, yeah this is right (D).</p>
Design educators	<p>I do not teach design leadership anymore but I can understand the process (E).</p> <p>I do not teach design leadership but I explained the importance of leadership in the lecture. I can understand the process (G).</p> <p>It is very straightforward. I can read it easily and I think it just needs to explain why this model is illustrated in this way. Later, you may put in more detail and give it more depth, but don't lose its clarity (H).</p>
Leadership trainers	<p>I have not heard the term design leadership, but I agree with Empathy as an initial step for leadership process. Leadership ability consists of achieving the task, leading the process, and being emotionally stable (I).</p> <p>I have never heard about design leadership, but I can understand the process (J)</p>
Raymond Turner	<p>Yes, it is easy to understand. The spiral line provides a sense of acceleration like the result of a wind or tornado or storm. But, after your explanation, it is clear. I don't think you need to make this clearer. The model itself is clear and just need to explain why it is a spiral.</p>

Table 7.2 Summary of feedback: the understanding of the conceptual model

According to the interviewees, the conceptual model and its process seemed to be understood. They indicated that the model was easy to understand, however, it was clearer after they heard about the research process and explanation about the conceptual model. Some participants pointed out that some key words in the conceptual model can be interpreted differently. For instance, “challenge” is intended to identify an appropriate and meaningful

NPD problem to be solved, however, some people such as non-designers may understand this as challenging. Thus, instead of just writing the word, a brief explanation should also be given for clarity of meaning.

Furthermore, some interviewees indicated what the spiral line within the conceptual model meant. After receiving an explanation of the conceptual model, they clearly understood. However, for the purpose of delivering a clear message, it was recommended that there should be a starting point and an end point of the process. Also, design leader participants pointed out that they analysed NPD-related issues with design thinking. Therefore, a principal code ‘Independence’, which symbolises holistic analysis about NPD-related issues, should be illustrated within the conceptual model. The sole phrase, design thinking, itself was not sufficient to illustrate the analytic process of design leadership at the FFE of NPD. Therefore, all feedback is included to modify the conceptual model at section 7.3.

2 Does this model contain all essential elements for design leadership at the FFE of NPD?

This question discussed with the participants the elements within the model. It was divided into two parts which consist of process and result.

- “Empathy” (as Motivation), “Active Listening” (as Behaviour), “Reflectively flexible” (as Attitude), and “Design Thinking” (as Analytic tool) as component elements of the design leadership process
- “Clarity” (of NPD issues), “Challenge” (as what to solve), “Creativity” (as Design led differentiated value for NPD) and “Confidence” (about Design led NPD) as a result of this model at the FFE of NPD

The interviewees emphasised what they thought the importance about leadership characteristics and process. The table below presents a summary of feedback about the question.

Participants	Summary of Feedback
Design leaders	Yes, you have to get people dynamics right. People must like each other first. Also, sometimes you need to convince people that the idea or innovation has not been done before. So yes, building credibility with others is important. Also, in a proposal, you outline time, budget and process. In addition, you need to give them

confidence that you are the right person to work with. You need to be flexible because not all projects have a budget equivalent to what you want to spend. You need to explore ideas first. Designers need to identify where design fits into the business because when a company makes a product, it is not necessary to use design in that process. However, a company may need design for branding, better communication with the customer or repackaging (A).

During the FFE, a design leader must identify an NPD issue and learn about it. Design leaders seek opportunities and have curiosity. Younger designers tend to be narrow-minded in identifying NPD problems. They need to be interested in people and broader subjects other than design. Instead of relying on gaining digital data only, they should engage in field research which will help them learn, in particular, if they speak to people in medicine or aerospace, they will learn something new.

You don't need to know and understand ever single bit but understand how they understand and their concerns about NPD and business. Design leaders need to have self-motivation. It requires understanding how and what they do, how they add value to their client mode like developing yourself in business. For instance, a receptionist should know how one adds value to that organisation day to day.

Everybody in business should understand how they add value in business, know how you fit and where you fit, and need to understand why your role fits in their business.

Selling your idea is an important skill and this is what a good sales person does. Internally and externally a design leader should make people excited about it. Generating ideas is what good designers can do and they are problem-solving people, otherwise they are just technician designers. Young designers are so focused on output; but adding value and generating ideas or conceptual thought is important (B).

Firstly, it is trying to know people first then figuring out the resources for NPD. No design terms should be used in communication with non-designers. Also, it requires trying to understand the business objective, marketing model, and figuring out and analysing whether it is appropriate to do or not (C).

Prior to a new project, I really try to understand about non-designers' culture so I can be aware of what to say and what to avoid saying when I work with them. At the end of the day, I am confident in this approach, so I can use this information to

	<p>collaborate with colleagues. It all comes down to people and culture. Everyone has a different approach.</p> <p>Exactly, it is about how to ask questions to seek innovation challenges. All NPD has a different time scale, either incremental or longer term. Being able to have different approaches to different people and projects is required.</p> <p>At the end of the project, it is yours. I don't use the word, design. Design agencies struggle because they try to run projects their own way. Many of them ignore the business and management sides in terms of building credibility and confidence with them. In a kick-off meeting, or at the beginning of a project, trying to understand and remove their project barriers and worries, it is frustrating to work on such issues with them (D).</p>
Design educators	<p>Empathy is important with very good social skills. It is all about communication. Communication with different levels is key. Yes, this is how design works. Active listening is a major link and oh yeah, design itself is reflective. I also aim to teach communication to my design management students. Wow, these are quite interesting terms. What about risk taking? Oh, challenge contains it. Confidence is also part of taking risk (H).</p>
Leadership trainers	<p>I do not hear about the design leadership. My perspective on leadership is authentic leadership. Leadership is not command and control. It is a more authentic approach in conversation to distribute the task to people. Flexibility in recognising the boundary of individual tasks and what they did very well for motivational reward. Also being flexible in your skills set. Prioritising the task in complex situations and identifying support for your work. Also, motivating people, maintaining proper relationship with people, and building credibility early on leads you to get an opportunity to work, leading by example. Thus, leadership consists of vision, setting a goal with people and aligning your and their vision, how much can you trust each other (I).</p> <p>I have not heard about the term design leadership. From my perspective, leadership can be built and I train people based on situational leadership theory. Leadership consists of communication, delegation, influence, and motivation. So, leadership is defined as inspiring people, vision. You are manager and leader at the same time.</p>

	<p>Managers often manage resources and people, and leaders deal more with future perspective and provide vision. You have to have both.</p> <p>Empathy and communication are key. The successful leadership skills set of 2013 is different from that of the 1960s, 70s, 80s, and 90s. Generation Y followers have different expectations from those of a leader. Generation Y people are not loyal to an organisation any more. The leader of today should win the mind of people, not only just command and control. Thus, integrity, fairness, and empathy are important. Sympathy is not good enough but empathy and understanding the impact on people are key. Interpersonal skill, empathy with other teams, and communication with them are important. Young people often try to prove themselves worthy but they don't do the interpersonal thing. Empathy leads to being reflective and adaptable (J).</p>
Raymond Turner	<p>I acknowledge these characteristics. It is fascinating that these characteristics are derived from the research. I like the point about research finding, ability to listen, in particular, empathy and listening carefully are vital. From my experience and perspective, trying to understand, from the other's perspective, is essential.</p> <p>Sometimes, people ask me why I describe myself as a design leader. I explain to them that it is because I am responsible for the product launch. People come to me if there are problems with their products.</p>

Table 7.3 Summary of feedback: the elements of the conceptual model

All of the interviewees understood the conceptual model. They also agreed that empathy is essential in the leadership element. Also, most of them acknowledged the necessity to be flexible and the importance of communication as leadership elements. Design leaders emphasised the people dynamic within an NPD team, identifying NPD-related issues and execution about design decision within the NPD process. In addition, the leadership trainers did not know or hear about design leadership, however, their professional opinions about the elements of leadership aligned with what design leaders emphasised about design leadership at the FFE of NPD. Furthermore, Raymond acknowledged the research findings of design leadership at the FFE of NPD. He supported the result of the research as “fascinating” that the findings were derived from the inductive research. Thus, the opinions of the different interviewees similarly agreed and supported the research findings within the conceptual model.

3 How do you rate the value of this model which can help designers to realise and learn what they need to become design leaders at the FFE of NPD?

The interviewees provided their opinions regarding how and what to develop in order to become a design leader. Thus, this question is about improvement for designers who wish to become design leaders. Also, it aims to support design educators and organisations that wish to train designers to become design leaders or more competent design communicators.

Participants	Summary of Feedback
Design leaders	<p>I learned design leadership after school and from work experience. Inexperienced designers often go straight to their ideas. It is difficult to teach experience. You only learn by doing. Most people don't understand what design is. Also, many designers don't feel comfortable with business terms and tools but you need to know all these in work. As a designer, you are in a perfect position to talk with engineers, sales people and many others. If designers look only within their design area, this is old-fashioned, I think. You need to be able to look at the bigger picture. However, you do not want to burden young junior designers too much. So, like many other professions, like business professionals, you move up to become a design leader after 15 years. Learning from an experienced member of a team is important (A).</p> <p>You need to be brave enough to come out of your comfort zone. Sometimes clients come with a ready-made solution in mind. We need to help them to see a product from the users' perspective and what this product is supposed to do.</p> <p>It is the duty of designers to read the brief well to get the solutions out of it. In design management, you must know when to give designers their work.</p> <p>You need to acknowledge that people see things in very different ways, thus, a designer should be able to speak in business terms. It is really important to learn about business and schools should educate students not just to become an in-depth person but a broader person (B).</p> <p>Designers should take an interest in business and learn about it. Also, they need to know how to form questions in order to identify NPD-related issues and appropriate business imperatives. Teaching empathy is important (C).</p>

	<p>It is recommended that you train yourself to be flexible, realistic in terms of timescale, and aware of people that believe their logic is perfect (D).</p>
Design educators	<p>I do not lecture on design leadership because there is no room to do so within my lecture time, however, I do point out this topic to my students (E).</p> <p>Yes, you are right; I have not considered the leadership part. I will point out these key words to my students (G).</p> <p>So your next research is how to develop these skills (elements of the conceptual model). My course aims to educate students about communication. I will consider your research results (H).</p>
Leadership trainers	<p>Considering what demotivates people and knowing what drives you, and your values and vision are important for leadership training. Also, it is important to understand task knowledge and process, about people and their motivation, and leadership function and situations. Lastly, you need to realise what you are going to do with your vision (I).</p> <p>Leadership is not always an inborn trait. Somebody may be born with a certain quality but that needs to be realised. It is necessary to make people consider the impact of their behaviour on others, and to think about and reflect on that. I never tell people what to do but I show them leadership models where it is easy for the leader. In order to be a good leader, you need to have a greater leader as a great boss (J).</p>
Raymond Turner	<p>Training design leadership is an unknown area and a major challenge. I think teaching behaviour skills are important because if you are a manager of a group of people, you need to change behaviours to different settings for different organisations. Also, I think it is about how and why, and how you link between strategy and implementation. The best situation I have seen this work in is where general management training has embraced the role of design leadership. So, you go to companies for a training programme. Having a component about design leadership within education module is what current success looks like. I think it is more about understanding how you do it.</p> <p>Designers from their early career are put into a box, calling themselves furniture, product or graphic designers. It is terrible. It is difficult to find designers who run an organisation, unlike in other disciplines or professions. You call yourself</p>

	<p>creative but you remain and put yourself within a boundary. If there is a design leader who sees the value, once that person leaves, so does all the quality. So I wonder how an organisation can keep that person's value. This is my personal wonder about design leadership training. It is a big challenge to change the organisational culture.</p>
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Table 7.4 Summary of feedback: Improvement and suggestion about design leadership training

Each category of interviewees provided their opinions. The interviewees from design leaders recommended that designers should learn about business, empathy, being flexible, and posing the right questions to identify the NPD context holistically. Similarly, Raymond agreed that designers should learn about business. He also revealed his concern about teaching design leadership because organisations often lose the culture of design leadership when a design leader leaves the organisation. These elements, regarding how to become a design leader, for part of recommended future research. In addition, leadership trainers pointed out that leadership can be taught. They recommended learning about people who lead. They and design leaders shared the view that it is important to learn from senior colleagues regarding leadership training. Lastly, design educators agreed with the research findings about the design leadership process, in particular, communication with non-designers at the FFE of NPD. They mentioned that they will point out the importance of learning leadership to their postgraduate design management students. After the interview, one design educator (interviewee_E) contacted the researcher to let him know that he had introduced the topic of design leadership in his lecture. Thus, the opinions of the interviewees provided their perspectives about what to learn about design leadership which is echoed in the key elements within the conceptual model.

7.3. Model Modification

This section provides the modified conceptual model, based on the feedback from the previous section. The figure below is the initial conceptual model. (Insert the model).

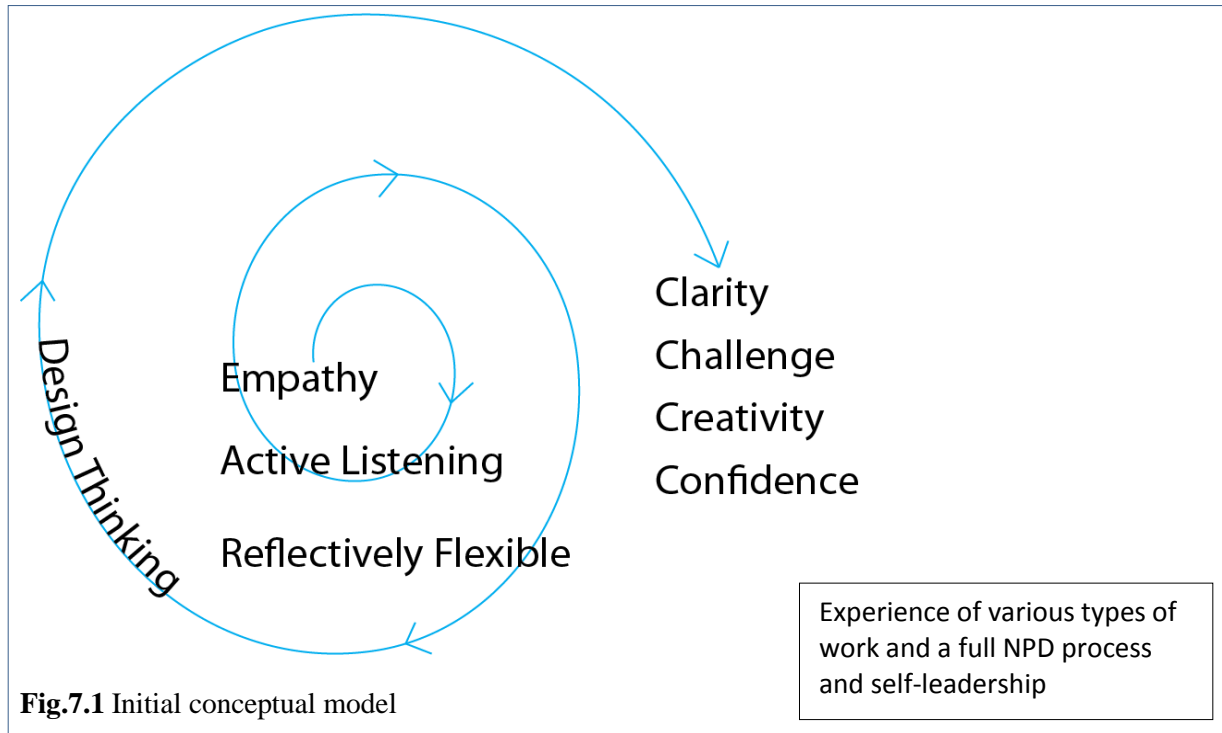


Fig.7.1 Initial conceptual model

The feedback from section 7.2 indicated that the conceptual model explaining the design leader’s communication process at the FFE of NPD is easy to understand. However, some of the interviewees mentioned that certain key words could be interpreted differently. For example, “Challenge” within the conceptual model is one of the key characteristic of a design leader’s communication practices at the FFE of NPD. However, it can be differently perceived. As section 6.3.1 (Model formulation process) explained, design leaders at the FFE of NPD identify “Challenge” as a real NPD problem. However, an interviewee (Design leader_B) pointed out that she could interpret the word challenge as how she differently approaches the task of leading non-designers to adopting a different perspective in identifying an NPD problem. Thus, the modified version should express each key word of 4C (Clarity, Confidence, Challenge, Creativity) with a brief explanation, thereby ensuring that the conceptual model exactly delivers the specific context of design leadership at the FFE of NPD.

In addition, some design leader interviewees explained that “Design Thinking” itself might not explain fully how design leaders holistically analyse the entire NPD-related issues. A

principal code “Independence” was combined with “Design Thinking” when the initial conceptual model was formulated (section 6.3.1). After receiving an explanation about the conceptual model, the interviewees understood and agreed with the process. Yet, they indicated about the importance of holistically analysing the entire NPD issues, including such as business objective, resource, and stakeholders. Instead of adding the principal code “Independence”, “Holistic Analysis” will be added next to the word ‘Design Thinking’. Adding this word may help to illustrate more specifically how design leaders aim to understand the entire NPD-related issues. Therefore, the conceptual model accurately illustrates what the research found out about design leadership at the FFE of NPD.

Lastly, a spiral line needs to have visual expression where the design leadership process, at the FFE of NPD, starts and ends. Some interviewees asked about the meaning of the spiral line yet they stated that the conceptual model is still easy to understand. As Raymond indicated that the spiral line may be interpreted as chaotic, like wind or a tornado, the loop line should have a starting and an ending location. The loop line is supposed to illustrate the attitude of the design leader and how they are willing to explain about design and the NPD direction again and again. Therefore, the modified conceptual model below is illustrated based on the feedback from the interviewees. It is modified in order to illustrate more clearly the specific context of design leadership and how design leaders communicate design to non-designers at the FFE of NPD.

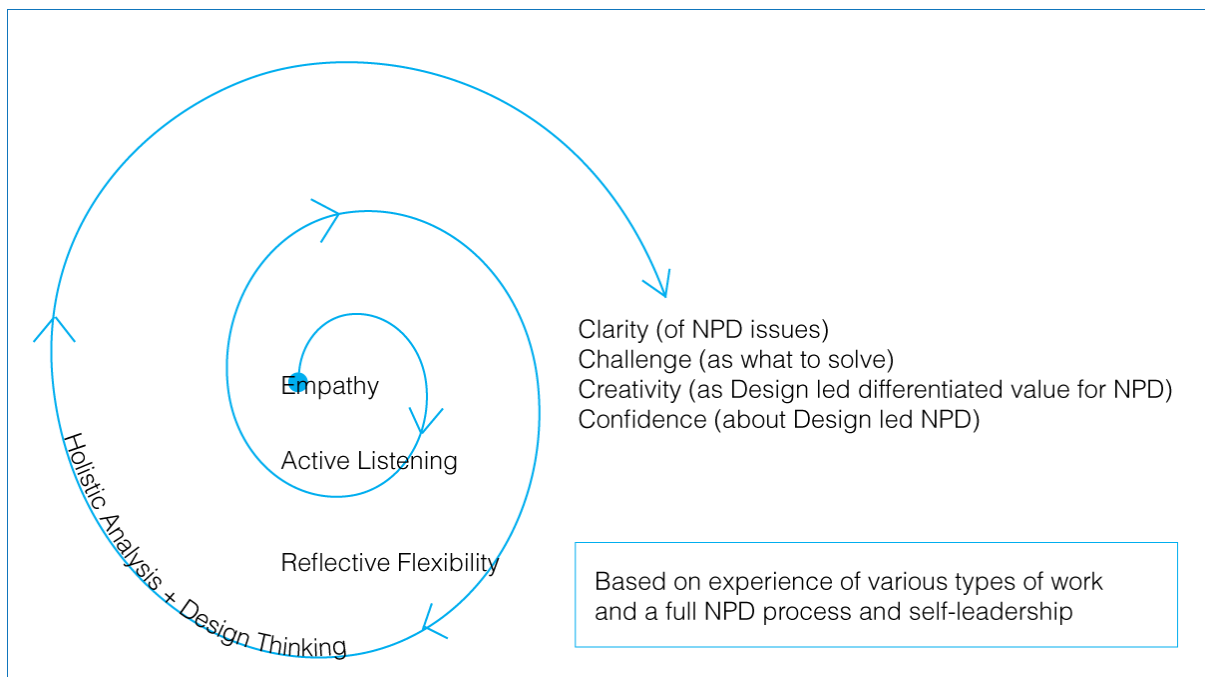


Fig. 7.2 Modified conceptual model

Chapter 8- Conclusion

This chapter presents the conclusions of this doctoral research. It consists of four sections. Section 8.1 provides a brief overview of the research summary. Section 8.2 presents the research contribution. Section 8.3 explains the research limitations. Lastly, section 8.4 gives recommendations for further research.

8.1. Research Overview

This section summarises the thesis, which consists of eight chapters. The aim of this research is to investigate and develop a conceptual model of design leadership that illustrates the characteristics of design leaders and how they communicate design to non-designers at the Fuzzy Front End (FFE) of New Product Development (NPD). In order to accomplish this aim, nine objectives were formulated. Figure 8.1 below illustrates how each objective is addressed in the chapters of this thesis.

Figure 8.1 The objectives of the research addressed in the chapters of this thesis



1) Introduction: This chapter provides an overview of the research context, including definitions of design, NPD, FFE, designer and communication. Then, it also identifies key problems and states the purpose of this research, research question, aim and objectives. Much research and evidence recognised the relationship between design and its importance to NPD success. The early stage has unclear information to make a new product definition. Thus, it has recommended having a multidisciplinary or cross-functional team to achieve a better success rate of NPD because these teams react fast to unstable market conditions and market demands. However, a problematic relationship between designers and non-designers within an NPD team has frequently been observed over many decades. It is caused by their different styles of thinking, working attitudes and preferences, and culture. Also, there are misunderstandings regarding design, a lack of design resources, and improper design decisions by non-designers. Besides, designers often face difficulty in communicating design to non-designers, thus, a lack of clarity in design delivery leads to ineffective use of design. On the contrary, a designer, competently communicating design, is considered a design leader who also analyses business context and presents design concepts to the non-designer team members, particularly marketers. However, there is little information or research on the profile of these design leaders. Indeed, many designers prefer working within the realm of visual and aesthetical design. Therefore, in order to avoid unfounded generalisations and anecdotal perspectives, this research aims to explore systematically the characteristics of a design leader from the designer aspect of communicating design to non-designers during the early stages (FFE) of NPD.

2) Literature Review: This chapter explores the literature of leadership studies, design leadership, project leadership and communication from the leadership perspective. It synthesises reviewed subjects indicated for the primary research criteria. Although there are too many different definitions caused by different perspectives, many researchers commonly agreed that a leader applies leadership knowledge and skills to carry out a process and uses their traits to influence others to achieve a goal. Recently suggested leadership characteristics are: ethical, adaptive, good communicators and supportive of the emotions and needs of team members. The role of a leader is usually seen as the figurehead of a project, however, a design leader has been seen as a process leader who can deliver design effectively, not exclusively as a leader. Besides, researches and assertions about design leadership have the tendency to focus on the role of design and the design leader in organisations and the positive

business impact made by design. A small number of design leadership researches focused on expectation about the role and leadership style of design managers from designers and organisations and different skill sets between design manager and design leader.

Several researchers have indicated that effective communication is an essential component of effective management and leadership. Similarly, project leadership requires: communicating project vision, creating the environment and direction, strong interpersonal skills, the ability to engage the management culture's support and integrative problem-solving skills to apply them in multiple areas, in related projects internally and externally. These are commonly successful leadership styles in leadership studies, project leadership, and design leadership. Furthermore, recently, leadership competency encompasses previous different leadership studies. It acknowledges a different mix of leadership attributes, including emotional, intellectual and managerial competences which are recommended for different types of projects and sectors. Thus, leadership style can be different for different types of project and sector.

3) Research Methods: This chapter explains the plan of the primary research. It describes the criteria of the research tools, research samples and how all primary research is conducted. It also explains the methods employed to analyse findings. After reviewing various research paradigms, Interpretivism was considered the most suitable and the inductive approach was employed because it allows a new understanding to emerge from the empirical research. The nature of this research is exploratory because it aims to understand the leadership of design leaders and how they communicate design to non-designers at the FFE of NPD. Thus, a qualitative research approach was selected for this research.

The plan of the primary research comprises two stages: 1) comparative studies between the designers and non-designers in a real-life context and 2) an in-depth study with design leaders. The first study comprised three qualitative tools: 1) observation, 2) a semi-structured interview, and 3) assistive questionnaires which are: Leadership Dimension Questionnaire (Dulewicz and Higgs, 2003) and Communication Style Measure (Norton, 1978). The findings from the qualitative researches are triangulated and synthesised to prepare the research criteria for the second study. Then, the second study is conducted by semi-structured, in-depth interviews. The findings of the qualitative research are interpreted by several levels of the coding process to answer the research question. The findings are discussed and compared to formulate the conceptual model.

4) The Pilot Study: This chapter presents the result of the primary research with designers and non-designers. The pilot study, with designers and non-designers (N=32) within a real context setting throughout and triangulated research methods, is conducted to identify designers' leadership and communicating difficulties about conveying design concepts to non-designers at the FFE of NPD. Key findings are: designers' strengths relate to visual communication. Having self-centred thinking, working preferences, and deficiencies in understanding and analysing project contexts are identified. Designers revealed that they could be argumentative in their communicating styles. Indeed, they indicated their emotional difficulty in engaging in better communication with and understanding of others. The study found how their deficiencies led not only to misleading the project process and development but also to ineffective team working. Therefore, these findings are integrated with findings from the literature review chapter to formulate the interview protocols for the in-depth interview the main study with design leaders.

5) The Main Study: This chapter presents the results of semi-structured interviews with design leaders in the UK (N=11). The main study with design leaders aims to identify characteristics of design leadership at the FFE of NPD, their communication process at the FFE of NPD, and how design leaders learn to communicate. The analytic coding process of the data saturates seven principal codes. The corpus of research data itself inductively reveals valuable insights regarding the elements of design leadership practice at the FFE of NPD throughout several periods of saturation coding. The analysis progressed through five levels of abstraction. Thus, this process produced seven themes. Throughout the semi-structured interviews, the interviewees demonstrate that design leaders had studied different design disciplines or had worked in different design areas, with various working experiences. However, the common patterns regarding their preferences in leadership and communication behaviours at the FFE of NPD are identified. The seven principal codes are: empathy (motivation), independence (analytic process and self-awareness), design competency (design thinking), reflective flexibility (leadership and communication attitudes), active listening (communication process and method), patience and consistency (leadership and communication attitudes), and experience and an epiphany moment (self-leadership and realisation experience to become a design leader).

6) Discussion and Model Formulation: this chapter compares and analyses findings of two studies from groups of designers and design leaders. Then, it explains the conceptual model formulation process. Throughout the discussion about seven principal codes, by comparing the results of the pilot and main studies and the theoretical concepts, it identifies how and why design leaders are differentiated from many designers who work rather as traditional visual design specialists. Design leaders at the FFE of NPD require leadership characteristics like empathy, strong self-awareness, the ability to holistically analyse the NPD context, design competency as design thinking, reflective flexibility in attitude and NPD language, active listening, patience and consistency in displaying the above design leadership competencies, and strong self-leadership. Their motivations to become design leaders and to learn business language, culture, and information are generated after experiencing the entire NPD process and having various non-design, in-house design and design consultancy working experiences. These characteristics differentiate them as design leaders at the FFE of NPD. Based on these defined codes of design leaders, the conceptual model is illustrated to explain the characteristics of design leaders and their communication process at the FFE of NPD.

7) Model Evaluation and Modification: This chapter presents the evaluation methods, criteria, process and results regarding the conceptual model. The participants (N=11) are some of design leaders, for the credibility and trustworthiness of the research data they provided and the conceptual model, postgraduate design management and strategy lecturers, leadership trainers, and Raymond Turner, design leadership expert. The conceptual model is easy to understand. Also, they understood the key word within the conceptual model, however, some of key words within the conceptual model may be interpreted differently. They also recommend how to develop design leadership abilities for designers who wish to become design leaders. Then, the modified conceptual model is presented.

8.2. Contributions of the Research

This research has made the following contributions.

Firstly, the contribution of the research is the result of empirically triangulated researches about designers in a real NPD context, at the FFE. Previously, only a few researches exploring the differences between designers and non-designers were conducted by comparing thinking, working attitude preference, and culture. This research, for the first time, approached the exploration of these differences from the leadership perspective, by employing LDQ (Dulewicz and Higgs, 2003) and communication styles, by employing CSM (Norton, 1978). Thus, the results from empirical studies about their differences by observations and semi-structured interviews and assistive questionnaires identified specific characteristics of designers and their deficiency in communicating design at the FFE of NPD.

Secondly, the contribution of this research is in its findings regarding the key characteristics of design leaders at the FFE of NPD, how design leaders competently communicate design and lead NPD at the FFE, and how they teach their leadership and communication skills. Its findings specifically indicate that the constituent elements of design leadership at the FFE of NPD are: 1) empathy in terms of being interested in people and business growth, 2) independence as holistic analysis of NPD issues and strong self-awareness, 3) design thinking as their design competency, 4) reflective flexibility as acknowledging the nature of NPD as the work of different people, 5) active listening as a communication process and method, 6) being patient and consistent as a willingness to explain design again and again, and 7) having experience and an epiphany moment by having strong self-leadership after experiencing the entire NPD process and various working experiences in different non-design roles and working environments. Thus, it could support designers who want to improve their communication of design to non-designers, academic design educators, and organisations which need to train design leaders.

Thirdly, the contribution of this research is the illustrated conceptual model. The conceptual design leadership model at the FFE of NPD describes the characteristics and communication process of design leaders at the FFE of NPD. No prior research was identified that focused on competent design communication to non-designers at the FFE of NPD from the leadership perspective. As the result of this research, the conceptual model provides a specific context

regarding the design leadership process at the FFE of NPD. Also, it identifies the distinguishable characteristics of a design leader in relation to common leadership characteristics in the current leadership theories. In particular, the research results of design leaders theoretically extend to strong self-leadership, which leads and trains oneself to achieve a certain goal. Although design leaders are not positioned as project leaders, they obtain their authority by communicating design concepts to non-designers.

8.3. Research Limitations

This PhD research is limited by a number of factors.

- 1) It was difficult to find design leaders since design leader is not a publicly recognised job title. Also, there is no academic journal associated with the characteristics of design leaders. Thus, the research relied on the purposive sample from the Design Council in the UK and its proven project success records.
- 2) This research investigated design leaders in the UK only. The conceptual model is based on the particular qualitative findings and is not for generalisation. Thus, the data may be differently produced and interpreted if this research is conducted in different countries.
- 3) Design leaders were not available to examine LDQ, CSM and for the opposite of other empirical research methods such as the observation of design leaders. Due to their busy working schedules, the research relied on the in-depth interview.
- 4) The studies of the characteristics of design leaders are limited to the FFE of NPD. Later stages of NPD may require different characteristics of design leadership.

8.4. Further researches

Due to the limitations, there are certain parts of this research that require further study.

- 1) Further research is suggested to employ different research methods such as ethnography or observation regarding the design leadership process and communicating design to non-designers in a real context. Employing different research methods will provide more specific data regarding design leadership and the communication process involved.
- 2) Researching design leadership at the later stages of NPD can clarify the findings of this research at the FFE of NPD. There are several stages in the NPD process and each stage may require different characteristics of design leadership. Therefore, compared and identified design leadership characteristics will provide more specific and distinguished design leadership elements and processes at the FFE of NPD.
- 3) Conducting this research in different cultures may strengthen the current findings. Comparative studies within different cultures may identify similarities and differences in design leadership characteristics. Thus, identified similar patterns from the comparative studies in different countries may confirm the elements of design leadership.
- 4) Future research should focus on teaching design leadership. Identified leadership characteristics should be researched in order to develop a curriculum of design leadership training. In particular, helping designers to avoid remaining within their own field of interest, teaching active listening, and providing the entire NPD process within the academic curriculum will provide designers who wish to become design leaders, or those facing difficulties in communicating design to non-designers, with an opportunity to improve their methods.

REFERENCES

- Adams, M. (2004) Findings from the PDMA Research Foundation CPAS Benchmarking, PDMA Foundation
- Adler, R.B. and Rodman, G. (2000) *Understanding human communication* (7th ed.), Orlando, FL: Harcourt.
- Alban-Metcalf, R and Alimo-Metcalf, B (2000), The transformational leadership questionnaire (TLQ-LGV): a convergent and discriminant validation study, *Leadership and Organization Development Journal*, Vol.21 No.6, pp.280-96
- Allen, T. (1970) Communication networks in R&D laboratories, *R&D Management*, 1: 14-21
- Allport, G.W. (1963) Behavioral science, religion and mental health, *Journal of Religion and Health* 2:187-19
- Allport, G. W., and Odbert, H. S. (1936) Trait-names: A psycho-lexical study. *Psychological monographs*, 47(1), i.
- Alvesson, M. and Skoldberg, K. (2000) *Reflexive methodology*, London: Sage.
- Andrasik, F. And Heimberg, J.S. (1982) Self-managment procedures, in Frederikson, L.W. (Ed.), *Handbook of Organizational Behavior Management*, Wiley, New York, NY, pp.219-47
- Arksey, H. and Knight, P. T. (1999) *Interviewing for social scientists: An introductory resource with examples*, Sage
- Arkin, A. (2004) Serve the Servants, *People Management*, 23 December
- Ashkanasy, N. M., Härtel, C. E. and Daus, C. S. (2002) Diversity and emotion: The new frontiers in organizational behavior research, *Journal of Management*, 28(3), 307-338
- Atwater, L. E., Dionne, S. D., Avolio, B., Camobreco, J. E. and Lau, A. W. (1999) A longitudinal study of the leadership development process: Individual differences predicting leader effectiveness, *Human Relations*, 52(12), 1543-1562
- Austin, J.L., (1955) *How to do things with words: The William James Lectures delivered at Harvard University in 1955*. Ed. J.O. Urmson. London: Oxford University Press, 1962. Print.
- Avery, G (2004) *Understanding Leadership*, Sage Publications Ltd., London UK
- Avolio, B (1999) Full leadership development: Building the vital forces in organizations, Sage, Thousand Oaks, CA
- Avolio, B., Bass, B.M and Jung, D.J (1999) Re-examining the components of transformational and transactional leadership using the Multifactor Leadership Questionnaire, *Journal of Occupational and Organizational Psychology*, 72, 441-462
- Avolio, Bruce; Walumbwa, Fred; and Weber, Todd J (2009) Leadership: Current Theories, Research, and Future Directions, *Annual Review of Psychology* 60(1): 421-449

- Awamleh, R., and Gardner, W. L. (1999) Perceptions of leader charisma and effectiveness: The effects of vision content, delivery, and organizational performance. *The Leadership Quarterly*, 10(3), 345–373
- Backlund, P.M. (1978) Defining communication competence. In C. Larson, P. Backlund, M. Redmond, and A. Barbour (Eds), *Assessing Functional communication* (pp11-28), Urbana, IL: Educational Resources Information Center
- Bailey, C. A. (2007) *A guide to qualitative field research*, Pine Forge Press.
- Baker, T.L. (1994), *Doing Social research* (2nd Edn.), New York: McGraw-Hill Inc.
- Bakhshi, H., McVittie, E. and Simmie, J. (2008) ‘Creating Innovation: Do the creative industries support innovation in the wider economy?’ London: NESTA
- Bales, R. F., and Cohen, S. P. (1979) SYMLOG: A system for the multiple level observation of groups, New York: Free Press
- Bandura, A. (1977) *Social Learning Theory*, Prentice-Hall, Englewood Cliffs, NJ
- Bandura, A. (1997) *Self-Efficacy: The exercise of control*, New York, H.W. Freeman
- Barczak, G and Wilemon, D (2003) Team Member experience in new product development: views from the trenches, *R&D Management*, Vol 33, Issue 5, 463-379
- Barrick, M.R. and Mount, M.K. (1991) The Big Five personality dimensions and job performance: A meta-analysis, *Personnel Psychology*, 44,1-26
- Barnlund, D.C. (1959) A comparative study of individual, majority, and team judgement, *Journal of Abnormal and Social Psychology*, 59, 55-60
- Barrick, M. R., Stewart, G. L., Neubert, M. J., and Mount, M.L. (1998) Relating member ability and personality to work-team processes and team effectiveness, *Journal of Applied Psychology*, 83:377-391
- Barry, B., and Stewart, G. L. (1997) Composition, process, and performance in self-managed groups: The role of personality, *Journal of Applied Psychology*, 82:62-78
- Bass, B. M. (1954) *The leaderless group discussion*, Psychological Bulletin, 51, 465-492.
- Bass, B (1985) *Leadership and Performance Beyond Expectations*, Free Press, New York, NY, USA
- Bass, B (1990a) Bass and Stogdill’s Handbook of Leadership: A Survey of Theory and Research, Free Press, New York, NY, USA
- Bass, B (1990b) From transactional to transformational leadership: Learning to share the vision, *Organizational Dynamics*, 18(3), pp.19-31
- Bass, B. M. (1999) Two decades of research and development in transformational leadership, *European journal of work and organizational psychology*, 8(1), 9-32
- Bass, B. and Avolio, B. (1990) The implications of transactional and transformational leadership for individual, team, and organizational development, W. Pasmore, R.W. Woodman (Eds.), *Research in organizational change and development*, vol. 4JAI Press, Greenwich, CT (1990), pp. 231–272

Bass, B and Avolio, B (1994) *Improving Organizational Effectiveness Through Transformational Leadership*, SAGE Publication London UK

Bartram, D. (1992) The personality of UK managers: 16PF norms for short-listed applicants, *Journal of Occupational and Organizational Psychology*, 65(2), 159-172.

Baumgarten, F. (1933) *Die Charaktereigen schaften, Beitrage zur Charakter-und personlichkeitsforschung: Monogr.1.* Bern:A. Francke

Bennis, W., and Nanus, B. (1985) *Leadership: The strategies for taking charge.* New York, NY: Harper & Row

Berens, L. V. (2001) *Quick guide to the 16 personality types in organizations: understanding personality differences in the workplace* Telos Publications.

Berggren, E. and Nacher, T. (2001) Introducing new products can be hazardous to your company: Use the right new-solutions delivery tools, *The Academy Of Management Executive*, 15(3): 92-101.

Berko, R.M. (1977) *Communicating: A Social and Career Focus*, Houghton Mifflin Harcourt

Bernasco, W., Weerd-Nederhof, P.C., Tilema, H Boer, H. (1999) Balanced matrix structure and new product development process at Texas Instruments Materials and Controls Division. *R&D management* 29 (2), pages 121-131

Berenson, Conrad and Mohr-Jackson, Iris (1994) Product Rejuvenation: A Less Risky Alternative to Product Innovation, *Business Horizons*, 37(6):1-57 (November-December)

Berger, C.R. (1991) Communication theories and other curios, *Communication Monographs*, 58, 101-113

Berlo, D. (1960). *The process of communication: An introduction to theory and practice.* New York: Holt, Rinehart and Winston.

Berggren WL, Wray JD (2002) Positive deviant behaviour and nutrition education. *Food Nutr Bull*, 2002;23 (4):7-8

Berry, D (2007) *Health communication: Theory and practice*, Open University Press

Best, K (2010) *The Fundamentals of Design Management*, AVA Publishing SA, Swaziland

Beverland, M. B. (2005) Managing the Design Innovation–Brand Marketing Interface: Resolving the Tension between Artistic Creation and Commercial imperatives, *Journal of Product Innovation Management*, Vol22 Issue2: 193-207

Beverland M and Farrelly (2011) Designers and Marketers: Toward a Shared Understanding, *Design Management Review*, Volume 22, Issue 3, pages 62–70

Bhuiyan, N. (2011) A framework for successful new product development, *Journal of Industrial Engineering and Management*, 4(4): 746-770

Biyalogotsky, E., Boulding, W. and Staelin, R. (2006) Stuck in the Past: Why Managers Persist with New Product Failures, *American Marketing Association*, Vol.70 (April) 108-121

- Bjork, RA. and Druckman, D. (1991) *In the mind's eye: Enhancing human performance*, Washington, DC: National Academy Press
- Blaszcyk, RL. (2000) *Imagining consumers: design and innovation from Wedgwood to Corning*, The Johns Hopkins University Press, Maryland
- Blake, R. R., and McCause, A. A. (1991) *Leadership dilemmas--grid solutions*. Houston: Gulf Publishing Company
- Blake, R. R., and Mouton, J. S. (1964) *The managerial grid*, Houston: Gulf
- Blake, R. R., and Mouton, J. S. (1978). The new managerial grid: strategic new insights into a proven system for increasing organization productivity and individual effectiveness, plus a revealing examination of how your managerial style can affect your mental and physical health. Gulf.
- Blake, R. R., and Mouton, J. S. (1985). The managerial grid III: a new look at the classic that has boosted productivity and profits for thousands of corporations worldwide. Gulf Publishing Company, Book Division
- Blank, W., Weitzel, J.R., and Green, S.G. (1990) A test of the situational leadership theory, *Personnel Psychology*, 43, 579-597
- Blaxter, L., Hughes, C. and Tight, M. (2010) *How to research*, McGraw-Hill International
- Blessing, L. T. and Chakrabarti, A. (2009) *DRM, a design research methodology*, London: Springer
- Boyatzis, R (1982) *The Competent Manager – A Model for Effective Performance*, Wiley, New York
- Brandt, D. R. (1979) On linking social performance with social competence: Some relations between communicative style and attributions of interpersonal attractiveness and effectiveness, *Human Communication Research*, 5(3), 223-226
- Braun, V. and Clarke, V. (2006) Using thematic analysis in psychology, *Qualitative research in psychology*, 3(2), 77-101
- De Brentani, U., & Kleinschmidt, E. J. (2004). Corporate culture and commitment: impact on performance of international new product development programs. *Journal of product innovation management*, 21(5), 309-333.
- De Vaus, D.A. (2014), *Surveys in Social Research* (6th Ed), London: Routledge.
- Brett, J., Behfar, K., and Kern, M. C. (2006) Managing multicultural teams, *Harvard Business Review*, 84(11): 85-91.
- Bridges, W. (1992) *The character of organizations: Using Jungian type on organizational development*, Pal Alto, CA: Consulting Psychologists Press
- Brodsky, S. Hooper, N., Tipper, D. and Yates, S (1999) Attorney invasion of witness space, *Law and Psychology Review*, 23, 49-68
- Brooks, W. and Heath, R. (1993) *Speech Communication*, Dubuque, IA: W.C. Brown
- Brown T (2008) Design Thinking, *Harvard Business Review*; Jun2008, Vol. 86 Issue 6, p84-92, 9p, 1 diagram, 2 illustrations, 7 color

- Brown, T., Boyle, M. Williams, B., Molly, A., McKenna, L., Palermo, C and Molly, L (2011) Listening and communication styles of undergraduate occupational therapy students: a cross-sectional study, *The British journal of occupational therapy*, Vol 74, Number 8, August 2011, pp. 387-393
- Bruce, M. and Bessant, J. (2002) *Design in Business*, Pearson Education Limited, Essex, England
- Bruce, M. and Cooper, R. (1999) Effective design management for small businesses, *Design Studies*: 297-315
- Bruce, M and Cooper, R (1997), *Marketing and design: a working relationship*, in Bruce, M and Cooper, R, *Marketing and Design*, International Thomson Business Press, London UK
- Bryant, B. (1982) An index of empathy for children and adults, *Child Development*, 53, 412–425
- Bryman, A. (1992). *Charisma and leadership in organizations* , London: Sage.
- Bryman, A., Stephens, M. Campo, A. (1996) *The importance of context: Qualitative research and the study of leadership*, *The Leadership Quarterly*, 7 (1996), pp. 353–370
- Bryman, A. And Teevan, J. (2005) *Social research methods*, (Canadian ed.) Oxford University Press, Toronto
- Buchholz, S. W. (1976). The effects of training in managing interpersonal relationships on the perceptions of social style: An empirical study, Doctoral dissertation, University of Nebraska, Lincoln. (UMI No. 7714635)
- Buchholz, S. W., Lashbrook, W. B., & Wenburg, J. R. (1976). *Toward the measurement and processing of social style*. Paper presented at the annual meeting of the International Communication Association, Portland, OR.
- Buller, M. K., and Buller, D. B. (1987) Physicians' communication style and patient satisfaction, *Journal of health and Social Behavior*, 375-388
- Buller, D. B. and Street Jr, R. L. (1991) The role of perceived affect and information in patients' evaluations of health care and compliance decisions, *Southern Journal of Communication*, 56(3), 230-237
- Burke, W.W. (1988) *Leadership Report*, W. Warner Burke and Associates, Pelham, NY
- Burgoon, M. and Ruffner, M. (1978) *Human Communication*, Holt, Rinehart and Winston, New York, NY
- Cacioppe, R. (1998) An integrated model and approach for the design of effective leadership development program, *Leadership & Organization Development Journal* 19(1): 44-53.
- Cairns, T. D., Hollenback, J., Preziosi, R. C., and Snow, W. A. (1998). Technical note: a study of Hersey and Blanchard's situational leadership theory. *Leadership & Organization Development Journal*, 19(2), 113-116
- Cagan, J, and Vogel, CM. (2002) *Creating breakthrough products: Innovation from product planning to program approval*, Prentice Hall, NJ
- Calantone, R., Garcia, R. and Droge, C. (2003), The Effects of Environmental Turbulence on New Product Development Strategy Planning, *Journal of Product Innovation Management*, 20(2), 90-103

- Campbell, D. T. and Fiske, D. W. (1959) Convergent and discriminant validation by the multitrait-multimethod matrix, *Psychological bulletin*, 56(2), 81-105
- Caracelli, V. J. and Greene, J. C. (1997) Crafting mixed-method evaluation designs. *New directions for evaluation*, 1997(74), 19-32
- Carey, J (1989) *A Cultural Approach to Communication, Communication as Culture: Essay on Media and Society*, Boston: Unwin Hyman
- Caris-Verhallenm W, Kerkstra, A. and Bensing, J. (1999) Nonverbal behaviour in nurse elderly patient communication, *Journal of Advanced Nursing*, 29, 808-818
- Carlson, J G (1985) Recent assessments of the Myers-Bnggs Type Indicator, *Journal of Personality Assessment*, 49, 356-365
- Carlyne, T (1907) "On Heroes, hero-worship, and the heroic in history", Boston: Houghton Mifflin.
- Carlyn, M. (1977) An assessment of the Myers-Briggs type indicator, *Journal of Personality Assessment*, 41(5), 461-473
- Carr, Garza and Vorster (2002) Relationship between Personality Traits and Performance for Engineering and Architectural Professionals Providing Design Services, *Journal of Management in Engineering*, October, 18: pp158-166
- Caruso, D.R. and Wolfe, C.J. (2004) Emotional intelligence and leadership development. In D.V. Day, S.J. Zaccarp, and S.M. Halpin (Eds.), *Leader development for transforming organization: Growing leaders for tomorrow* (pp.237-266). Mahwah, NJ: Lawrence Erlbaum
- Carver, C. S. and Scheier, M. F. (1981) *Attention and self-regulation*, New York: Springer-Verlag
- Cattell, R, Eber, H and Tatsuoka, M (1970) Handbook for the 16PF, IPAT, IL, USA
- Cattell, R.B. Cattell, A.K., Cattell, H.E.P. and Kelly, M.L. (1999) *The 16PF Select Manual*. Champaign, IL: nstitute for Personality and Ability Testing.
- Cattell, R.B. Eber, H.W. and Tatsuoka, M.M. (1970) *Handbook for the Sixteen Personality Factor Questionnaire*. Champaign, IL: Institute for Personality and Ability Testing.
- Cattell, R and Mead, A (2008) The Sixteen Personality Factor Questionnaire (16PF), Chapter 7, The SAGE Handbook of Personality Theory and Assessment, Vol.2 Personality Measurement and Testing. SAGE, London , UK
- Cautela, J.R. (1969) Behavior therapy and self-control: techniques and applications, in Franks, C.M. (Ed.), *Behavioral Therapy: Appraisal and Status*, McGraw-Hill, New York, NY, pp.323-40
- Cepeda, G. and Martin, D. (2005) A review of case studies publishing in Management Decision: Guides and criteria for achieving quality in qualitative research, *Management Decision*, 43(6), 851-876
- Cherryholmes, C. H. (1992) Notes on pragmatism and scientific realism. *Educational researcher*, 13-17
- Cheung, S.O.; Thomas Ng, S.; Lam, K.C.; Yue, W.M. (2001) A satisfying leadership behavior model for design consultant, *International Journal of Project Management* 19: 421-429.

- Chiu, M.-L. (2002) An organizational view of design communication in design collaboration, *Design Studies*, 23: 187-210.
- Chiva, R. and Alegre, J. (2009) Investment in Design and Firm Performance: The Mediating Role of Design Management, *Journal of Product Innovation Management* 26: 424-440.
- Choperena, A.M. (1996) Fast Cycle time- driver of innovation and quality, *Research-Technology Management*, 39, 36-40
- Christiansen, N.D., Goffin, R.D., Johnston, N.G. and Rothstein, M.G. (1994) 'Correcting for faking: Effects on criterion-related validity and individual hiring decisions', *Personnel Psychology*, 47(4): 847-60.
- Cialdini, R (2008), *Harnessing the Science of Persuasion* in Harvard Business Review on The Persuasive Leader, originally published in October 2001, Harvard Business Press, Boston MA USA
- Ciulla, J.B (1999) *The importance of leadership in shaping business value*, Long Range Planning, Vol. 32, No. 2, pp. 166 -172
- Clark, K.B. and Fujimoto, T. (1990) The Power of Product Integrity, *Harvard Business Review*, November, 68(6):107-118
- Clark, K. and Smith, R. (Summer 2008), Unleashing the Power of Design Thinking, *Design Management Review*, 19(3), 8-15
- Clarkson, J. and Eckert, C. (2010) *Design process improvement: a review of current practice*, Springer
- Clipson, C. (1990) Design as a business strategy, *Design management*, 96-105
- Clover, W.H., Rosenbach, W.E. (1986), Item reduction of the multifactor leadership questionnaire, working paper
- Cobb, A. T. (2006) *Leading project teams: An introduction to the basics of project management and project team leadership*, Sage
- Cobley, P. (2001) *Narrative*, London: Routledge.
- Cockton, G. and Lavery, D. (1999) A framework for usability problem extraction, *Proc. Interact 1999*, 344-352
- Cohen, L. and Manion, L. (2000) *Research methods in education* (5th edition), Routledge
- Cohen, D. and Strayer, J. (1996) Empathy in conduct-disordered and comparison youth, *Developmental Psychology*, 32(6), 988
- Cole R, Puro S, Rossi M, Sein M (2005) Being Proactive: Where Action Research meets Design Research, *Proceedings of the Twenty-Sixth International Conference on Information systems*, Las Vegas, p 325-336
- Collingwood, H (2001) Personal histories, *Harvard Business Review*, December, pp.27-38
- Conger, J. (1998) Qualitative research as the cornerstone methodology for understanding leadership, *The Leadership Quarterly*, 10(3), 107-121

Conger, J. (2008), *The necessary Art of Persuasion* in Harvard Business Review on The Persuasive Leader, originally published in May 1998, Harvard Business Press, Boston MA USA

Conger, J and Kanungo, R (1987) Toward a behavioral theory of charismatic leadership in organizational settings, *Academy of Management Review*, 12, pp. 637–647

Conn, S.R. and Rieke, M.L. (1994) *The 16PF Fifth Edition Technical Manual*. Champaign, IL: Institute for Personality and Ability Testing.

Cook, H. and Tate, K. (2005) *Project Management*, The McGraw-Hill Companies, New York, NY, USA

Cooper, R.G. (1993). *Winning at New Products: Accelerating the Process from Idea to Launch*. Reading, MA: Addison-Wesley.

Cooper, R.G. (2000) Strategic Marketing Planning for Radically New Products. *Journal of Marketing*, 64, 1–16.

Cooper, R (2005) *Product Leadership* (2nd ed.), Basic Books, New York, NY USA

Cooper, Junginger and Lockwood (2011) *The handbook of design management*, Berg, Oxford, UK

Cooper, R.G. and Kleinschmidt E.J. (1995) Benchmarking the Firms Critical Success Factors in New Product Development, *Journal of Product Innovation Management*, 12: 374-391.

Cooper, R.G., Edgett, S.E. and Kleinschmidt, E.J. (2004), Benchmarking best NPD practices, *Research-Technology Management*, Vol. 47 No. 1 31-43

Cooper, C., Scandura, T.A and Schriesheim, C.A. (2005) Looking forward but learning from our past: Potential challenges to developing authentic leadership theory and authentic leaders, *Leadership Quarterly*, 16:474-493

Cooper, R.K. and Sawaf, A. (1997) *Executive EQ: emotional intelligence in leadership and organizations*, Grosset/Putman, New York

Coren, S, Ward, L, and Enns, J (ed. 6th) (2003) *Sensation and Perception*, John Wiley & Sons, Inc. NJ, USA

Costa, P.T. and McCrae, R.R. (1976) 'Age differences in personality structure: A cluster analytic approach', *Journal of Gerontology*, 31: 564–70.

Costa Jr. P.T. and McCrae, P.R (1989) *The NEO-PI/NEO-FFI manual supplement*, Psychological Assessment Resources, Odessa, FL

Costa Jr, P. T., and McCrae, R. R. (1992). Reply to Ben-Porath and Waller. *Psychological Assessment*, 4(1), 20-22.

Costa, P. T., & McCrae, R. R. (2008) The revised neo personality inventory (neo-pi-r), *The SAGE handbook of personality theory and assessment*, 2, 179-198

Costa Jr, P. T., and McCrae, R. R. (2010) Bridging the gap with the five-factor model, *Personality Disorders: Theory, Research, and Treatment*, 1(2), 127-130. Doi:10.1037/a0020264

Covey, S. (1992) *Principle-centered Leadership*, Simon & Schuster, London

- Cowley, W. H. (1931) Traits of face-to-face leaders. *Journal of Abnormal Social Psychology*, 26, 304-313.
- Crawford, L.H. (2003) *Assessing and developing the project management competence of individuals* In: Turner, J.R., (Ed.), *People in Project Management*, Gower, UK.
- Crawford, M. C., & Di Benedetto A. (2006) *New products management*, International edition, McGraw-Hill, Singapore.
- Creswell, J.W. (2005) *Educational research: Planning, conducting and evaluating quantitative and qualitative research* (2nd ed.), Upper Saddle River, N.J.: Pearson Merrill Prentice Hall
- Creswell, J.W. (2009) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, (3rd eds.)Sage, London UK
- Creswell, J.W. (2014) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, (4th eds.)Sage, London UK
- Creswell, J.W. and Clark, V.L.P. (2007) *Designing and conducting mixed methods research*.SAGE
- Cross, N. (1999) Design research: A disciplined conversation, *Design issues*, 5-10.
- Cross, N. (2006) *Designerly ways of knowing*, Springer London
- Cupach, W. R., and Spitzberg, B. H. (1983) Trait versus state: A comparison of dispositional and situational measures of interpersonal communication competence, *Western Journal of Speech Communication*, 47(4), 364-379
- Cushman, D. P., and Craig, R. T. (1976). Communication systems: Interpersonal implications. In G. R. Miller (Ed.), *Exploration in interpersonal communication* (pp. 37-58). Beverly Hills, CA: Sage.
- Danzig, M. (2002) By Design: The BlueLight Brand Story, *Design Management Journal* 13(1):26–32.
- Davies, P. Design Council (2008) **An introduction to emerging technology.**, 29
May and updated 20 Oct 2008. Available at:
http://www.designcouncil.org.uk/AutoPdfs/Emerging_technology.pdf [Accessed March 2011]
- de Camprieu, R., Desbiens, J., and Feixue, Y. (2007) Cultural' differences in project risk perception: An empirical comparison of China and Canada, *International Journal of Project Management*, 25(7), 683-693
- Deci, E.L. (1975) *Intrinsic Motivation*, Plenum, New York, NY
- Deci, E.L. and Ryan, R.M. (1985) *Intrinsic Motivation and Self-determination in Human Behavior*, Plenum, New York, NY
- Deetz, S. A., Tracy, S. J. and Simpson, J. L. (2000) *Leading Organizations Through Transition*, Sage, Thousand Oaks, CA
- Denzin, N.K. (1978) *The research act: A theoretical introduction to sociological methods*, New York: McGraw-Hill.
- Denzin, N.K. and Lincoln, Y. (2011) *Handbook of Qualitative Research. (4th eds.)Thousand Oaks, CA: Sage.*

Den Hartog, D. N., House, R. J., Hanges, P. J., Ruiz-Quintanilla, S. A., and Dorfman, P. W. (1999) Culture specific and cross-culturally generalizable implicit leadership theories: Are attributes of charismatic/transformational leadership universally endorsed? 11The first five authors participated in the statistical analyses and the writing of this monograph. The Senior Research Associates provided general research support to the Principal Investigator and the GLOBE Coordinating Team, assisted country representatives in translation and back-translations of instruments and in data collection, and *The Leadership Quarterly*, 10(2), 219-256

Design council, (July 2005), *Design Index: The impact of Design on Stock Market Performance-December 2004*, London: Design Council

Design council, (2008), *Design Returns: A review of national design strategy 200-2008*, London: Design Council

Design council (2013, 6 Jan2013) Design Leadship Programme, Retrieved 5 Jan 2012, from <http://www.designcouncil.org.uk/our-services>

Devito, J. A. (1998) *The interpersonal communication book* (Rev. ed.). New York: Longman.

De Vries, R., Bakker-Pieper, A. and Oostenveld, W. (2009) Leadership = communication ? The relations of Leaders' Communication Style with Leadership Styles, Knowledge Sharing and Leadership outcomes, *Journal of Business Psychology*, (2010), Vol 25, pp.367-380

De Vries, M. F. K., and Florent-Treacy, E. (2002) Global leadership from A to Z: Creating high commitment organizations. *Organizational Dynamics*, 30(4), 295-309

De Vaus, D.A. (2014), *Surveys in Social Research* (6th Ed.), London: Routledge.

Dewey, J. (1933). *How we think*, Boston: D. C. Heath & Company

Dey I. (1993) *Qualitative Data Analysis A User-Friendly Guide for Social Scientists*, Routledge, London

Dickson, P., Schneider, W., Lawrence, P and Hytry, R. (1995) Managing Design in Small High-Growth Companies, *The Journal of Product Innovation Management*, 12: 406-414.

Dilworth,L. and Richter,K. (1995) QFD and personlaity type: The key to team energy and effecetiveness, *Industrial Engineering*, 27(2),57-61

Dixon, N.F. (1976) *On the Psychology of Military Incompetence*, London: Joanthan Cape

Dorsey, D. (2000) Positive deviant, *Fast Company*, 41, 284

Dorst, K. and Cross, N. (2001) Creativity in the design process: co-evolution of problem–solution, *Design studies*, 22(5), 425-437

Dougherty, D. (1992). Interpretive barriers to successful product innovation in large firms. *Organization Science*, 3, 179–202

Dulewicz, V and Higgs, M (2003) LEADERSHIP AT THE TOP: THE NEED FOR EMOTIONAL INTELLIGENCE IN ORGANIZATIONS *International Journal of Organizational Analysis*, Vol. 11 Iss: 3 pp. 193 - 210

Draws, C. (2009) Unleashing the full potential of design thinking as a business method, *Design Management Review*, 20(3), 38-44

Dulewicz, V and Higgs, M (2005) Assessing leadership styles and organisational context, *Journal of Managerial Psychology*, Vol.20 No. 2 pp.105-123

Dumas, A. (1994) Building totems: metaphor-making in product development, *Design Management Journal*, Vol. 5 No. 1, pp. 71-82

Dumas, A. and A. Fentem (1998). "Totemics: New metaphor techniques to manage knowledge from discovery to storage and retrieval." *technovqtion* 18(8/9).

Dunn, W (2008) *Living Sensationally: Understanding your Senses*, Jessica Kingsley Publishers, London UK

Duran, R. L., and Zakahi, W. R. (1987), Communication performance and communication satisfaction: What do we teach our students?, *Communication Education*, 36(1), 13-22

Eadie, W. F., and Paulson, J. W. (1984) Communicator attitudes, communicator style, and communication competence, *Western Journal of Speech Communication*, 48(4), 390-407

Eckersley, M (2003): Integrated Design Strategy Management: Challenges and Opportunities. Design Management Institute Ebulletin, March 2003. Proceedings of the DMI 2002 Annual Conference (Cape Cod)

Ebadi, YM. And Utterback, JM. (1984) The effects of communication on technological innovation, *Management Science*, 30 (5), 572-585

Edmondson, A. (1999) Psychological safety and learning behavior in work teams, *Administrative Science Quarterly*, 44, 350–383

Ernst, H. (2002) Success factors of new product development: A review of the empirical Literature, *International Journal of Management Reviews*, 4(1), 1-40.

Ernst and Young (1997) *Measures that Matter*, SCORE retrieval file no. PP0265.

Evans, M. G. (1970) The effects of supervisory behavior on the path-goal relationship, *Organizational behavior and human performance*, 5(3), 277-298

Feist, G. J. (1998) A meta-analysis of personality in scientific and artistic creativity, *Personality and Social Psychology Bulletin*, 2, 290–309

Fentem, A., A. Dumas, et al. (1998) Evolving spatial representations to support innovation and the communication of strategic knowledge, *Knowledge-Based System* 11: 417-428.

Fiedler, F.E. (1967) *A Theory of Leadership Effectiveness*. New York: McGraw-Hill

Fiske, J (1990) *Introduction to Communication Studies*, (2nd Ed.)Routledge

Fitzgerald, C and Kirby, L (Eds.). (1997) *Developing leaders: Research and applications in psychological type and leadership development*. Palo Alto, CA: Davies-Black

Flauto,F (1999) Walking the Talk: The Relationship Between Leadership and Communication Competence, *Journal of Leadership & Organizational Studies*, Vol.6, No. 1 - 2, Pages.86-97

Flick, U. (2004) Triangulation in qualitative research, *A companion to qualitative research*, 178-183

Foucault, M. (1997) Michel Foucault: ethics, subjectivity and truth. The essential works of Michel Foucault 1954–1984, Vol 1 (Ed. P. RABINOW) (London, Allen Lane, The Penguin Press)

Foucault, M. (1999) *Discourse and Truth: the problematization of Parrhesia* (six lectures given by Michel Foucault at the University of California at Berkeley, October–November 1983 (Ed. J. PEARSON 1985), compiled from tape-recordings and re-edited in 1999. Available at: <http://foucault.info/documents/parrhesia/>

Fraser, H. (2006) Turning design thinking into design doing, *Rotman Magazine*. Toronto, Canada: 24-28.

Frayling, C. (1993). *Research in art and design*. London: Royal College of Art.

Friedman, K (2004): *Of Course Design Pays: But Who Says So, And Why? Research Report for Design for Latvia*, presented at the Design Research for Competitive Advantage Conference, November 16, 2004, Riga, Latvia.

Furnham, A. (1990). The fakeability of the 16 PF, Myers-Briggs and FIRO-B personality measures. *Personality and Individual Differences*, 11(7), 711-716.

Galton, F. (1869) *Hereditary genius*, Macmillan and Company.

Galton, F. (1884) Measurement of character, *Fortnightly Review*, 36, 179-185

Gardner, W and Martinko, M (1996) Using the Myers-Briggs type indicator to study managers: a literature review and research agenda, *Journal of Management*, Vol.22, No 1, pp. 45-83

Gaynor, G. (2002) *Innovation by design: what it takes to keep your company on the cutting edge*, Amacom

Geertz, C. (1973). *The interpretation of cultures: Selected essays*. New York: Basic Books Gemser

Gerbner, G. (1967). Mass media and human communication theory, *Human communication theory*, 40-57.

Gerber, E and Carroll, M (2012) The psychological experience of prototyping, *Design Studies*, Vol33. pp.64-84

George, B. (2003) *Authentic leadership: Rediscovering the secrets to creating lasting value*, John Wiley & Sons

Gibbs, G. R. (2007) *Analyzing Qualitative Data* (Book 6 of The SAGE Qualitative Research Kit)

Gill, R (2006) *Theory and Practice of Leadership*, Sage Publications Ltd., London, UK

Gillham, B. (2000) *Case study research methods*, Bloomsbury Publishing

Gloppen, J. (2009a). *Service Design Leadership*. First Nordic Conference on Service Design and Service Innovation. Oslo, Norway: 1-16.

Gloppen, J. (2009b). "Perspectives on Design leadership and design thinking and how they relate to European service industries." *Design Management Journal*: 33-47.

Gode, A. (1959) *Interlingua Manifesto (Manifesto De Interlingua)*, News Interlingua anno, IV, in. 3 to 4 May - august 1959 (Novas de Interlingua anno, IV, nos. 3-4 maio - agosto 1959) Available at: <http://starter5.aitcom.net/interlinguaus/pakupaku/uploads//GodeManifestodeInterlingua.pdf>

Goffee, R and Jone, G (2000) Why should anyone be led by you? *Harvard Business Review*, September-October, pp.63-70

Goldberg, L.R. (1990) 'An alternative "description of personality": The big-five factor structure', *Journal of Personality and Social Psychology*, 59(6): 1216–29.

Goldkuhl, G. (2012) Pragmatism vs interpretivism in qualitative information systems research, *European Journal of Information Systems*, 21(2), 135-146

Gomes, J., Weerd-Nederhof, DE. , Pearson, A. and Fisscher, O. (2001) Senior management support in the new product development process, *Creativity and Innovation Management*, Vol. 10 No. 4, pp. 234-42

Gorb and Dumas (1987) Silent Design, *Design Studies*, Volume 8, Issue 3, July 1987, Pages 150–156

Gorb, P. (ed.) (1990) The Future of Design and its Management in Oakley M(ed.) *Design Management: A Handbook of Issues and Methods*, Basil Blackwell, Oxford, UK

Goleman, D. (1995) *Emotional intelligence*, New York: Bantam

Goleman, D. (1998) *Working with emotional intelligence*, New York: Bantam

Goleman, D., Boyatzis, R., and McKee, A. (2002). *Primal leadership*. Boston, MA: Harvard Business School Press

Gough, H. G., and Bradley, P. (1996) *CPI manual* . Palo Alto.

Gouran, D. S., Hirokawa, R. Y., Julian, K. M., & Leatham, G. B. (1993) The evolution and current status of the functional perspective on communication in decision-making and problem-solving groups: A critical analysis. *Communication Yearbook*, 16, 573-600

Graber, D. A. (2003) The power of communication: Managing information in public organizations, Washington, DC: CQ Press.

Graeff, C. L. (1983). The situational leadership theory: A critical view. *Academy of Management Review*, 8, 285-291.

Graeff, C. L. (1997). Evolution of situational leadership theory: A critical review. *Leadership Quarterly*, 8, 153-170.

Gray, D (2009) "*Doing research in the real world*" (2nd Ed.) SAGE Publication, London UK

Gray, C. and Malins, J. (2004) Visualizing research: A guide to the research process in art and design, Aldershot, Hampshire: Ashgate

Greenleaf, R (1970) *The servant as leader*, Indiannapolis: The Robert K. Greenleaf Center, 1-37

Griffin, A., (1997). PDMA research on new product development practices: Updating trends and benchmarking best practices, *Journal of Product Innovation Management*. 14 (6), 429-458

Guastello, S.J. and Rieke, M.L. (1993) *The 16PF and Leadership: Summary of Research Findings 1954–1992*. Champaign, IL:Institute for Personality and Ability Testing.

Hackman, J. R. and Morris, C. G. (1975) *Group tasks, group interaction process, and group performance effectiveness: A review and proposed integration*. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 8, pp. 45-99), New York: Academic Press

Hailey, J. L., Daly, J. A., and Hailey, J. (1984) Communicator characteristics associated with relationship disengagement strategies, *Communication Research Reports*

Hakatie, A. and Ryyänen, T (2007) Managing creativity: a gap analysis approach to identifying challenges for industrial design consultancy services, *Design Issues*, 23,1, p 28-46

Hall, R. J., and Lord, R. G. (1995). Multi-level information-processing explanations of followers' leadership perceptions. *The Leadership Quarterly*, 6, 265-281

Hammer, A. L., and MacDaid, G. P. (1992) *MBTI career report manual*. Consulting Psychologists Press.

Hammersley, M and Atkinson, P. (1995) *Ethnography: Principles in Practice*, London: Routledge

Hands, D. (2009) *Vision and Values in Design Management*, AVA Book

Harris, L. and Cronen, V. E. (1979). A rules-based model for the analysis and evaluation of organizational communication. *Communication Quarterly*, 27, 12-28

Harry, M. (1994) *Information Systems in Business*, Pitman, London

Hautala, T (2005) The relationship between personality and transformational leadership, *Journal of Management Development*, Vol. 25. No.8, pp.777-794

Hautala, T. M. (2006) The relationship between personality and transformational leadership. *Journal of Management Development*, 25(8), 777-794.

Hargie, O and Dickson, D (2003) *Skilled Interpersonal Communication: Research, Theory and Practice*, (4th ed.) Routledge, London , UK

Harris, L., and Cronen, V. E. (1979) A rules-based model for the analysis and evaluation of organizational communication, *Communication Quarterly*, 27(1), 12-28

Hazleton Jr, V., and Cupach, W. R. (1986) An exploration of ontological knowledge: Communication competence as a function of the ability to describe, predict, and explain, *Western Journal of Communication (includes Communication Reports)*, 50(1), 119-132

Heath, CA. and Bryant, J. (2000) *Human communication theory and research: Concepts, contexts, and challenge*, (2nd eds.), Lawrence Erlbaum Associates, Inc.,

Heath, C and Heath, D (2010) *Switch: How to Change Things When Change is Hard*, (Jin Hwan Kim, Trans.) Arrangement with Fletcher&Company LLC, published by Woongjin Think Big Co., Ltd. , (Original work published 2010, New York, NY)

Hedrick, T.E., Bickman, L., and Rog, D.J. (1993) *Applied Research Design: A Practical Guide*, Sage Publications, Newbury Park, CA

- Hemphill, J. K., and Coons, A. E. (1957). Development of the leader behavior description questionnaire. *Leader behavior: Its description and measurement*, 6, 38.
- Henn, M. Weinstein, M. and Foard, N. (2006) *a critical introduction To Social Research*, (second edition) Sage Publications: London
- Herbst, W. (1996) *The PDMA Handbook of New Product Development*, New York: John Wiley & Sons, Inc.
- Herman, J. L., Morris, L. L. and Fitz-Gibbon, C. T. (1987) *Evaluator's handbook*, Newbury Park, CA: Sage
- Hersey, P., and Blanchard, K. H. (1969) Life cycle theory of leadership, *Training & Development Journal*.
- Hersey, P. and Blanchard, K. (1982) "Leadership style: Attitudes and behaviors", *Training & Development Journal*, Vol 36(5), May 1982, 50-52
- Hersey, P., and Blanchard, K. (1993) *Management of organizational behavior: Utilizing human resources* (6 ed.). Upper Saddle River, NJ: Prentice-Hall, Inc
- Hersey, P., Blanchard, K. and Johnson, D.E. (2001), *Management of Organizational Behavior, 8th ed.*, Prentice-Hall, Englewood Cliffs, NJ.
- Hertenstein, J.H., Blatt, M.B., and Veryzer, R.W. (2005) The Impact of Industrial Design Effectiveness on Corporate Financial Performance, *Journal of Product Innovation Management*, 22:3-21
- Hetland, H. and Sandal, G.M. (2003) Transformational leadership in Norway: Outcomes and personality correlates, *European Journal of work and organizational psychology*, 12(2),147-170
- Higgs, M (2003) How can we make sense of leadership in the 21st Century? , *Leadership and Organization Development Journal*, Vol. 24, No 5, pp273-284
- Higgs, M., and Rowland, D. (2003). Is change changing? An examination of approaches to change and its leadership, *WORKING PAPER SERIES-HENLEY MANAGEMENT COLLEGE HWP*, (13)
- Hill, N. C., and Ritchie, J. B. (1977). The effect of self-esteem on leadership and achievement: A paradigm and a review. *Group and Organization Studies*, 2, 491–503.
- Hirowaka, R.Y. (1982) Group communication and problem-solving effectiveness I: A critical review of inconsistent findings, *Communication Quarterly*, 30, 134-141
- Hirokawa, Cathcart, Samovar and Henamn (2003), *Small Group Communication*, (8th ed.) Roxbury Publishing Company, LA USA
- Hofstee, W. K., De Raad, B., and Goldberg, L. R. (1992) Integration of the big five and circumplex approaches to trait structure. *Journal of Personality and Social Psychology*, 63(1), 146.
- Hofer, S.M. and Eber, H.W. (2002) Secondorder factor structure of the Cattell Sixteen Personality Factor Inventory (16PF), in B. DeRaad and M. Perugini (eds), *Big-Five Assessment*. Ashland, OH: Hogrefe & Huber, pp. 397–404.

Hogan, R. (1969) Development of an empathy scale, *Journal of Consulting and Clinical Psychology*, 1969, 33, 307-316

Hogan, R. (2002) Leadership: what do we know?, presentation for MDC, Wellington

Horváth, I. (2001) A Contemporary Survey of Scientific Research into Engineering Design, in Design research – Theories, methodologies and product modelling, Proceedings of ICED2001, Glasgow, p.13-20

Hough, L. M., Ones, D. S., and Viswesvaran, C. (1998, April) *Personality correlates of managerial performance constructs*, Paper presented at the 13th Annual Conference of the Society for Industrial and Organizational Psychology, Dallas, TX

Houghton, J.D. and Neck, C.P. (2002) The revised self-leadership questionnaire: Testing a hierarchical factor structure for self-leadership, *Journal of Managerial Psychology*, Vol.17, Iss:9, pp. 672-691

House, R. J. (1977) A 1976 theory of charismatic leadership effectiveness, *Leadership: The cutting edge*. Feffer and Simons, Carbondale.

House, R.J. and Mitchell, T.R. (1974) Path-goal theory of leadership, *Journal of Contemporary Business* 3:81-97

HM Treasury (2005) *Cox Review of creativity in Business: building on the UK's strengths*. Available at http://www.hm-treasury.gov.uk/coxreview_index.htm [Accessed October, 2010]

Hult, G. T. M., Hurley, R. F., Guinipero, L. C. and Nichols, E. L. (2000) Organizational learning in global purchasing: A model and test of internal users and corporate buyers, *Decision Sciences*, 31(2), 293-325

IBM Global CEO Study (2006) *Expanding the Innovation Horizon*, IBM Corporation

Infante, D. A., and Gorden, W. I. (1989) Argumentativeness and affirming communicator style as predictors of satisfaction/dissatisfaction with subordinates, *Communication Quarterly*, 37(2), 81-90

IPAT (2004a) *Dutch 16PF5 User's Manual*, Champaign, IL: Institute for Personality and Ability Testing.

IPAT (2004b) *16PF5 Manual: Norwegian Version*. Champaign, IL: Institute for Personality and Ability Testing

IPAT (2006) *The 16PF5 User's Manual: South African Version*. Champaign, IL: Institute for Personality and Ability Testing

Jabareen, Y. R. (2009) Building a conceptual framework: philosophy, definitions, and procedure, *International Journal of Qualitative Methods*, 8(4), 49-62

Jackson, G. (1973) A preliminary bicultural study of value orientations and leisure attitudes, *Journal of Leisure Research*, 5, 10-22.

Jago, A.G. (1982) Leadership Perspectives in Theory and Research, *Management Science*, Vol.28, No.3, pp.315-336

Jang, S., Yoon, Y., Lee, I. and Kim, J. (2009), Design-oriented new product development: LG Electronics' Chocolate Phone illustrates what it takes to be successful, *Research, Technology Management*, 52 (2) March-April: 36-46.

Janis, I. L. and Mann, L. (1977) *Decision making: A psychological analysis of conflict, choice, and commitment*, New York: Free Press.

Järvinen, P. (2005). Action research as an approach in design science. *The EURAM (European)*

Jassawalla, A.R., and Sashittal. H.C (2002) Cultures that support product innovation processes, *Academy of Management Executive*, 16: 42-53.

Jaques, E., and Clement, S. D. (1991) *Executive leadership: A practical guide to managing complexity*, Arlington, VA: Cason Hall.

Jenkins, J. (Summer 2008) Creating the Right Environment for Design, *Design Management Review*, 19(3), 16-22

Jevnaker, B. (2000) How Design Becomes Strategic, *Design Management Journal*, Winter, vol. 11, 41-47

Jozaisse, F. (2011) *Design Leadership: Current Limits and Future Opportunities.*” In R. Cooper, S. Junginger, T. Lockwood (Eds.), *The Handbook of Design Management* (pp. 398–413). Oxford, UK: Berg.

Judge, T. A., Bono, J. E., Ilies, R., and Gerhardt, M. W. (2002) Personality and leadership: A qualitative and quantitative review, *Journal of Applied Psychology* 87(4): 765-780.

Judge, T. A., & Ilies, R. (2002) Relationship of personality to performance motivation: a meta-analytic review, *Journal of Applied Psychology*, 87(4), 797.

Jung, C (1971) *Psychological Types*, (trans. H. G. Baynes, revised R. F. C. Hull) Princeton University Press, Princeton (1971) (Original 1921)

Kahn, K.B., Castellion, G. and Griffin, A. (2005) *The PDMA Handbook of New Product Development* (2nd ed.), Wiley& Sons, Inc.

Kakabadse and Kakabadse (1999) *Essence of Leadership*, International Thomson Business Press, London UK

Kanter, R. M. (1993) *Men and women of the corporation*. New York: Basic Books.

Kanfer, F.H. (1970) Self-regulation: research, issues, and speculations, in Neuringer, C. And Michael, J.L. (Eds), *Behavioral Modification in Clinical Psychology*, Appleton-Century-Crofts, New York, NY, pp.178-220

Karnes, F. A., Chauvin, J. C., and Trant, T. J. (1984). Leadership profiles as determined by the 16 PF scores of honors college students. *Psychological reports*,55(2), 615-616.

Katz, R.L (1963) *Empathy: its nature and uses*, Free Press of Glencoe, London

Keates, S.and Clarkson, J. (2003), Countering design exclusion. In *Inclusive Design* (pp. 438-453), Springer London.

Kellett, J. B., Humphrey, R. H. and Sleeth, R. G. (2006) Empathy and the emergence of task and relations leaders, *The Leadership Quarterly*, 17(2), 146-162

Kendall, G. and Wickham, G. (2001) *Understanding Culture: Cultural Studies and Cultural Ordering*, London: Sage

Kerr, S. and C.A. Schriesheim, CA. (1974) Consideration, initiating structure, and organizational criteria—An update of Korman's 1966 review *Personnel Psychology*, 27 (1974), pp. 555–568

Kessler, E.H. and Chakrabarti, A.K. (1999) Speeding up the pace of new product development, *Journal of Product Innovation Management*, 16, 231-247.

Khurana, A. and Rosenthal, S. R. (1997): Integrating the fuzzy front end of new product development; *Sloan Management Review*, Cambridge

Khurana, A. and Rosenthal, S. R. (1998) Towards holistic front ends in new product development, *Journal of Product Innovation Management* , 15: 57-74.

Kickul, J. and Neuman, G. (Fall 2000) EMERGENT LEADERSHIP BEHAVIORS: THE FUNCTION OF PERSONALITY AND COGNITIVE ABILITY IN DETERMINING TEAMWORK PERFORMANCE AND KSAS, *Journal of Business and Psychology* 15(1): 27- 51.

Kirkpatrick, S. A., and Locke, E. A. (1991) Leadership: Do traits matter? *Academy of Management Executive*, 5, 48–60.

Kirkpatrick, S. A., and Locke, E. A. (1996). Direct and indirect effects of three core charismatic leadership components on performance and attitudes. *Journal of Applied Psychology*, 81, 36–51

Klenke, K (2008) *Qualitative Research in the Study of Leadership*, Emerald Group Publishing Limited, Bingley, UK

Kono, T. and Lynn, L. (2007) *Strategic new product development for the global economy*, Palgrave Macmillan

Kotter, J. P. (1996) *Leading change*, Harvard Business Press.

Klages, L.(1926) *Grundlagen der Charakterkunde*. Leipzig: J. A. Barth,

Korman, A.K. (1966) Consideration,” “Initiating Structure,” and organizational criteria-a review, *Personnel Psychology*, 19 (1966), pp. 349–360

Kotler, P and Rath, G.A. (1984) Design: A Powerful but Neglected strategic tool, *Journal of Business Strategy*, Vol.5 Iss:2, pp16-21

Kotler, P., Kartajaya, H., and Setiawan, I. (2010) *Marketing 3.0: From Products to Customers to the Human Spirit*, (JinHwan Ahn Trans.) , John Wiley&Sons, USA (Original work published 2010)

Kotter, J. (1990). *A force for change*. New York: Free Press

Kotter, J. (2001, December) What Leaders Really Do, *Harvard Business Review*, 79(11), 85-96.(Original work published in 1979)

Kotter, J. P. and Cohen, D. S. (2002) *The heart of change: Real-life stories of how people change their organizations*, Harvard Business Press.

Kouzes, J and Posner, B (1988) *The Leadership Challenge*,(6th ed.) Jossey-Bass, San Francisco, CA, USA

- Krishnan, V. and Ulrich, K.T. (2001) Product development decisions: A review of the literature, *Management science*, Vol.47, No.1, 1-21
- Kroeger, O and Thuesen, J (1998) *Type Talk: The 16 personality types that determine how we live, love, and work*, New York: Delta
- Kuczumski and Associates, Inc. (1994) *Winning New Product and Service Practices for the 1990's*, Chicago,IL.,Kuczumski & Associates
- Kumar, S. and Gupta, Y. P. (1993) Statistical process control at Motorola's Austin assembly plant, *Interfaces*, 23(2), 84-92
- Kvale, S. (1996) *InterViews—An introduction to qualitative research interviewing*, Thousand Oaks, CA: Sage
- Labone, R. et al (2003) *Success by Design.* 'Wellington: New Zealand Design Task Force
- LaFrance, P (1990) *Fundamental concepts in communication*, Prentice Hall, NJ
- Lamude, K.G. and Daniels, T.D. (1984) Perceived managerial communicator style as a function of subordinate and manager gender, *Communication Research Reports*, 1 (1) (1984), pp. 91–96
- Laruche J.C. (ed.) (2008) *The Momentum Effect: The secrets of Efficient Growth*, Kyobo book Centre Co., Ltd. Korean ed. 2009
- Larson, E. And Gray, C. (2011) *Project Management: The Managerial Process* (International edition).Singapore: McGraw-Hill/ Irwin
- Laver, J. and S. Hutcheson, (eds.) (1972) *Communication in Face to Face Interaction*, Harmondsworth, Middlesex: Penguin.
- Lawrence, G. (1982) *People types and tiger stripes: A practical guide to learning styles*, Gainesville, FL: Center for Applications of Psychological Type
- Leary, T. (1957) *Interpersonal diagnosis of personality; a functional theory and methodology for personality evaluation*, Oxford:Ronald Press
- Leavitt, H. J. (1951). Some effects of certain communication patterns on group performance, *Journal of Abnormal and Social Psychology*, 46, 38-50.
- Lee, K. and T. Cassidy (2007) Principles of design leadership for industrial design teams in Taiwan, *Design Studies* 28(4): 437-462.
- Lee A and Nickerson J (2010) Theory as a case of design: lessons for design from the philosophy of science, *Proceedings of the 43rd Hawaii International Conference on System Sciences*
- Leonard-Barton, D. (summer,1992) core capability and core rigidities: a paradox in managing new product design, *Strategic Management Journal* 13(special issue: Strategy process: managing corporate self-renewal): 111-125.
- Leonard, Dorothy, Rayport, Jeffrey, F. (1997) Spark Innovation through Empathetic Design, *Harvard Business Review*, 75(6):102-113 (November-December).

- Leonhardt, Ted, Faust and Bill (2001). Brand Power: Using Design and Strategy to Create the Future. *Design Management Journal* 12(1):10–13.
- Levering, B. (2002) Concept analysis as empirical method, *International Journal of Qualitative Methods*, 1(1), 35–48
- Likert, R. (1961) New patterns of management, McGraw Hill, New York (1961)
- Lin, C. a. Chen., C. (2004) A Fuzzy-Logic-Based Approach for New Product go-no go decision at front end, *IEEE Transactions on systems*, 34(1): 132-143.
- Livari, J., Venable J. (2009), *Action Research and Design Science Research – Seemingly Similar But Decisively Dissimilar*, European Conference on Information Systems
- Lloyd-Walker, B., and Walker, D. (2011) Authentic leadership for 21st century project delivery, *International Journal of Project Management*, 29(4), 383-395
- Locke, E.A. and Latham, G.P. (1990) *A theory of Good Setting and Task Performance*, Prentice Hall, Englewood Cliffs, NJ
- Lockwood, T. (2009) Transition: How to Become a More Design-Minded Organization, *Design Management Journal*: 29-37.
- Lockwood, T (2010) Design Thinking: Integrating innovation, Customer Experience, and Brand Value, Allworth Press, New York, NY, USA
- Lord, R. G., De Vader, C. L., and Alliger, G. M. (1986). A meta-analysis of the relation between personality traits and leadership perceptions: An application of validity generalization procedures. *Journal of Applied Psychology*, 71, 402–410.
- Lowe, K.B and Gardner, W.L. (2001) Ten years of the Leadership Quarterly: Contributions and challenges ofr the future, *Leadeship Quartely*, 11(4), 459-514
- Luo, L., Kannan P.K, Besharati, B. and Azarm, S. (2005) Design of Robust New Products under Variability: Marketing Meets Design, *Journal of Product Innovation Management*, 22: 177-192.
- Luthans F. And Avolio BJ. (2003) Authentic leadeship: a positive developemental approach. In *Positive Organizatinoal Scholarship: Foundations of a New Disciplines*, (eds.) KS Cameron, JE Dutton, RE Quinn, pp.241-58, San Francisco, CA: Berrett-Koehler
- Luthans, F. and Youssef, C. M. (2004) Human, Social, and Now Positive Psychological Capital Management: Investing in People for Competitive Advantage, *Organizational dynamics*, 33(2), 143-160
- Maccoby, M. (2003) *The Productive Narcissist: The Promise and Peril of Visionary Leadership*. New York: Broadway Books
- Madhavan, R., and Grover, R. (1998). From embedded knowledge to embodied knowledge: New product development as knowledge management. *Journal of Marketing*, 62(4), 1–12
- Madlock, P (2008) The Link Between Leadership Style, Communicator Competence, and Employee Satisfaction, *Journal of Business Communication*, 45: 61, pp.61-78

- Mahoney, J. M., and Stasson, M. F. (2005). Interpersonal and Personality Dimensions of Behavior: FIRO-B and the Big Five. *North American Journal of Psychology*, 7(2).
- Mann, R. D. (1959) A review of the relationship between personality and performance in small groups, *Psychological Bulletin*, 56, 241–270.
- Manu, A. (2007) *The Imagination Challenge. Strategic foresight and Innovation in the global economy*,. New Riders; Berkeley, CA
- Manz, C.C. (1983) *The Art of Self-Leadership: Strategies for Personal Effectiveness in your Life and Work*, Prentice-Hall, Englewood Cliffs, NJ.
- Manz, C.C. (1986) Self-leadership: toward an expanded theory of self-influence processes in organizations, *Academy of Management Review*, Vol. 11 pp.585-600
- Manz, C.C.(1992), *Mastering Self Leadership: Empowering Yourself for Personal Excellence*, Prentice-Hall, Englewood Cliffs, NJ.
- Manz, C.C. and Neck, C.P.(1999) *Mastering Self Leadership: Empowering Yourself for Personal Excellence*, (2nd ed.), Prentice-Hall, Englewood Cliffs, NJ.
- Manz, C.C. and Sims, H.P. Jr (2001) *The New SuperLeadership: Leading Others to Lead Themselves*, Berrett-Koehler, San Francisco, CA
- Mäkilouko, M. (2004). Coping with multicultural projects: the leadership styles of Finnish project managers. *International Journal of Project Management*, 22(5), 387-396
- Marsen, S. (2006). *Communication studies*. Palgrave Macmillan.
- Marshall, T. (1991) *Understanding Leadership: Fresh Perspectives on the Essentials of New Testament Leadership*, Chichester: Sovereign World.
- Marsh DR, Schroeder, DG, Dearden KA, Sternin J, Sternin M. (2004) The power of positive deviance. *British Medical Journal* ; 329; 1177-1179
- Martin, R. (2009) *The design of business*, Harvard Business School Publishing, Massachusetts.
- Mayer, J. D., and Salovey, P. (1995) Emotional intelligence and the construction and regulation of feelings, *Applied & Preventive Psychology*, 4, 197–208
- Mayer, J. D., and Salovey, P. (1997) What is emotional intelligence? In P. Salovey and D. Sluyter (Eds.), *Emotional development and emotional intelligence: Implications for educators* (pp. 3–31). New York: Basic Books
- Mayer, J. D., and Salovey, P. and Caruso, D.R. (2000) Models of emotional intelligence. In R.J. Sternberg (Ed.), *Handbook of intelligence* (pp. 396-420), CambridgeL Cambridge University Press
- Mayer, J. D., and Salovey, P. and Caruso, D.R. (2002) Mayer-Salvoey-Caruso Emotional Intelligence Test (MSCEIT) user’s manual, Toronto, ON:MHS
- Mayer, J. D., and Salovey, P. and Caruso, D.R. (2004) Emotional Intelligence: Theory, Findings, and Implication, *PsychologicalInquiry*, Vol.15, No.3, 197-215
- McCaulley, M. H. (1990). The MBTI and individual pathways in engineering design.*Engineering Education*, 80(5), 537-542

- McClelland, D. C. (1975) *Power: The inner experience*, New York: Irvington Press
- McClelland, D. C., and Boyatzis, R. E. (1982) Leadership motive pattern and long-term success in management, *Journal of Applied psychology*, 67(6), 737.
- McCroskey, J. C. (1982) Communication competence and performance: A research and pedagogical perspective, *Communication Education*, 31(1), 1-7.
- McCullagh, K. (June 2, 2008). The Many Faces of Design Leadership. Available at http://www.core77.com/blog/featured_items/
- McCullagh, K. (2010) Stepping Up: Seizing the Opportunities Design Thinking Has Uncovered, *Design Management Review*, September
- McCullagh, K. (2013) Stepping Up: Beyond Design Thinking, *Design Management Review*, 24(2), 32-34
- McCrae, R. R. (1996) Social consequences of experiential openness, *Psychological Bulletin*, 120, 323–337
- McCrae, R and Costa, P.T., Jr. (1989) Reinterpreting the Myers-Briggs Type Indicator from the perspective of the five factor model of personality, *Journal of Personality*, 57. pp17-40
- McCrae, R. R., and Costa, P.T., Jr. (1997). Personality trait structure as a human universal, *American Psychologist*, 52, 509–516.
- McCroskey, J. C, Daly, J. A., Martin, M. M. and Beatty, M. J. (1998) *Communication and personality: Trait perspectives*, Cresskill, NJ: Hampton Press, Inc
- McCullagh, K. (2008) *The Many faces of design leadership*, Internaitonal Council of Societies of Industrial design (Original work published in Core77.com). Available at: <http://www.icsid.org/feature/current/articles583.htm>
- McDonough, E.F. III (1993) Faster new product development: investigating the effect of technology and characteristics of the project leader and team, *Journal of Product Innovation Management*, 10, 241-250.
- McDonough, E.F., III and Barczak, G. (1991) Speeding up new product development: the effects of leadership style and source of technology, *Journal of Product Innovation Management*, 8,203-211
- McDonough, E.F., III and Spital, F.C. (1984) Qucik response new product development, *Harvard Business Review*, 62, 52-62
- Mehrabian, A. (1972) *Nonverbal Communication*, Chicago, IL: Aldine-Atherton
- Merrill, D. W., and Reid, R. H. (1981) *Personal styles & effective performance*, CRC Press.
- Miles, M. B.and Huberman, A. M. (1994), *Qualitative data analysis: An expanded sourcebook*, Sage.
- Miller, R. And Gallagher M. (2000) The interview approach, in O Hargie and D. Tourish (eds) *Handbook of Communication Skills*, 3rd edn. London:Routledge

Miles, I. and Green, L., National Endowment for Science, Technology and Arts (2008) **Hidden Innovations for Creative Industries**. Available at <http://www.nesta.org.uk/publications/reports> [Accessed February 2011]

Miller and Moultrie (2013) Understanding the Skills of Design Leaders, *Design Management Journal*, Volume8, Issues1 pages 35-51

Mintzberg, H. (1994) Rounding out the manager's job, *MIT Sloan Management Review*, 36, 11-25.

Mintzberg, H., Ahlstrand, B. and Lampel, J. (1998) *Strategy Safari: A Guided Tour Through the Wilds of Strategic Management*, New York: Simon & Schuster

Mishler, E.G. (1990) Validation in inquiry-guided research: The role of exemplars in narrative studies, *Harvard Educational Review*, 60 (1990), pp. 415–442

Moenaert, R., De Meyer, A., Souder, W.E. and Deschoolmeester, D. (1995) R&D/Marketing Communication During the Fuzzy Front-End, *IEEE TRANSACTIONS ON ENGINEERING MANAGEMENT*, 42(3): 243-259.

Moenaert, R., Caeldries, F., Lievens, A., and Wauters, E. (2000) communication flows in international product innovation teams, *Journal of Product Innovation Management* 17: 360-377.

Moore, T. (1987) Personality tests are back, *Fortune*, 30. 74-82

Moorman, C., and Miner, A. S. (1997) The impact of organizational memory on new product performance and creativity, *Journal of Marketing Research*, 34(February), 91–106.

Monge, P. R., Backman, S. G., Dillard, J. P., and Eisenburg, E. M. (1982). Communicator competence in the workplace: Model testing and scale development. *Communication Yearbook*, 5, 505-528

Montgomery (Nov.2012) "What makes a good client relationship?", <http://www.designweek.co.uk/editors-view/what-makes-a-good-client-relationship/3035669.article> (Accessed 30 Nov 2012)

Moody, S. (1980) The Role of Industrial design in Technological Innovation, *Design Studies*, 1(6):329-39

Mossberg L. (2007) A marketing approach to the tourist experience, *Scandinavian Journal of Hospitality and Tourism* 7(1): 59–74

Moultrie, J., Clarkson, P.J., and Robert, D. (2007) Development of a Design Audit Tool for SMEs, *Journal of Product Innovation Management* 24(4): 335-368.

Borja de Mozota, B. (2003) *Design Management: Using Design to build Brand Value and Corporate Innovation*, Allworth Press, New York USA

Borja de Mozota, B (2006) The Four Powers of Design: A Value Model in Design Management, *Design Management Review* 17(2): 44-53.

Borja de Mozota, B. (2008) A theoretical model for Design in Management science, *Design Management Journal*, 3(1), 30-37

- Müller, R., and Turner, J (2007) “*Matching the project manager’s leadership style to project type*”, *International journal of project management*, 25, pages 21-32
- Müller, R., and Turner, R. (2010) Leadership competency profiles of successful project managers, *International Journal of Project Management*, 28(5), 437-448.
- Murmann, P.A (1994) Expected development time reductions in the German mechanical engineering industry, *Journal of Product Innovation Management*, 11, 236-252
- Murphy, S. A. and Kumar, V. (1997) The Front End of New Product Development: A Canadian Survey; *R&D Management*, 27 (1997) 1: 5-16
- Myers, I., McCaulley, M., Quenk, N. and Hammer, A (1998) *Manual: A guide to the development and Use of the Myers-Briggs Type Indicator*, 3rd ed., Consulting Psychologists press, Palo Alto, CA, USA
- Myers, I. B. and McCaulley, M. H. (1985) *Manual A guide to the development and use of the Myers-Briggs Type Indicator*, Palo Alto Consulting Psychologists Press
- Mynott, C. (2000) Successful Product Development: The Key Management Issues. Paper Presented at the Successful Product Development Seminar at the Imperial War Museum, Duxford, UK, March 22
- Nachmias, C. F. and Nachmias, D. (1996) Research designs: cross-sectional and quasi-experimental designs, *Research methods in the social sciences*, 125-151
- Nahavandi, A (1997) *The Art and Science of Leadership*, Prentice-Hall, New Delhi,
- The National Communication Association (2014) *Discipline*, Available at: <http://www.natcom.org/discipline/> [Accessed: April, 2012]
- Nelson, H (2013) *Design Communication: Systems, Service, Conspiracy, and Leadership*, Advanced Design Institute, Seattle, WA, USA, ADi Publications
- Neumeier, M (2009) *THE DESIGNFUL COMPANY*, NEW RIDERS, Berkley, CA USA
- NextDesign Leadership Institute: [Http://www. Nextd.org](Http://www.Nextd.org). (Accessed on January 10, 2011)
- Neuman, W.L. (2006) *Social research methods qualitative and quantitative Approaches*, 6th Edition, Pearson, Boston
- Nicholson, N. (2001) Gene politics and the natural selection of leadership. *Leader to Leader*, 20(Spring), 46–52
- Noftle, E. E., and Shaver, P. R. (2006). Attachment dimensions and the big five personality traits: Associations and comparative ability to predict relationship quality. *Journal of Research in Personality*, 40(2), 179-208.
- Nonaka, L. (1991) The knowledge-creating company, *Harvard Business Review*, November-December, pp.96-104
- Norman, D. (1998) *The Design of Every Things*, MIT press.
- Norrgrén, F. and Schaller, J. (1999) Leadership style: Its impact on cross-functional product development, *Journal of Product Innovation Management*, 16, 377–384

- Northouse, P. G. (2010). *Leadership: Theory and practice* (5th ed.). Thousand Oaks, CA: Sage.
- Norton (1978) Foundation of a Communicator Style Construct, *Human Communication Research* 4:99-112
- Norton, R. (1983) Communicator style: Theory, applications, and measures, Beverly Hills, CA: Sage.
- Norton, R. W., and Pettegrew, L. S. (1979) Attentiveness as a style of communication: A structural analysis, *Communications Monographs*, 46(1), 13-26
- Nussbaum, B. (2011) *Design thinking is a failed experiment. So what's next?*. Accessed online at <http://www.fastcodesign.com/1663558>
- Nussbaum, J. F. and Scott, M. D. (1979) Instructor communication behaviors and their relationship to classroom learning, *Communication yearbook*, 3, 561-583
- Oakley, A. (1999) *People's way of knowing: gender and methodology. Critical Issues in Social Research* (Hood, S., Mayall, B., Oliver, S., eds.), Open University Press, Buckingham, 154-177
- Oakley, M (ed.)(1990), Designer and Design Management, in Oakley M(ed.) Design Management; A Handbook of Issues and Methods, Basil Blackwell, Oxford, UK
- Ochieng, E. G., and Price, A. D. (2009) Framework for managing multicultural project teams, *Engineering, Construction and Architectural Management*, 16(6), 527-543
- Oxford Dictionary (2013) Oxford University Press, Available from: <http://www.oxforddictionaries.com/> [Last Accessed at 10 September 2013]
- Papworth, M. A., D. Milne, et al. (2009) An exploratory content analysis of situational leadership, *Journal of Management Development* 28(7): 593-606
- Parker, G (2003) *Cross-Functional Teams*, JOSSEY-BASS a Wiley Imprint, San Francisco, CA, USA
- Paton, B and Dorst, K (2011) Briefing and reframing: A situated Practice, *Design Studies*, Vol 32 No 6, pp.573-587
- Patton, M.Q. (1990) *Qualitative evaluation and research methods*, (2nd eds), Sage Publications, Beverly Hills, CA
- Pavitt, C. (1999) Theorizing about the group communication-leadership relationship: Input-process-output and functional models. In L. R. Frey, D. S. Gouran, & M. S. Poole (Eds.), *The handbook of group communication theory and research* (pp. 313–334). Thousand Oaks, CA: Sage
- Paton, B. and Dorst, K. (2011) Briefing and reframing: A situated practice, *Design Studies*, 32(6), 573-587
- Pearman, R. (2001) Introduction to type and emotional intelligence, Palo Alto, CA: CPP, Inc
- Pearson, A., Brockhoff, K and Boehmer, A. (1993) Decision parameters in global R&D management, *R&D Management*, vol.23 (3): 249-262
- Pedler, M., Burgoyne, J. and Boydell, T. (2004) *A Manager's Guide to Leadership*, McGraw-Hill, Maidenhead
- Penley, L. E., and Hawkins, B. (1985) Studying interpersonal communication in organizations: A leadership application, *Academy of Management Journal*, 28(2), 309–326.

- Pennypacker, J and Cabanis-Brewin, J (2003) *What Makes a Good Project Manager*, Center for Business Practices, Havertown, Pennsylvania, USA
- Perks, H., Cooper, R., Jones, C. (2005) Characterizing the Role of Design in New Product Development an empirical derived taxonomy, *Journal of Product Innovation Management*, 22: 111-127.
- Peters, T. (1989) The Design Challenge, *Design Management Journal*, Fall, Vol.1, no.1, 8-13.
- Pfeiffer, J., Heslin, R., and Jones, J. (1976) Instrumentation in human relations training: a guide to 92 behavioural sciences (2nd ed.). San Diego, CA: University Associates
- Pine, B. J. II, and Gilmore, J. H. (1999) *THE EXPERIENCE ECONOMY*, HARVARD BUSINESS SCHOOL PRESS, BOSTON, MA.
- Pinto, M. B. and J. K. Pinto (1990) Project Team Communication and Cross-Functional Cooperation in New Program Development, *Journal of Product Innovation Management* 7: 200-212.
- Pittenger, D. J. (1993) The utility of the Myers-Briggs type indicator, *Review of Educational Research*, 63(4), 467-488.
- Plutchik, R. (1987) Evolutionary bases of empathy, N. Eisenberg, J. Strayer (Eds.), *Empathy and its development*, Cambridge Univ. Press, New York (1987), pp. 38-46
- Porter, D. T. (1982) Communicator style perceptions as a function of communication apprehension, *Communication Quarterly*, 30(3), 237-244
- Potter, S. (2006) *Doing postgraduate research*, (2nd eds.), SAGE
- Press, M. and Cooper, R (2003) *Design Experience*, Ashgate Publishing Limited, England, UK
- Price, V, Tewksbury, D and Powers, E. (1997) Switching Trains of Thought: The Impact of News Frames on Readers' Cognitive Responses, *Communication Research*, Vol.24, No.5, 481-506
- Project Management Institute (PMI) (2000) *A A guide to the Project Management Body of Knowledge*, Newtown Square, PA: Project Management Institute
- Provost, JA. And Anchors, S. (1987) *Applications of the Myers-Briggs Type Indicator in higher education*, Palo Alto, CA: Consulting Psychologists Press
- Punch, K. (2000) *Developing effective research proposals*, Sage.
- Reid, S., and Brentani, U. (2004) The Fuzzy Front End of New Product Development for Discontinuous Innovations-A Theoretical Model, *Journal of Product Innovation Management* 21: 170-184
- Reinmoeller, P. (2002) Design with markets! Leveraging knowledge for innovation, *Design Management Journal (Former Series)*, 13(2), 38-46.
- Riecken, H. (1958) The effect of talkativeness on ability to influence group solutions of problems. *Sociometry*, 21, 309-321

Riggio, R. E., Riggio, H. R., Salinas, C., and Cole, E. J. (2003). The role of social and emotional communication skills in leader emergence and effectiveness. *Group Dynamics: Theory, Research, and Practice*, 7, 83–103

Roald, J. (May 2006). Design Leadership: Cross-pollinating design and management. 5th NordCode Seminar: “Connecting fields” Oslo School of Architecture and Design (AHO)

Rogers, E.M. (1995) *Diffusion of Innovations*, (4th ed.) Free Press, New York

Rogers, C. E and Farson, R. E. (1987) Active listening. In Huseman, R. C. et al. (Eds), *Readings in Interpersonal and Organizational Communication*, Holbrook Press, Boston

Rogers, C. R. (1951) *Client-centered therapy: Its current practice, implications and theory*, London: Constable

Rogers, C. R. (1975) Empathic: An unappreciated way of being, *The counseling psychologist*, 5(2), 2-10

Rosellini, A. J., and Brown, T. A. (2011). The NEO Five-Factor Inventory: latent structure and relationships with dimensions of anxiety and depressive disorders in a large clinical sample. *Assessment*, 18(1), 27-38.

Rosenau, M.D., Jr. (1988) From experience faster new product development, *Journal of Product Innovation Management*, 5, 150-153

Rosenblum, L.; Earnshaw, R. A.; Encarnação, J.; Hagen, H.; Kaufman, A.; Klimenko, S.; Nielson, G.; Post, F., and Thalmann, D. (1994) *Scientific visualization: advances and challenges*. London; San Diego: Academic Press; 1994. ISBN: 0-12-227742-2.

Rosete, D., and Ciarrochi, J. (2005) Emotional intelligence and its relationship to workplace performance outcomes of leadership effectiveness, *Leadership & Organization Development Journal*, 26(5), 388-399

Rossmann, G.B. and Wilson, B.L. (1985) Numbers and words: Combining quantitative and qualitative methods in single, large scale evaluations, *Evaluation Review*, 9 (1985), pp. 627–643

Roush, P.E. (1992) The Myers-Briggs type indicator, subordinate feedback, and perceptions of leadership effectiveness, in Clark, K.E., Clark, M.B., Campbell, D.P. (Eds), *Impact of Leadership*, Center for Creative Leadership, Greensboro, NC, pp.529-43.

Rowley, J. (2012) Conducting research interviews, *Management Research Review*, 35(3/4), 260-271

Roy, D.D. (1996) ‘Personality model of fine artists’, *Creativity Research Journal*, 9(4): 391–4. Russell,

Roy, R. and Potter, S. (ed.) (1997) *The commercial impacts of investment in design (in 1993)*, in Bruce, M. and Cooper, R., *Marketing and Design*, International Thomson Business Press, London UK

De Ruyter, K. and Scholl, N. (1998) Positioning qualitative market research: reflections from theory and practice, *Qualitative market research: An international journal*, 1(1), 7-14.

Saldaña, J. (2013) *The coding manual for qualitative researchers*, (2nd eds.), London, Sage.

Salacuse, J. W. (2007). Real leaders negotiate. *University Business*, 10, 2-3.

- Sallinen-Kuparinen, A. (1992), Teacher communicator style, *Communication Education*, 41(2), 153-166
- Salovey, P., and Mayer, J.D. (1990) Emotional Intelligence. *Imagination, Cognition, and Personality*, 9, 185-211
- Salovey, P., and Mayer, J.D. (1997). What is emotional intelligence? In P. Salovey & D. Sluyter (eds.), *Emotional development and emotional intelligence: Implications for educators* (pp.3-31), New York: Basic Books
- Sarin, S., and Mac Dermott, C. (2003), The effect of team leader characteristics on learning, knowledge application, and performance of cross-functional new product development teams, *Decision Science*, 34(4), 707-739.
- Sashkin, M., Rosenbach, W.E., Deal, T.E., Peterson, K.D. (1992) Assessing transformational leadership and its impact", in Clark, K.E., Clark, M.B., Campbell, D.P. (Eds), *Impact of leadership*, Center for Creative Leadership, Greensboro, NC, pp.131-48
- Sashkin, M and W.E. Rosenbach (1998) *Visionary leadership theory: A current overview model, measures, and research* (Working Paper 9-114). Washington DC: GWU.
- Application, and Performance of Cross-Functional New Product Development Teams " *Decision Sciences* 34(4): 707-739.
- Schilling, M.A., & Hill, C.W.L. (1998) Managing the New Product Development Process: Strategic Imperative, *Academy of Management Executive*, 12 (3), 67–81.
- Schmitt, B (1999) *Experiential Marketing: How to Get Customers to SENSE, FEEL, THINK, ACT and RELATE to your Company and Brands*, THE FREE PRESS, New York, NY USA
- Schmidt, J. B., M. M. Montoya-Weiss, et al. (2001) New Product Development Decision-Making Effectiveness_ Comparing Individuals, Face-To-Face Teams, and Virtual Teams, *Decision Sciences* 32(4): 575-601
- Schneewind, K. A., and Graf, J. (1998). *Der 16-Persönlichkeits-Faktoren-Test, revidierte Fassung* (16 PF-R). Verlag Hans Huber.
- Schnell, E., and Hammer, A. (1997). Integrating the FIRO-B with the MBTI: Relationships, case examples, and interpretation strategies. In C. Fitzgerald & L. Kirby (Eds), *Developing leaders* (pp. 439–464). Palo Alto, CA: Davies-Black.
- Schön, D. (1983) *The Reflective Practitioner* Basic Books, New York
- Schramm, W. (1954). *How communication works*. In W. Schramm (Ed.), *The process and effects of mass communication*. Urbana, IL: University of Illinois Press
- Schriesheim, J.F. (1980) The social context of leader-subordinate relations: An investigation of the effects of group cohesiveness, *Journal of Applied Psychology*, 65 (1980), pp. 183–194
- Schuerger, J.M. and Watterson, D.G. (1998) *Occupational Interpretation of the 16PF Questionnaire*. Cleveland, OH: Watterson and Associates
- Schutz, W (1958) *FIRO: A three dimensional theory of interpersonal behaviour*. New York,: Holt, Rinehart and Winston

- Schutz, W. (1978) FIRO: A three-dimensional theory of interpersonal behaviour, Holt, Rinehart and Winston, New York
- Schutz, W. (1992). Beyond FIRO-B—Three New Theory Derived Measures—Element B: Behavior, Element F: Feelings, Element S: Self. *Psychological Reports*, June, 70, 915-937.
- Schutz, W. (1994). *The Human Element: Productivity, Self-Esteem and the Bottom Line*. San Francisco, CA : Jossey-Bass.
- Schutz, W. (2009) *Element B:Behavior*, The Schutz Company, Business Consultants, Inc
- Scollon, R. and Scollon, SW. (2001) 'Discourse and intercultural communication' In Schiffrin, D. Tannen, D. and Hamilton, E. (eds) Wiley Online Library, pp537-547
- Scott, M. D. and Nussbaum, J. F. (1981) Student perceptions of instructor communication behaviors and their relationship to student evaluation, *Communication Education*, 30(1), 44-53
- Seale, C. (Ed.). (2004) *Researching society and culture*, Sage
- Searle, J. (1969). *Speech acts: An essay in the philosophy of language*. Cambridge: Cambridge University Press.
- Seibert, S. E., Kraimer, M. L., and Liden, R. C. (2001). A social capital theory of career success. *Academy of Management Journal*, 44(2), 219-237.
- Seidel, V. P. (2007) Concept Shifting and the Radical Product Development Process, *Journal of Product Innovation Management*, 24: 523-533.
- Seidman, I. (1998) *Interview as qualitative research*, New York, Teacher's College Press
- Sen, A. and Vinze, A. S. (1997) Understanding the Complexity of the Model Formulation Process: A Protocol Analysis Approach*, *Decision Sciences*, 28(2), 443-473
- Sethi, R (2000) Superordinate Identity in Cross-Functional Product Development Teams: Its Effect on New Product Performance and Its Antecedents, *Journal of the Academy of Marketing Science*, 28 (Summer), 330-44.
- Shah, J. and Hazelrigg, H. (1996, April). Research opportunities in engineering design. In *NSF Strategic Planning Workshop National Science Foundation, USA*
- Shah, J.J., Finger, S., Lu, S., Leifer, L.C., Cruz-Neira, Wright, P., Cagan, J. and Vandenbrande, J (2004) ED2030: strategic plan for engineering design, Final Report- NSF Workshop on Engineering Design in 2030, March 26-29, Cold Canyon, AZ 2004
- Shamir, B., House, R. J., and Arthur, M. B. (1993). The motivational effects of charismatic leadership: A self-concept based theory. *Organization science*, 4(4), 577-594.
- Shamir, B., Arthur, M. B., and House, R. J. (1994). The rhetoric of charismatic leadership: A theoretical extension, a case study, and implications for research. *The Leadership Quarterly*, 5, 25-42
- Shannon, C.E. and Weaver, W. (1949) *The Mathematical Theory of Communication*. University of Illinois Press, Urbana
- Shaw, K. (2005) Getting leaders involved in communication strategy: Breaking down the barriers to effective leadership communication, *Strategic Communication Management*, 9, pp14-17

- Shaw, M., and Penrod, W. (1962). Does more information available to a group always improve group performance? *Sociometry*, 25, 37-390.
- Shenhar, A. J. (2004) Strategic Project Leadership® Toward a strategic approach to project management, *R&D Management*, 34(5), 569-578
- Silverman, D (2001) *Interpreting Qualitative Data: Methods for analysing Talk, Text and Interaction*, (2nd Eds.), SAGE London
- Silverthorne, C., and Wang, T. H. (2001) Situational leadership style as a predictor of success and productivity among Taiwanese business organizations, *The Journal of Psychology*, 135(4), 399-412.
- Simon, H.A (1969) *The Sciences of the Artificial*. Cambridge, Mass, MIT Press
- Simon, H.A (1991) *The Sciences of the Artificial*. (2nd eds,) Cambridge, Mass, MIT Press
- Singh, S. (1989) Personality characteristics, work values, and life styles of fast-and slow-progressing small-scale industrial entrepreneurs. *The Journal of social psychology*, 129(6), 801-805.
- Singh, S. and Kaur, R. (2001) A comparative study of the personality characteristics, motives, and work values of the autocratic and democratic executives, *Journal of the Indian Academy of Applied Psychology*, 27(1-2): 143-9
- Sirias, D., Karp, H. B., and Brotherton, T. (2007) Comparing the levels of individualism/collectivism between baby boomers and generation X: Implications for teamwork, *Management Research News*, 30(10), 749-761
- Sivadas, E. and Dwyer, F. (2000) An Examination of Organizational Factors Influencing New Product Success in Internal and Alliance based processes, *Journal of Marketing*, 64, 31-49.
- Skapinker, M. (2002) *The Change Agenda*. CIPD: London
- Smith, Preston G., and Donald G. Reinertsen, (1991) *Developing Products in Half the Time*, Van Nostrand Reinhold (1991).
- Snaverly, W and McNeill, J (2008) Communicator Style and Social Style: Testing a Theoretical Interface, *Journal of Leadership and Organizational Studies*, 14: pp.219-232
- Somekh and Lewin, (2011)(ed.) *Theory and Methods in Social Research*, Sage, London UK
- Song M and Parry M (1997), A Cross-National Comparative Study of New Product Development Processes: Japan and the United States, *Journal of Marketing*, 16 (2), April 1997, 1-18.
- Sorenson, R. L. and Savage, G. T. (1989). Signaling participation through relational communication: A test of the Leader Interpersonal Influence Model. *Group and Organization Studies*, 14, 325-354
- Sosik, J.J., Kahai, S.S. and Avolio, B.J. (1998) Transformational leadership and dimensions of creativity: Motivating idea generation in computer-mediated groups, *Creativity Research Journal*, 11, 111-121
- Souder, W.E. (1981) Disharmony between R&D and Marketing, *Industrial Marketing Management*, 10, 67-73

- Saunders, M. N., Saunders, M., Lewis, P., & Thornhill, A. (2011) *Research methods for business students (5th eds)*. Pearson Education India.
- Sparrowe, R. T. (2005) Authentic leadership and the narrative self. *The Leadership Quarterly*, 16(3), 419-439.
- Spence, R., Owens, M., and Goodyer, I. (2012) Item response theory and validity of the NEO-FFI in adolescents, *Personality and individual differences*, 53(6), 801-807.
- Spangler, W. D., & House, R. J. (1991) Presidential effectiveness and the leadership motive profile, *Journal of Personality and Social Psychology*, 60(3), 439
- Spitzberg, B. H. (1983) Communication competence as knowledge, skill, and impression. *Communication Education*, 32(3), 323-329
- Strauss, A. and Corbin, J. (1998) *Basics of Qualitative Research: Grounded Theory Procedures and Technique* (2nd Edition) Sage, Newbury Park, London
- Steiner, C (2002) The technicity paradigm and scientism in qualitative research, *The Qualitative Report*, Retrived 1 February 2013 from <http://www.nova.edu/ssss/QR/QR7-2/steiner.html>.
- Sternglanz, R. W. and Depaulo, B. M. (2004) READING NONVERBAL CUES TO EMOTIONS: THE ADVANTAGES AND LIABILITIES OF RELATIONSHIP CLOSENESS, *Journal of Nonverbal Behavior*, 28 (4) Winter, Science+Behavior Media, Inc.
- Stewart, J. and D'Angelo, G. (1993) *Together: Communicating Interpersonally*, (2nd ed.), p.22. McGraw-Hill, (Reading, MA: Addison-Wesley, published 1980)
- Stohl, C. (1984, May). *Quality circles and the quality of communication*. Paper presented at the Speech Communication Association Convention, Chicago, IL.
- Stogdill (1948) Personal Factors Associated with Leadership- A Survey of the Literature, *The Journal of Psychology: Interdisciplinary and Applied*, Vol.25, Issue 1
- Stogdill, R (1974) *Handbook of Leadership*, Free Press, New York, NY, USA
- Straker, D. (2008) *Changing Minds in detail*, Syque Publishing, Crowthorne UK
- Strang, K. D. (2007) Examining effective technology project leadership traits and behaviors, *Computers in Human Behavior* 23(1): 424-462
- Streufer, S., and Swezey, R. W. (1986). *Complexity, managers, and organizations*, Academic Press.
- SUZUKI, Tanyanuparb ANANTANA Takao ENKAWA Sadami, New Product Development Efficiency and Firm's Financial Performance: Perspective of Technology Trajectories in Japanese Manufacturing, pp766-774
- SYMPHER, H. E. (1980) Illusory correlation in communication research, *Human Communication Research*, 7(1), 83-87
- Taj, A., Abdolvahabi, Z., Naghavi, V., Rahmati, H. and Naini, S. (2010) The relationship between the coach's transformational and transactional leadership styles, *World Applied Sciences Journal*, 10(1), 9-18
- Takeuchi, H., and Nonaka, I. (1986) The new new product development game, *Harvard Business Review* 64(1), 137-146

Tannenbaum, R and Schmidt, W (1958) "How to Choose a Leadership Pattern" Harvard bus. Rev., March-April 1958, 36 (2)

Taylor, S. and Bogdan, R. (1984) *Introduction to research methods*, New York: Wiley

Theodorson G. A. and Theodorson A. G. (1969) *Modern Dictionary of Sociology*, New York, T.Y. Crowell Co.

Thompson, H.L. (2000) FIRO element B(TM) and psychological type, *Bulletin of Psychological Type*, 23(2), 18–22.

Thompson, N (2003) *Communication and Language: A Handbook of Theory and Practice*, PALGRAVE MACMILLAN, London UK

Thompson, N (2011) *Effective Communication, A guide for the people Professions* (2nd ed.), PALGRAVE MACMILLAN, London UK

Thoresen, C.E. and Mahoney, M.J. (1974) *Behavioral Self-control*, Holt, Rinehard, and Winston, New York, NY

Topalian, A(ed.)(1990), *Developing a Corporate Approach* (in June 1984), in Oakley M(ed.) *Design Management; A Handbook of Issues and Methods*, Basil Blackwell, Oxford, UK

Topalian, A. (2002) Promoting Design Leadership through Skills Development Programs, *Design Management Journal*, 13(3): 10-18.

Topalian, A. (2010) Living Briefs to Turn desired futures into reality, *Design Management Journal*: 73-79.

Towler, A. J. (2003). Effects of charismatic influence training on attitudes, behavior, and performance, *Personnel Psychology*, 56(2), 363–381

Trenholm, S. (1999) *Thinking through communication: An introduction to the study of human communication*. Boston, MA: Allyn & Bacon.

Turner, J.R., and Müller, R., (2005). The project manager's leadership style as a success factor on projects: a literature review. *Project Management Journal* 36, 49–61.

Turner, J. R. and Müller, R. (2006) *Choosing Appropriate Project Managers: Matching their leadership style to the type of project*. Project Management Institute, Newton Square; USA

Turner, J.R., Müller, R., (2010) Leadership competency profiles of successful project managers, *International Journal of Project Management*, Vol 28, Issue 5, July, pp.437-448.

Turner, R (2000): *Design and Business: Who Calls the Shots?* Design Management Journal. Fall

Turner, R (2007) *Leadership Success: Does Personality matter?*, The California Psychologist, September/ October

Turner, R (2013) "Design Leadership: Securing the Strategic Value of Design", Gower

Turner, R., and Topalian, A.: *Core responsibilities of design leaders in commercially demanding environments*. 2002, Inaugural presentation at the Design Leadership Forum

- Ulrich, K. and Eppinger, S. (2008) *Product and Design Development* (4thed.), McGrawHill, New York, NY USA
- Ulrich, K. and Eppinger, S. (2012) *Product and Design Development* (5thed.), McGrawHill, New York, NY USA
- Urban, G., J. Hauser. (1993) *Design and Marketing of New Products*, Prentice Hall, Englewood Cliffs, NJ.
- Upton N. and Yates, I. (2001) Putting design research to work, In Culley S. Et al. (eds) International Conference on Engineering Design (ICED'01). ImechE, Glasgow
- Valencia, J. P. (Aug 2005) Experience and the Brand. London UK, London Business School: 1-22.
- VALiD An approach to value delivery that integrates stakeholder judgment into the design process. UK and US VALiD. VALiD Defining Organizational Values. UK and US: 1-2.
- VALiD Understanding Value to Improve Programming. UK and US, VALiD.
- Van Dierendonck, D., and Nuijten, I. (2011) The servant leadership survey: Development and validation of a multidimensional measure, *Journal of Business and Psychology*, 26(3), 249-267
- Van Eeden, R., Cilliers, F., and Van Deventer, V. (2008) Leadership styles and associated personality traits: Support for the conceptualisation of transactional and transformational leadership. *South African Journal of Psychology*, 38(2), 253-267.
- Van Patter, GK (2003): NextDesign Leadership Institute. <http://www.nextd.org>
- Vecchio, R. P. (1987). Situational leadership theory: An examination of a prescriptive theory. *Journal of Applied Psychology*, 72, 444-451.
- Veryzer, R. W. (2005) The Roles of Marketing and Industrial Design in discontinuous new product development, *Journal of Product Innovation Management*, 22: 22-41.
- Von Hippel, E. (2005) *Democratizing innovation*, MIT press, Cambridge
- von Krogh, G. and Roos, J. Eds, (1996) *Managing Knowledge: Perspectives on Cooperation and Competition*, Sage Publications Ltd, London
- Von Stamm, B. (2008) *Managing innovation design and Creativity* (2nded.), John Wiley & Sons Ltd., West Sussex, UK
- Voss, C. and L. Zomerdijk (2007) "Innovation in Experiential Services – An Empirical View". In: DTI (ed). *Innovation in Services*. . London: DTI. 97-134
- Vroom and Jago, (2007) The role of the situation in leadership, *American Psychologist*, Vol 62(1), Jan 2007, 17-24
- Waldman DA, Ramirez CG, House RJ, Puranam P (2001) Does leadership matter? CEO leadership attributes and profitability under conditions of perceived environmental uncertainty, *Academy of Management Journal*, 44:134-43

- Walker, D (ed.)(1990),Mangers and designers: two tribes at war? in Oakley M(ed.) Design Management; A Handbook of Issues and Methods, Basil Blackwell, Oxford, UK
- Walsh, V. and Roy,R. (1985) The designer as gatekeeper in manufacturing industry, *Design Studies* 6, 127
- Walter, V. (2000) *16PF Personal Career Development Profile Technical and Interpretive Manual*. Champaign, IL: Institute for Personality and Ability Testing.
- Walumbwa, F. O., Avolio, B. J., Gardner, W. L., Wernsing, T. S., and Peterson, S. J. (2008) Authentic Leadership: Development and Validation of a Theory-Based Measure†, *Journal of management*, 34(1), 89-126
- Wang, E., Chou, H. W. and Jiang, J. (2005) The impacts of charismatic leadership style on team cohesiveness and overall performance during ERP implementation, *International Journal of Project Management*, 23(3), 173-180
- Watkins J.W.N. (1952) Ideal types and historical explanation, *British Journal for the Philosophy of Science*, 3/9:22-43.
- Watterson, D.G. (2002) *The 16PF Leadership Coaching Report Manual*. Champaign IL: Institute for Personality and Ability Testing.
- Webb, E.J., Campbell, D.T., Schwartz, R.D. and Sechrest, L. (1966) *Unobtrusive measures*, Chicago: Rand McNally
- Weber, M. (1947) *The Theory of Social and Economic Organisation*, (Trans A.R. Henderson and T. Parsons) New York: Oxford University Press
- Weick, K. E. (1995) *Sensemaking in organizations* (Vol. 3) Sage
- Wiemann, J. M. (1977), Explication and test of a model of communicative competence, *Human Communication Research*, 3(3), 195-213
- Willemain, T.R. (1995) Model formulation: what experts think about and when, *Operations Research*, 43, pp. 916–932
- Wisker, G. (2008) *The postgraduate research handbook: succeed with you MA, Mphil, and PhD*, Palgrave Macmilan
- Wylant, (2008) Design Thinking and the Experience of Innovation, *Design Issue* Vol24 No2 Spring
- Yeasmin, S. and Rahman, K. F. (2012) Triangulation’research method as the tool of social science research, *Bup Journal*, 1(1), 154-163
- Yukl, G. (1998) *Leadership in organizations* (4th ed.) Englewood Cliffs, NJ: Prentice-Hal
- Yukl, G. (1999) An evaluation of conceptual weaknesses in transformational and charismatic leadership theories, *Leadership Quarterly*, 10, 286-306
- Yukl, G. A. (2006) *Leadership in organizations* (6th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Yukl, G., and Van Fleet, D. D. (1992) Theory and research on leadership in organizations. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (Vol. 3, pp. 147–197). Palo Alto, CA: Consulting Psychologists Press

Yun, S., J. Cox, and Sims Jr. (2006) The forgotten follower: a contingency model of leadership and follower self-leadership, *Journal of Managerial Psychology* 21(4): 374-388

Zaccaro, S.J. (2004) Leadership in C. Peterson & M.E.P. Seligman (Eds.), *Character strengths and virtues* (pp.413-428), Oxford, England, and Washington, DC: Oxford University Press and American Psychological Association

Zaccaro, S. J. (2007) Trait-based perspectives of leadership, *American Psychologist*, 62(1), 6.

Zaccaro, S. J., and Banks, D. J. (2001). Leadership, vision, and organizational effectiveness. In S. J. Zaccaro & R. J. Klimoski (Eds.), *The nature of organizational leadership* (pp. 181-218). San Francisco: Jossey-Bass

Zaccaro, S. J., Kemp, C., & Bader, P. (2004) *Leader traits and attributes* In J. Antonakis, A. T. Cianciolo, and R. J. Sternberg (Eds.), *The nature of leadership* (pp. 101–124). Thousand Oaks, CA: Sage.

Zaccaro, S.J. and Klimoski, R. (2001) (Eds.), *The nature of organizational leadership: understanding the performance imperatives confronting today's leaders*, Jossey-Bass, San Francisco, pp. 3–41

Zaccaro, S. J., Rittman, A. L., and Marks, M. A. (2002) Team leadership, *The Leadership Quarterly*, 12(4), 451-483.

Zaleznik A (2004 January) Managers and Leaders: are they different? (Best of 1977) *Harvard Business Review* 74-81

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Appendix A: Leadership Dimension Questionnaire (LDQ)

Design leadership and communication

The questionnaire is design to explore a designer’s leadership competency and communicating styles. The information gathered from this questionnaire will be used for academic purpose only. All responses will be strictly confidential. This survey will take 10~15 minutes. Thank you for your time and consideration.

A. Elements of the Leadership Dimensions Questionnaire

The purpose of using “leadership dimension questionnaire” is to explore an individual designer’s leadership competencies. This will identify components of leadership during the early stages of new product or project developments. Please rate the importance of your leadership capability (3: high, 2: medium, 1: Low) during the early stages of new project or product development.

Because there is no such thing as a "correct" capability of leadership, none of the following items has a right or wrong answer. Please do not spend too much time on the items. Let your first inclination be your guide. Try to answer as honestly as possible.

Competences	3:High	2:Medium	1:Low
1. Critical Analysis and Judgement : A critical faculty that probes the facts, identifies advantages and disadvantages and discerns the shortcomings of ideas and proposals			
2. Strategic Perspective: Sees the wider issues and broader implications. Explores a wide range of relationships, balances short- and long-term considerations.			
3. Vision and Imagination: Imaginative and innovative in all aspects of one’s work. Establishes sound priorities for future work. A clear vision of the future direction of the organisation to meet business imperatives.			
4. Resource Management: Plans ahead, organises all resources and coordinates them efficiently and effectively.			
5. Self-awareness: Awareness of one’s own feelings and the capability to recognise and manage these in a way that one feels that one can control.			
6. Emotional resilience: Performs consistently in a range of situations under pressure and adapts behaviour appropriately.			
7. Intuitiveness: Arrives at clear decisions and drives their implementation			

when presented with incomplete or ambiguous information using both rational and “emotional” or intuitive perceptions of key issues and implications.			
8. Interpersonal sensitivity: A willingness to keep open one’s thoughts on possible solutions to problems and to actively listen to, and reflect on, the reactions and inputs from others.			
9. Influence: Persuades others to change views based on an understanding of their position and a recognition of the need to listen to this perspective and provide a rationale for change.			
10. Engaging Communication: A lively and enthusiastic communicator, engages others and wins support. Clearly communicates instructions and vision to staff.			
Competences	3:High	2:Medium	1:Low
11. Empowering: Encourages a critical faculty and a broad perspective, and encourages the challenging of existing practices, assumptions and policies.			
12. Developing: Believes others have potential to take on ever more-demanding tasks and roles, and encourages them to do so.			
13. Motivation: Has the drive and energy to achieve clear results and make an impact and, also, to balance short- and long-term goals with a capability to pursue demanding goals in the face of rejection or questioning.			
14. Achieving: Willing to make decisions involving significant risk to gain a business advantage. Decisions are based on core business issues and their likely impact on success.			

15. Conscientiousness: Displays clear commitment to a course of action in the face of challenge and to match “words and deeds” in encouraging others to support the chosen direction. Shows personal commitment to pursuing an ethical solution to a difficult business issue or problem.			

Appendix B: Communicator Style Measure (CSM)

B. Instructions: You have impressions of yourself as a communicator. The impressions include your sense of the way you communicate. This measure focuses upon your sensitivity to the way you communicate, or what is called your communicator style. The questions are not designed to look at what is communicated; rather, they explore the way you communicate. Because there is no such thing as a "correct" style of communication, none of the following items has a right or wrong answer. Please do not spend too much time on the items. Let your first inclination be your guide. Try to answer as honestly as possible. Some of the items will be similarly stated. But each item has a slightly different orientation. Try to answer each question as though it were the only question being asked. Finally, answer each item as it relates to a general face to-face communication situation—namely, the type of communicator you are most often.

Please rate the scale if you agree with below statement.

- 1) strong agreement with the statement
- 2) agreement with the statement
- 3) neither agreement nor disagreement with the statement
- 4) disagreement with the statement
- 5) strong disagreement with the statement

	1	2	3	4	5
1. I am comfortable with all varieties of people.					
2. I laugh easily.					
3. I readily express admiration for others.					
4. What I say usually leaves an impression on people.					
5. I leave people with an impression of me which they definitely tend to remember.					
5. I leave people with an impression of me which they definitely tend to remember.					
6. To be friendly, I habitually acknowledge verbally other's contributions.					
7. I am a very good communicator.					
8. I have some nervous mannerisms in my speech.					
9. I am a very relaxed communicator.					

10. When I disagree with somebody I am very quick to challenge them.	1	2	3	4	5
Please rate the scale if you agree with below statement.					
1) strong agreement with the statement, 2) agreement with the statement 3) neither agreement nor disagreement with the statement, 4) disagreement with the statement, 5) strong disagreement with the statement					
11. I can always repeat back to a person exactly what was meant.					
12. The sound of my voice is very easy to recognize.					
13. I am a very precise communicator.					
14. I leave a definite impression on people.					
15. The rhythm or flow of my speech is sometimes affected by my nervousness.					
16. Under pressure I come across as a relaxed speaker.	1	2	3	4	5
17. My eyes reflect exactly what I am feeling when I communicate.					
18. I dramatize a lot.					
19. I always find it very easy to communicate on a one-to-one basis with strangers.					
20. Usually, I deliberately react in such a way that people know that I am listening to them.					
21. Usually I do not tell people much about myself until I get to know them well.					
22. Regularly I tell jokes, anecdotes and stories when I communicate.					
23. I tend to constantly gesture when I communicate.					
24. I am an extremely open communicator.					
25. I am vocally a loud communicator.					
26. In a small group of strangers I am a very good communicator.					
27. In arguments I insist upon very precise definitions.					
28. In most social situations I generally speak very frequently.					
29. I find it extremely easy to maintain a conversation with a member of the opposite sex whom I have just met.					
30. I like to be strictly accurate when I communicate.					
31. Because I have a loud voice I can easily break into it conversation.					
32. Often I physically and vocally act out what I want to communicate.					
33. I have an assertive voice.					
34. I readily reveal personal things about myself.					

35. I am dominant in social situations.					
36. I am very argumentative.					
37. Once I get wound up in a heated discussion I have a hard time stopping myself.					
38. I am always an extremely friendly communicator.					
39. I really like to listen very carefully to people.					
40. Very often I insist that other people document or present some kind of proof for what they are arguing.					
41. I try to take charge of things when I am with people.					
42. It bothers me to drop an argument that is not resolved.					
43. In most social situations I tend to come on strong.					
44. I am very expressive nonverbally in social situations.					
45. The way I say something usually leaves an impression on people					
46. Whenever I communicate, I tend to be very encouraging to people.					
48. I very frequently verbally exaggerate to emphasize a point.					
49. I am an extremely attentive communicator.					
50. As a rule, I openly express my feelings and emotions.					
51. Out of a random group of six people, including myself, I would probably have a better communicator style than other people (please rate 1 as one person and 5 as 5 people)					

- Name:
- How many years have you worked? :
- What were your jobs? (if you had more than one, please specify)
- Your Institution :
- Your Major and degree:

Thank you very much for your time and consideration to complete this questionnaire. Your response is very important and highly valuable to this research.

Appendix C: Semi-structured interview for the pilot study

- 1) Could you tell me your name, major and study backgrounds? If you worked before, how many year did you work and what was your role and activity?
- 2) Why did you apply for this programme?
- 3) What did you expect from this programme?
- 4) Which programme did you like more working with a larger group or a smaller group?
- 5) How did you involve into the team work?
- 6) How do you communicate? (ex. Talk, example, listen)
 - a. Did you try to lead or follow within the group?
- 7) Whose ideas were selected for your team?
- 8) How was to work with your teammates from different country and major?
 - a. Was it difficult or easy and why?
- 9) Did you like your teams and are you satisfied with team working?
- 10) Was the brief difficult to understand?
 - a. Project Focus: Context of NPD and experience of customer- where did you spend more time?
- 11) How was your motivation from day 1 to day 4?
- 12) What were the idea selection criteria?
- 13) Was the project successful? Why?
- 14) How do you feel about this programme?
 - a. Could you come up with a word that represents your experiences about the workshop?
- 15) What did you learn?
- 16) What do you wish to learn more based on this programme?
- 17) Any suggestions for the programme?

Appendix D: Semi-structured interview for the main study

Initial Interview Protocol

A. Leadership

- 1) Could you tell me about how you became to be at a design leading position?
- 2) What do you think are your capabilities of leading design during the meeting?
- 3) What do you value most about yourself?
- 4) Could you describe how you build a rapport or good relationship with non-designers?
- 5) How much do you involve in a new project at the early stage?
- 6) Does your position require managing resources such as project budget, allocating design task and etc.?

B. Communication

- 7) Could you describe the procedure of presenting and communicating about design to non-designers?
- 8) What kinds of methods, tools or communication channels do you prefer using to deliver design successfully?
- 9) During the early stage meetings, at which point would you notice they do not follow your lead about design?
- 10) What is typically the cause? Can you give an example?
- 11) How do you lead non-designer to agree with your direction when you encounter a disagreement or conflict with non-designers?
- 12) When you write or re-write the design brief, what are the most considering and important factors (Initiative)?
- 13) Since which point of career in your life time, did you feel comfortable with delivering design to non-designers?

C. Extra (open-end)

14) Is there anything else you would like to add to today's conversation? What question do you have for me?

- **Revised Interview Protocol**

- 1) Could you tell me about how you became to be at a design leading position?
- 2) How much do you prepare to know other team members prior to an initial meeting?
- 3) How often do you meet during FFE? What is the meeting mood like?
- 4) What role do you play in a new project at the early stage? (Involvement, problem solving or integrating all aspects of project)
- 5) Could you describe the procedure of presenting and communicating design idea to non-designers? (How do you start an initial meeting? what do you present? Using verbal or non-verbal communication, tool?)
- 6) What about your preference of delivering design such as methods, tools or communication channels?
- 7) What is your preference for leading style in the meeting such as active, passive attitudes or listening to others more?
- 8) Could you describe how you get along (building a rapport or good relationship) with non-designers? (informal meeting, activity or joke)
- 9) When you write or re-write the design brief, what are the most considering and important factors (judgement)? (What do you clarify ? such as customer experience, brand)
- 10) During the early stage meetings, at which point would you notice they do not follow your lead about design?
- 11) What is typically the cause? Can you give an example?

- 12) How do you lead non-designer to agree with your direction when you encounter a disagreement or conflict with non-designers?
- 13) Since which point of career in your life time, did you feel comfortable with delivering design to non-designers?
- 14) How do you measure or know the success of NPD? (Brand awareness, turn over, transforming the organisation as design led?)
- 15) What do you value most about yourself if you need to lead a project meeting? (strategic perspective, engaging communication, empowering, showing commitment, delegating tasks, achievement, emotional support for others, self-motivation)
- 16) Does your position require managing resources such as project budget, allocating design task and etc.? (Also do you get sufficient support from the senior management?)
- 17) Is there anything else you would like to add regarding design leadership or design communication? What question do you have for me?

Appendix E: The main study analysis- coding

Level 1 Coding-Open coding (n=617)

1. Strategy decision base model
1-1 diagnostic tool
1-2 reason for diagnostic tool
1-3 Using tool for success
1-4 Designer background but standing objectively
1-5 all cause comes with results
1-6 Make a model based on experience
1-7 finding business objectives (being strategic)
1-8 not just turn over, more than turn over
1-9 Shifting culture by Design
2. Strategy decision base framework
2-1 Decision for Business growth-Change, Manufacture, Brand awareness
2-2 using stage gate to show reality,
2-3 (2) matching business objectives

3. Client doesn't know Design
3-1 confusion between design & innovation
3-2 don't know design usage
3-3 come to you for design support
3-4 No ability, strategy, experience
3-5 Running a business as they want
3-6 Client have done D within their resources
3-7 Respect what clients have done D
3-8 Selling your thought, not visual
3-9 (8) Clients are different (aim, style, objective)
3-10 (9) not look for new, prefer existing solutions

3-11 (10) rare to find Business people for new trial
3-12 D and MKT literate become clients
3-13 No D literate not becoming clients
3-14 No D term speaking, MKT term
3-15 Practical people, speak straight forward needed
3-16 Most companies think incrementally
3-17 They don't know they can do better
3-18 They don't know how to Fail, difficulty with uncertainty
3-19 they do not know what they really want
3-20 Client likes to talk more
3-21 everyone is unique
3-22 their logic is perfect to them
3-23 every project is risky for SME
3-24 Large Corp moves slow
3-25 SME moves fast

4. Background
4-1 3D Study
4-2 2D study
4-3 No Design study
5. Early NPD experience
5-1 NPD 3-6 years- working experience

6. Consulting experience
6-1 Founding member
6-2 Various project experience
6-3 International project experience
6-4 work with corporation clients
6-5 more than 10yrs consulting

6-6 own consultancy more than 5~7 yrs
6-7 own consultancy more than 10 yrs
7. Corporation and company experience
7-1 international corporation experience
7-2 As a board of director
7-3 worked in SME (3D)
7-4 worked in SME (2D)

8. Wrong habit of clients
8-1 Jumping to a solution too early
9. FFE-Finding a meaningful challenge (problem)
9-1 if too easy, not real challenge
9-2 must understand problem well, not just know
10. Group working
10-1 Client- existing company with many teams
10-1-1 know what they want
10-1-2 more serious they are, more success NPD opportunity
10-2 Silent design
10-3 Difficult client- having strong self-ego
10-3-1 believe in their idea only
10-4 lost or had bad experience of design
10-4-1 only reducing cost
10-5 only 80% of earning benefit, if they are lucky
10-5-1 no growth by managing only
10-6 good company trains their staff
11. Communicator Style
11-1 Good mood, being funny, humour, being intelligent

12. Must listen, understand, stand on them (two ears one mouth)
12-1 coming from outside
12-2 must work in a short time
12-3 acting as a detective
12-4 Fine tuning in conversation
12-5 Not using Design terms
12-6 Willing to explain again and again
12-7 Alternative way to show reality
12-8 Understanding B, MKT, D Objectives

13-1 Meet non-D people every day, know each other
14. CPD, DBA-help, train D companies
15. Leadership styles
15-1 Dictatorship-seems generally successful
15-2 Demonic L- Steve Jobs, Dyson, Brandson
15-3 Dictators must have right morals
15-4 Dictators are decision makers
15-5 flexible leadership
15-6 Father figure
15-7 Apologize if you need to
15-8 Being consistent
15-9 Leading team as family
16. Traditional style leadership- company
16-1 group decision
16-2 Design needs to deploy
16-3 Design Leader must active, creative, political in companies
17 D deploy into the board decision making
17-1 DL's responsibility to put D into decision making

17-2 making decision at right time by DL

18. Different types of relationship In& Out

18-1 Inside of Business-negative

18-2 Prove yourself by receiving awards

18-3 Follow you if you have D awards

18-4 Fight for your position

18-5 Lucky, if your CEO supports D

18-6 CEO without D supports

18-7 Even CEO ignores Design

19. Inside of Business-Positive

19-1 responsible given with influence

19-2 More involvement in decision making

19-3 Influence beyond the role of Design

19-3-1 Influence wider than your responsibility

19-4 Ex) MKT head-more influence

19-5 DL must articulate all of B

20. Elements of Design Leader (DL)

20-1 DL is L of D&B sectors

20-2 L of Design in any sectors

20-3 L in a D company is a business L of D sector

20-4 having Confidence

20-5 Confidence from understanding their business

21. DL has Verb & Noun

21-1 Def. what I am

21-2 what I do-> justifying my role

21-3 DL offers alternative suggestions

21-4 using 'what if' question

21-5 ex-what if-> make client imagine
21-6 success moves to next project
22. Leadership can be developed
22-1 Then train leadership for company
22-2 Through education development for L within business
22-3 Hard to be a true DL but can be true DL as external consultant
22-4 As external developing internal house team
23. DL: Persistent, Endurance
23-1 Projecting design, more business responsibility
23-2 Ex) build values of design in company
23-3 difference between DL and CEO of D
23-4 DL's task, increasing D value in company
23-5 Mentoring Design through process
23-6 DL: being creative, flexible, reflective
23-7 Strong self-awareness
23-7-1 Self-awareness for better communication with non D
23-8 ability of decision making
23-9-1 decision making between objective & subjective
23-10 (->9) Know utilising Design process
23-11 Brave enough to stop if necessary
23-12 help to broaden client view of design
23-13 Educating client about design
23-14 (13) Basic skill is essential
23-14 (14) Basic skill lead communication
23-15 (14) Knowing commercial value
23-16 (15) asking probing questions
23-17 (16) have your own speciality (branding yourself)
23-18 (17) understanding other's lives

23-19 (18) Being objective
23-20 (19) Fast analysis of difference
23-21 Understanding others, their thinking, styles, culture
23-22 educate design to non-designers
24. Becoming DL, knowing you have more influence to B
24-1 Must have company experience- experiencing of having bad days
24-2 make client have confidence
24-3 unrecognised by job title, no job title
24-4 (3) lean thinking
24-5 After NPD experience
24-6 Confidence by personal credibility
24-6-1 Showing past examples for credibility
24-7 Run own agency
24-8 Not pushing your style

25. Comfortable of delivering design
25-1 After 5yrs of company, begin to being confidence
25-2 Late 30s (15+ yrs), knowing using all D competencies as well
25-3 after 10 yrs-having confidence
25-4 Maturity needs after full NPD process experience
25-5 Need confidence
25-6 lack of self-awareness
25-7 between 15-20 years' experience
25-8 Building trust, empathy first then design delivery
25-8-1 Then discussing other issues-money, people...
25-9 Design competency, information need
25-10 Empathy align with culture
26. FFE Process

26-1 Acting as a GP, solicitor, detective
26-2 Using white board (showing visuals)
26-3 Listen to find meaningful challenge
26-4 ask probing questions
26-5 show past examples to find opportunity for clients
26-6 Facilitating a workshop
26-6-1 workshop for future
26-7 Identifying real opportunity
26-8 Possible solution for a meaningful challenge
26-9 Building a model, persona at the end of the process
26-10 Not new but essential process, elements
26-11 Always modify, not rigid attitude
26-12 Importance of listening
26-13 It is a group work, not your own solo work
26-14 Writing a proposal as sum-up of process
26-15 Decision making is Key (FFE)
26-16 Looking context holistically
26-17 (16) decision making by facts
26-18 (16) where are we on process
26-19 (17) Find what clients want
26-20 (18) Identifying client's business structure, context
26-21 (19) Identifying decision making people
26-22 (20) What they (decision makers) want
26-23 (21) Seeing a big picture
26-24 (22) balance between intuition and analysis
26-25 (23) rigorous research
26-26 (24) Synthesising
26-27 (25) Strong story telling

26-28 (26) take B people out to see reality, customer behaviours
26-29 (27) let them experience comparing between their view and reality
26-30 (28) ex) field study, taking them out and see
26-31 (29) Profitability
26-32 vision with realistic data
26-31 Vision must be achievable
26-32 Checking resources
27. Personality
27-1 Always being curious
27-2 Look all evidences
27-3 Interested in people' business
27-4 Enthusiastic for work
27-5 Flexible attitude
27-6 Reflecting their view
27-7 Having credibility
27-8 No credibility, no next stage
28. Leadership training
28-1 never had trainings but learned by doing, experience
28-2 MBA by company sponsoring
28-3 I thought non-D people
28-4 Motivation led teaching listening
28-5 MBA gives extra skills for corp. but not for SME
29. Innovation +Design are predictable process-Creative process
29-1 good Design through the ugly machine
30. Learning Business language
30-1 Learned from B experience
30-2 Learned from communication master
30-3 or Learned from Designer, communication master, DL

30-4 (30-3)DL is not a master of D but highly interactive
30-5 Importance of Listening
30-6 Learning by experience
30-7 Can't learn Business at art school
30-8 Business context within NPD is essential
30-9 How B measure NPD success
30-10 (11) tell them I prepared to build a rapport
30-11 (9) interest leading what to learn
30-12 Self taught
30-13 Learn from peers
30-14 Speaking B give an opportunity
30-15 Combinations of empathy and speaking their language
31. B language (lang) has dialects
31-1 B lang means all lang but D
32. Career path decision- learning communication
32-1 Decide either forward or stay
32-2 Becoming DL is a personal decision
33. Motivation
33-1 Enjoy D process, act of designing
33-2 Design is a process
33-3 Silent design is unappropriated
33-4 Doing good design is insufficient, need to build D culture within company

35. Prep meeting- depending on clients
35-1 they want us to understand fast
35-2 Always research information, trend, B context
35-3 Fast learning needs
35-4 Learning by doing (meeting)

35-5 desk research
35-5-1 desk research of competitor
35-6 desk research support building a rapport
35-7 telling them I prepared
35-8 be careful of predetermined view
35-9 find issues at the meeting
35-10 finding business objectives
35-11 after meeting, finding their pitfalls
35-12 Meeting for positive
36. Recommendation for becoming DL
36-1 Against humanity in company these days
36-2 Know your context for battles
36-3 Designers are mostly visual designers, want to remain
36-4 Observe, research, how NPD& Brand works
36-5 Trend& internal quality development
36-6 Inner quality development
36-7 Responsibility for ongoing implication
36-8 Understanding clients first is key to win a pitch
36-9 Design (D) school tends to remain their own inner circles.
36-10 D school focuses on aesthetics
36-11 Understanding, speaking, learning Business language
36-12 Working, meeting with B, non D people
36-13 Understanding trend, different disciplines
36-14 Design competency, mastering design
36-15 Prefer leading than styling
36-16 Develop D think from user's perspective
36-17 How people think, react, live, work, prefer...
36-18 Visual memory
36-19 Design for people

36-20 No right way
36-21 Executing, making decision experience
37. UG sets up start-up without essential B skills
37-1 writing B plan at their last semester
37-2 B plan for yourself, SWOT, B value learning needs
37-3 learning Brand yourself
37-4 No convincing skills at Uni
37-5 No managing skills at Uni
37-6 D school doesn't care of B skills since students get jobs
37-7 Study Business at D school
37-8 Learning NPD influence to marketing
37-9 various life, work, discipline experience need
37-10 learning how to manage people
37-11 Business language
37-12 Being in business environment
37-13 observation skills-context, people, thinking skill
37-14 leading people' experiences
37-15 Rotating to have leading experience, group works
38. Designers- insufficient using diagnostic tools
38-1 designers believe their visual pieces will work enough, self-centred
38-2 (38-1) is not true
39. choosing your working sector
39-1 motivation- how much you want to change the company
39-2 Still business don't know Design fully
39-3 NO empathy in B, thus Design understanding is tough
39-3-1 Choose your battle field carefully
39-4 It is disappointment
39-5 Design is not different from others
39-6 DL can be in MKT or sales, anywhere

39-7 Designers felt as victims, but we are in the same boat with others
39-8 (7) personal interest is key for DL
40. we (designer) are not different
41. Consultancy works as if clients don't need us anymore
42. B(client) interests in growth only (FFE)
42-1 Designer or DL must link all for B growth
42-2 Faster income

43 NPD
43-1 NPD is product, service, experience
43-2 Trend (is essential)
44. Communicating Design (FFE)
44-1 Leading by showing example
44-2 Ask probing questions
44-3 Selling your thoughts
44-4 explaining a generating idea process
44-5 Sketching to understand
44-6 Understand Business language, if you want to be a DL

45. Attitude
45-1 Enthusiastic at FFE
45-2 Respecting SME owners
45-3 Don't tell what to do
45-4 telling ruins relationship
45-5 changing client's perspective by providing better solutions
45-6 you are selling your thoughts, not your visuals
45-7 DL helping others
45-7-1 not leading by your preference

45-8 Challenge for right idea
45-9 Love your job (design)
45-10 (9) Reflectively flexible (attitude)
45-11 (9) Brave enough to stop if necessary
45-12 (10) Strength: naivety and curious
45-13 (11) curious, interest
45-14 Interest in Non D' life, business, environment
45-15 Interest in their business growth
45-16 Interest in building rapport, empathy
45-17 helping, taking care
45-18 I am a straight forward
45-19 Natural to explain clearly
45-20 Motivator
45-21 working with different people
45-22 part of group work
45-23 low ego, not pushing my style, not centre of attention
45-24 Sensitive, reflective
45-25 Keep learning
46. how to listen (Learning B lang)
46-1 2ears 1mouth
46-2 listen inside and out, soft, hard facts
46-3 Let client speaks freely and more
47. Meeting Prep
47-1 Observe client's from customer's view
47-2 Knowing too much (stereotype) leads misjudgement
47-3 (2) observe, challenge from commercial view
48. Key is how you make a relationship with B people (FFE)
49. Becoming Design Associate
49-1 suggested by others

49-2 I approached to the Design Council

50. Design (definition)
50-1 has gravitas (Brand) (-> FFE)
50-2 Where NPD fits into Brand (FFE)
50-3 Finding opportunities for NPD
50-4 nuance of design
50-5 More than creative process (visual)
50-6 (4) Commercial innovation
50-7 (5) Right price, beneficial for good use (Design)
50-8 (6) Problem Solving
50-9 (7) Designer's intuition is important
50-10 (8) (D is) mix between intangible and tangible
50-11 (9) (D is) a process
50-12 (10) D NPD is new or update
50-13 (11) a differentiator
50-14 (12) investing design for growth
50-15 Design has not been change, its names have been changed
50-16 Make it simple
50-17 Design always aims forward, growth, not repeating
50-18 Sensory is more important
50-19 dealing with more soft issues
50-20 Breaking boundary
50-21 Has a visual language
51. Designers
51-1 external consultant is a sales person
51-2 make clients fell you are the best person to work with
51-3 importance of people dynamics (must consider)

51-1-1 need money to survive
51-1-2 Money helps grow your business
51-4 No after hour work for your creativity
51-5 designer needs to remain refreshing
51-6 If you love your work, people will recognise yours
51-7 NPD is a group work
51-8 Must make client happy
51-9 Many skills to learn (for designers)
51- 10 (9) Knowing consumers by research
51-10-1 Depending on client
51-11 Don't dive into solutions
51-12 Strength- visualisation of intangibles
51-13 must have various experiences
51-14 are versatile
51-15 there are too many designers
51-16 iterative, fast, curious
51-17, intellectual, funny, humorous
52 Design typology
52-1 create only
52-2 only solving
52-3 blend of creativity and solving
53 NPD
53-1 outcome
53-2 output
53-3 difference between outcome and output
53-4 designer mostly focus on output
53-5 should be trained at Uni
53-6 Understanding influence of decision
53-7 ex. Outcome

53-8 considering impact of business
53-9 NPD is people thing
53-10 (9) understanding NPD structure
53-11 (10) right team is vital
53-11-1 observing is key (to understand client)
55 All NPD depends on clients

Level 2 Code –Merging similar codes from Level 1 code (n=396)

1-1 diagnostic tool
1-6 Make a model based on experience
1-9 Shifting culture by Design
2-3 (2) matching business objectives
3-1 confusion between design & innovation
3-2 don't know design usage
3-9 (8) Clients are different (aim, style, objective)
3-14 No D term speaking, MKT term
3-17 They don't know they can do better
3-18 They don't know how to Fail, difficulty with uncertainty
3-19 they do not know what they really want
3-20 Client likes to talk more
3-22 their logic is perfect to them
10-2 Silent design
10-3 Difficult client- having strong self-ego
10-3-1 believe in their idea only
10-4 lost or had bad experience of design
10-4-1 only reducing cost
12-3 acting as a detective
12-4 Fine tuning in conversation
12-5 Not using Design terms

12-6 Willing to explain again and again
12-7 Alternative way to show reality
12-8 Understanding B, MKT, D Objectives
15-5 flexible leadership
15-8 Being consistent
20-4 having Confidence
20-5 Confidence from understanding their business
21-1 Def. what I am
21-2 what I do-> justifying my role
21-3 DL offers alternative suggestions
21-4 using 'what if' question
21-5 ex-what if-> make client imagine
21-6 success moves to next project
23. DL: Persistent, Endurance
23-1 Projecting design, more business responsibility
23-2 Ex) build values of design in company
23-4 DL's task, increasing D value in company
23-5 Mentoring Design through process
23-6 DL: being creative, flexible, reflective
23-7 Strong self-awareness
23-7-1 Self-awareness for better communication with non D
23-8 ability of decision making
23-9-1 decision making between objective & subjective
23-10 (->9) Know utilising Design process
23-12 help to broaden client view of design
23-14 (14) Basic skill lead communication
23-15 (14) Knowing commercial value
23-16 (15) asking probing questions
23-17 (16) have your own speciality (branding yourself)

23-18 (17) understanding other's lives
23-19 (18) Being objective
23-20 (19) Fast analysis of difference
23-21 Understanding others, their thinking, styles, culture
24-4 (3) lean thinking
24-5 After NPD experience
24-6 Confidence by personal credibility
24-8 Not pushing your style
25-4 Maturity needs after full NPD process experience
26-1 Acting as a GP, solicitor, detective
26-7 Identifying real opportunity
26-10 Not new but essential process, elements
26-13 It is a group work, not your own solo work
26-17 (16) decision making by facts
26-18 (16) where are we on process
26-19 (17) Find what clients want
26-20 (18) Identifying client's business structure, context
26-23 (21) Seeing a big picture
26-25 (23) rigorous research
26-26 (24) Synthesising
26-27 (25) Strong story telling
26-28 (26) take B people out to see reality, customer behaviours
26-29 (27) let them experience comparing between their view and reality
26-32 vision with realistic data
26-31 Vision must be achievable
26-32 Checking resources
27-3 Interested in people' business
27-4 Enthusiastic for work

27-5 Flexible attitude
27-6 Reflecting their view
27-8 No credibility, no next stage
30-5 Importance of Listening
30-6 Learning by experience
30-10 (11) tell them I prepared to build a rapport
30-12 Self taught
32. Career path decision- learning communication
32-1 Decide either forward or stay
32-2 Becoming DL is a personal decision
35-6 desk research support building a rapport
35-12 Meeting for positive
36-6 Inner quality development
36-7 Responsibility for ongoing implication
36-8 Understanding clients first is key to win a pitch
36-12 Working, meeting with B, non D people
36-14 Design competency, mastering design
36-17 How people think, react, live, work, prefer...
36-19 Design for people
36-21 Executing, making decision experience
37-1 writing B plan at their last semester
37-5 No managing skills at Uni
37-9 various life, work, discipline experience need
39. choosing your working sector
39-3 NO empathy in B, thus Design understanding is tough
40. we (designer) are not different
44-1 Leading by showing example
44-2 Ask probing questions
44-3 Selling your thoughts

44-4 explaining a generating idea process
44-5 Sketching to understand
44-6 Understand Business language, if you want to be a DL
45-1 Enthusiastic at FFE
45-2 Respecting SME owners
45-3 Don't tell what to do
45-4 telling ruins relationship
45-5 changing client's perspective by providing better solutions
45-6 you are selling your thoughts, not your visuals
45-7 DL helping others
45-7-1 not leading by your preference
45-8 Challenge for right idea
45-9 Love your job (design)
45-10 (9) Reflectively flexible (attitude)
45-11 (9) Brave enough to stop if necessary
45-12 (10) Strength: naivety and curious
45-13 (11) curious, interest
45-14 Interest in Non D' life, business, environment
45-15 Interest in their business growth
45-16 Interest in building rapport, empathy
45-17 helping, taking care
45-20 Motivator
45-21 working with different people
45-22 part of group work
45-23 low ego, not pushing my style, not centre of attention
45-24 Sensitive, reflective
45-25 Keep learning
46-1 2ears 1mouth
46-2 listen inside and out, soft, hard facts

47-1 Observe client's from customer's view
50-10 (8) (D is) mix between intangible and tangible
50-11 (9) (D is) a process
50-12 (10) D NPD is new or update
50-13 (11) a differentiator
50-14 (12) investing design for growth
50-17 Design always aims forward, growth, not repeating
50-18 Sensory is more important
50-19 dealing with more soft issues
50-21 Has a visual language
51-7 NPD is a group work
51-12 Strength- visualisation of intangibles
51-13 must have various experiences
53-4 designer mostly focus on output
53-6 Understanding influence of decision
53-9 NPD is people thing
53-10 (9) understanding NPD structure
53-11 (10) right team is vital
53-11-1 observing is key (to understand client)

Level 3 code (Categorising, 155 codes) -> Level4 Code (28 Topical codes)

Level 4	Level 3
Group work	3-9 (8) Clients are different (aim, style, objective)
	26-13 It is a group work, not your own solo work
	40. we (designer) are not different
	45-21 working with different people
	45-22 part of group work
	53-9 NPD is people thing
Right team	53-9 NPD is people thing
	53-11 (10) right team is vital

Strong Self-awareness	21-1 Def. what I am
	23-7 Strong self-awareness
	23-7-1 Self-awareness for better communication with non D
	30-12 Self taught
	32. Career path decision- learning communication
	32-1 Decide either forward or stay
	32-2 Becoming DL is a personal decision
	39. choosing your working sector
	45-9 Love your job (design)
	53-4 designer mostly focus on output
Interest in people, business growth	23-2 Ex) build values of design in company
	23-4 DL's task, increasing D value in company
	23-12 help to broaden client view of design
	27-3 Interested in people' business
	27-4 Enthusiastic for work
	35-12 Meeting for positive
	36-19 Design for people
	39-3 NO empathy in B, thus Design understanding is tough
	45-1 Enthusiastic at FFE
	45-12 (10) Strength: naivety and curious
	45-13 (11) curious, interest
	45-15 Interest in their business growth
	45-20 Motivator

Low Ego	3-14 No D term speaking, MKT term
	26-13 It is a group work, not your own solo work
	45-7-1 not leading by your preference
	45-23 low ego, not pushing my style, not centre of attention

Helping people	3-17 They don't know they can do better
	23-5 Mentoring Design through process
	45-7 DL helping others
	45-17 helping, taking care

Humble, Not telling what to do	45-2 Respecting SME owners
	24-8 Not pushing your style
	45-3 Don't tell what to do
	45-4 telling ruins relationship

Understanding people	3-20 Client likes to talk more
	3-22 their logic is perfect to them
	36-6 Inner quality development
	36-8 Understanding clients first is key to win a pitch
	36-17 How people think, react, live, work, prefer...
	36-19 Design for people
	37-5 No managing skills at University
	45-14 Interest in Non D' life, business, environment
	45-16 Interest in building rapport, empathy
	50-19 dealing with more soft issues
53-11-1 observing is key (to understand client)	

Having Confidence	20-4 having Confidence
	20-5 Confidence from understanding their business
	21-6 success moves to next project
	24-6 Confidence by personal credibility
	27-8 No credibility, no next stage

Self-Taught, Keep learning	30-12 Self taught
	45-25 Keep learning

Diagnostic tool	1-1 diagnostic tool
	21-2 what I do-> justifying my role
	26-7 Identifying real opportunity
	45-8 Challenge for right idea
	45-11 (9) Brave enough to stop if necessary

Lean, critical, creative, visionary thinking	21-2 what I do-> justifying my role
	24-4 (3) lean thinking
	44-1 Leading by showing example
	50-12 (10) D NPD is new or update
	50-13 (11) a differentiator
	50-17 Design always aims forward, growth, not repeating

Selling your thought	12-7 Alternative way to show reality
	21-3 DL offers alternative suggestions
	26-7 Identifying real opportunity
	44-3 Selling your thoughts
	45-6 you are selling your thoughts, not your visuals

Fast Analysis for vision, resource, aim	21-2 what I do-> justifying my role
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	23-20 (19) Fast analysis of difference
	26-7 Identifying real opportunity
	26-32 vision with realistic data

Being objective. Consistent	15-8 Being consistent
	23. DL: Persistent, Endurance
	23-19 (18) Being objective
	26-17 (16) decision making by facts

Research based	26-25 (23) rigorous research
	26-26 (24) Synthesising
	35-6 desk research support building a rapport

Balance btw intangible & tangible	23-8 ability of decision making
	23-9-1 decision making between objective & subjective
	50-10 (8) (D is) mix between intangible and tangible

Design Competency	1-9 Shifting culture by Design
	3-1 confusion between design & innovation
	3-2 don't know design usage
	3-18 They don't know how to Fail, difficulty with uncertainty
	23-1 Projecting design, more business responsibility
	23-12 help to broaden client view of design
	23-14 (14) Basic skill lead communication
	23-17 (16) have your own speciality (branding yourself)
	26-10 Not new but essential process, elements
	36-14 Design competency, mastering design
	44-5 Sketching to understand
	50-10 (8) (D is) mix between intangible and tangible
	50-12 (10) D NPD is new or update
	50-13 (11) a differentiator
50-21 Has a visual language	
51-12 Strength- visualisation of intangibles	

Design is a process	1-9 Shifting culture by Design
	12-7 Alternative way to show reality
	23-10 (->9) Know utilising Design process
	26-23 (21) Seeing a big picture
	26-32 Checking resources
	44-4 explaining a generating idea process

	50-11 (9) (D is) a process
Flexible (style, leadership)	15-5 flexible leadership
	27-5 Flexible attitude
	27-6 Reflecting their view
	36-17 How people think, react, live, work, prefer...
	45-10 (9) Reflectively flexible (attitude)
	45-24 Sensitive, reflective
Sensitive, influence of decision	10-4 lost or had bad experience of design
	15-5 flexible leadership
	26-27 (25) Strong story telling
	36-7 Responsibility for ongoing implication
	36-21 Executing, making decision experience
	45-24 Sensitive, reflective
	50-18 Sensory is more important
	50-19 dealing with more soft issues
53-6 Understanding influence of decision	

Acting as GP, solicitor & detective	12-3 acting as a detective
	26-18 (16) where are we on process
	26-28 (26) take B people out to see reality, customer behaviours
	26-29 (27) let them experience comparing between their view and reality
	26-31 Vision must be achievable
	26-32 Checking resources
	44-1 Leading by showing example
	45-5 changing client's perspective by providing better solutions

Observing, (being objective) carefully listening	21-2 what I do-> justifying my role
	46-2 listen inside and out, soft, hard facts
	47-1 Observe client's from customer's view
	53-11-1 observing is key (to understand client)

Asking probing questions	21-2 what I do-> justifying my role
	21-4 using 'what if' question
	21-5 ex-what if-> make client imagine
	23-16 (15) asking probing questions
	44-2 Ask probing questions

Not speaking Design terms	3-14 No D term speaking, MKT term
	12-5 Not using Design terms

Fine tuning conversation	12-4 Fine tuning in conversation
	23-15 (14) Knowing commercial value
	26-27 (25) Strong story telling
	30-5 Importance of Listening
	30-10 (11) tell them I prepared to build a rapport
	45-16 Interest in building rapport, empathy
	46-1 2ears 1mouth
	46-2 listen inside and out, soft, hard facts

Explain again and again	12-6 Willing to explain again and again
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Various Experience	1-6 Make a model based on experience
	24-5 After NPD experience
	30-6 Learning by experience
	36-12 Working, meeting with B, non D people
	37-9 various life, work, discipline experience need
	51-13 must have various experiences

Understanding Business language, culture, structure Understanding FFE, NPD	1-6 Make a model based on experience
	2-3 (2) matching business objectives
	3-1 confusion between design & innovation
	3-2 don't know design usage
	10-2 Silent design
	10-3 Difficult client- having strong self-ego
	10-3-1 believe in their idea only
	10-4 lost or had bad experience of design
	10-4-1 only reducing cost
	20-5 Confidence from understanding their business
	23-18 (17) understanding other's lives
	23-21 Understanding others, their thinking, styles, culture
	26-19 (17) Find what clients want
	26-20 (18) Identifying client's business structure, context
	36-8 Understanding clients first is key to win a pitch
	37-1 writing B plan at their last semester
	51-7 NPD is a group work

Principal Level 5 codes and their relationships with Level 4 codes

Group of Level 4 codes (28 codes)	Intermediate theme	Level 5 Key words (7codes)
Group work, right team, low ego, Humble, not telling what to do	1. Low Ego (acknowledging difference, it is a work of people after all).	1, 3, 8 were merged as 1. Empathy (motivation)
Strong self-awareness, having confidence, diagnostic tool, selling your thought, Fast analysis for vision, resource, aim, Research based	2. Independence (analytic and diagnosing process, Self- awareness)	2. Independence
Interest in people, business growth, understanding people, Not speaking design terms, Fine tuning conversation	3. Interest in people & their business success, fine tuning conversation	
Lean, critical, creative and visionary thinking, Design Competency, Design is a process	4. Design competency-mastering design, a critical design thinker with business understanding	3. Design thinking
Self-taught, keep learning, Flexible, Sensitive, influence of decision, Acting as a GP, a solicitor & a detective, Observing, carefully listening, Asking probing questions	5. Carefully listening & analysing.	4. Reflectively flexible (attitude)
	6. Reflectively flexible attitude	5. Active listening (carefully listening, analysing & asking probing questions)
Being objective & Consistent, Balance between intangible and tangible	7. Patient and consistent	6. Patience and consistency
Helping people, Explain again and again	8. Helping others	
Various experiences	9. Various work, life , a full NPD process experiences	7. Epiphany: Experience of various types of work and a full NPD process

Appendix F: Evaluation Interview question

Evaluation Questions for the conceptual model

- 1) From your perspective, do you agree with these elements for design leadership of design leader at the Fuzzy Front End (FFE, Early stages) of New project Development (NPD) ?
- 2) How important do you think “Empathy” (as Motivation) as component elements for the design leadership?
- 3) How important do you think “Active Listening” (as Behavior) as component elements for the design leadership?
- 4) How important do you think “Reflectively flexible” (as Attitude) as component elements for the design leadership?
- 5) How important do you think “Design Thinking” (as Analytic tool) as component elements for the design leadership?
- 6) How important do you think “Clarity” (of NPD issues) as a result from this model at FFE of NPD?
- 7) How important do you think “Challenge” (as what to solve) as a result from this model at FFE of NPD?
- 8) How important do you think “Creativity” (as Design led differentiated value for NPD) as a result from this model at FFE of NPD?
- 9) How important do you think “Confidence” (about Design led NPD) as a result from this model at FFE of NPD?
- 10) Does this model contain all essential elements for the design leadership at FFE of NPD?
- 11) Does this model illustrate the underlying process of design leadership at FFE of NPD?
- 12) Do you see the value of this model which can help designers to realize what they need to become design leaders at FFE of NPD?

Appendix G: Publication

Han, K and Lam, B (2014) Characteristics of design leaders: Ability to communicate Design to Non-designers in NPD, *Proceeding of the 19th DMI: Academic Design Management Conference: Design Management in an Era of Disruption*

Characteristics of Design Leaders: Ability to Communicate Design to Non-designers in NPD

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This study examines the key characteristics of design leaders in the context of the new product development process (NPD), especially during the Fuzzy Front End (FFE) or the early stage of the process. It focuses on how design leaders communicate design to non-designers. Increasingly, design has been acknowledged as a critical factor for NPD success. However, it is often observed that designers have difficulty in communicating design to non-designers. Previous researches and anecdotal evidence since the 1970s indicate that design leaders are effective design communicators. However, the definition and key characteristics of design leaders remain unclear. According to the comparative studies conducted with real-life NPD projects with designers, and in-depth interviews with design leaders in the UK, there are distinct differences between designers and design leaders in terms of attitudes toward non-designers, motivation, and communicating style. This study highlights key characteristics of design leaders, namely sufficient experience of the entire NPD process, a good understanding of design competency, motivation as having interest in people and all key stakeholders of NPD projects, and a reflective and flexible attitude with good active listening skills. The identification of these characteristics could help young designers who wish to become design leaders or to improve design communication and relationships with non-designers.

Keywords: Design Leadership, Communication, FFE, NPD

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Introduction

New Product Development (NPD) is a central business activity (Cooper & Kleinschmidt, 2000). A key challenge of NPD is how to delegate in an unstable environment to reduce the risk of failure either of the project or of the resulting product (Calantone et al., 2003). In particular, Fuzzy Front End (FFE) is the early stage of NPD and is seen as the period to create and activate ideas prior to the first official group meeting where it decides upon a new product idea and whether to develop the idea further (Moenart et al., 1995; Reid & Brentani, 2004). Owing to uncertainty at FFE, many companies fail to have clear product definitions (Khurana & Rosenthal, 1998). According to Brown (2008), the methods and sensibilities of a designer match people's needs, feasibility of technology, and visible business strategy to create customer value and market opportunity. Thus, design has been acknowledged as one of the key elements for business success, and its performance for business success has been evidently reported (Nussbaum, 2005; Bruce & Cooper, 1997; Design Council, 2005; 2008). Employing user-centred and informed design research methods supports the development of products and services from the beginning of the investigation (Mozota, 2003). Design is tailored to the various needs of different NPD. Perks, Cooper and Jones (2005) identified that, within NPD, the designer works as a functional specialist, an interdisciplinary team member and a leader.

Designers often face difficulty in delivering design to non-designers (Beverland & Farrelly, 2011; Montgomery, 2012), and different styles of thinking, working preferences and culture (Walker, 1990; Beverland & Farrelly, 2011) can cause difficult integration. This results in non-designers being in decision-making positions, a concept known as silent design (Gorb, 1987), and lack of resources constantly causes organisations to use design inappropriately. Consequently, designers do not gain sufficient confidence in business circles (Eckersley, 2003; Friedman, 2004). These issues of miscommunicating and misunderstanding design are anecdotally evident and academically reported. Researchers and practitioners have recommended several tools for improving communication: delivering design values by applying the Balanced Score Card (Borja de Mozota, 2006), using Persona to describe the lifestyle of the product's target market (Beverland & Farrelly, 2011), and employing a product strategy map and a visual mood board (Dumas & Fentem, 1996). Indeed, several

researchers and practitioners have repeatedly and commonly recommended that designers learn business language (Von Stamm, 2008; Fraser, 2006; Topalian, 2002).

However, some designers, competent in business language and communicating design, have been recognised as design leaders since 1970 (Topalian, 2002). Numerous researchers have identified that a principal activity of a designer is to envision a business objective turning into reality or to create an intangible experience. Design leaders are particularly good at envisioning the business directions (Roald, 2006; Turner, 2013). People in effective design communication rather than in roles of authority have been considered as having distinguished design leadership qualities (Nelson, 2003). However, it is difficult to find a designer who wishes to become an NPD leader and has business experience because designers usually tend to remain traditional style designers (Perks, Cooper & Jones, 2005). NextDesign Leadership Institute (2003) advocates a changing paradigm in design where designers need to be prepared to take on larger strategic responsibilities. Thus, Van Patter (2003) has warned that the design community will end up as 'a field of labourers'. Therefore, this paper investigates design leaders regarding:

- 1) How do they become design leaders?
- 2) What types of leadership do design leaders have?
- 3) How do they communicate design to non-designers at FFE of NPD?

Design Leadership

Design leadership has been a buzzword for the last decade. Turner (2013) defines design leadership as a strategic value that makes a business plan and strategy tangible and visible, while Lockwood (2009) defines design leadership and design strategy as outputs of effective design thinking and design management. Similarly, other researchers and practitioners echo this definition at the strategic level (Turner & Topalian, 2002; Mozota, 2003). The Design Council in the UK has been promoting design to non-designers, and recently, the Council introduced a design leadership program that emphasises the importance of design for business success (Design Council, 2013).

Previous studies have explored design performance leadership as a global business resource (Lockwood, 2009), expectations of design managers for design teams (Lee & Cassidy, 2006), and skills of design leaders in the specific industry (Miller & Moultrie, 2013). These studies found that a design leader at a design-led company needs to be a visionary, a practice resource manager, and demonstrate strong design skills. Design team members expect a design manager to be emotional, empathic, participative, representative, and charismatic. Thus, design leadership is identified as envisioning a future for design that includes managerial activities. This is in accordance with Kotter (2001), who mentioned that leadership and management are complementary because one function cannot survive without the other in the current economy. Similarly, project leadership requires both abilities. The abilities required are communicating project vision, creating the environment and direction, strong interpersonal skills and ability to engage the management culture's support, and integrative problem solving skills to apply them in multiple areas in related projects internally and externally (Cook & Tate, 2006; Pennypacker & Cabanis-Brew, 2003).

From the perspective of leadership studies, leadership does not have one universal definition (Avery, 2004; Bass, 1990; Stogdill, 1948). There are around 1,500 different definitions. However, a commonly agreed leadership trait via meta-analysis was self-esteem (Judge et al., 2002). Owing to different social, economic, and political environments, the definition has varied widely (see Table 1). Trait theories and classical theories, such as the 'great man' theory, focus on personal qualities (Carlyne, 1907; Gill, 2006; Kirkpatrick & Locke, 1991), and suggest that the major events in world history were led by members of the upper class who inherited extraordinary leadership abilities. However, the style of leadership depends on the situation. In the 1950s and 60s, scientific leadership, action-centred leadership in the UK and Blake and Mouton's (1964) Managerial Grid were popular approaches generating better productivity and efficiency in the manufacturing economy. Due to economic paradigm shifts, various focuses on different types of leadership were researched, such as servant leadership, a business leadership concept developed by Greenleaf in the 1970s, which puts the leader as responsible to the followers (House & Mitchell, 1974). Developing leadership believes a leader will emerge as the needs of society, a group of people, or a certain situation arises (Bass, 1954). Transformation leadership is to meet a goal (Avolio, Bass & Jung, 1999). Transactional leadership is a traditional approach of rewarding followers based on their skills and abilities to handle tasks. Fiedler's contingency theory in the 1960s and situational leadership by Hersey and Blanchard (1993) are adjustable styles to meet the situation that leaders face. In other words, leaders change their styles in different situations.

In recent years, research has focused on a new style of leadership theory, such as visionary leadership (Sashkin & Rosenbach, 1998), charismatic leadership that has the complete trust of its followers (Bass, 1985; Ciulla, 1999), organic leadership, which mixes different types of leadership for better outcomes for an organisation (Avery, 2004), and authentic leadership (Avolio et al., 2009), which aims to be more ethical and encouraging in sharing information needed to make decisions while accepting followers' input. The organic leadership style is developed from transformation leadership. Avery (2004) indicated that the leadership studies tend to identify the importance of sharing value and vision and emotional support and to deal with multi-culture in globalisation.

Although each definition has shortcomings, they support each other. Recently, Dulewicz and Higgs (2003) proposed the competency leadership approach, which encompasses most theories to analyse skills and styles of leaders. They mention that effective leaders have competencies including traits, intellect, emotions, behaviour as problem-solving and management skills, adaptable attitude contingently in different situations, and charisma and vision from transactional and transformational leadership styles.

Theory	Key Idea	Researchers
Trait	Effective leaders exhibit common traits, leaders are born.	Carlyne (1907); Kirkpatrick and Locke (1991)
	Emotional intelligence has a stronger influence than intellect.	Goleman et al. (2002)
Behaviour or style	Effective leaders adopt styles and behaviour and leadership skills can be developed.	Blake and Mouton (1978); Tannenbaum and Schmidt (1958)
Contingency or emergence	Different situations need different types of leaders or the needed leaders emerge from situations.	Fiedler (1967); Greenleaf (1970); Hersey and Blanchard (1982)
Transformation & transactional	Leaders influence and develop followers and rewards. Most accepted theory in leadership with influence to develop related theories such as visionary, charismatic and organic.	Bass (1990); Bass & Avolio (1994)
Competency	Effective leaders have certain competencies such as traits, behaviour, emotions, and intellect. Different styles are better in different situations.	Dulewicz and Higgs (2003)

Table 1 Different types of leadership

While there are many different definitions of leadership caused by different perspectives, it is generally conceived as one person's action in leading a group of people to achieve a common goal (Avery, 2004; Gill, 2006; Vroom & Jago, 2007). Several researchers have indicated that effective communication is an essential component of effective management and leadership (Awamleh & Gardner, 1999; Flauto, 1999; Kirkpatrick & Locke, 1996; Snively & McNeill, 2008). Pavitt (1999) and Madlock (2008) recommended that effective communication between leaders and subordinates is highly related to work satisfaction.

However, Vries, Bakker-Pieper and Oostenveld (2009) stated that although the core element of leadership is interpersonal communication, few researches have attempted to operationalise leaders' communication styles in their daily transactions with subordinates. By reviewing literature of leadership studies, the leadership process can be identified as: a leader applies leadership knowledge and skills to carry out a process, and uses their traits to influence the actions of others (Jago, 1982). Some design leadership research has focused on the definitions of design leaders in organisations and the positive business impact made by design. Thus, this research focused on exploring the characteristics of design leaders who can competently communicate design at the early stage of new project development.

Methodology

Although most leadership researches have been conducted using positivist and quantitative paradigms, due to the nature of this research, which explores the characteristics of design leaders at FFE of NPD, it is more appropriate to employ a qualitative methodology. Qualitative methods allow a closer relationship between the researcher and the participants (Denzin & Lincoln, 1994), thus providing extensive and in-depth descriptions of a phenomenon (Geertz, 1973). Klenke (2008) proposed that qualitative research in the leadership study captures 'the subjective experience of leaders and followers, its slippery nature, and the local context in which leadership takes place'. To understand the characteristics of design leaders, this research included two studies designed to compare designers and design leaders.

Study one – Research setting

A live case study with young designers at the early stage of NPD was chosen as the first study. The objectives of the first study were to identify leadership styles of design students and how they communicated design with non-designers at FFE of NPD. The project was to create a concept for a learning centre, called U-Zine, a €12 million project of five hectares in Saint-Étienne, France. The aim of the learning centre is to be an academic, economic, and industrial realm that focuses on collaboration, innovation and teaching, and knowledge transfer. The brief given was to design user-oriented products. The place needs to have accessibility, flexibility, and service for knowledge transfer. Four universities (Brunel University, UK; Politecnico di Milano, Italy; Auburn University, USA; and Ecole des Mines, France) grouped together. There were thirty-two participants, with up to eight years of work experience. There were young designers from mixed disciplines and non-designers with engineering and business backgrounds.

The process of the program was conducted over four days and divided into two parts. For the first two days, all the participants were divided into four groups of eight to ensure that each team had a balanced mix of all disciplines and countries. For the first half of the program, they were given time to generate ideas. Each team had a facilitator, who led and wrote down ideas and concepts. Each team created 100 concepts. Then each team presented their project idea. The idea with the potential for further development was chosen by the facilitators. For the second half of the program, each group was divided into eight groups of four participants, and they developed the chosen concept further. In addition, they were asked to prepare a presentation at the Biennale Internationale Design Saint-Étienne. The project concept was presented to the public and the program participants.

Research Methods

Direct observation and semi-structured interviews were the research methods employed to understand the characteristics of young designers and how they communicated design with non-designers and people from different cultures. Also, all programme participants including design and non-design students were asked to complete two different questionnaires. Adapting quantitative data is not for statistical significance. However, it aimed to provide an in-depth understanding of their leadership and behaviours from multiple perspectives. Understanding the real situation is vital for research initiation. Triangulating different sources of researched data to justify coherently different perspectives can be argued as the validity of the study (Creswell, 2009). Questionnaires from the Leadership Dimension Questionnaires (LDQ) (Dulewicz & Higgs, 2003) and the Communicator Style Measure (CSM) (Norton, 1978) were adapted. LDQ from the competency school of leadership study (Dulewicz & Higgs, 2003) encompasses all the previous leadership studies of traits and behaviours because appropriate competency profiles may apply in different situations. After reviewing the literature on leadership studies, Dulewicz and Higgs (2003) identified fifteen leadership competencies, which were grouped into three main competence types: intellectual (IQ), managerial (MQ) and emotional (EQ). They also identified three leadership styles: goal-oriented style for low complexity projects, involving style for medium complexity projects, and engaging style for high complexity projects. The programme participants were asked to read the descriptions of the fifteen competencies carefully then rate the leadership competencies (Table 2) by assigning 3 for high, 2 for medium and 1 for low (Muller & Turner, 2007).

Group	Competency	Goal	Involving	Engaging
Intellectual (IQ)	1. Critical analysis and judgment	High	Medium	Medium
	2. Vision and Imagination	High	Medium	Medium
	3. Strategic Perspective	High	Medium	Medium
Managerial (MQ)	4. Engaging Communication	Medium	Medium	High
	5. Managing Resources	High	Medium	Low
	6. Empowering	Low	Medium	High
	7. Developing	Medium	Medium	High
	8. Achieving	High	Medium	Medium
Emotional (EQ)	9. Self-awareness	Medium	High	High
	10. Emotional Resilience	High	High	High
	11. Motivation	High	High	High
	12. Sensitivity	Medium	Medium	High
	13. Influence	Medium	High	High
	14. Intuitiveness	Medium	Medium	High
	15. Conscientiousness	High	High	High

Table 2 Fifteen leadership competencies, adapted from Dulewicz and Higgs (2003) and the competence profiles of their three styles of leadership.

Another questionnaire was the Communicator Style Measure (CSM) by Norton (1978), which was employed to compare the differences between design and non-design participants' communication styles. This questionnaire is self-assessed and consists of 51 items, of which 45 are scored using the Likert-type scale. CSM has been validated as well as examined for reliability several times. CSM has been used in analysing a leader's communication style, such as: organisational studies (Snaveley & McNeill, 2008; Sorenson & Savage, 1989); how humour functions in manager and subordinate relationships (Martin & Gayle, 1999); communicator style and managerial performance in complex organisations (Bednar, 1982); and occupational therapy students as a cross-sectional study (Brown et al., 2011). All data from the different research methods for the first study were triangulated for the validity claim of this study.

Findings from Young Designers

Analysis of qualitative and quantitative data was conducted concurrently. First, the results of the self-rating questionnaire about leadership competency were not statistically significant. Overall, design students rated themselves higher scores.

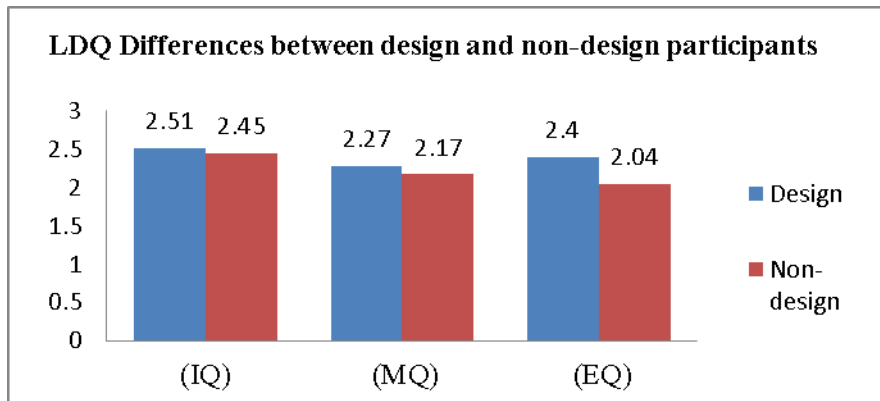


Chart 3 LDQ results of the participants

Non-design participants rated intellectual competency as more important than other competencies. Due to their lack of working experience, they humbly admitted that managing and distributing resources for NPD was difficult. This result illustrated that design students have slightly higher confidence in their leadership competencies than non-design students. The differential characteristics of both parties also referred to the result of the Communication Style Measure. Both design and non-design students shared a preference for communicating style, however, the ranks of preferred communicating styles were different. The argumentative style of communication was ranked first by the design students, followed by the friendly style. In contrast, the first rank of communicating style preferences from non-design students was friendly and the second preference was attentive. These findings echoed with the observation results.

Design participants' favoured communicator styles				Non-design participants' favoured communicator styles			
First Preferences	Count	Second Preferences	Count	First Preferences	Count	Second Preferences	Count
Argumentative	4	Friendly	6	Friendly	5	Attentive	3
Friendly	4	Relaxed	4	Dramatic	2	Expressive	2
Attentive	3	Alternative	2	Open	1	Open	2
Dramatic	3	Attentive	2	Precise	1	Friendly	1
Expressive	3	Dramatic	2			Impression	1
Dominant	2	Expressive	2			Leaving	1
Precise	2	Impression	2			Relaxed	1
Friendly	1	Leaving	2				
Open	1	Precise	2				
		Argumentative	1				

Table 4. Times of each category rated by the participants

As reflected in the design participants' communication preference of argumentative style, their communication difficulties in sharing and developing project concepts were often observed. This is echoed with the results from LDQ (Table 5), where the design participants rated low in communication and self-

awareness emotionally. In addition, the non-design participants also had difficulty in communicating their ideas and influencing the design participants.

Leadership competences	Design participants	Non-design participants
Highly rated	1. Influence (2.75), EQ	1. Strategic perspective (2.7), IQ, and Developing (2.7), MQ
	2. Strategic perspective (2.67), IQ	2. Critical analysis and judgement (2.45), IQ, and Achieving (2.45), MQ
	3. Critical analysis and judgement (2.58), IQ	
Lowly rated	1. Self-awareness (2.04), EQ	1. Empowering (1.5), MQ
	2. Engaging communication (2.08), MQ	2. Influence (1.75), EQ
	3. Resource management (2.21), MQ	3. Emotional resilience (1.95), EQ

Table 5. Highly and lowly rated leadership competences

During the observations and interviews, the designers seemed to be egocentric and jumped to solutions quickly. First of all, each team had a hard time understanding the project brief, as not only designers but also young non-designers showed similar traits. Most participants did not actively seek what to do for this project. This was caused not only by the language barrier but also by cultural and national differences and disciplines. Therefore, they experienced friction in communicating ideas. Most design participants said that this multicultural group work was ‘a nightmare’. Designers tended to talk more about their ideas and concepts. Some design students on each team faced communication difficulties. The non-designer participants seemed to organise ideas from team members rather than insisting only on their own ideas. Their communication style seemed more attentive. On the other hand, it was observed that a few designer participants who had non-design work experience—such as marketing, insurance, and engineering—tended to have flexible attitudes and communicated better with different cultural and national participants. Most of them were emerging to lead their teams.

Second, most participants had difficulty adjusting to the new working environment. They admitted it was awkward to work with people they do not know well. Also, most participants were aged 25–33 and always worked with the Internet, and the facility provided limited Internet service. In addition, the project concept for each team was not decided based on an individual’s favourite concept in the team. This influenced them to create projects less productively and effectively. However, regardless of the facility or communication barriers and the lack of understanding of the project brief, designer participants were the most effective and productive participants in preparing visual presentations with the pressure of having a time limit.

Third, most designer participants who were studying business and strategy at the postgraduate level showed paradoxical behaviours. They said they knew how to apply strategies and marketing techniques but they did not use these methods to meet the requirements of the project brief. Throughout the multidisciplinary and multicultural group workshop for concept development, design participants commonly admitted that they wished to develop a better way of communicating their ideas to people from different cultures and different nationalities. Also, they realised that working personalities or leadership styles needed to be flexible and changeable. However, most of the students did not know what or how to study to acquire better communication and leadership skills.

One interesting fact was that their attitude and thinking can be influenced by their surroundings or guided environments. Prior to the workshop, the students were asked to put a dot on a map to determine how innovative they perceived their school to be. Four days later, most of the students changed the location of their dots from *less innovative* to *more innovative*. Though the schools had not changed over the four days, the participants’ perspectives had been changed and influenced during this workshop (Figures 1 & 2).

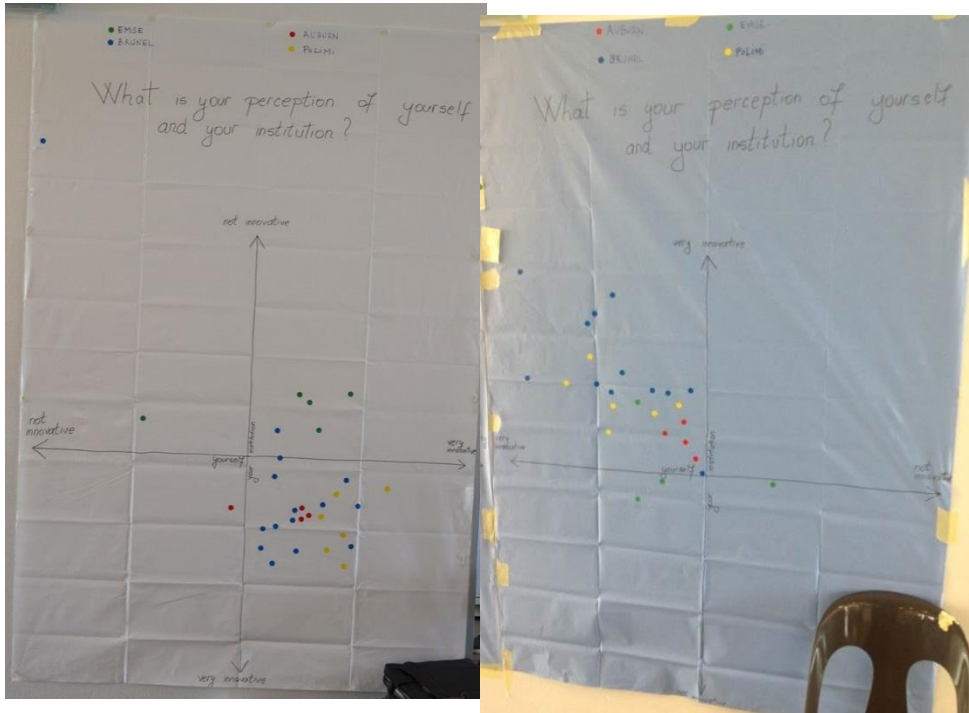


Figure 1 & 2 (Left: 1st day, perceptions of students and their schools; Right: 4th day, changed perceptions of students and their schools. Over the four days, the dots are moved toward more innovative from less innovative.)

Fourth, the actual behaviour and attitudes of participants during the program and thematic analysis of their interview statements were sometimes paradoxical about self-awareness and their abilities in respect of communication and leadership. However, it indicated that young designers have difficulties in communicating design and have deficiencies in leadership abilities. Also, this study indicates that young designers can be easily influenced by given working environments and education.

Study two - Design leaders

The purpose of study two was to explore how design leaders deliver design successfully to non-design members during FFE of NPD. To understand the characteristics of design leaders, semi-structured interviews were used. The interview questions were formulated based on deficiency in leadership and communicating design from the study with young designers and the literature of leadership studies regarding leadership qualities and behaviour at the early stage of NPD. The objectives of the interviews were to identify their motivation and career paths for becoming design leaders, characteristics of design leaders, and how they communicate design to non-designers at the early stage of NPD.

The sample for this was purposive and snowball sampling was used as a non-probability method, which is the selection of a small group of people to represent a certain type of person that meets the selected research criteria (Creswell, 2009; Gray, 2009). Eleven design leaders were identified for this study. The research interviewees were design leaders recognised by the UK Design Council. They were design associates from the Design Leadership Programme. Others were snowball samples who were recognised in the design sector as design leaders, design thinkers, and design strategists in the UK. They have experience of working in both corporations and consultancy. All interviews were face to face but one was conducted via Skype. Most interviews were between forty five to ninety minutes. All were recorded and transcribed.

Qualitative data analysis was supported by the Nonnumerical Unstructured Data: Indexing Searching and Theorising (NUD*IST Vivo or Nvivo 10), a computer software for qualitative research and solutions. Nvivo was used to store and categorise interview transcripts and memos. Coding was created manually first, then

organised through Nvivo. Thus, the interviews were initiated with open coding, then analysed thematically. A huge number of lower order categories of 155 from 617 open coding appeared initially in the coding process. For the fourth trial of clustering, codes were grouped with similar topics or themes into 28 categories. The codes at level 4 began to represent the specific characteristics of design leadership practice at the FFE of NPD. These topical codes were: 1) Group work, 2) Right team, 3) Strong self-awareness, 4) Interest in people and business growth, 5) Low ego, 6) Helping people, 7) Humble, not telling others what to do, 8) Understanding people, 9) Having confidence, 10) Self-taught, keep learning, 11) Diagnostic tool, 12) Lean, critical, creative, visionary thinking, 13) Selling your thought, 14) Fast analysis for vision, resources, aims, 15) Being objective and consistent, 16) Research-based, 17) Balance between intangible and tangible, 18) Design competency, 19) Design is a process, 20) Flexible (Leadership style), 21) Sensitive, influence of decision, 22) Acting as a GP, a solicitor, and a detective, 23) Observing, carefully listening, 24) Asking probing questions, 25) Not speaking in design terms, 26) Fine tuning conversation, 27) Explaining again and again, 28) Various experiences. Yet, these codes had not captured the essential perspective which may conceptualise the leadership of design leaders at FFE of NPD. Thus, another level of abstraction was applied to capture the defining features. This level 5 of coding concentrated on key principles to produce an informed theory of design leadership at the FFE of NPD. These codes were grouped to answer research questions, which were presented in the introduction, 1) leadership characteristics, communication behaviours and processes, and 2) how they became design leader. Level 5 coding produced seven codes, which are: 1) Empathy, 2) Independence, 3) Design competency, 4) Reflective Flexibility, 5) Active listening, 6) Epiphany: Experience of various types of work and a full NPD process, and 7) Patience and consistency. The table below presents how 28 themes emerged into 7 key principal codes. (See Table 6)

Group of Level 4 codes	Level 5 Key Principal codes
1. Group work; right team; low ego; humble, not telling others what to do	1, 3, 7 were merged as 1. Empathy (motivation)
2. Strong self-awareness; having confidence; diagnostic tool; selling your thought; fast analysis for vision, resources, aims; research-based	2. Independence
3. Interest in people and business growth; understanding people; not speaking in design terms; fine tuning conversation	
4. Lean, critical, creative and visionary thinking; design competency, design is a process	3. Design thinking
5. Self-taught, keep learning; flexible; sensitive, influence of decision; acting as a GP, a solicitor and a detective; observing, carefully listening; asking probing questions	4. Reflectively flexible (attitude)
	5. Active listening (carefully listening, analysing and asking probing questions)
6. Being objective and consistent; balance between intangible and tangible	6. Patience and consistency
7. Helping people; explaining again and again	
8. Various experiences	7. Epiphany: Experience of various types of work and a full NPD process

Table 6. 7 themes emerged from 28 categories

During the interview, the interviewees all mentioned that every design leader has different styles and characteristics. However, they have several common characteristics of leadership and similar communicating styles. This resulted in the emergence of common characteristics:

Epiphany, a good grasp of the full NPD process and various discipline experiences: Design leaders learned non-designers' language, information and culture by active listening. They explained that they realised they needed to learn active listening after experiencing the entire NPD process and working either in-house or in an agency, managing and running a company or working in non-design roles. This is reflected by self-leadership (Manz, 1983, 1992; Manz & Neck, 1999). Self-leadership explains how people can influence their own cognition and motivation so that it improves their behaviours (Bandura, 1997). Also, self-leadership indicates that people practise before the actual performance to avoid costly mistakes (Manz, 1992; Manz & Neck, 1999; Thoresen & Mahoney, 1974). Design leaders motivated themselves to learn how to communicate with non-designers. Most design leaders spent a certain amount of time (10–15 years) learning active listening properly.

Several years in small consultancies, reinforcing the wrong view that designers are separate...The problem is that designers only relate to designers, as does anybody...there was one guy who was the corporate vice president of design. He was a very clever guy. He used humour, and he opened my eyes to the notion that designers are not automatically right...From that point, that is when I became more interested in design management...how different people see things (#7)

Empathy and interest in people and their business: It is their motivation in having an interest in people, non-design colleagues or clients and business growth. Design leaders at the FFE of NPD claimed themselves as empathic leaders. To build a rapport, they deliberately do not use design terms to non-designers. Empathy is a central element of emotional intelligence (Salovey & Mayer, 1990, 1997). They acknowledge that NPD is a work with roles for a range of people, and design leaders believe different people need to be gathered together for positive results. Their positive attitude, combined with emotional intelligence, is related to authentic leadership (Avolio et al., 2004).

We just think design is different, but actually, it is not any different (#1).

If you do not build rapport, they are not interested in having you back (#4).

In some ways, that is just about the humans being interested in other humans and basic empathy (#9).

Always try to work with some sympathy and empathy with the people for whom you are designing. Put yourself in their place. Imagine how they feel and it makes you much more sensitive (#10).

Independence and confidence: The early stage of NPD is known as the Fuzzy Front End because all of the information is unclear. Design leaders investigate NPD contexts objectively and holistically. This comes from the maturity of working experience, and it leads them to have self-confidence in leading and communicating their design from the accumulated experiences of the NPD success. Each one-third of the interviewees gained confidence after 10, 15, and 20 years of working experience. This trait is also echoed in leadership studies' literature and published articles.

You need to link all design suggestions with business growth (#2).

I always ask how your business is first. I am not talking about design words at all (#9).

Design competency in the design thinking process: Throughout this research, soft skills were essential at the early stage of NPD. However, this is based on an understanding of the full spectrum of design regarding the role of nouns and verbs and executing competent design abilities. Several interviewees mentioned that they were now more interested in identifying and using design properly for NPD direction than in the actual visualising and doing of the aesthetic part of the design. Sketching and other basic design skills are still important abilities to communicate effectively and efficiently.

You can start changing things. What you are really trying to do is get them to understand how design really works so they can make decisions for themselves, rather than getting me to make decisions for them (#4).

It is still a very unrecognised (design leadership role)... I still have to explain to people what I do. It is not a readily recognised job title. You will not find it in the drop-down box of job titles. It is still very unknown (#6).

Reflectively flexible attitude: To enable design leadership characteristics regarding an empathic attitude, analysing NPD issues and design thinking at the FFE, design leaders strategically are reflective and flexible because every NPD has a different nature, such as a different aim, time, and budget, and involves stakeholders and players (Ulrich & Eppinger, 2012). Some design leaders appeared aggressive, and others had facilitative personalities. However, they were all reflective and flexible. Interestingly, all interviewees opposed egocentric attitudes. A reflective attitude successfully enables one to negotiate within situations of 'uncertainty, instability, uniqueness, and value conflict' (Schon, 1983). Researchers (Fiedler, 1967; Hersey & Blanchard, 1993) have noted that effective leadership depends on how favourable a situation is.

I find I have developed an approach that means I will never speak to a customer, client, or business owner in my language but always speak in their language. So they understand from a business benefit's perspective, not a technical perspective (#8).

Being able to adapt the language for whoever the audience is (#11).

Active listening: 'Two ears, one mouth'. Most of the design leaders learned the importance of listening carefully early in their career. To frame a meaningful challenge rather than responding to the given brief, listening and asking probing questions are vital. The attitude of reflective flexibility is enabled by active listening (Rogers & Farson, 1987). This also underlines the empathic attitude of serving others, which can be explained by the concept of servant leadership (House & Mitchell, 1974; Greenleaf, 1970). Design leaders strongly emphasised listening carefully and asking probing questions to uncover knowledge and information about NPD. FFE is the NPD period, where exploring, identifying NPD issues and deciding to either develop the project or not are required (Moenart et al., 1995; Reid & Brentani, 2004). Some learned this from various people or training, such as from a barrister, a board of directors, or empathic training courses. This is how most of them learned not only business language and knowledge, but also other disciplinary information related to NPDs. Some went on to get their MBA through the support of a corporation. However, the fundamentals of speaking business language came from mastering active listening.

Two ears and one mouth, you should listen twice as much as you explain (#6)

I think if you are sensitive and you have an interest, then you can learn quite a lot about the business side of things (#4).

Patience and consistency: Although design leaders are not in a leadership position within NPD, their strong self-leadership characteristics enable them to conduct various tasks, such as actively listening, showing a reflective, flexible attitude, design thinking and conducting holistic context analysis of NPD at the FFE of NPD. They begin to fill a leadership role, and different leadership theories explain that an emergent leader is someone who plans to direct others toward a problem's solution among participants in an ambiguous situation (Bass, 1954). As authentic leadership emphasises supporting positive emotions and trust (Avolio et al., 2004), their design leadership behaviours build a rapport and confidence with non-designers. Design leaders lead through the authority of their communication, tasks and responsibility, not through their position (Turner, 2013).

Thus, design leaders at the early stage of NPD can be identified as empathetic people with experience in the entire NPD process and the ability to listen actively. They have reflectively flexible attitudes when it comes to understanding, communicating, and executing a design properly. Their leadership and soft skills, such as 'active listening' and 'empathy', are core design leadership characteristics and communication behaviours. Design leadership at the FFE of NPD does not belong to one leadership theory. However, the characteristics of design leadership at the FFE of NPD are explained partially through various leadership theories. Several

researchers have identified that there are many different leadership definitions (Yukl, 1998). However, leaders for project contingencies need a distinctive set of leadership competencies (Turner & Muller, 2005, 2010). Leadership of design leaders and their behaviour and process of communicating design to non-designers at the FFE of NPD can be illustrated as shown below:

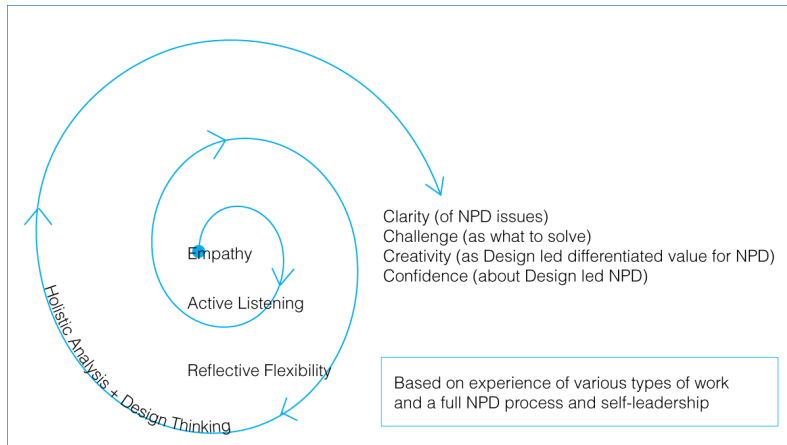


Figure 3. Conceptual model of design leadership at the early stage of NPD

Conclusion

This research on the characteristics of design leaders who can communicate design to non-designers at FFE of NPD was initiated by identifying a gap, which is rarely researched. Although this research has limitations in investigating design leaders at a project level and at the early stage of NPD in the UK, it identifies key characteristics of design leaders that can increase the effectiveness in communicating with non-designers. Comparative researches between design students and design leaders identified distinctively different characteristics of leadership and communication behaviour. The interviews revealed that design leaders had epiphanies when they realised the importance of communication and appreciated what non-designers think about their design contributions. Subsequently, this motivated them to educate themselves to become design leaders. Thus, a conceptual model of design leaders at FFE of NPD is proposed. To fulfil the research questions, this study highlights key characteristics of design leaders at the FFE of NPD:

- Design leadership characteristics: Interest in people and involved stakeholders within business and NPD, Aiming for business growth first, understanding how design fits in NPD process, reflectively flexible attitude.
- Their communication behaviours: Building a rapport, holistic analysis about NPD-related issues, active listening, willingness to explain repeatedly, showing examples for better communication.
- Becoming a design leader: acknowledging NPD is the work of different people, experiencing the entire NPD process, working in different sectors and organisations or in non-design roles, learning how to listen carefully to different non-design language, culture, and information.

Becoming a design leader takes time, and designers need to develop their fundamental leadership skills and design abilities and attitude. The identification of these characteristics could help designers who wish to become design leaders or to improve design communication and relationships with non-designers. During the course of this design leadership research, design students generally faced difficulty in group work and described the experience as a 'nightmare'. This result suggests that giving young designers opportunities to work in multidisciplinary teams is not enough to help them build empathy toward other disciplines and improve their communication skills. Design educators and lecturers should emphasise the importance of soft skills and perhaps include them as part of the assessment criteria. As a practice, this research indicates the abilities required and subjects that designers need to concentrate on within design schools and organisations. The limitation of this research is generalisability. Although this research was conducted with design students from different cultures and nations, it was mainly conducted with UK design leaders at project level only. Thus,

further researches are recommended to be conducted in different countries and at different stages of NPD, which may require different leadership characteristics for design leaders.

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References

- Avery, G (2004) *Understanding Leadership*, Sage Publications Ltd., London UK
- Avolio, B., Bass, B.M and Jung, D.J (1999) Re-examining the components of transformational and transactional leadership using the Multifactor Leadership Questionnaire, *Journal of Occupational and Organizational Psychology*, 72, 441-462
- Avery, G (2004) *Understanding Leadership*, Sage Publications Ltd., London UK
- Avolio, B., Gardner, W., Walumbwa, O, Luthans, F., May, D. (2004) Unlocking the mask: a look at the process by which authentic leaders impact followers attitudes and behaviors, *The Leadership Quarterly*, Vol15, Issues6, Decembedr pp801-823
- Avolio, Bruce; Walumbwa, Fred; and Weber, Todd J (2009). Leadership: Current Theories, Research, and Future Directions. *Annual Review of Psychology* 60(1): 421-449.
- Awamleh, R., and Gardner, W. L. (1999). Perceptions of leader charisma and effectiveness: The effects of vision content, delivery, and organizational performance. *The Leadership Quarterly*, 10(3), 345-373
- Bandura, A. (1997) *Self-Efficacy: The exercise of control*, New York, H.W. Freeman
- Bass, B. M. (1954). The leaderless group discussion. *Psychological Bulletin*, 51, 465-492.
- Bass, B (1985) *Leadership and Performance Beyond Expectations*, Free Press, New York, NY, USA
- Bass, B (1990) Bass and Stogdill's "*Handbook of Leadership: A Survey of Theory and Research*", Free Press, New York, NY, USA
- Bass, B and Avolio, B (1994) "Improving Organizational Effectiveness Through Transformational Leadership", SAGE Publication London UK
- Bednar, D.A. (1982) Relationship between communicator style and managerial performance in complex organizations: A field study. *Journal of Business Communication*, 19: 51-76
- Beverland M and Farrelly (2011) Designers and Marketers: Toward a Shared Understanding, *Design Management Review Volume 22, Issue 3*, pages 62-70
- Blake and Mouton (1964) "*The managerial grid*", Houston:Gulf
- Brown T (2008) Design Thinking, *Harvard Business Review*; Jun2008, Vol. 86 Issue 6, p84-92, 9p, 1 diagram, 2 illustrations, 7 color
- Brown, T., Boyle, M. Williams, B., Molly, A., McKenna, L., Palermo, C and Molly, L (2011) Listening and communication styles of undergraduate occupational therapy students: a cross-sectional study, *The British journal of occupational therapy*, Vol 74, Number 8, August 2011, pp. 387-393
- Bruce, M and Cooper, R (1997), *Marketing and Design*, International Thomson Business Press, London UK
- Calantone, R., Garcia, R. and Droge, C. (2003), The Effects of Environmental Turbulence on New Product Development Strategy Planning, *Journal of Product Innovation Management*, 20(2), 90-103.
- Carlyne, T (1907) "On Heroes, hero-worship, and the heroic in history", Boston: Houghton Mifflin.
- Ciulla, J.B (1999) The importance of leadership in shaping business value, *Long Range Planning*, Vol. 32, No. 2, pp. 166 -172
- Cook, H and Tate, K (2005) "*Project Management*", The McGraw-Hill Companies, New York, NY, USA
- R. Cooper, S. Junginger, T. Lockwood (Eds.)(2013), *The Handbook of Design Management*, Oxford, UK: Berg.
- Cooper R G and Kleinschmidt E (2000) New Product Performance: What Distinguish the Star Products, *Australian Journal of Management*, Vol25, NO 1. June. Page17-46

- Creswell JW. (1994). *Research design: Qualitative and quantitative approaches*. Thousand Oaks, CA: Sage Publications, Inc.
- Creswell (2009) *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches*, Sage, London UK
- De Vries, R., Bakker-Pieper, A. and Oostenveld, W. (2009) Leadership = Communication ? The relations of Leaders' Communication Style with Leadership Styles, Knowledge Sharing and Leadership outcomes, *Journal of Business Psychology*, (2010), Vol 25, pp.367-380
- Denzin, N. and Lincoln, Y. (1994). *Handbook of Qualitative Research*. Thousand Oaks, CA: Sage.
- Design council, July 2005, *Design Index: The impact of Design on Stock Market Performance-December 2004*, London: Design Council
- Design council, 2008, *Design Returns: A review of national design strategy 200-2008,,* London: Design Council
- Design council (2013, 6 Jan2013) *Design Leadship Programme*, Retrieved 5 Jan 201, from <http://www.designcouncil.org.uk/our-services>
- Dulewicz and Higgs (2003) LEADERSHIP AT THE TOP: THE NEED FOR EMOTIONAL INTELLIGENCE IN ORGANIZATIONS, *International Journal of Organizational Analysis*, Vol. 11 Issue: 3 pp. 193 – 210
- Eckersley, M (2003): *Integrated Design Strategy Management: Challenges and Opportunities*. Design Management Institute E-bulletin, March 2003. *Proceedings of the DMI 2002 Annual Conference (Cape Cod)*.
- Flauto,F (1999) *Walking the Talk: The Relationship Between Leadership and Communication Competence*, *Journal of Leadership & Organizational Studies*, Vol.6, No. 1 - 2, Pages.86-97
- Fraser, H. (2006). *Turning design thinking into design doing*. Rotman Magazine. Toronto, Canada: 24-28.
- Friedman, K (2004): *Of Course Design Pays: But Who Says So, And Why?* Research Report for Design for Latvia, presented at the *Design Research for Competitive Advantage Conference*, November 16, 2004, Riga, Latvia.
- Fiedler, F.E. (1967) *A Theory of Leadership Effectiveness*. New York: McGraw-Hill
- Greenleaf, R (1970) *The servant as leader*, Indianapolis: The Robert K. Greenleaf Center, 1-37
- Geertz, C. (1973). *The interpretation of cultures: Selected essays*. New York: Basic Books
- Gloppen, J. (2009). Perspectives on Design leadership and design thinking and how they relate to european service industries. *Design Management Journal*: 33-47.
- Gill, R (2006) *Theory and Practice of Leadership*, Sage Publications Ltd., London, UK
- Goleman, D., Boyatzis, R., & McKee, A. (2002) *"Primal leadership"*. Boston, MA: Harvard Business School Press
- Gorb and Dumas (1987) *Silent Design*, *Design Studies*, Volume 8, Issue 3, July 1987, Pages 150–156
- Gorb, P. (ed.) (1990), "The Future of Design and its Management" in Oakley M(ed.) *Design Management; A Handbook of Issues and Methods*, Basil Blackwell, Oxford, UK
- Gray, D (2009) *"Doing research in the real world"* (2nd Ed.) SAGE Publication, London UK
- Hersey, P. and Blanchard, K. (1982) Leadership style: *Attitudes and behaviors*, *Training & Development Journal*, Vol 36(5), May 1982, 50-52
- Hersey, P., and Blanchard, K. (1993) *Management of organizational behavior: Utilizing human resources* (6 ed.). Upper Saddle River, NJ: Prentice-Hall, Inc
- House, R.J. and Mitchell, T.R. (1974) Path-goal theory of leadership, *Journal of Contemporary Business* 3:81-97
- Jago, A.G. (1982) Leadership Perspectives in Theory and Research, *Management Science*, Vol.28, No.3, pp.315-336
- Judge, T., Ilies, R. Bono, J. and Gerhardt, M. (2002). Personality and leadership: A qualitative and quantitative review, *Journal of Applied Psychology* 87(4): 765-780.
- Khurana and Rosenetahl (1998) Towards holistic front ends in new product development, *Journal of Product Innovation Management* 15: 57-74.
- Kirkpatrick, S. A., & Locke, E. A. (1996) Direct and indirect effects of three core charismatic leadership components on performance and attitudes, *Journal of Applied Psychology*, 81, 36–51.

- Klenke, K (2008) *Qualitative Research in the Study of Leadership*, Emerald Group Publishing Limited, Bingley, UK
- Kotter, J (2001) What Leaders Really Do, *Harvard Business Review*, December, Pages3-12
- Lee, K. and T. Cassidy (2006) Principles of design leadership for industrial design teams in Taiwan, *Design Studies* 28(4): 437-462.
- Lockwood, T. (2009) Transition: How to Become a More Design-Minded Organization, *Design Management Journal*: 29-37
- Martin, D. and Gayle, B. (1999) It isn't a matter of just being funny: Humor production by organizational leaders, *Communication Research Reports*, 16:1, 72-80
- Madlock, P (2008) The Link Between Leadership Style, Communicator Competence, and Employee Satisfaction, *Journal of Business Communication*, 45: 61, pp.61-78
- Manz, C.C.(1983), *The Art of Self-Leadership: Strategies for Personal Effectiveness in your Life and Work*, Prentice-Hall, Englewood Cliffs, NJ.
- Manz, C.C.(1992), *Mastering Self Leadership: Empowering Yourself for Personal Excellence*, Prentice-Hall, Englewood Cliffs, NJ.
- Manz,C.C. and Neck, C.P.(1999) *Mastering Self Leadership: Empowering Yourself for Personal Excellence*, 2nd ed., Prentice-Hall, Englewood Cliffs, NJ.
- McCullagh, K. (June 2, 2008) The Many Faces of Design Leadership. Available at http://www.core77.com/blog/featured_items/
- Miller and Moultrie (2013) Understanding the Skills of Design Leaders, *Design Management Journal*, Volume8, Issues1 pages 35-51
- Moenert, R., at el. (1995) "R&D/Marketing Communication During the Fuzzy Front-End." IEEE TRANSACTIONS ON ENGINEERING MANAGEMENT, 42(3): 243-259.
- Montgomery (Nov.2012) What makes a good client relationship?, <http://www.designweek.co.uk/editors-view/what-makes-a-good-client-relationship/3035669.article> (Accessed 30 Nov 2012)
- Mozota, B (2003) *Design Management: Using Design to build Brand Value and Corporate Innovation*, Allworth Press, New York USA
- Mozota, B (2006). "The Four Powers of Design: A Value Model in Design Management." *Design Management Review* 17(2): 44-53.Oakley M (ed.) (1990) *Design Management; A Handbook of Issues and Methods*, Basil Blackwell, Oxford, UK
- Muller, R and Turner, J (2007) Matching the project manager's leadership style to project type, *International journal of project management*, 25, pages 21-32
- Nelson, H (2013) *Design Communication: Systems, Service, Conspiracy, and Leadership* NextDesign Leadership Institute: [Http://www. Nextd.org](Http://www.Nextd.org). (Accessed on January 10, 2011)
- Norton (1978) Foundation of a Communicator Style Construct, *Human Communication Research* 4:99-112
- Nussbaum, B. (2005) *How to Build Innovative Companies*, BusinessWeek Special Report: Get Creative, pages60-81
- Pavitt, C. (1999) Theorizing about the group communication-leadership relationship: Input-process-output and functional models, In L. R. Frey, D. S. Gouran, & M. S. Poole (Eds.), *The handbook of group communication theory and research* (pp. 313–334).Thousand Oaks, CA: Sage.
- Pennypacker, J and Cabanis-Brewin, J (2003) "What Makes a Good Project Manager", Center for Business Practices, Havertown, Pennsylvania, USA
- Perks, H. Cooper, R. Jones, C. (2005) Characterizing the Role of Design in New Product Development: an empirical derived taxonomy, *Journal of Product Innovation Management* 22: 111-127.
- Reid, S. E., and U. de Brentani.(2004). The fuzzy front end of new product development for discontinuous innovations: A theoretical mode, *Journal of Product Innovation Management* 21 (3): 170–84.
- Road, J. (May 2006). Design Leadership: Cross-pollinating design and management, 5th NordCode Seminar: "Connecting fields"Oslo School of Architecture and Design (AHO)
- Rogers, C. E and Farson, R. E. (1987), Active listening. In Huseman, R. C. et al. (Eds), *Readings in Interpersonal and Organizational Communication*, Holbrook Press, Boston.

- Salovey, P., and Mayer, J.D. (1990) Emotional Intelligence. *Imagination, Cognition, and Personality*, 9, 185-211.
- Salovey, P., and Mayer, J.D. (1997). What is emotional intelligence? In P. Salovey & D. Sluyter (eds.), *Emotional development and emotional intelligence: Implications for educators* (pp.3-31), New York: Basic Books.
- Sashkin, M and W.E. Rosenbach (1998) *Visionary leadership theory: A current overview model, measures, and research* (Working Paper 9-114). Washington DC: GWU.
- Schon D (1983) *The Reflective Practitioner* Basic Books, New York
- Sorenson, R. L., & Savage, G. T. (1989). Signaling participation through relational communication: A test of the Leader Interpersonal Influence Model. *Group and Organization Studies*, 14, 325-354
- Snaverly, W and McNeill, J (2008) Communicator Style and Social Style: Testing a Theoretical Interface, *Journal of Leadership and Organizational Studies*, 14: pp.219-232
- Stogdill (1948) Personal Factors Associated with Leadership- A Survey of the Literature, *The Journal of Psychology: Interdisciplinary and Applied*, Vol.25, Issue 1
- Ulrich, K. and Eppinger, S. (2012) *Product and Design Development* (5thed.), McGrawHill, New York, NY USA
- Tannenbaum, R and Schmidt, W (1958) How to Choose a Leadership Pattern, *Harvard bus. Rev.*, March-April 1958, 36 (2)
- Thoresen, C.E. and Mahoney, M.J. (1974) *Behavioral Self-control*, Holt, Rinehard, and Winston, New York, NY.
- Topalian, A. (2002) Promoting Design Leadership through Skills Development Programs. *Design Management Journal* 13(3): 10-18.
- Turner, R (2013) *Design Leadership: Securing the Strategic Value of Design*, Gower
- Turner, J.R., Müller, R., (2005). The project manager's leadership style as a success factor on projects: a literature review. *Project Management Journal* 36, 49-61.
- Turner, J.R., Müller, R., (2010) Leadership competency profiles of successful project managers, *International Journal of Project Management*, Vol 28, Issue 5, July, pp.437-448.
- Ulrich, K. and Eppinger, S. (2012) *Product and Design Development* (5thed.), McGrawHill, New York, NY USA
- Van Patter, GK (2003): *NextDesign Leadership Institute*. <http://www.nextd.org>
- Von Stamm, B (2008) "*Managing innovation design and Creativity*" (2nded.), John Wiley & Sons Ltd., West Sussex, UK
- Vroom and Jago, (2007) "*The role of the situation in leadership*", *American Psychologist*, Vol 62(1), Jan 2007, 17-24
- De Vries, R., Bakker-Pieper, A. and Oostenveld, W. (2009) "Leadership = Communication ? The relations of Leaders' Communication Style with Leadership Styles, Knowledge Sharing and Leadership outcomes", *Journal of Business Psychology*, (2010), Vol 25, pp.367-380
- Yukl, G. (1998). *Leadership in organizations* (4th ed.). Englewood Cliffs, NJ: Prentice-Hal
- Walker, D (ed.) (1990), *Managers and designers: two tribes at war?* in Oakley M(ed.) *Design Management; A Handbook of Issues and Methods*, Basil Blackwell, Oxford, UK