Modernizing Creative Work

How organizations in the creative industries can support knowledge workers to develop the skills they need

Mirjam Koehorst

Modernizing Creative Work

**HOW ORGANIZATIONS IN THE CREATIVE INDUSTRIES CAN SUPPORT
KNOWLEDGE WORKERS TO DEVELOP THE SKILLS THEY NEED**

Mirjam Maria Koehorst

Cover design: Yasmin Katlich, persoonlijkproefschrift.nl
Printed by: Ipskamp Printing | proefschriften.net
Lay-out: Yasmin Katlich, persoonlijkproefschrift.nl
ISBN: 978-90-365-5089-5
DOI: 10.3990/1.9789036550895

© 2020 Mirjam Maria Koehorst, The Netherlands. All rights reserved. No parts of this thesis may be reproduced, stored in a retrieval system or transmitted in any form or by any means without permission of the author.

MODERNIZING CREATIVE WORK

HOW ORGANIZATIONS IN THE CREATIVE INDUSTRIES CAN SUPPORT
KNOWLEDGE WORKERS TO DEVELOP THE SKILLS THEY NEED

DISSERTATION

to obtain
the degree of doctor at the Universiteit Twente,
on the authority of the rector magnificus,
Prof. dr. ir. A. Veldkamp,
on account of the decision of the Doctorate Board
to be publicly defended
on Friday 11 December 2020 at 16.45 hours

by

Mirjam Maria Koehorst

born on the 30th of August, 1986
in Oldenzaal, The Netherlands

This dissertation has been approved by:

Supervisor: Prof. dr. ing. A.J.A.M. van Deursen

Supervisor: Prof. dr. J.A.G.M. van Dijk

Co-supervisor: Prof. dr. J. de Haan

Graduation Committee:

Chair:	Prof. dr. T.A.J. Toonen
Supervisors:	Prof. dr. ing. A.J.A.M. van Deursen Prof. dr. J.A.G.M. van Dijk
Co-supervisor:	Prof. dr. J. de Haan
Committee Members:	Prof. dr. A.J.M. de Jong Prof. dr. T. Bondarouk Prof. dr. K. Tijdens Prof. dr. B. Steijn

This research was funded by the Dutch Research Council (NWO) under project number 409-15-214.

Table of Contents

1. General Introduction	9
1.1. Skills for Contemporary Workers	10
1.2. The Creative Industries	11
1.3. Human Capital in the Contemporary Workspace	13
1.4. Goals and Research Questions	16
2. A Process-Based Definition for the Creative Industries	23
2.1. Introduction	24
2.2. Theoretical Framework	25
2.3. Method	28
2.4. Results	31
2.5. Discussion	40
3. 21st-Century Digital Skills and the Process-Model of Creation	43
3.1. 21st-Century Skills in the Digital Workplace	44
3.2. Implications	51
4. A Review of Organizational Factors Potentially Influencing 21st-Century Digital Skills	53
4.1. Introduction	54
4.2. Theoretical Framework	55
4.3. Method	58
4.4. Results	62
4.5. Discussion	66
5. How Organizations can Support the Development of 21st-Century Digital Skills among their Workers: An Empirical Investigation of the Creative Industries	71
5.1. Introduction	72
5.2. Theoretical Framework	73
5.3. Method	82
5.4. Results	90
5.5. Discussion	91
6. Organizational Factors Influencing 21st-Century Digital Skills: Interviews with Leaders in the Creative Industries	97
6.1. Introduction	98
6.2. Theoretical Framework	99
6.3. Method	101
6.4. Results	105
6.5. Discussion	121

7. General Conclusion and Discussion	129
7.1. Introduction	130
7.2. A Work-Process of Creation in the Creative Industries	131
7.3. 21st-Century Digital Skills	132
7.4. Determinants of 21 st -Century Skills (Digital) Skills	136
7.5. The Influence of Organizational Determinants on the Level of 21st-Century Digital Skills	137
7.6. Explaining the level of 21st-Century Digital Skills among Workers in the CIs	139
7.7. Recommendations for Organizations and Policy Makers	141
7.8. Limitations and Future Research	145
8. References	149
9. Appendices	167
10. Samenvatting (Summary)	183
11. Dankwoord (Acknowledgements)	191
12. About the Author	199

Chapter 1

General Introduction

1 General Introduction

1.1 Skills for Contemporary Workers

Society is changing! Many scientific articles, books or dissertations have started with this platitude. They then continue to expand on how our 21st-century society, which was once industrialized, has changed into a knowledge/information/network-society. In large part, this dissertation starts just as such. However, it will also explore the impacts of these changes on organizations and their employees. The consequences for organizations with respect to nurturing employee skills are also different because the human resource needs of these organizations are different. This raises some significant questions, which are as follows: What are these changes? What causes these changes? What does this imply for the skills the workforce needs? Finally, how can organizations prepare their employees to face these changes?

The skills needed by the employees of earlier centuries were focused on manual labor to a much greater extent. For contemporary professionals, knowledge is often their greatest asset. Knowledge—and the ideas generated with this knowledge—are now seen as commodities (Anderson, 2008; UNCTAD, 2008). This is why some say we are living in a “knowledge society” (Anderson, 2008) or a global “information society” with “knowledge societies” as a source for development (UNESCO, 2005). New hierarchical structures and job specifications have caused changes in what employees need to know and do. Furthermore, the technologies that professionals use to perform their jobs are incomparable to the technologies used five decades ago. The reliance of information and communication technologies (ICTs) on cognitively demanding tasks is growing (Jacobs, 2017), especially in sectors where knowledge creation is occurring at high speeds.

The cognitive skills that enable employees to employ that knowledge are especially valued when applied in digital environments (Claro et al., 2012). However, the exact skills that knowledge workers need and what mechanisms influence the level of these skills within an organizational context are rarely studied. Therefore, the efforts by organizations and policy makers to improve these skills, if taken at all, mostly lack empirical evidence.

This dissertation focuses on the creative industries (CIs) in the Netherlands. In this chapter, the context will be discussed first before moving on to the human resources changes occurring in organizations. Finally, the goals and research questions will be stated.

1.2 The Creative Industries

The application of cognitive skills in digital environments is especially relevant in sectors where science and technology intertwine. In these sectors, including the CIs, knowledge creation is occurring at extremely high speeds (David & Foray, 2003). The CIs are a collection of industries in which innovation is central, and creativity is at the core of all the activities. With its activities, the CIs help find solutions to important societal challenges (Rutten, Koops, & Visser, 2019; UNCTAD, 2018), such as the Fairphone¹ or the Emergency Sanitation Operation System² (Ministry of Education Culture and Science, 2014). The CIs' members are generally highly educated and skilled professionals (Glaeser, 2004). Due to rapid growth, the CIs are a source of employment opportunities and add great value to the overall economy (UNCTAD, 2018). However, since many of the challenges organizations in CIs are trying to solve are contemporary issues, it is difficult for employers to anticipate the exact skills employees need. In this respect, concepts such as 21st-century skills and digital skills are frequently used; however, they are seldomly defined. What will become clear in this dissertation is that employers often assume that the 21st-century skills combined with digital skills are adequately developed among their employees, even though the exact make-up of these skills is unclear to them.

1.2.1 The Creative Industries in the Netherlands

In 2011, representatives from nine sectors of business, knowledge institutes and the government in the Netherlands composed a plan to increase the competitiveness and knowledge infrastructure development in the Netherlands. The Netherlands is a world leader in regard to trades and industry, but this position cannot be taken for granted. Therefore, the Ministry of Economic Affairs decided to help foster the potential of a number of promising top sectors of the Dutch economy³. These sectors were selected by the Dutch government based on four criteria, which are as follows:

These sectors are:

1. Knowledge intensive;
2. Export-oriented;
3. Deal with specific legislation; and
4. Contribute significantly to solving societal issues (Centraal Bureau voor de Statistiek, 2018).

1 www.fairphone.com

2 www.flex.nl/case/esos-smart-emergency-sanitation/

3 www.topsectoren.nl

The research in this dissertation is aimed at the CIs in the Netherlands, which is a sector that interacts on the cross-section of science and technology and has the potential to achieve great economic growth (Stam, de Jong, & Marlet, 2008). The CIs are made up of a wide variety of different industries. These industries have in common that they have initial creation as their core business, either in form, meaning or symbolic value (Centraal Bureau voor de Statistiek, 2018). This, along with the fact that in some subsectors, such as Arts & Cultural Heritage, profit is less essential, distinguishes the CIs from other top sectors.

1.2.2 Inclusion of Industries

The creative economy can be viewed as the combined economic value that the creative endeavors in a country generate. Every country concerned with stimulating the “creative economy” by developing policies for their CIs has its own framework for defining it (e.g. Bakhshi, Freeman, & Higgs, 2013; Braams, 2011; Department for Culture Media & Sport, 2015; Ministry of Economic Affairs & Science, 2005). In this regard, the Netherlands is no different. Across countries, the sector is primarily characterized in terms of specific professions, such as visual artists, photographers, and architects (Urlings & Braams, 2011), or “the creative class”, as Richard Florida (2012) calls it, or by using industrial lines, such as broadcasting, performing arts, and advertising (Department for Culture Media & Sport, 2014; Ministry of Economic Affairs & Science, 2005). However, although there is an ongoing discussion about what industries to include in the CIs, there is agreement on the inclusion of the following industries: publishing and literature; performing arts; music; film, video, and photography; broadcasting (television and radio); visual arts and crafts; advertising; design, including fashion; museums, galleries, and libraries; and interactive media (Flew & Cunningham, 2010; UNCTAD, 2008).

Currently, the delineation of the CIs in the Netherlands is based on the SBI 2008 (*Standaard Bedrijfsindeling 2008*), which is a detailed delineation developed by the Statistics Netherlands (CBS). However, for the CIs, subsequent tailoring was needed to determine which organizations to select based on extra information from the top sector. According to the CBS, the CIs in the Netherlands can be subdivided into the following four subsectors: arts, cultural heritage, media and entertainment industry, and creative and business services (Appendix A). However, the CIs are constantly evolving, which makes them a very dynamic sector. New innovations give rise to organizations and professions that are difficult to fit into the existing frameworks. The delineation approaches based on industry or professional lines are very static and, therefore, are unsuitable for a sector such as the CIs. Therefore, an alternative approach to the delineation of the CIs will be introduced in Chapter 2.

1.2.3 Value of the Creative Industries

Worldwide, CIs are growing both in terms of generated value and the number of professionals working within the sector. According to the European Union (EU), the CIs have been experiencing a growth rate more than four times the EU's total average growth (KEA European Affairs, 2006). The first European country in which creative activity received special attention was the United Kingdom. Since the development of the first mapping document by the Department of Culture, Media and Sport of the United Kingdom in 1998, the "cultural economy" has been gradually replaced by the creative economy. However, the discussion of what exactly to include in the CIs has been raging ever since. Nesta (2006) states that the purpose of the CIs is to exploit creative capital for commercial gain. This view is supported by UNCTAD. According to UNCTAD, "(...) the creative industries generate income through trade and intellectual property rights (UNCTAD, 2018, p. 3). This is underlined by claiming that the services and goods produced by the CIs—in addition to creative content—should have economic value and be capable of being marketed (2008). This view clearly differs from the domain of "arts and cultural heritage" according to Rutten, Koops, and Roso (2010), who state that economic motives are subsidiary to artistic motives and a certain aesthetic need. However, the CIs have important economic value in terms of global trade (UNCTAD, 2018) and are essential to strengthening a country's competitiveness in global markets (Yue, 2006).

In the next section of this chapter, the types of skills that knowledge workers – such as professionals in the CIs – need to thrive in a 21st-century workplace will be briefly discussed.

1.3 Human Capital in the Contemporary Workspace

An individual's complete skillset can be described as their *human capital* and is used as a measure for that person's economic value. In the current Western society, there is a new appreciation for knowledge: "If capital and labor are the major structural features of industrial society, information and knowledge are those of postindustrial society" (Bell, 1973, p. xiii). Both routine cognitive work and manual labor are increasingly performed by machines. This leaves tasks such as idea generation and problem solving to humans (Levy & Murnane, 2004), since these processes require cognitive functioning. 21st-Century skills are an example of a set of skills that is often mentioned as being valuable and important for professionals to be successful in the contemporary workplace. Ideally, all professionals in the current society possess these skills.

Although the term 21st-century skills is commonly used in both research and practice, there is no consensus regarding what skills are actually included. The concept is merely used to indicate that contemporary skill requirements in the 21st century are vastly different from the skills needed during and after the industrial revolution (Ananiadou & Claro, 2009; Van Laar, Van Deursen, Van Dijk, & De Haan, 2017). However, in the academic literature, some often used definitions of 21st-century skills can be found (e.g. Ahonen & Kinnunen, 2015; Cobo, 2013; Donovan, Green, & Mason, 2014; Romero, Usart, & Ott, 2015), which on many occasions are used in policies and recommendations (e.g. European Commission, 2016; Global Partnership for Education, 2020). Ananiadou and Claro (2009) define 21st-century skills and competencies as “those skills and competencies young people will be required to have in order to be effective workers and citizens in the knowledge society of the 21st century” (p. 8). In addition, where education in earlier centuries was more focused on academic skills and subject-specific knowledge, the need is growing for more general cognitive skills (Carnevale & Smith, 2013).

Most of the skills that are considered 21st-century skills are needed for the generation and valorization of knowledge. These skills are not just based on rote learning (memorizing key facts and components) but also require cognitive processing. According to David and Foray (2003), professionals need to be able to analyze and evaluate explicit knowledge to create new meaning by using 21st-century skills. When a professional has these skills, s/he can use the information and explicit knowledge to develop new cognitive approaches. These definitions have led to different frameworks of the skills deemed important for 21st-century education and citizenship, such as the frameworks of the Organization for Economic Cooperation and Development (OECD), the Partnership for 21st-century skills (P21) and the Assessment and Teaching of 21st-century skills (ATC21S). The latter, for example, defines ten 21st-century skills in four categories, which are “ways of thinking”, “ways of working”, “tools for working”, and “ways of living in the world”. A systematic literature review performed by Van Laar et al. (2017) found that the seven skills most mentioned in the academic literature as being indispensable for 21st-century workers are information management, creativity, critical thinking, collaboration, communication, problem solving, and technical skills.

Thus, 21st-century skills have become increasingly important for the contemporary workplace. Employers are no longer concerned with what an employee knows but how well s/he is able to learn and absorb new knowledge and structure information (Anderson, 2008). However, for organizations, it remains unclear how to best nurture and improve these skills among their employees. Organizations intuitively feel that 21st-century skills are important for their employees; these skills are important if they want to stay ahead of the competition. However, very little evidence exists in

the academic literature on how to optimally develop them. Furthermore, technology is playing an increasingly important role in the 21st-century workplace. As Ananiadou and Claro (2009) state, “Not surprisingly, most, if not all, of these competencies are either supported or enhanced by ICT” (p. 5).

1.3.1 Digital Skills in the 21st Century

Organizations can and should play a large role in the facilitation of ICTs and how employees develop digital skills. Vyssotsky (1979) examined how the increasing use of computers changed an organization’s daily operations. He predicted that by the end of the 20th century, a significant portion of professionals would understand how computers work and would be able to use them for work. Currently, not having sufficient digital skills and not being able to work with computers might even be detrimental to one’s job prospects. With the increased use of technology in all aspects of life, including the workplace, digital skills are indispensable to keep pace with current society.

The Internet has made communicating, sharing, and searching for information significantly faster and cheaper. The result is that professionals can now use the knowledge gained from a community of experts from around the world. This has some advantages. For example, by replicating the knowledge of others, an individual can “learn to learn”. Furthermore, by replication, new knowledge is tested for its quality, and since the information is accessible to everyone, it will not need to be rediscovered. Additionally, new knowledge can be improved through the collaboration of different individuals who would otherwise not come in contact with one another (David & Foray, 2003). However, the abundance of information can make it impossible for professionals to keep up-to-date with all the new knowledge in one’s field.

Therefore, in addition to the growing importance of these 21st-century skills, employees need to be able to work with ICTs, such as computers with an internet connection and mobile devices, in almost all layers of an organization. They need to be digitally skilled and be able to use contemporary tools to perform their jobs. Digital competency (being able to understand (digital) media, search and find information and – once retrieved – be critical about its contents, and use ICTs to communicate with others) is a prerequisite for anybody who wants to be a functional member of the 21st-century economy (Ferrari, 2012). This implies that for professionals to be truly skilled, they need to be able to use 21st-century skills in combination with ICTs. In chapter 3 of this dissertation, a detailed description of these skills will be discussed.

1.4 Goals and Research Questions

How can organizations facilitate the development of contemporary skills for their knowledge workers? To answer this question, we first have to examine what these skills are. Second, the factors that are important to determine the levels of these skills must be identified. A distinction can be made between personal and organizational determinants. In this dissertation, the focus is on organizational determinants. However, in the dissertation of Van Laar (2019), personal factors are discussed extensively. When the organizational determinants are known and we know the current level of 21st-century digital skills among workers in the creative industries, we can start making recommendations for organizations and governments to implement changes and policies that will support, develop, and improve these skills. Thus, organizations in the CIs will be better equipped to deal with increasingly competitive world markets. To achieve the end goal of improving the level of 21st-century digital skills among professionals in CIs, some subgoals are formulated.

1.4.1 Goals

The current method of delineating the CIs in the Netherlands is based on static and often discretionary lines. By proposing a process model of creation and linking job-function groups to this process model, policies can be valorized more efficiently without having to revisit the process model when new industries emerge. Therefore, the first research goal is as follows:

1. To construct a conceptual model for the work process of creation within the CIs:
 - a. For the selection of participants by linking job-function groups to the process model;
 - b. For efficient assimilation of research findings in regard to recommendations and policy formulation; and
 - c. That can be used to redefine the CIs in the Netherlands.

The concept of 21st-century digital skills was recently developed. Therefore, little empirical research exists that studies the level of these skills and what influences them. Linking 21st-century digital skills to the process model enables more directed research regarding the level of these skills. Therefore, the next goal of this dissertation is as follow:

2. To explore what 21st-century digital skills are needed within the work process for the CIs by linking them to the different phases of the process model.

Although the 21st-century digital skills framework is novel, its importance for knowledge workers has been established by research (Van Laar, 2019). It is important for organizations to know what they can do to improve the level of these skills. To achieve the following goal, a systematic literature review of the academic literature regarding the organizational factors that influence the level of 21st-century skills is performed:

3. To review the academic literature to identify potential organizational factors that determine the level of 21st-century digital skills of the individual employee.

By measuring both the level of 21st-century digital skills among professionals in the CIs in the Netherlands and the level at which the organizational factors found in the systematic literature review occur in their organization, a first exploration can be made into the actual levels of these variables. These can be used to inform policy and further research. Therefore, the next goal is as follows:

4. To estimate the actual influence that organizational factors have on the level of 21st-century digital skills.

To develop 21st-century digital skills among employees, knowing the level of these skills and what influences them is not sufficient. It is also important to understand how organizational factors influence these skills so that the policies developed will have a more significant impact, which leads to the next goal of this paper, as follows:

5. To gain insight into **how** these factors influence 21st-century digital skills.

Finally, knowledge is only worth something if it can be valorized. Therefore, the hope is that the following final goal has a societal impact:

6. To provide practical recommendations to organizations and policy makers on how to improve the 21st-century digital skills level of employees.

1.4.2 Research Questions

To achieve these goals, this dissertation is subdivided into the following chapters.

Chapter 2: A Process-Based Definition for the Creative Industries

The CIs in the Netherlands are used as the context for this dissertation. Despite efforts to classify the CIs, the current approaches have severe limitations. These approaches are static and are unable to adapt to the dynamics of the CIs. For effective policy to be written, the classification on which the policies are based should accurately describe these dynamic attributes. Therefore, in the second chapter, the creative industries will be examined by means of **interviews**. These interviews will be used to inform the development of a process-based approach of creation and production within the CIs. This approach helps to effectively classify the CIs in order to write directed policy. Furthermore, job-function groups will be linked to the process-model so that it can be used for the selection of respondents in further research. This will also support the development of even more directed policy and recommendations. To develop this process-model and the ability to select respondents based on their job function, the following questions are answered:

- What work process can characterize *creation* and *production* in the creative industries?
- What are the job functions needed to successfully support this process?

Chapter 3: 21st-Century Digital Skills for the Creative Industries

In the third chapter, a framework of 21st-century digital skills will be presented. Research on 21st-century skills has been prevalent in academic literature for many decades. However, with the rise of the Internet and ICT-solutions to assist knowledge work, these skills need to be redefined to be suitable for this context as well. Therefore, in the framework of 21st-century digital skills, the 21st-century skills that are deemed most important by the literature are operationalized with an ICT component (Van Laar, et al., 2017). These skills will be connected to the model presented in Chapter 2, based on the findings from the interviews and literature. This will result in the operationalization of 21st-century digital skills for employees in the CIs. The question that will be answered in this chapter is as follows:

- What skills are important for all knowledge workers in the creative industries?

Chapter 4: A Systematic Literature Review of Organizational Factors Influencing 21st-Century Skills

In the fourth chapter, the execution of the **review of the academic literature** is discussed. Since the research on 21st-century digital skills in an organizational context is in its infancy, focus was given to 21st-century skills. The review is carried out to provide an overview of the organizational factors that have been shown to influence the 21st-century skills of individual employees. The research question answered in this chapter is as follows:

- What organizational factors are statistically significant in influencing the level of 21st-century skills of employees, according to academic literature?

By knowing what factors influence 21st-century skills, follow-up research can be conducted to explore whether these factors also influence 21st-century *digital* skills. These findings, in turn, can inform organizational policy for the improvement of 21st-century digital skills among employees.

Chapter 5: How Organizations can Support the Development of 21st-Century Digital Skills among their Workers: An Empirical Investigation of the Creative Industries

In the fifth chapter, a **survey** to measure 21st-century digital skills and their determinants is described. Here, an analysis is performed to estimate what effects organizational factors have on 21st-century digital skills. The research question that is leading this chapter is as follows:

- What organizational factors influence the level of 21st-century digital skills of employees working in the CIs in the Netherlands?

Chapter 6: Organizational Factors Influencing 21st-Century Digital Skills: Interviews with Leaders in the Creative Industries

Interviews with managers in the CIs were held to explore how the results from the quantitative survey analysis in Chapter 5 can be explained. If an understanding is developed on not just if, but how the factors influence 21st-century digital skills, the development of these skills can be informed by these finding, and in turn be implemented more efficiently and effectively. Furthermore, the interviews can be used as additional validation of the 21st-century digital skills framework. Therefore, the first research question of these interviews is as follows:

- What 21st-century digital skills are important for the employees in the CIs according to their employers and why?

By obtaining an understanding of the current environment and facilitation regarding employee-development, recommendations and policy can be adapted to the current situation. This will result in a larger chance of adoption and success of the measures taken. Therefore, the second research question in Chapter 6 is as follows:

- How do organizations in the CIs facilitate the development of 21st-century digital skills among their employees?

Finally, to understand what measures can be taken accounting for the results presented in Chapter 5, we explore the following research question:

- How do factors relating to organizational, development and technological opportunities affect the level of 21st-century digital skills?

Chapter 7: General Conclusion and Discussion

In the final chapter, the general conclusions resulting from all studies conducted in this dissertation will be presented, along with a general discussion and implications for further research. Furthermore, practical recommendations for policy regarding 21st-century digital skills will be made in order to help organizations in the creative industries support knowledge workers in developing the skills they need.

Chapter 2

A Process-Based Definition for the Creative Industries

Koehorst, M., van Deursen, A., van Dijk, J., De Haan, J., (2019). Exploring the Creative Industries: Toward a Classification by Process and Job Functions, *Journal of Innovation Management*, www.open-jim.org, 7(3), 69-95.

2 A Process-Based Definition for the Creative Industries

2.1 Introduction

As established in the previous chapter, earlier frameworks derived from research and policy propose different ways to define the creative industries (CIs). These frameworks mostly apply delineations based on either industrial or occupational lines. However, since innovation is central within the CIs, the sector is constantly evolving. In recent literature on the CIs in the Netherlands, a conceptual approach is used in which the CIs are described as a sector that uses creation and production of symbolic materials and the exploitation of access to these materials, for end-users or companies (Rutten et al., 2019). Due to constant innovation, the CIs keep reinventing themselves, including the kind of organizations and occupations that are part of it. Due to these continuous developments, the occupations found within the sector are not always clearly definable. Furthermore, creative professions do not occur exclusively in the CIs, but are spread throughout the economy. The term 'embedded creativity' is used for creative jobs occurring in sectors that are not primarily part of the CIs (Rutten et al., 2019).

All this makes it difficult for HR-managers and CEOs to determine what skills the employees that fulfill these new occupations need. That is why, in this chapter it is explored how the CIs can be characterized without using strict and arbitrary industry lines or occupations. Alternatively, a work-process will be suggested to characterize the development of innovative products or services in the CIs. By linking both creative and non-creative job functions needed in each phase to the process, all occupations involved in the creation of innovative products or services are considered, not just those jobs that are creative at their core. Also, this process eliminates the need to use static industry-boundaries that resulted in a limited inclusion of organizations with certain end products in the sector. In contrary to existing frameworks for the demarcation of the CIs, the process-model can be used for both existing and new industries. Finally, by knowing what job-functions are needed in specific stages within the work-process, human resource professionals can deduce skills that are needed for different professionals working within the process and human capital in the CIs can be adequately improved and utilized where needed. In addition, this approach to characterize the CIs is more dynamic and can capture the essence of this ever-changing sector. To achieve this goal, the following questions are addressed in this chapter:

- a. What work-process can characterize *creation* and *production* in the creative industries?
- b. What are the job functions needed to successfully support this process?

To answer these questions, a set of semi-structured interviews were conducted with key players in the Dutch CIs.

This chapter will start with a short review of the literature on the definition of creativity, an introduction into the history of the CIs, the creative process, and job functions usually involved in the creation of innovative products and services. After that, the methods and results of the interviews will be given. In the results, the work-process will be introduced. Finally, in the discussion and concluding remarks I will clarify how this can impact further research and policy formation.

2.2 Theoretical Framework

2.2.1 Creativity and Creative Industries

Creativity is a much sought-after asset in workers in almost any industry, from automotive and advertisement to logistics and agriculture. However, the degree of creative intensity varies among the diverse professions in these industries. Furthermore, the understanding of creativity fluctuates within different contexts. Depending on the profession and industry in which people are employed, their idea of what creativity entails is likely to differ. Given the numerous definitions of creativity and the diversity of organizations and workers in the CIs, finding consensus on what should be considered part of this sector is a complex endeavor.

In the scientific literature, the debate over a standard definition of creativity has been an issue since the middle of the twentieth century. Parkhurst (1999) claims that the lack of consensus about the definition complicates not only our understanding of the CIs but also the development of sufficient policy for nurturing creativity in students who are supposed to interact in the work environment of the twenty-first century. According to Runco and Garrett (2012), Stein (1953) provided the first “standard” definition of creativity, which combines two elements: (1) originality (e.g., innovation, novelty) and (2) effectiveness (e.g., fit, appropriateness). In this definition “effectiveness” is described as “a solution to a problem; a completed, communicable idea; or something tangible like an invention or work of art” (Parkhurst, 1999, p. 17). These two key elements seem to have been generally adopted by scholars and are

combined in the definition of Amabile, Conti, Coon, Lazenby, and Herron (1996): “the productions of novel and useful ideas in any domain” (p. 1155). This definition is therefore often adopted by scholars in creativity research (e.g. Ernst, Hoyer, Krafft, & Soll, 2017; Sarooghi, Libaers, & Burkemper, 2015).

For the development of policies, however, a formal definition of creativity is not used as a starting point to understanding the CIs. Every country concerned with stimulating the CIs has its own framework for defining it, which is often based on industrial lines (Bakhshi et al., 2013; Braams, 2011; Department for Culture Media & Sport, 2015; Ministry of Economic Affairs & Science, 2005). However, due to spillovers to other industries, it is difficult to measure the effects of policy initiatives. The creative economy is more complex than the sum of these industries and might drive change throughout the whole economy (Potts & Cunningham, 2008; Potts, Cunningham, Hartley, & Ormerod, 2008).

2.2.2 The Origin of the Creative Industries

Since the development of the first DCMS mapping document (DCMS, 1998), the “cultural economy” has been gradually replaced by the creative economy. This change has promoted discussion about whether activities that are termed “cultural heritage” should be included in the definition of the CIs. Potts et al. (2008) note that the CIs are now classified on industrial lines, which is “an extension of the *cultural industries* definition to incorporate the *copyright industries*” (p. 2). This has remained unchanged since the first outline of the DCMS mapping document in 1998. However, this definition is too vague and inadequate to characterize the CIs (Flew & Cunningham, 2010). The CIs use creative resources to generate value (UNCTAD, 2018), and they are organized to profit from human creativity (Jones, Lorenzen, & Sapsed, 2015). However, these conceptual characterizations of the CIs do little to help delineate these industries in a manner that facilitates policy. Although different efforts have been made to characterize the CIs, it is complicated for scholars and policy makers to depart from the original approach of classification by industry. Furthermore, there is a need for an approach that makes it possible to write policy to improve the human and creative capital of professionals in the CIs that goes above and beyond cultural heritage and industrial lines.

2.2.3 The Creative Process

Creativity is at the core of the CIs, which UNCTAD (2008) describes as organizations that create, produce, and distribute services or goods with economic value for which intellectual capital is the most important input. Nonetheless, little has been published on the subject of a creative process to characterize organizations, let alone sectors. To date, the creative process as described in the literature focuses

primarily on individual creation, which often follows the “four-stage model creative process”: (1) preparation, (2) incubation, (3) illumination, and (4) verification (Guilford, 1950). However, Lubart (2000-2001) acknowledges that this model may need revision because it has been superficial since its conception. To define creativity, Torrance (1965) used a process approach in which the “sensing of difficulties, problems, and gaps in information” (p. 8) is necessary to define and solve a problem. This is often referred to as problem analysis, which is considered essential for finding an adequate solution to a problem. When insufficient time is spent at the problem-analysis stage, there is a high risk of error (Römer, Leinert, & Sachse, 2000). Bannerot (2003) further stresses the importance of problem analysis by stating that to obtain a clear overview of the client’s needs, the process should entail (1) clarification of objectives, (2) establishment of requirements, (3) identification of constraints, and (4) establishment of job functions. The downside to the process-description of creativity by Torrance (1965) is that it does not differentiate between a typical creative endeavor and, for instance, a scientific one (Parkhurst, 1999).

Caniëls, De Stobbeleir, and De Clippeleer (2014) describe how different stages of the creative process require different incentives to maximize employee creativity. They summarize creativity as a process with three stages: idea generation, idea promotion, and idea implementation. In idea generation, multiple concepts are generated that might be possible solutions to a problem at hand. According to Wang (2013), this phase of concept generation—although very important—is typically characterized by a lack of structure. Although the approach of Caniëls et al. (2014) incorporates implementation and therefore has a wider scope than the model by Guilford (1950), it is still too limited for the purposes of the current contribution as it focuses on individual creativity, and we are interested in this process on an organizational level. Furthermore, since a key component of the CIs is the economic value of marketable products, this aspect should be included in a process model.

2.2.4 Job Functions

The principle of human capital and the knowledge and ideas of workers are a significant component of a successful creative organization. Knowledge is indispensable for innovation and development and therefore is directly correlated with economic growth (David & Foray, 2003). This is why the CIs are seen as one of the sectors where great economic growth can be accomplished. Consequently, policy designed to support the growth of the CIs should be based on a clear understanding of these industries and of the people who work in them.

Another method chosen to characterize the CIs is to approach this characterization from the perspective of the creative professional. Urlings and Braams (2011) counted the number of professionals working in job functions classified as creative because

these professions are deemed important for stimulating economic growth. Bakhshi et al. (2013) proposed a focus on “creative intensity”, which is the percentage of creatively occupied jobs in a sub-industry in comparison with the total number of jobs in that industry. However, for a complete overview of the economic value of the CIs, focusing on creative job functions is not sufficient. With these methods, the dynamic value of the CIs remains unclear because there might be many professions that are not classified as creative but that nevertheless play a crucial role in how a creative product or service transpires.

2.3 Method

Because very little scientific literature addresses the characterization of the CIs using a process approach, explorative research with qualitative methods of data collection and analysis was chosen for this study. Semi-structured interviews were used to gather information about the processes in CI organizations and the job functions that are important in this process.

2.3.1 Research Setting: The Dutch Top Sector Creative Industries

In the mapping document for creative activity in the Netherlands, which dates back to 2005, the CIs are classified as a collection of industrial segments in which a major part of the creative production occurs (Ministry of Economic Affairs & Science, 2005). A division among three categories is proposed: (1) arts, (2) media and entertainment, and (3) creative and business services. Each of these categories is further divided into four stages: initial creation, production, distribution, and retail. These four stages are used to define a broad classification and a limited one. As a starting point, the limited classification of the ministries of Economic Affairs and Education, Culture and Science (2005) was used (Appendix A) because these are the organizations in which the creative process occurs and, as previously mentioned in chapter 1, there is a consensus on the industries included in this classification (Flew & Cunningham, 2010; UNCTAD, 2008). Although we attempt to find a more dynamic classification of the CIs, this classification helped us to achieve the necessary variety within the sample.

2.3.2 Sample

The study focused on key players in the Dutch CIs. A list of different industries in the creative sector was constructed, after which potential participants were selected using LinkedIn and the researchers’ personal networks. For the final selection, *criterion-based sampling* was used to ensure that every element of interest for the research was covered. More specifically, we used *maximum-variation sampling* so

that each of the different constituents of the CIs was included (Ritchie, Lewis, & Elam, 2003). A total of 23 interviews were held with 24 participants. Of the participants, 33.3% were female ($n=8$). Among these were CEOs/founders ($n=8$), working professionals ($n=3$), HR managers ($n=2$), recruiters ($n=2$) and board members ($n=2$). Participants working in the following industries were included: media, advertising, graphic design, game development, software development, publishing, architecture, Dutch design, journalism, music, and fashion (Table 2.1).

Table 2.1. Industries and Job Functions Interviewees

#	Industry	Function interviewee	#	Industry	Function interviewee
1	Overarching	CEO	12	Publishing/ media	Managing dir.
2	Architecture	Founder/CEO	13	Publishing/ media	HR chief
3a	Architecture	HR manager	14	Media	Manager
3b	Architecture	Business Developer	15	Advertising/ media	Founder/CEO
4	Architecture/ education	Board member	16	Advertising/ media	Film director
5	Education	Board member	17	Fashion	Founder/CEO
6	Education	Head of dept.	18	Fashion/ education	Head of dept.
7	Education/gaming	Head of dept.	19	Textiles/design	Founder/CEO
8	Gaming	Founder/CEO	20	Music	Programmer
9	Serious gaming	Recruitment man.	21	Music	Founder/CEO
10	Serious gaming	Founder/CEO	22	Journalism	Independent
11	Publishing/media	Interim director	23	Museum	Interim director

Procedure

After selection, participants were contacted via e-mail to make an interview appointment. A semi-structured interview approach was used to collect information. By doing so, open-ended questions could be adapted to the participants' specific industry. Of the 23 interviews, 22 were individual interviews (with one participant). The interviews were recorded and later transcribed.

Every interview began with the recording of informed consent, after which the first author asked the participant to describe the company in which he or she worked and the kind of work the participant did for the company. As the interview

continued, the questions focused on processes and job functions. After the introductory questions, participants were asked what kind of products or services they provided and how these were developed. Participants were asked to draw the process of product creation on a sheet of paper. This drawing served as a guideline throughout the rest of the interview. After the process was drawn and discussed in depth, participants were asked what job functions or professions could be linked to the different steps of the process. These professions were written on blue pieces of paper and were placed near the corresponding steps of the process.

2.3.3 Data Analysis

All interviews were transcribed and then coded with the use of ATLAS.ti. Content analysis was used to derive a codebook. The codebook contained all codes subdivided into themes. The themes were mostly predetermined by the interview questions (i.e., process, job functions, CI) (see Appendix B). These themes were used to categorize the codes, which were extracted during content analysis on basis of the interviewees' answers (e.g., the code "designer" was added to the theme "job functions" when an interviewee mentioned a designer as someone who worked in the CIs). These codes were added to quotes referring to the construct of the code. After the content analysis, relational analysis was used to identify similarities in coding and merge overlapping codes. The analyses of the 23 interviews resulted in 8 themes with 138 codes (Table 2.2). A ninth theme (*steps*) was added to connect the different steps of the process, as mentioned by the participants, to a number to achieve an order in the steps. Some of the themes had multiple subthemes to differentiate several concepts and contextual elements (see Appendix B). The interrater agreeability between two raters had a Cohen's Kappa of .67, indicating a 'substantial' agreement between the coders.

Table 2.2. Themes of the codebook with the number of subthemes and labels

Theme	# of subthemes	# of labels
Creativity	0	3
CIs	2	12
Culture	0	4
Job functions	3	34
Organization	0	9
Other	0	1
Process	4	43
Skills	5	27

2.4 Results

In the following section, the results of the interviews are discussed based on the concepts of the process and job functions.

2.4.1 The CI Process Model

Based on the content analysis of the interviews and the drawings, steps in the work process within the CIs could be distinguished. Because a characteristic of the CIs is adding economic value, these steps involve the introduction of products into the marketplace. The steps are elucidated here.

Problem analysis. Problem analysis was often mentioned as an important prerequisite for a successful creative process. Without a clear definition of the problem, it is unlikely that the final product will meet the client's expectations. Participants explained that the problem-analysis stage helps to define the exact question of the client and therefore the relevant problem to be solved. Clients frequently have a fixed idea about what the solution to the problem should be, even before the design process has begun. Problem analysis helps to focus on the final goal instead of the way in which this goal is achieved. During problem analysis, all pieces of information are collected. According to the participants, a characteristic of creative problem solving is that many options for solving one problem are explored, so having all the information is crucial. As one of the participants put it,

"In general, they [the clients] say, 'We want X', and a firm then says, 'Are you sure you want X?' 'Yes'. 'I think you have a problem that you could want to solve with X, but it could also be something else'. So, yeah, maybe that is more or less the difference between knowing you buy bread or somebody saying, 'You are hungry, that is the problem, and maybe you want bread, or maybe something else'."

Respondents indicated that in the creative process, the solution starts with determining the "right" problem. This is not always clear to the client, even though the client might think it is.

Concept generation.

Participants suggested that concept generation starts with sketches or rough ideas that have been generated in response to the needs and criteria that are derived from problem analysis. They stated that in the concept phase, various directions are explored:

"... on the basis of the analysis, you will often go to the concept phase, in which different directions are developed".

With the help of the output of problem analysis, initial sketches or manifestations of what the final result could be are developed without going into detail. A concept expresses the idea that eventually should be conveyed to users once the product is completed. It is the first step toward the final idea. It is common for multiple concepts or ideas to be explored during this stage. A combination of concepts can be applied in the finalized product. In general, during the concept-generation stage, there are very few limitations. Because everything is still open and all options can be explored, this is where creativity can flow most freely and creative intensity is at its peak.

Design.

Design was often divided into multiple stages by the participants. Whereas during the concept phase various ideas are given a rough form or are sketched, in design, one or more of those ideas is further explored and perhaps executed. The participants used many different names for the design stages, such as schematic design, provisional design, technical design, contextual design and final design. However, almost all of them made a distinction between the first phases of design, in which more freedom was permitted and ideas were not yet set in stone, and the stricter final design, in which details were worked out and the design was finalized before it went to the production, execution or engineering phase (Fig 2.1).

"... with a concept design (...), that is more or less the dating phase: (...) are we the right match? And if you conclude, we want to date each other, then you are going to objectify that [the concept design]. Then you make a schematic design, which means you have clearer objectives..."

Iterations.

Iterations are represented in the model by the arrows moving in different directions (Fig. 2). Iterations are loops in the process; developers are continuously testing and altering the product. While doing so, much of the initial ideas might perish. Iterations were often mentioned in combination with "scrum" or "agile development", methods that are used in the CIs. As one of the interviewees explained:

"Iterations is THE keyword in the creative industries. (...) You just start very small, you make something, you test it, you improve it, you test it, you improve it, you test it, you improve it, you test. So you go in short loops towards the endpoint"

Iterations mostly appear in the concept-generation and design phases, although during design, it might be beneficial to go back to the problem-analysis phase to obtain extra information.

Production/execution and product introduction.

As previously discussed, the CIs are characterized by the ability to achieve commercial gain by marketing novel and useful ideas. This is why the production and execution of the designs and the introduction of those products into the marketplace are a crucial part of the creative process for the CIs. Without a successful and well thought out introduction of those products, the CIs would cease to exist. Indeed, part of the CIs' activities is to creatively market products or services for clients. As this interviewee described it:

"What does a creative person do? They work on an assignment and at some moment it is finished, 'Oh, the assignment is finished. What should I do next?' There is another process behind it, among others, business development."

Companies specializing in marketing products for clients go through all the steps of the process themselves to introduce these products into the marketplace. In these instances, the end result of the process is not the client's product but the marketing campaign created by the company. As the product nears finalization, creative intensity degrades because the choices made are more definitive.

Considering all these steps, a model of the process derived from the interviews, drawings, and the literature is shown in Figure 2.1. As shown in Figure 2.1, the start of the process can be either triggered by *demand* from either a client of the market, or by *opportunities* from the market or society.

2.4.2 Job Functions

Since the kind of sectors included in the CIs display a lot of differentiation in the principal products they produce, the job-functions found within these sectors differ greatly. However, some overlap in groups of job-functions can be found, even though the manner in which these jobs are performed, and the products they produce are un-alike. To group these job-functions, we compared the job-functions mentioned by the respondents with the creative job-functions as summarized by Urlings and Braams (2011). With this comparison, a few things stand out. The job-functions Urlings and Braams (2011) characterize as creative are divided in three categories, namely arts, media and entertainment and creative and business services. The third category is predominantly related to job-functions in architecture and urbanism. However, a great deal of the job-functions included by Urlings and Braams (2011) were described by the respondents as less creative, or even non-

creative. Examples are: constructor, engineer or managing partner. In other categories Urlings and Braams (2011) included job-functions that were characterized by the respondents as non-creative, mainly with regards to project management for film, publishing and new media, and more executing job-functions like programmer or engineer. Furthermore, many functions named by respondents were not even included: Job-functions related to game design – either for entertainment or serious games – and job-functions related to fashion design were absent in their framework.

Fig. 2.1. Process-model characteristic for product or service development in the CIs

Table 2.3. Job-functions mentioned by respondents and their corresponding job-function group in the model

Job-function group in model	Examples mentioned by respondents	Sector	Corresponding job-function by Urlings and Braams (2011)*
Designer	Artist	Gaming	-
	Game designer	Gaming	-
	Visual designer	Gaming	-
		Marketing/media	Book illustrator, lightning sketcher, decor-,
	Fashion designer		marketing-, graphic
	Textile designer	Fashion	designer (intermediate)
	Architect	Fashion	
		Architecture	-
	Architect (Interior)		-
		Architecture	Urbanist; architect,
	Architect		construction engineer
	(Landscape)	Architecture	Interior designer; architect,
			construction engineer
	Interaction designer	Marketing/media	Garden- and landscape
		Gaming	architect
	Photographer	Marketing/media	-
			-
	Sound designer	Gaming	Photographer, film- and
			tv-camera operator, film
	Curator	Museums	editor or mechanic, photo
	Composer	Music	laboratory operator
			(intermediate)
			Instrumentalist, composer,
			conductor (excl. choir),
			songwriter
Strategist			-
	Strategist	Marketing/media	-
		Gaming	-
	Business Developer	Architecture	-
	Researcher	Gaming	-
	Booker	Music	-

Table 2.3. Continued

Job-function group in model	Examples mentioned by respondents	Sector	Corresponding job-function by Urlings and Braams (2011)*
Project Manager	Production assistant	Television	-
	Content manager	Publishing	-
	Film director	Film	Director theatre, film
	Floor manager	Film	-
	Art director	Marketing/media	-
		Gaming	-
	Creative director	Fashion	-
	Project manager	Film	-
		Gaming	-
	Producer	Architecture	-
		Museums	-
		Marketing/media	-
Engineer	Programmer	Gaming	-
		Marketing/media	-
	Construction engineer	Architecture	Designer-constructor
	Installation engineer	Architecture	Designer-constructor
			energy, telecommunication
	Knitting specialist	Fashion	technique, electric motors, electronics
Marketing Manager			-
	Marketer	Publishing	-
		Museums	-
	Sales manager	Publishing	-
	Sales director	Fashion	-

* If applicable. Some of the job-functions were absent in the framework of Urlings and Braams (2011), this could also be due to the fact that some of the job-functions as mentioned by the respondents were considered to be non-creative.

Professional creativity.

To be able to connect job functions to the different stages of the model, we first need to obtain an understanding of the degree of creativity for the involved professionals. Therefore, we take a closer look at what is viewed as a creative professional.

As noted by many of the interviewees, creativity is a skill or trademark that is desired in most, if not all, professionals in the twenty-first century. In that sense, it should be used in the general line of work. Most interviewees responded to the

questions about which job functions they considered creative by stating that it is preferable for all employees to possess some degree of creativity to help them with their daily activities. Initially, they felt reluctant to appoint certain job functions as being more creative than others:

“... I actually think that, of everybody who works for us, a certain degree of creativity is required (...) Except for the bookkeeper—that is somebody we don’t need because of his creativity—but for all the production-oriented people, (...) we expect a certain degree of creativity”.

For creative professionals, creativity is the aspect that makes them successful; it is the aspect around which their jobs revolve. It is why clients come to them: to think of something no one else had thought of. Participants noted that some clients tend to take the place of the designer, making the creative professional an executor instead of a creator and innovator. However, being the innovator and not the executor is a very important trademark of the creative professional.

To discover what they viewed as truly creative, the participants were asked to give their own definition of creativity. Many interviewees mentioned “out-of-the-box” as a phrase that instantly came to mind when asked about creativity. Almost all participants mentioned creation or finding new solutions as an aspect of creativity, although none of them referred to both innovativeness and effectiveness as key factors of creativity. The closest to a definition was given by this participant:

“Creativity is a part of the creative/artistic process. Creativity means that you are able to make a new composition from an existing context and situation. So that is actually the creative part in it. But it is also, in the artistic/creative process, there is also a part—if you are talking about the development process—that is just repetition and doesn’t have anything creative in itself. (...) But the creative moment itself is the moment that you take existing elements and make something that is new to you”.

Participants acknowledged the difference between creativity as at the core of someone’s profession and creativity as a skill to be better at a job. Thus, a distinction can be made between “creative job functions” (e.g., designers, researchers, strategists, art directors) and “non-creative job functions” (e.g., producers, project leaders). Even though all job functions are equally important for efficient product development, most non-creative job functions (with the exception of the project leader) could be viewed as supporting or executive roles.

Creativity was considered a more important skill in the beginning of the process, when new ideas had to be generated. As the process of development continues, the margin for creativity diminishes and the more execution-related job functions

(i.e., functions that realize the ideas conceived in earlier stages of the process) begin to play a larger role.

2.4.3 The CIs' Process Model Supplemented with Job Functions

In the following section, the process model described earlier is supplemented with the job functions mentioned by the interviewees. Considering the breadth of the CIs, these job functions are formulated as groups with a common underlying incentive.

Problem analysis.

Job functions involved in this stage, according to the participants, are business developers, strategists and researchers who determine what information is needed to successfully execute the project. These job functions might be executed by the same person—or possibly even the designer—depending on the size of the organization:

"... that job function is just united in one person in the way I just said. It is, however, often the case that the analysis is performed by people who actually understand how you can build something after that."

When problem analysis is completed, a team can be assembled that will design and develop the solution. If a project-manager is appointed, he or she will be involved in this stage of the process as well.

Concept generation.

In this stage, creativity can flow freely. This is where creative professions such as designers come up with multiple ideas, only loosely guided by project management.

Design and production/execution.

Depending on the product or service developed, designers, architects, game designers, or art directors are most involved in these stages. Engineers are involved in this stage to begin the execution of the product. Through iterations of design and production/execution, designers and engineers work together. As the process continues—from concept generation, to provisional design, to final design—the degree of freedom for creativity becomes increasingly restricted. However, through iterations, the product is continuously tested, analyzed and improved, so the degree of freedom and the people involved might be dynamic.

"So, that constructor, he will say, 'I want concrete pillars. And I want concrete beams, or steel beams'. Give those to his engineers, and they will incorporate that in that model. Those get slid into each other. Every week it gets taken apart and put together again. And this is how the design gets developed further".

As another example of how different job functions are connected to different steps of the process, depending on the degree of finalization of the product, one architect said:

“We [the architects] are very focused on the concept phase, and the co-architect is actually more focused on the execution phase”.

Product introduction.

The product introduction-phase is concerned with introducing the finalized product into the market. The importance of this step was emphasized by this interviewee:

“I think product development is real creation, but my eyes have really been opened the last few years to what creativity means if you are talking about graphics and about marketing because for me, this all has to do with the same thing. That is, somebody sees something, feels something, that it gives you a warm feeling—to keep it vague—ultimately making you want to buy the product or use it. And that is, on the one side, dependent on the product, but since we founded [the company] and did the whole branding, the way in which we started selling, that really made a difference in how people look at you as a brand and, yeah, we really saw a difference between the old branding and the new branding and what it adds to the fact that your product is just interesting. (...) I think that that branding (...) resulted in more conversion”.

This statement shows that to generate value, introduction into the market and the way a product is branded are very important. This is why strategists and marketers are important for economically thriving CIs.

A general overview of what job-function groups play a role in the different steps of the creative process model is shown in Figure 2.2.

Fig.2.2. Process-model supplemented with job-function groups

2.5 Discussion

2.5.1 Main Findings

Because the definition of the CIs is now based on seemingly arbitrary industrial lines, the current study aimed to find a process that could characterize the CIs and help with the development of policy by linking job functions to this process. Policy regarding the CIs is now mainly focused on maintaining existing structures that would be difficult to uphold without subsidies or other kinds of incentives from governmental structures (Jones et al., 2015). However, to improve the economy by optimizing the innovative force of the CIs a different kind of policy is needed. That is why we developed a work-process to delineate the CIs in a manner that is more dynamic in comparison to frameworks currently used. This dynamic property is important, since the industries for which policy has to be written are more dynamic than structures in the past. Also, work has changed a lot in the last few decades, which has greatly impacted the required human capital. By linking job-functions to the work process, it can help in understanding what skills employees in different job-function groups need to innovate, and to focus on the development of these skills. With respect to the first question (What work process can characterize creation and production in the creative industries?), we derived a six-phase process, based on analysis of literature and the interview data: problem analysis, concept generation, provisional design, final design, production/execution, and product introduction (Figure 2.1). This process partly overlaps the generation and implementation of ideas (Caniëls et al., 2014), but adds the characterization of a method for collective development instead of focusing on individual creation. The proposed process model is unique in a way that it is meant to be applicable to the CIs as an economy that uses their products as commodities to create value. This has been described as imperative for the CIs (Nesta, 2006; Rutten et al., 2010; UNCTAD, 2008; Yue, 2006). One element that makes this work-process specifically suitable for the CIs is the role of the problem analysis-phase. In the CIs, when this phase is successfully executed, the goal (i.e. what to achieve with the solution) is clear, but the way to achieve the goal (i.e. the solution) is not. Therefore, to achieve the goal, the solution must be both novel – since it is not yet known – and useful. This is in line with the definition of creativity as given by Amabile et al. (1996).

Two components distinguish this work process from work processes in other industries. Firstly, iterations are an indispensable aspect of work in the CIs. These iterations serve as a check, to prevent a mismatch between the question asked and the final solution being given. In other industries a funnel-like approach to product development is more common, in which taking a step back is difficult. Secondly,

the CIs are not just demand-driven. Many products are developed when a person or organization sees an opportunity in the market or in society. Both demand and opportunity are depicted in the work-process (Figure 2.1).

To follow up on the process model, we attempted to answer the question of what job functions are needed to successfully support this process. We found that, regarding the creative process, a distinction can be made between “core creative job functions” and supporting and executive job functions, which are generally considered less creative. These “non-creative job functions”, however, are very important. By connecting all these job functions to the model, we make a case for our approach by acknowledging that it is not only those job functions that are creative at their core that are needed for the creation of economic value in the CIs. Supporting roles such as those of project managers help to complete the process fluently and enable the core creative professionals to work to the best of their ability. This central role of creative job-functions is shown in table 2.3. Job-functions included in the framework of creative job-functions in the Netherlands by Urlings and Braams (2011) are mostly prominent in the designer sub-group, which plays the largest role in the beginning of the work-process. This is where creativity can flow the most freely. The absence of the other job-functions in the framework of Urlings and Braams (2011) shows that our work-process has the unique ability to include all job-functions needed in the CIs and is therefore more suitable to use when writing policy for this sector. By using the work-process approach, policies to improve skills of all professionals in the CIs can be developed.

2.5.2 Limitations and Future Research

Although we found a model that seems applicable to most—if not all—developmental activities in the CIs, the capacity to differentiate between the CIs and other industries might be improved upon. However, our goal was to develop a model that could be used to help stimulate growth in the CIs by looking at the human capital needed, and it is our belief that this model enables just that. Still, for future research, the model could be improved to make a better distinction between different industries.

The identified model can be used to study and better understand the CIs. It provides input for processes and the important job functions that are required at each stage of the process. Future studies could research the most important skills among workers at each stage of the process.

Chapter 3

21st-Century Digital Skills and the Process-Model of Creation

3 21st-Century Digital Skills and the Process-Model of Creation

3.1 21st-Century Skills in the Digital Workplace

The skills needed by the employees of earlier centuries differ from those of contemporary workers. During the industrial era, manual labor skills were the main focus. However, in the current Western society, knowledge is often an employee's greatest attribute, and this knowledge is used to generate value (Anderson, 2008; Bejinaru, 2016; Sokól & Figurska, 2017; UNCTAD, 2018). In 1979, Daniel Bell predicted that knowledge and information would replace labor and become the most vital assets of professionals. This was later endorsed by Peter Drucker, who stated the following: "The basic economic resources – 'the means of production,' to use the economist term, is no longer capital, nor natural resources ... nor 'labor'. It is and will be knowledge" (1993, p. 8). Furthermore, the introduction of the Internet made information – which is needed to generate knowledge – available in abundance. However, to use this knowledge to their advantage, employees need cognitive skills. Such skills – among which creativity, communication, and critical thinking – as well as digital skills, increase in importance.

The collection of skills needed by employees in the 21st-century workplace are often referred to as 21st-century skills. With the focus on knowledge in contemporary labor, 21st-century skills have become indispensable for organizations to thrive. Meanwhile, the use for routine skills and physical labor is decreasing (Carey, Florisson, & Giles, 2019; European Commission, 2017). Furthermore, globalization and the evolution of technology dramatically increased the dissemination of information and knowledge (Hadad, 2017). Tapscott (2014) describes the knowledge economy as a digital economy. Therefore, next to the growing importance of cognitive skills, employees need to be able to work with ICTs, such as computers and mobile devices connected to the internet. However, the combination of cognitive skills and digital skills is given little attention in the work environment. This might be because it is often believed that the exposure to ICTs is enough for employees to reap the benefits (Van Dijk, 2017), and the level of cognitive skills is difficult to quantify (Cobo, 2013).

To study the cognitive skills among workers in the CIs, we use the 21st-century digital skills framework of Van Laar et al. (2017), who operationalized the most

relevant 21st-century skills for digital environments¹. In the second part of this chapter, the importance for these skills, in general, and for the workers in the CIs, in particular, will be explained. Finally, the link between these skills and the process model of creation of chapter 2 will be explored.

3.1.1 The 21st-Century Digital Skills Framework

The concept of '21st-century skills' is commonly used to indicate that the contemporary skill requirements in the 21st century are quite different from the skills needed during and after the industrial revolution (Van Laar et al., 2017). However, due to the rise of technology, in general, and ICTs, in particular, employees also have to be able to utilize these skills in a digital environment (McKinsey & Company & Business of Fashion (BoF), 2019). Therefore, Van Laar et al. (2017) developed a framework in which a set of the 21st-century skills most mentioned in academic literature is operationalized with a digital component. This set of 21st-century digital skills includes technical skills, information management, communication, collaboration, creativity, critical thinking, and problem solving. For this dissertation, the terminology of technical skills is adapted to operational skills since this nomenclature fits the conceptual definition more accurately. Table 3.1 shows these 21st-century skills dimensions with their conceptual definitions. These skills indicate how the cognitive skills needed by contemporary employees could be reflected in the use of ICTs and the internet.

Table 3.1. Framework of Van Laar et al. (2017) with conceptual definitions of core 21st-century digital skills

21 st -century digital skills dimensions	Conceptual definition	Examples
Operational skills	The skills to use (mobile) devices and applications to accomplish practical tasks and recognize specific online environments to navigate and maintain orientation.	<ul style="list-style-type: none"> • Being able to access digital resources by operating mobile applications. • Being able to navigate online environments.

¹ This dissertation and the framework of Van Laar et al. (2017) are part of the 'e-skills, key to 21st-century labor' project, funded by the NWO (project number 409-15-214). The dissertation of Ester van Laar (What are E-ssential skills?) was published in November 2019.

Table 3.1. Continued

21st-century digital skills dimensions	Conceptual definition	Examples
Information management	The skills to use ICT to efficiently search, select, organize information to make informed decisions about the most suitable sources of information for a given task.	<ul style="list-style-type: none"> • Selecting the right key words when using Google to search for information. • Using a folder structure to save and organize information.
Communication	The skills to use ICT to transmit information to others, ensuring that the meaning is expressed effectively.	<ul style="list-style-type: none"> • Adapting your communication style to the medium (i.e. WhatsApp, e-mail, Skype).
Collaboration	The skills to use ICT to develop a social network and work in a team to exchange information, negotiate agreements, and make decisions with mutual respect for each other towards achieving a common goal.	<ul style="list-style-type: none"> • Using online applications and cloud services like Trello, Google docs or Dropbox. • Being able to use applications for videoconferencing, like Zoom or Microsoft Teams.
Creativity	The skills to use ICT to generate new or previously unknown ideas, or treat familiar ideas in a new way and transform such ideas into a product, service or process that is recognized as novel within a particular domain.	<ul style="list-style-type: none"> • Using internet to find inspiration and know what applications you can use to execute ideas (e.g. Photoshop or Illustrator for visuals; Logic, Pro Tools or Cubase for audio).
Critical thinking	The skills to use ICT to make informed judgements and choices about obtained information and communication using reflective reasoning and sufficient evidence to support the claims.	<ul style="list-style-type: none"> • Look for multiple sources online and determine whether the information is accurate and reliable based on e.g. publication time or sources used.

Table 3.1. Continued

21 st -century digital skills dimensions	Conceptual definition	Examples
Problem solving	The skills to use ICT to cognitively process and understand a problem situation in combination with the active use of knowledge to find a solution to a problem.	<ul style="list-style-type: none"> • A combination of the above mentioned skills and examples (Van Laar, Van Deursen, Van Dijk, & De Haan, 2019a)

Note. Adapted from “The Relation Between 21st-Century Skills and Digital Skills: A Systematic Literature Review,” by E. van Laar, A.J.A.M. van Deursen, J.A.G.M. van Dijk, and J. de Haan, 2017, *Computers in Human Behavior*, 72, p. 583.

3.1.2 The Importance of 21st-Century Digital Skills

Currently, citizens need to be able to navigate digital environments for a multitude of tasks. Examples include the internet applications used for filing taxes or to apply for a job. However, even though the generation born after the 1980s grew up with the internet and the use of ICTs, this does not automatically imply that they have sufficient skills. The ongoing research into digital inequality acknowledges that mere exposure to digital environments does not necessarily give people the cognitive skills for critical use and intentional outcomes (Van Deursen, Helsper, Eynon, & Van Dijk, 2017; Van Dijk, 2017).

While routine jobs are increasingly replaced by machines, knowledge workers face a smaller risk of losing their jobs due to automation. Despite the fact that many jobs in CIs are supported by ICTs, due to their cognitive nature, they are at lower risk of becoming automated in the near future (Bakhshi, Frey, & Osborne, 2015), even though some argue that with the rise of artificial intelligence, knowledge work will also be increasingly performed by computers (Kelly, 2016). Technological advancements, together with globalization, organizational developments, and governmental policies, brought about large changes in the CIs, which has resulted in an increasing interest in the implications for these changes for work (Carey et al., 2019). In addition to cognitive skills, employees need to be digitally and technologically skilled and need to be able to use contemporary tools (Garcia, Klinger, & Stathoulapoulos, 2018; McKinsey & Company & Business of Fashion (BoF), 2019). With regard to the CIs, many of the skills that were once performed manually – such as designing a building – can now be performed with the help of digital tools. This has grown to such an extent that the term ‘createch’ skills has been coined for the combination of creative and digital skills (Bakhshi, Djumalieva, & Easton, 2019).

These skills – and more specifically, the jobs that are associated with these skills – are expected to grow in the future and are specifically important for creative work, both within and outside the CIs. However, according to the UK Employer Skills Survey, there is already a shortage of digital and complex analytical skills (Winterbotham et al., 2018). Therefore, organizations in the CIs should focus on developing such skills among their employees to remain innovative and competitive.

3.1.3 21st-Century Digital Skills for Organizations in the CIs

With the rise of the knowledge economy, attention to the management of human capital has also grown (Hadad, 2017). Human capital is viewed as one of the characteristics of a competitive organization. It is all the knowledge, skills, and experiences of the people working within an organization combined and is the only organizational asset that can generate innovation (Bejinaru, 2016). Therefore, organizations should invest in the skills and knowledge of their employees. However, whenever an employee decides to leave an organization, their expertise is lost, which makes creating a favorable working environment important to retain talent.

In chapter 2, a process model of creation was introduced that describes how the products within the CIs are developed, created, and introduced into the market. During the interviews that resulted in the process model, the respondents were also asked about the skills they deemed important for this process and whether they recognized the skills in the 21st-century digital skills framework. Although the participants had difficulty comprehending the digital component in combination with the 21st-century skills, they acknowledged the importance of the six skills in the framework. In particular, information management, communication, collaboration and problem solving were often mentioned (Van Laar, Van Deursen, Van Dijk, & de Haan, 2019b). By linking 21st-century digital skills to the process model, the development of employees can be focused on those skills most predominant in the phase to which their job function is connected. Even though all 21st-century digital skills are desired to a certain degree for all job functions and throughout the process, some skills are more predominant in certain phases and, therefore, are more important for certain disciplines. Figure 3.1 shows an explorative overview of what skills are needed for the different phases and functions connected to the process based on the interviews in chapter 2 and Van Laar et al. (2019b) and a review of the literature. Although it is expected that critical thinking is needed in other steps – next to problem analysis - this is not included in Figure 3.1, since it could not be specifically derived from the interviews and literature.

Figure 3.1. The process-model of creation supplemented with skills needed per phase

The process model consists of six steps, of which problem analysis is the first. Holgaard, Guerra, Kolmos, and Petersen (2017) describe problem analysis as “the process of identification, analysis, and formulation of a problem” (p. 1070). In the CIs, much time and attention is allocated to this stage. It helps in “assessing the validity of the argument that leads to the articulation of the problem statement” (Thron Dahl, Velmurugan, & Stentoft, 2018, p. 433). When this is not done properly, the developers are at risk of creating a product that might be good in itself but is not a suitable solution for the problem at hand. For problem analysis, the 21st-century digital skills of critical thinking, communication, and information management are important. Any design project begins with critically asking questions to define the design objectives and to research what the client truly wants. It is an integral part of design (Dym, Agogino, Eris, Frey, & Leifer, 2005). Questions such as why, what, who, where when and how address the appropriate problem (Holgaard et al., 2017; Thron Dahl et al., 2018). In the CIs, the products are mostly created for clients, so the person performing the problem analysis needs to be able ask the right questions,

be able to read between the lines, and interpret what the client is saying and to be able to translate that into what the actual problem is. Therefore, communication is an important skill in the problem analysis phase.

The second, third and fourth steps of the model are related to the product design. This is where creativity and problem solving are at their peak. The amount of freedom for creativity diminishes when progressing in the design stages of the model (Koehorst, Van Deursen, Van Dijk, & De Haan, 2019). In design, negotiation and communication, problem solving, acceptance of responsibility, collaboration, and project management are skills and competences that are valued by clients (Lewis & Bonollo, 2002). Organizing information in such a way that it can be easily located when needed is an important part of project management, so information management is a skill that is also required in the design stages. Furthermore, engineers using the process of design thinking need to have good collaboration skills, since design is increasingly “a team process with multiple sociotechnological dimensions” (Dym et al., 2005, p. 107).

For the production and execution phase, engineers are often deeply involved. They execute the ideas generated by the designers. In the case of a software engineer, this implies great operational skills. However, collaboration skills are also very important, since they need to be able to cooperate with the designer to make their vision come to life.

The introduction phase is a special and complicated phase in this model with regards to connecting skills, since introducing a product or service to the market often involves going through the whole process in and off itself. Therefore, it is difficult to determine the specific skills that are emphasized during this phase. However, during the interviews, the participants mentioned that some skills that are applicable throughout the whole process, such as the skills to conceive of and execute ideas, for which they thought creativity and operational skills were crucial (Van Laar et al., 2019b). Additionally, communication was important in every stage. Every discipline has its own lexicon, and it is useful for colleagues in different disciplines to understand each other, since the process of creation is a joint effort. This also implies that collaboration is an important skill in every step of the process.

3.2 Implications

In this short overview, the 21st-century digital skills and their relevance in the process model of creation are discussed. Linking 21st-century digital skills to the process model enables the development of these skills to be executed more efficiently. By knowing what disciplines and skills are involved in the different phases of the process model, it will be easier to determine what skills need specific attention while professionals in the CIs aim to develop themselves.

Chapter 4

A Systematic Literature Review of Organizational Factors Influencing 21st- Century Skills

4 A Review of Organizational Factors Potentially Influencing 21st-Century Digital Skills

4.1 Introduction

Increasing globalization and the technological revolution forced organizations to rethink their methods of business in order to maintain competitive (Hitt, Keats, & DeMarie, 1998). Globalization and technology also changed the way in which employee skills are applied and valued (Azim et al., 2010; Bakhshi et al., 2019). Employees are increasingly valued for the knowledge they possess and how they can use that knowledge to produce tangible ideas (Bejinaru, 2016; Serrat, 2017; Sokól & Figurska, 2017). In this regard, the concept of 'knowledge workers' refers to professionals whose jobs are characterized by non-routine problem solving, which predominantly requires mental work and creative thinking (Reinhardt, Schmidt, Sloep, & Drachsler, 2011; Sokól & Figurska, 2017). Skills like problem solving and creativity are examples of skills that are important for all knowledge workers in the 21st-century. These skills are often labelled 21st-century skills, which differ from skills needed in the 20th century mainly due to the rise of information and communication technologies (ICTs) (Dede, 2010).

21st-Century skills refer to both higher-order cognitive skills, and to social and digital skills. These skills are needed for non-standardized tasks that require the processing of knowledge and information (OECD, 2017). Black and Lynch (1996) already established a few decades ago that the improvement of computer-skills is particularly important to boost the productivity of employees. Nowadays ICT can be considered an inherent resource to efficiently perform knowledge work (Jacobs, 2017). 21st-Century skills are crucial for organizations that want to be innovative and competitive (Bejinaru, 2016; Sokól & Figurska, 2017) and national policies are developed around the world to improve these skills for both students and the workforce (e.g. Anderson, 2008; Ferrari, 2012; Voogt & Roblin, 2012). For organizations, the incorporation of development policies for employees should be part of an organization wide business strategy (Gardiner, Leat, & Sadler-Smith, 2001). This should not only entail formal training of employees, but also keep into account what organizational factors can influence the level of 21st-century skills. By doing so, the development of 21st-century skills among knowledge workers can be optimized, which gives organizations a competitive advantage in an age in which knowledge, and what employees can do with this knowledge, is considered a valuable asset (Anderson, 2008; Sokól & Figurska, 2017; UNCTAD, 2018).

To evaluate what organizational factors influence the level of 21st-century skills according to empirical scientific research we conducted a systematic literature

review. By doing so, we want to answer the following research question: *What organizational factors are statistically significant in influencing the level of 21st-century skills of employees, according to academic literature?* Knowing what organizational factors influence 21st-century skills of employees can help organizations to implement effective policies to develop the skills that are needed by knowledge workers.

4.2 Theoretical Framework

4.2.1 21st-Century Skills

As stated before, 21st-century digital skills are higher-order cognitive, social, and digital skills that knowledge workers need to produce tangible ideas from their knowledge (Bejinaru, 2016; Serrat, 2017; Sokól & Figurska, 2017). Ferrari (2012) uses the term digital competence to describe an individual that is able to understand (digital) media, search and find information and – once retrieved – be critical about its' contents, and use ICTs to communicate with others. Anderson (2008) endorses the importance of knowledge workers being able to use ICTs to search, organize and evaluate information from a multitude of sources. Based on extensive job analysis reports, Jacobs (2017) divided knowledge-based tasks into five types of work behaviours: *problem solving*, *decision making*, *conducting an inspection*, *developing a design*, and *facilitating a work process*. These five work behaviours require the individual to employ their problem-solving skills, for instance by testing hypothesis and to recall available knowledge. Furthermore, it requires creativity and critical thinking. These findings draw parallels to the most important skills for knowledge workers found in a systematic review performed by Van Laar et al. (2017). This review of academic literature revealed that the seven most mentioned 21st-century skills in literature are: operational skills, information management, communication, collaboration, creativity, critical thinking, and problem solving. In this framework operational skills are “the skills to operate computer and network hardware and software” (Van Deursen & Van Dijk, 2010, p. 894). This definition is expanded on by Van Laar et al. (2017) by adding other (mobile) devices and the skills to recognize, navigate, and maintain orientation in specific online environments. So, knowledge workers have to be able to use contemporary tools, mostly in the form of ICTs. The remainder of the skills are so-called higher-order cognitive skills and social skills, which implies that these are not developed by rote learning, but involve higher cognitive processing. Due to the novelty of the concept of 21st-century digital skills as described in the previous chapter, this systematic literature review uses the core skills found by Van Laar et al. (2017) without the context of digital environments.

Table gives an overview of the conceptual definitions of these seven core 21st-century skills.

Table 4.1. Framework with core 21st-century skills

21 st -century skills dimensions	Conceptual definition
Operational skills	The skills to use (mobile) devices and applications to accomplish practical tasks and recognize specific online environments to navigate and maintain orientation.
Information management	The skills to efficiently search, select, organize information to make informed decisions about the most suitable sources of information for a given task.
Communication	The skills to transmit information to others, ensuring that the meaning is expressed effectively.
Collaboration	The skills to develop a social network and work in a team to exchange information, negotiate agreements, and make decisions with mutual respect for each other towards achieving a common goal.
Creativity	The skills to generate new or previously unknown ideas, or treat familiar ideas in a new way and transform such ideas into a product, service or process that is recognized as novel within a particular domain.
Critical thinking	The skills to make informed judgements and choices about obtained information and communication using reflective reasoning and sufficient evidence to support the claims.
Problem solving	The skills to cognitively process and understand a problem situation in combination with the active use of knowledge to find a solution to a problem.

Note. Adapted from “The Relation Between 21st-Century Skills and Digital Skills: A Systematic Literature Review,” by E. van Laar, A.J.A.M. van Deursen, J.A.G.M. van Dijk, and J. de Haan, 2017, *Computers in Human Behavior*, 72, p. 583.

4.2.2 Possible Determinants of 21st-Century Skills for Employees

Even though it is acknowledged that 21st-century skills are important, the work environment is often not optimally equipped to nurture these skills (Bryan & Joyce, 2005). Organizations have to adapt to be able to provide professionals the best possible circumstances to flourish. They need to invest in their employees, and give them the opportunity to gain knowledge and skills (Hitt et al., 1998). However,

although some claim that the innovation and creation of new products is an accomplishment of individuals (McMullen & Shepherd, 2006) which necessitates the stimulation of individual employee skills, such as creativity (Wu, McMullen, Neubert, & Yi, 2008), there is now a general agreement among authors that knowledge work is hardly ever a solitary undertaking (McDermott, 2005). Therefore, collaboration is an increasingly important skill for knowledge workers.

Most research so far has been focussing on the effects of organizational determinants directly on organizational output (e.g. Burnside-Lawry, 2012; Montes, Moreno, & Morales, 2005), and not on the effect of these determinants on the skills of employees. However, some prior research has shown that there are several organizational factors that might play a role in employee skill development. According to Amabile and Pratt (2016), organizational resources such as sufficient financing for projects, tangible materials, and infrastructure are needed for individual employees to perform creative tasks. Also, creativity and innovation should be stimulated through organizational culture. Organizational culture can be best described as the communal values and beliefs that people within an organization hold (Mumford, Whetzel, & Reiter-Palmon, 1997). These values and beliefs heavily influence the behaviour of people within the organization (Andriopoulos, 2001). In the case of promoting creativity and innovation among employees this requires “a bias toward clear-eyed risk-taking (versus clinging to the status quo), a genuine openness to new ideas, a system for developing creative ideas, and an offensive strategy of leading the organization’s industry to the future” (Amabile & Pratt, 2016, p. 161). In other words, the organization needs a clear directive towards innovation, shown by the actions and statements of organizational members such as founders and leaders (Amabile & Pratt, 2016).

Leaders play a vital role in executing the values related to organizational culture (Wang, Xue, & Su, 2010). They can increase the appeal of a job by showing support, which in turn can influence creative behaviour of employees (Oldham & Cummings, 1996). This leader-support is an aspect of a leadership style called transformation leadership (Bass, 1990a; Bass & Avolio, 1993), which is shown to support creativity (Chang & Teng, 2017; Gilmore, Hu, Wei, Tetrack, & Zaccaro, 2013; Herrmann & Felfe, 2013; Jaiswal & Dhar, 2016; Wang, Tsai, & Tsai, 2014). It transpires when a leader is able to expand the interests of employees beyond their own self-interest, and make them aware and accepting of the goals of the group (Bass, 1990b). Transformational leaders influence their employees by considering their individual preferences and the personalities, communicating a clear vision and being able to motivate employees by giving them the confidence to go beyond specified goals (Dvir, Eden, Avolio, & Shamir, 2002).

Another manner in which an organization can develop the skills of their employees is through training. Training can be described as a method of learning and development that improves the effectiveness of individuals or groups in a methodical and organized way (Goldstein & Ford, 2002). When an organization facilitates training for their employees, it is investing in knowledgeable employees. A highly skilled workforce can give organizations a competitive advantage, and multiple studies have shown that training can improve both employee and organizational performance (e.g. Arthur, Bennett, Edens, & Bell, 2003; Kraimer, Seibert, Wayne, Liden, & Bravo, 2011). Furthermore, it is also found that training has a positive effect on creativity (Ekore, 2014).

Job autonomy, task variety and routine (the degree to which a variety of tasks are required to perform a job), and decision latitude of the employee are factors that account for job complexity as defined by the *Dictionary of Occupational Titles* classification system (Roos & Treiman, 1980). When a job is complex, the work excitement of employees is raised, because they experience responsibility for work outcomes and job-significance (Coelho, Augusto, & Lages, 2011), and this has been shown to have a positive influence on creativity (Mathisen, 2011; Slåtten, 2014; Sung, Antefelt, & Choi, 2017; Yeh & Huan, 2017). Job autonomy is “the degree to which the job provides substantial freedom, independence, and discretion to the employee in scheduling the work and in determining the procedures to be used in carrying it out” (Hackman & Oldham, 1975, p. 162). Job autonomy is also closely related to organizational culture and structure, since the accompanying values can influence the amount of freedom employees have to perform their jobs. According to Hackman and Oldham (1975) the responsibility that high job autonomy brings, results in more satisfaction at work and a higher quality of output.

By knowing what skills are important for professionals, and what the possible organizational determinants are that influence these skills, a systematic literature review can be performed to get a more comprehensive overview of organizational factors influencing the 21st-century skills level of employees.

4.3 Method

4.3.1 Systematic Literature Review

To answer the research question, a systematic literature review was performed. A systematic literature review conveys that unambiguous methods are used to systematically find, select and evaluate suitable research, and to analyse the included data to answer a research question (Moher, Liberati, Tetzlaff, Altman, &

The PRISMA Group, 2009). The review was performed using the PRISMA-protocol (Moher et al., 2009). This is a 27-step protocol and reporting guideline for systematic reviews, developed to minimize bias and increases the transparency of the research process in order to improve the reliability of published papers (Moher et al., 2015). Although this protocol is developed for systematic literature reviews in health care, it can serve the same function for social sciences, in that it focusses on reporting on research in a clear and concise manner. The protocol also helps to prevent publication bias, which is a major concern in the reporting of systematic reviews (Moher et al., 2009).

4.3.2 Sources and Search Strings

The final search for the systematic literature review was performed in November 2017. The databases used for the search were Scopus, Web of Science and EBSCO-host. Within EBSCO the choice has been made for the databases of Business Source Elite, PsycINFO and Psychology and Behavioral Sciences Collection, since these are most appropriate for social science research. The document types were limited to peer-reviewed articles. This choice was made to ensure a certain kind of scientific quality within the retrieved documents. Finally, all documents had to be in English.

Considering that within 21st-century skills research the included skills differ per framework, the researchers chose to include the skills identified in the systematic review by Van Laar et al. (2017). These skills, and related terms were used separately in the search string. The search-string consisted out of three parts, based on the research question: *What organizational factors are statistically significant in influencing the level of 21st-century skills of employees, according to academic literature?* The first part is made up out of “factors” and possible synonyms (e.g. determinants, predictors, indicators) (Table 4.2). The second part consists of the different skills as defined by Van Laar et al. (2017). Since operational skills is one of skills in the framework, the general terms “skills” and “competences” (and derivative terms) were used in hopes to also include articles considering operational skills or ICT competences, but also sets of skills closely related to 21st-century skills. Since early searches found very little to no articles on information management, related terms found in initial searches (i.e. knowledge transfer, learning transfer, knowledge management, and information literacy and derived terms) were included in the search string. The third part of the search string was related to the level in which the factors and skills had to emerge. These three parts resulted in the final search string showed in Table 4.2.

Table 4.2. Selection criteria to determine in- of exclusion of documents

Title		AND Title	AND Title
predict*	OR	skills	OR work N2 culture OR
factor*	OR	competenc*	OR work N2 environment OR
determin*	OR	creative*	OR work N2 climate OR
indicator*	OR	“problem solving”	OR firm OR
condition*	OR	“critical thinking”	OR organization* OR
antecedent*	OR	communication	OR employ* OR
associat*	OR	collaboration	OR business
contribut*	OR	teamwork	OR
influenc*	OR	“information management”	OR
related	OR	“knowledge transfer”	OR
relation	OR	“learning transfer”	OR
moderat*	OR	“knowledge management”	OR
assess*		“information literac*”	

4.3.3 Inclusion Criteria and Selection

To help with the selection of articles to include, and to help prevent inclusion bias, criteria were formulated based on the research question. The criteria are shown in Table 4.3. Research that used moderators or mediators (indirect connections) in their research questions or hypotheses was allowed. Since the skills included in the search are considered 21st-century skills, it was decided to only include studies that were published after 2005.

Table 4.3. Criteria for the inclusion of documents

1. At least one of the following concepts should be described:	a. creativity; b. problem solving; c. critical thinking; d. communication; e. collaboration (or teamwork); f. Information management (or knowledge management, knowledge transfer, learning transfer or information literacy); g. operational skills or competences; h. a set of skills or competences (e.g. 21 st -century skills)
2. The article should report on empirical, quantitative data	
3. The influential factor(s) described should be in the context of an organization	
4. The influential factor(s) described should be on an organizational level	

Table 4.3. Continued

5. The factor(s) described should have an influence on an individual skill-level (top-down), so NOT for an organization as a whole
6. The factor(s) described should influence the skill of the employee(s), NOT the intended audience or consumers
7. At least one of the concepts mentioned in criteria 1. should be the dependent variable. Factors influencing adoption or implementation are NOT included
8. The document should be an article published in a peer-reviewed journal. Books, book chapters or book reviews are NOT included
9. Articles published prior to 2005 are NOT included, as are articles after 2016

The selection and analysis of articles was done in multiple steps. First, duplicates of documents found in multiple databases were removed. After that, articles were screened based on title, after which articles were excluded on basis of summary. Of the articles that remained, the full text was analysed to determine whether articles should be included. Since not all the terminology concerning the dependent variables was uniform, when in doubt the measure for and definition of the dependent variable was checked to see the article could be included in our study. All the included articles contained empirical, quantitative data. So, the hypotheses and research questions were analysed to report on the findings. Some articles contained multiple research questions and/or hypotheses of which not all were applicable for the current study. In that case only the hypotheses that were relevant were included in the analysis.

4.3.4 Study-Level Assessment

To prevent bias in the selection of included studies, a study-level assessment was performed. The principal researcher made an instruction document for a so-called 2nd coder, whom had to select documents to include in the study using the criteria mentioned in Table 4.3. The study-level assessment was performed in multiple stages. In the first stage, the 2nd coder performed its own search in the Scopus database with the search string given below. Scopus was used because this database gave the highest number of hits. This search was performed in the beginning of 2018. Considering the fact that the search of the principal researcher ended in November 2017, the years 2017 and 2018 were excluded from the search results. The documents found were sorted on date and the first 100 were selected for screening and selection by the 2nd coder. After this initial round, differences in the findings were discussed between the principal researcher and the 2nd coder, during which one criteria was more accurately defined. For a second round of screening and selecting by a different 2nd coder, 100 different document-titles were given to this

2nd coder, to ensure that there was no difference between the documents found by the principal researcher and the 2nd coder. The selection in the second round had a Cohen's Kappa of .83, which was deemed sufficient.

4.4 Results

Figure 4.1 shows the PRISMA-flowchart for the exclusion and selection of documents. After the deletion of duplicate documents, 1229 records were identified within the three database-hosts. Of those records, 1011 were excluded after stepwise screening of the title and abstract. The remaining 217 documents were eligible for inclusion. There were ten reasons to not included 175 records, which were: (1) the full-text was not available ($n = 51$); (2) the dependent variable was not on an individual level (e.g. factors found influenced creative output on an organizational level) ($n = 46$); (3) not the right operationalization of the skill (e.g. the skill was operationalized as the intention to master ICTs) ($n = 26$); (4) the independent variable was not on an organizational level (e.g. only the moderator was on an organizational level, the independent variable was a personal trait) ($n = 17$); (5) the skill mentioned was not the dependent variable (wrong direction of influence) ($n = 14$); (6) the context of the research was not fitting for this research (e.g. nurse-physician collaboration, in which job-related tasks and factors are not generalizable to other organizations) ($n = 8$); (7) no empirical, quantitative data ($n = 7$); (8) the document was a book ($n = 1$); (9) the publication date of the article was before 2005 ($n = 4$); (10) one article turned out to be retracted and was therefore excluded from our research ($n = 1$). In the end, 42 documents remained.

Table 4.4 shows what skills were studied in the included articles. It should be noted that research with creativity as the dependent variable was predominant. Of the 42 articles included, 83% ($n = 35$) mentioned creativity or a related dependent variable (e.g. creativity and innovation, employee creativity, creative discretion). Knowledge transfer was the second most mentioned skill ($n = 4$). The factors influencing knowledge management skills of individual employees largely overlap those of creativity, which can be seen in Table. For six of the dependent variables that were used in the search string, no articles were found that mentioned organizational factors influencing the dependent variable on an individual level.

Figure 4.1. PRISMA flowchart**Table 4.4.** Skills measured in included articles (n = 42)

Skill	n
Creativity	35
Knowledge transfer	4
Collaboration/Teamwork	1
ICT adaptability	1
Skills	1
Communication	0
Critical thinking	0
Information management/information literacy	0
Knowledge management	0
Learning transfer	0
Problem solving	0

Table 4.5 shows an overview of the factors found per skill. These are subdivided into three categories, based on the finding of this study. The first category is related to the leader. Due to the high number of factors found for 'creativity', for this skills the category is further subdivided into factors based on 'leadership style' or 'leader characteristics'. 'Transformational leadership' as a leadership style

was the most mentioned factor in the included articles, with it being mentioned influencing employee creativity seven times and influencing 'skills' once. The second category are factors that were concerned with the job, and was subdivided into 'job characteristics' and 'task characteristics' for 'creativity'. In the first subcategory both 'job autonomy' and 'job complexity' are mentioned multiple times. The final category is related to the organization in total and is subdivided into a 'social-organizational' and 'organizational policies' for 'creativity'. In the first category, 'social support' is mentioned five times as an influential factor and in the latter 'pay for performance' is mentioned three times. For knowledge transfer 'extrinsic rewards' is mentioned, of which 'pay for performance' is an example. Due to the shortage of factors found for the other skills, 'creativity' is the only skill with subcategories.

In appendix C, a full list of the included articles is given, and includes information about the direction of the relations, studied mediators and moderators, interactional effects, and partially or non-supported hypotheses.

Table 4.5. Factors per skill, subdivided in categories

	Leader related	Job related	Organization related
Communication	-	-	-
Collaboration / Teamwork	-	-	· External collaboration (allying with expert firms)
Creativity	Leadership style: • Empowerment • Leader-member exchange • Transformational leadership (7x) Leader characteristics: • Leadership behavior (4x) • Leader creativity expectation • Leader integrity • Self-enhancing humor of leader	Job characteristics: • Freedom • Job autonomy (2x) • Job complexity (3x) • Job design	Social-organizational: • Communication • Cultural norms • Organizational climate • Project development climate • Relationship with customers • Social support (5x) • Team spirit • Work group relations • Organizational policies: • Bureaucratic structure (-)

Table 4.5. Continued

	Leader related	Job related	Organization related
		Task related: • Challenge-related stress • Hindrance-related stress (-) • Role ambiguity (-) • Role conflict • Task novelty • Tasks requiring creative thinking	• Innovation orientation of the organizational culture (+/-) • Job tenure • Organizational formality • Pay for performance (3x) • Perceptions of justice o Distributive o Interactional o Procedural • Resources • Target-focused
Critical thinking	-	-	-
ICT adaptability	-	• ICT work intensity • Workload	• ICT-strategy • Personnel policy
Information management / Information literacy	-	-	-
Knowledge transfer	• Organizational leadership	-	• Extrinsic rewards • Intrinsic rewards • Organizational support • Project development climate • Training
Knowledge management	-	-	-
Learning transfer	-	-	-
Problem solving	-	-	-
Skills	• Individual focused transformational leadership	-	-

Note. (-) a negative relation is found between the dependent and independent variable; (..x) times the factor is mentioned, when > 1; (+/-) the hypothesis was partially supported. Only factors that showed a significant influence were included in this table.

4.5 Discussion

4.5.1 Main Findings

This systematic literature review had the objective to identify organizational factors that are statistically significant in influencing the level of 21st-century skills of employees. To achieve our goal, we focussed our search on a set of seven core skills: operational skills, information management, creativity, critical thinking, communication, collaboration, and problem solving (Van Laar et al., 2017) as dependent variables. Furthermore, we looked specifically for research that assessed the influence of the organizational factors on the level of the employee.

To answer our research question – *“What organizational factors are statistically significant in influencing the level of 21st-century skills of employees, according to academic literature?”* – we executed a search in three online databases. The organizational factors we found that influence the dependent variables could be subdivided into three main categories: (1) Leader-related, which included factors related to the style or characteristics of the leader, (2) job-related, which included factors concerning job or task characteristics, and (3) organization-related, which included factors related to the organization in total, such as factors associated with social norms or organizational policies.

In the leader-related category, leadership style and behaviour were the most mentioned factors. Specifically, “transformational leadership” was the most mentioned factor in all articles included in this review, with it being mentioned as a leadership style in eight instances, for multiple skills. Transformational leadership is known to motivate, inspire and stimulate employees (Dvir et al., 2002), which is influenced by the culture within an organization. Swieringa and Wierdsma (1990) make a distinction between management and leadership. Management is the activation of employees to show the desired behaviour, and leadership is the convincing, accompanying, advising and motivating of employees, which is similar to the four I’s of transformational leadership. So, great leadership is critical for an organization to be successful and to be able to change (Swieringa & Wierdsma, 1990). In the second category – job-related factors – autonomy and job-complexity were mentioned multiple times. According to Amabile (1993) autonomy can intrinsically motivate employees. It was also found that autonomy has a positive effect on creative self-efficacy (Mathisen, 2011). Finally, for organization-related factors social support, organizational support and rewards were the independent variables in multiple articles. Social support was the most mentioned factor for creativity. Organizational support and rewards were mentioned for multiple skills. These findings indicate that for employees to improve their skills and for them to go the

extra mile with their work, they want to feel valued and taken seriously. In this regard research shows a reciprocal effect of organizational culture and leadership.

Analysing our findings on the level of the dependent variables, showed that research into factors influencing creativity prevailed, with 35 of the 42 included articles focussing on this skill. For communication and collaboration, we did not find any articles that described organizational factors influencing the skill on an individual level. Most articles identified in the initial search covered business communication, or the communication skills of business-students and could therefore not be included in this review.

Critical thinking and problem solving also did not yield any suitable articles. For critical thinking almost all articles in the initial search results focussed on critical thinking skills of students and were not included in this review. With regards to problem solving, some scholars argue that problem solving and creativity are closely related to each other; Basadur and Graen (1982) state that problem solving is a part of the 'complete' creativity process, which consists of problem finding, problem solving, and problem implementation. Furthermore, research by Van Laar et al. (2019a) show that creativity is a condition for problem solving. This might explain why the search on problem solving skills generated little results.

Our systematic review also revealed several research gaps. First of all, most of the research that met all of our inclusion criteria was focussed on creativity. In creativity research, the study of organizational factors influencing individual creativity goes back decades, as is shown in the review of Baker, Winkofsky, Langmeyer, and Sweeney (1976). This might have caused a bias towards creativity in our findings. Another gap identified concerns actual empirical studies that focus on organizational determinants of 21st-century skills. A fair amount of research focusses on factors that influence output on an organizational level (e.g. Burnside-Lawry, 2012; Montes et al., 2005), however, much less has been written on what factors affect individual employee skill.

In summary, this review showed an strong preference for organizational determinants influencing individual creativity. Both for creativity, and for the results in general, (transformational) leadership was most prevalent as a factor that had a significant (positive) effect on multiple 21st-century skills. Our review also shows that there is a lack of research considering skills like information management, problem solving, critical thinking, communication and collaboration, even though these are the skills most mentioned in academic literature as important 21st-century skills. Furthermore, our search showed that when these concepts are being mentioned in literature, it is not in the context of studying organizational determinants of these skills. By further addressing the determinants found in this study in future research and policy, the development of the skills that are needed by knowledge

workers in contemporary and future work will be supported. Eventually this makes organizations more competitive in the increasingly globalizing market.

4.5.2 Limitations and Future Research

This research initially focussed on factors that influence actual skill. However, it proved to be difficult to find a large body of research that focusses purely on skill, instead of performance or outcome. This might be mitigated by the fact that 21st-century skills are not unambiguously defined. Also, due to the cognitive nature of these skills they might be hard to measure without looking at outcomes. In this review, we assumed that skill and performance are positively related. By doing so, articles that seemed of great value for this research, but measured outcome or performance, could be included in this review.

Even though information management is the most mentioned 21st-century skill in literature (Van Laar et al., 2017), we did not find any study that focussed on organizational determinants of information management skills of the individual employee. The low presence of articles about information management was previously noticed during preliminary searches, which was the reason to include knowledge transfer, learning transfer, knowledge management, and information literacy (and resembling terms) in the search string. However, as became clear during the scanning of abstracts and full-texts, the term knowledge management, which had the highest prevalence in the documents identified by the databases, is mostly used to describe a system or tool used by organizations to manage knowledge, and to a lesser extend as a skill held by individual employees. Even though knowledge management was the second most mentioned skill in the articles included in this study, there remains some unclarity about the exact correlation between information management and knowledge management.

Finally, the size of organizations included in the studies might also be a reason for concern. Due to the nature of the organizations and the design of the studies included in this review, it can be assumed that it mainly involves larger companies. This might cause bias, since for example in the Netherlands 99% of the companies have less than 250 employees, of which more than two-third are freelance or an independent contractor. However, in the case of companies with fewer than 5 employees, factors such as leadership or organizational culture would hardly apply. The aim of this research is to get insight in what influence organizational factors have on the individual skill level of employees. Therefore, the bias of research found in this article is not problematic, since the added value from this study is focussed on larger organizations that have the capacity to invest in the development of their employees.

The majority of articles found, focussed on creativity. Although *some* consensus on the bilateral definition of creativity has been achieved, there is a continuing debate on how broad or specific it should be: "What is needed seems not to be so much the identification of previously unidentified characteristics associated with creativity and their subsequent formulation into a new definition, as is the development of a definition precise enough to indicate what is meant professionally by the term *creativity* yet broad enough to achieve some degree of consensus" (Parkhurst, 1999). With an ongoing discussion about this definition, one can imagine that measuring this concept is even more ambiguous. This, in turn, complicates the successful implementation of organizational policies for employee-development, since with obscure definitions and ways to measure a construct, the result of implementation becomes even more unpredictable. Further research – especially empirical research – into *all* 21st-century skills with more clear definitions and operationalizations might help with the writing and implementing of successful policies.

Also, for future research it will be interesting to examine not only whether there is a positive or negative relationship of the factors on the skill level of employees, but also what mechanisms are responsible for this relationship. In-depth qualitative research will be of great added value to retrieve insight in how exactly these factors influence certain skills. These insights will prove useful for organizations looking for practical recommendations for the improvement of 21st-century skills of their employees.

Chapter 5

How Organizations can Support the Development of 21st-Century Digital Skills among their Workers: An Empirical Investigation of the Creative Industries

5 How Organizations can Support the Development of 21st-Century Digital Skills among their Workers: An Empirical Investigation of the Creative Industries

5.1 Introduction

The skillsets expected of employees have changed since the industrial age, when manual labor and mass production were more important than tacit knowledge and innovation (Authors, 2019; Carnevale & Smith, 2013; Gekara & Nguyen, 2018). Tacit knowledge – the skills, experiences and insights people have that are difficult to codify and directly articulate (Anderson, 2008; Chugh, 2015) – has become an important asset for 21st-century professionals. Currently, much more emphasis is placed on higher-order cognitive thinking skills that require tacit knowledge. Higher-order cognitive thinking skills are often referred to as 21st-century skills by scholars and policy makers (e.g., Anderson, 2008; Voogt & Roblin, 2012). In general, 21st-century skills include digital skills in addition to higher-order cognitive thinking skills (Van Laar et al., 2017; Voogt & Roblin, 2012) since the integration of ICTs in the workplace makes it imperative to be able to navigate digital environments. However, digital skills should not be viewed as separate from higher-order cognitive thinking skills or as solely related to operating or handling digital tools (Jacobs, 2017; Van Laar et al., 2017), as ICTs are also used to perform cognitively demanding tasks (Jacobs, 2017). Unfortunately, digital skills are rarely integrated into higher-order cognitive thinking skills (e.g., the Framework of the Partnership for the 21st Century and The Assessing and Teaching of 21st Century Skills (ATC21S)). A notable exception is reflected in the definition of *21st-century digital skills* as described in chapter 3. The development of 21st-century digital skills is not just a role reserved for education. Due to the speed of digital innovation together with the competition of international markets, demands regarding human capital are constantly evolving and organizations should invest in lifelong learning among their employees (KEA & PPMI, 2019). Unfortunately, little empirical research has examined what factors contribute to a good climate for the development of 21st-century digital skills in organizations. Existing studies typically focus on a single skill (e.g., creativity) or consider the effect of a single organizational factor, as became clear in chapter 4. In this chapter we aim to develop a more comprehensive view by considering several potentially important organizational factors on the most important 21st-century digital skills in the CIs in the Netherlands. The great value of human capital to the CIs implies that investing an employee's development can increase productivity

(Goldin, 2016). This human capital drives the capacity for innovation so important for organizations in the CIs (Anderson, 2008). Furthermore, since the CIs are at the forefront of innovation, new technologies are integrated at a rapid rate. These technologies require the use of specific and well-developed skills, increasing the demand for superior human capital (Goldin, 2016). This increase renders the CIs a very suitable context for this study.

In the current contribution, we focus on organizational factors that might promote the development of 21st-century digital skills by answering the following research question:

What organizational factors influence the level of 21st-century digital skills of employees working in the CIs in the Netherlands?

We conducted an online survey among workers in the creative industries (CIs) in the Netherlands. Due to an absence of a strong theoretical basis of organizational factors that affect individual skills, this study was exploratory in nature. However, the explored factors are based on the determinants found in chapter 4. When possible, hypotheses have been proposed. For less clear relations, exploratory research questions have been raised.

5.2 Theoretical Framework

5.2.1 21st-Century Skills and 21st-Century *Digital Skills*

21st-century skills constitute an important part of a 21st-century workers' toolbox. Even though there is ongoing discussion regarding whether these skills are specifically important for this century, the importance of rote learning has decreased since explicit knowledge is now readily available online. Due to the globalization of the workplace, ICTs are central to the development of 21st-century skills (Lewin & McNicol, 2015). From this premise, Authors (2017) stress the importance of 21st-century *digital skills*. When mastering this set of skills, an employee can incorporate ICTs in performing cognitively demanding tasks. These skills surpass knowledge about specific software and rather focus on how an employee performs cognitive tasks in a technologically rich workplace (e.g. Ahmad, Karim, Din, & Albakri, 2013; Claro et al., 2012). Successful knowledge professionals are able to retrieve and manage information found online and offline in an effective manner and to take advantage of this information to improve their position. Furthermore, 21st-century digital skills are needed to distinguish between reliable and less reliable information and to be critical about its content (Ferrari, 2012). Additionally, ICTs can also be used in creative and problem solving contexts. ICTs afford employees the opportunity

to look for creative examples and hardware for the practical application of creative initiatives. Creative problem solving is used to communicate a specific message online using text manipulation and graphics (Wheeler, Waite, & Bromfield, 2002). Furthermore, ICTs help individuals adapt to and discover new ways of working (Wheeler et al., 2002). Employees who are not able to adjust to rapid technological advances might experience ICTs as an extra hurdle or additional load on their cognitive capacity rather than as useful tools to make work easier. Thus, workers should be able to confidently use ICTs in combination with 21st-century skills.

In chapter 3, the framework of 21st-century digital skills is described. This framework is used in this chapter. In the development of the 21st-century digital skills instrument by Van Laar, Van Deursen, Van Dijk, and De Haan (2018) some of these skills are composed of multiple factors: *Information management* refers to two factors: *Manage* ("manage information to find it later" (Van Laar et al., 2018, p. 2185), which represents whether employees are capable of archiving information in such a way that they can find it whenever needed, and *evaluate*, which refers to whether respondents are able to evaluate the usefulness and reliability of a source. *Communication* as a 21st-century digital skill has four components. *Networking* measures the potential to make (online) connections with significant returns (Lee & Chen, 2017). *Building* evaluates how often a respondent initiates new contacts or collaborations, whereas *sharing* measures how often someone shares information to start a discussion online or how often they post new articles, blog entries or messages. *Expressiveness* assesses if somebody is successful and knowledgeable in disseminating the right message and accomplishing what they intend to accomplish (Van Laar et al., 2018).

5.2.2 Organizational Factors Determining 21st-Century Digital Skills

Little empirical research has focused on how organizations can influence and improve 21st-century digital skills among their workers. Nonetheless, the systematic literature review in chapter 4 shows some factors can be identified that influence the level of 21st-century skills. In this chapter we look at a selection of determinants of which we believe they can be most suitable to be influenced by policy initiatives. The factors we investigate can be subdivided in: *organizational opportunities*, *development opportunities*, and *technological opportunities* (e.g. Akdogan & Kale, 2017; Dong, Bartol, Zhang, & Li, 2016; Mathisen, 2011; Tjidsen & Steijn, 2005). In the following section these categories are elaborated.

Organizational Opportunities

Organizational opportunities are related to organizational climate and culture. These two influential determinants in turn impact creativity and innovation (Akdogan & Kale, 2017). Organizational climate is reflected in the personal beliefs, experiences, and feelings of employees. Organizational culture, on the other hand, can be described as the common values and beliefs that people within an organization hold. This culture can be observed in commonly held cognitions, which are reflected in leadership styles, expectations, routines, and definitions of what makes an organization successful (Cameron & Quinn, 2006; Zeqiri & Alija, 2016). Innovative cultures are often characterized by factors such as high autonomy and low bureaucracy (Akdogan & Kale, 2017). The factors regarded as important organizational opportunities can be structured around *organizational culture*, *transformational leadership*, *spatial and content related autonomy*, and *rewards*.

Organizational culture. Hofstede (2011) defines culture as “the collective programming of the mind that distinguishes the members of one group or category of people from others” (p. 3). The CIs are characterized by their high levels of innovation (UNCTAD, 2018) and by an external focus that helps organizations foster innovation (Naranjo-Valencia, Jiménez-Jiménez, & Sanz-Valle, 2016). Organizational cultures with an external focus – i.e., being effective when competing and interacting with entities outside their own organization (Cameron & Quinn, 2006) – best correspond with the CIs as here organizations need to quickly adapt and innovate to address challenges that arise from society. Cameron and Quinn (2006) developed the *competing values framework*, in which they describe different organizational cultures. They propose two types of culture that are externally focused: *adhocracy* and *market culture*. An organization that is characterized by an *adhocracy culture* is very responsive to external demands. Innovativeness and pioneering are believed to enhance the success of an organization. “...organizations are mainly in the business of developing new products and services and preparing for the future” (Cameron & Quinn, 2006, p. 43). A *market culture* is found in an organization that itself tries to function as a market. Core values for this type of organization include productivity and competitiveness (Cameron & Quinn, 2006). Since an external focus helps organizations foster innovation (Naranjo-Valencia et al., 2016) and creativity as a prerequisite for innovation (Amabile et al., 1996; Slåtten, 2014), both cultures are expected to make a positive contribution to the development of creativity among employees in an organization. Therefore, we hypothesize:

H1a: An adhocracy culture contributes positively to creative digital skills.

H1b: A market culture contributes positively to creative digital skills.

For the remaining 21st-century digital skills (i.e., information management, communication, collaboration, critical thinking and problem solving), the following research question is formulated:

Q1: To the level of which 21st-century digital skills are adhocracy and market culture related?

Transformational leadership. Leadership and organizational culture are closely related. Leaders can influence an organizational culture in favor of creative output and can influence the structure and human resource practices of an organization to in turn lay the foundations for creation and innovation (Jaskyte & Kisieliene, 2006). In chapter 4 it became clear that leadership style has emerged as an important factor in the literature as a means to influence creative skills. Furthermore, there is some evidence that leadership style influences knowledge transfer (İdris, Ali, & Godwin, 2015). The style most widely represented as having a positive effect is transformational leadership (e.g. Chang & Teng, 2017; Gilmore et al., 2013; Herrmann & Felfe, 2013; Jaiswal & Dhar, 2017; Mittal & Dhar, 2015; Slåtten, 2014; Wang, Tsai, & Tsai, 2014). Transformational leadership is subdivided into four different leadership behaviors: individual consideration, intellectual stimulation, inspirational motivation and idealized influence (Avolio, Waldman, & Yammarino, 1991). When a leader exhibit individual consideration, he or she acknowledges that every employee is unique and has his or her own needs, strengths, and weaknesses. When a leader exhibits intellectual stimulation, employees are encouraged by this leader to question their existing values, suppositions and work patterns. Inspirational motivation helps employees to see their leader as an example. Finally, idealized influence is demonstrated by leaders when they build confidence and trust among their followers (Avolio et al., 1991). Since transformational leadership has been mentioned most frequently in the literature as having a positive effect on creativity, we hypothesize that:

H2: Transformational leadership contributes positively to creative digital skills.

For the remaining 21st-century digital skills (i.e., information management, communication, collaboration, critical thinking, and problem solving), the following research question is formulated:

Q2: To the level of which 21st-century digital skills is transformational leadership related?

Rewards. Rewards given by leadership and an organization – often regulated by human resource practices and the organizational culture – are also believed to

influence the development of human capital (e.g. Amabile et al., 1996; Zhang, Long, Wu, & Huang, 2015). These rewards can come in many different forms. They can range from a metaphorical “pat on the back” or positive feedback from a superior to monetary compensation. In research on the effects of rewarding employees on motivation, scholars make a distinction between intrinsic and extrinsic motivation. An employee is believed to be intrinsically motivated when the task she must perform is rewarding in itself (Amabile, 1993; Hackman & Oldham, 1976; Lepper, Greene, & Nisbett, 1973). External rewards are regarded as extrinsic motivation, which is a form of motivation that emerges when an employee wants to acquire outcomes that do not result from the work itself (Amabile, 1993). Amabile (1993) revealed that obvious extrinsic rewards such as pay for performance can negatively influence creative performance by negatively impacting intrinsic motivation. However, other studies show that rewards for skill performance contribute to employee creativity (Hon, 2012). Furthermore, when employees believe that their failures and successes are ascribed to their own capabilities, the potential controlling effect of extrinsic rewards on intrinsic motivation is mitigated and intrinsic motivation can actually be strengthened when performing creatively (Malik, Butt, & Choi, 2015). Zhang et al. (2015) also found that pay can have a positive effect on creativity, moderated by intrinsic motivation. Therefore, we hypothesize the following:

H3: Rewards contribute positively to creative digital skills.

For the remaining 21st-century digital skills (i.e., information management, communication, collaboration, critical thinking and problem solving), the following research question is formulated:

Q3: To the level of which 21st-century digital skills are rewards related?

Autonomy. An organizational culture that fosters creative output is often found to be high in employee autonomy. Hackman and Oldham (1976) defined autonomy as “the degree to which the job provides substantial freedom, independence, and discretion to the individual in scheduling the work and in determining the procedures to be used in carrying it out” (p. 254). In their Job Characteristics Model of Work Motivation, autonomy is defined as one of the core job dimensions that influences personal and work outcomes through critical psychological states (Hackman & Oldham, 1976). Autonomy granted by an organization affords employees the time and freedom to use and explore (with) ICTs to perform their jobs. Amabile (1993) considers autonomy a characteristic of a job that intrinsically motivates employees, and Mathisen (2011) concludes that autonomy has a positive effect on creative self-efficacy or ‘the belief one has the ability to produce creative outcomes’ (Tierney & Farmer, 2002a, p. 1138). According to Tierney and Farmer (2002a), creative self-

efficacy is positively related to creative performance. Other scholars have found similar results in that when employees feel that they have control and responsibility over how they perform a task, this feeling has a positive effect on their creativity (e.g., Amabile, 1993; Amabile et al., 1996). Two different components with regard to autonomy are distinguished by the authors: *spatial autonomy* and *content related autonomy*. Spatial autonomy concerns the freedom to perform a job when and where it is seen fit while content related autonomy is the degree to which employees are free to determine how they execute their work and the latitude that they have to make their own decisions regarding their work. Since the freedom to decide where to work might influence the resources with which employees get to work to a greater extent than having high content related autonomy, we expect both components to have an independent effect on creativity. Based on the findings of e.g., Tierney and Farmer (2002a) and Amabile et al. (1996) we hypothesize:

H4a: Spatial autonomy contributes positively to the level of creative digital skills.

H4b: Content related autonomy contributes positively to the level of creative digital skills.

For the remaining 21st-century digital skills (i.e., information management, communication, collaboration, critical thinking and problem solving), the following research question is formulated:

Q4: To the level of which 21st-century digital skills are spatial and content autonomy related?

Development Opportunities

As described above, investment in human capital is very important for organizations operating in an increasingly globalized society. Organizations should be concerned with the personal development of their employees. This development can be done through formal training, but learning on the job or other forms of informal learning can be very valuable as well. For instance, working in a team with a wide variety of expertise can facilitate the development and generation of knowledge for the individual employee.

Personal development opportunities. For an organization to survive, employees must operate effectively, constantly improve, and be able to adapt to vastly changing surroundings (Falola, Osibanjo, & Ojo, 2014). Furthermore, the development of human capital can enhance the productivity of employees (Goldin, 2016). Development refers to an activity in which individual growth is accomplished through “activities leading to the acquisition of new knowledge or

skills for purposes of personal growth” (Aguinis & Kraiger, 2009, p. 452). A means through which organizations can invest in their human capital is that of formal training. Goldstein and Ford (2002) describe training as a method of learning and development that systematically advances the effectiveness of individuals or groups. Formal training concerns the deliberate effort of transferring knowledge from a presumed expert to any person attending the training. In an organization, it offers employees new opportunities to learn and further their careers. Furthermore, it is the most important factor in predicting knowledge transfer success (Ekore, 2014). Organizational training has a comparable or stronger effect relative to other organizational interventions (Arthur et al., 2003). Overall, training has been shown to have a positive effect on performance and job behavior (Arthur et al., 2003). Next to formal training, learning on the job, seminars and symposia, and clubs and informal gatherings are also utilized for employee development (Weifeng, Elnaghi, & Hatzakis, 2011). In a study on perceived career opportunities it was found that stronger developmental support within an organization is related to stronger performance (Kraimer et al., 2011). Since the first part of the definition of knowledge transfer according to Stuhlman (2016) – the conscious implementation of a strategy to collect, store and retrieve knowledge – has much common ground with information management as defined in chapter 3, we hypothesize that:

H5: Personal development opportunities contribute positively to information management digital skills.

For the remaining 21st-century digital skills (i.e., communication, collaboration, creativity, critical thinking, and problem solving), the following research question is formulated:

Q5: To the level of which 21st-century digital skills are personal development opportunities related?

Team variety. Employees with different backgrounds or different areas of expertise can expose a group to different paradigms (Van der Vegt & Bunderson, 2005). Therefore, multidisciplinary teams or teams high in team variety are often used when complex problems or processes are involved. The different views and knowledge of individual professionals can be used to solve such problems (Van der Vegt & Bunderson, 2005). However, there are some restrictions when trying to work effectively with multidisciplinary teams. For example, for multidisciplinary teams to be most effective, tasks should not be routine (Hambrick, Cho, & Chen, 1996). Furthermore, members of the team should be diverse in their knowledge and information but agree on the goals and tasks of the team (low in value diversity) (Jehn, Northcraft, & Neale, 1999).

From a literature review on group diversity in organizations Milliken and Martins (1996) concluded that diversity can differ in terms of affective, cognitive, and communication-oriented consequences. Affectivity can, for example, refer to group identification. On a group level, diversity in observable attributes can have a negative effect on affective outcomes. However, diversity in observable attributes can have a positive impact on cognitive outcomes such as cooperation during complex tasks and the number and quality of ideas appraised (Milliken & Martins, 1996). Furthermore, Milliken and Martins concluded that from diversity within the team, team members might be more inclined to talk to people outside of the group, which can result in more positive communication-oriented consequences.

Thus, while for teams high in diversity more effort and time are required to reach consensus due to fewer common values, beliefs and habits (Hambrick et al., 1996), their heterogeneity renders them more adaptable to change and therefore higher in creative potential (Milliken & Martins, 1996; Murray, 1989; Van der Vegt & Bunderson, 2005). Therefore, we hypothesize that:

H6a: Higher team variety contributes positively to collaboration digital skills.

H6b: Higher team variety contributes positively to creative digital skills.

For the remaining 21st-century digital skills (i.e., information management, communication, critical thinking and problem solving), the following research question is formulated:

Q6: To the level of which 21st-century digital skills is team variety related?

5.2.3 Technological opportunities

ICT advancement. Organizational climate dimensions such as sufficient resources influence employee creativity through intrinsic motivation (Hunter, Bedell, & Mumford, 2007). In general, ICT facilitation is a popular means through which to improve employee skills, as it is easy for an organization to account for (Hunter et al., 2007). However, not only the availability of ICT resources is important for skill development. Next to the presence of ICTs, the value that an organization places on ICTs in the form of its culture and policies is important. For example, when providing assistance for employees in regard to work-related problems and communicating to employees that their work is valued, employees are more likely to employ creative problem solving and other cognitive processes (Hsu & Fan, 2010). Furthermore, an individual is more willing to acquire ICT-competencies when an organization has a well-briefed ICT strategy (Tijdens and Steijn (2005). This positive attitude towards ICTs constitutes the first step in improving 21st-century digital skills. The combination

of this positive organizational attitude with sufficient ICT resources can be best described as the ICT advancement of an organization. Since research shows that an organization can support its employees' creativity by ensuring the resources necessary for creativity (Amabile, Hadley, & Kramer, 2002; Scott & Bruce, 1994; Yeh & Huan, 2017), we hypothesize that:

H7: ICT advancement contributes positively to creative digital skills.

For the remaining 21st-century digital skills (i.e., information management, communication, collaboration, critical thinking and problem solving), the following research question is formulated:

Q7: To the level of which 21st-century digital skills is ICT advancement related?

Figures 5.1 and 5.2 show a conceptual model of the different categories and the contributions of their associated factors to certain 21st-century digital skills.

Figure 5.1. Conceptual model with hypotheses

Figure 5.2. Conceptual model with exploratory questions

5.3 Method

To determine whether certain organizational factors contribute to 21st-century digital skill development, we conducted an online survey of employees employed in the Dutch CIs. The survey took place in the fall/winter of 2017.

5.3.1 Sample

Respondents of the survey comprise a sample of employees in the Dutch CIs. The process-model proposed in chapter 2 was used to select respondents. Both professionals with job descriptions based purely on creativity work and supporting job functions – such as project managers – are included in this study.

For the selection of respondents, convenience sampling was used. Respondents were recruited by means of an extensive internet search using LinkedIn or employers' websites. The researchers attempted to approach potential respondents in a ratio resembling the composition of the CIs with regard to the branches in which potential respondents were employed (Table 2). However, given our non-random sampling approach we do not claim that our sample is generalizable to the CIs overall. In total, 6,957 respondents received an invitation through e-mail and were promised a coupon of 10 euros for participating in the survey, resulting in 1,034 responses (response rate of 14.9%). Furthermore, two online panels (Panelclix and Panelinzicht) were used. Respondents were selected from a database on the basis of the fields they were employed in. Further selection was executed through the use of screening questions to ensure that they were working in the CIs. Panel respondents received a small incentive for their participation. For both samples, partial responses were removed, and the remaining responses were screened for reliability by job function, country of employment, and response time. This screening resulted in 776 eligible responses from the respondents contacted via e-mail and 446 usable responses from both panels. Due to the nature of the research, all respondents that were self-employed or in leadership roles in their organizations were removed from the sample. All respondents were directly involved in the creative work process and indicated in the survey that they were under the supervision of leadership. This outcome resulted in 510 responses that were suitable for our research. The sample's characteristics can be found in Table 5.1.

Table 5.1. Sample characteristics (N = 510)

	N	%
Gender		
Male	249	48.8
Female	261	51.2
Age		
18 – 30	227	44.5
31 – 45	182	35.7
46 – 60	88	17.3
60+	13	2.5
Education		
Medium	113	22.2
High	397	77.8
Branch organization		
Advertising/marketing	66	12.9
New media/software	56	11.0
Graphic Design	40	7.8
Architecture	34	6.7
Performing arts	42	8.2
Publishing/media	37	7.3
Radio/television	55	10.8
Museums	33	6.5
Gaming	30	5.9
Journalism	34	6.7
Industrial design	26	5.1
Books/magazines	15	2.9
Visual arts/photography	17	3.3
Fashion/textile design	11	2.2
Film	14	2.7

5.3.2 Pretesting

Pretesting of the survey was done over two rounds. In the first round of participatory pretesting, eight cognitive interviews were conducted. Cognitive interviewing involves systematically developing survey questions through investigations that intensively probe the thought processes of individuals presented with those inquiries (Willis, 2005). Questions that surfaced as problematic were evaluated and adjusted. The second round of undeclared pretesting involved online survey

pilot tests of 57 respondents. The aim was to test the reliability and validity of the constructed scales. The amount of time required to complete the final survey was approximately 55 minutes. This period was based on transformations we executed to filter out outliers for respondents who, for instance, might have forgotten to close their web browsers when taking the survey in multiple sittings.

5.3.3 Measures

The level of 21st-century digital skills was measured using an instrument developed by Van Laar et al. (2018). This instrument proposes a set of items for each distinct 21st-century digital skill-factor. The instrument uses frequency scales on a 5-point Likert scale (1=*never*, 2=*rarely*, 3=*sometimes*, 4=*often*, 5=(*almost*) *always*) to measure how often certain tasks or actions are performed at work. A principal component analysis with varimax rotation and Kaiser normalization was used to identify the underlying 21st-century digital skill clusters. The analysis confirmed the ten factors of the original instrument with eigenvalues of over 1.0, which together explained 65.77% of the variance. The means, standard deviations and reliability of all skills measures can be found in Table 5.2.

Table 5.2. Means, standard deviations and reliability of the skills measures

	M	SD
<i>The next statements are about processing information for work-related purposes. At work, how often...</i>		
Information management ($\alpha = .76$)	4.10	0.75
do you save useful digital files directly to the right folder	4.23	0.82
are you consistent in the naming of digital files	4.03	0.92
do you organize digital files via a hierarchical folder structure	4.03	1.02
<i>The next statements are about searching information for work-related purposes. At work, how often...</i>		
Information evaluation ($\alpha = .69$)	3.66	0.70
do you check the reliability of a website	3.61	0.95
do you check the information found on a different website	3.45	0.91
do you check if the information found is up to date	3.93	0.81
<i>The next statements are about profiling yourself online for work-related purposes. At work, how often...</i>		
Communication expressiveness ($\alpha = .78$)	3.84	0.60
do you get what you want from interactions on the internet	3.71	0.75
are you via the internet effective in accomplishing what you want	3.92	0.69

Table 5.2. Continued

	M	SD
do you know how to use the internet to express ideas clearly	3.90	0.73
Communication building ($\alpha = .85$)	2.68	0.92
do new collaborations emerge by approaching online contacts	2.64	1.00
do you establish online contacts to collaborate with	2.86	1.08
do you find experts on the internet to start a project with	2.55	1.09
Communication networking ($\alpha = .91$)	2.85	0.82
do you spend time and effort in online networking with people from your field	2.85	1.00
do you use your online network to benefit from it	2.90	1.02
do you use your online network to generate business	2.63	1.09
do you build online relationships with people from your field	3.13	1.01
does the internet help you approach new professional contacts	3.16	0.94
do you use your online network to increase brand awareness	2.91	1.12
do you start a conversation with other professionals via the internet	2.63	1.05
do you use your online network to achieve policy goals	2.60	1.02
Communication sharing ($\alpha = .77$)	2.57	0.92
do you post new messages on the internet	3.02	1.11
do you post a blog/article on the internet	2.27	1.14
do you share information on the internet to start a discussion	2.41	1.08
<i>The next statements are about sharing information for work-related purposes. At work, how often...</i>		
Collaboration ($\alpha = .92$)	3.30	0.78
do you share important information with your team via the internet	3.48	1.00
do you use the internet to share information that supports the work of others	3.37	0.98
do you use the internet to share resources that help the team perform tasks	3.30	1.05
do you use the internet to provide each other with information that progresses work	3.54	0.99
does the internet help you get support from co-workers	3.20	1.01
do you communicate via the internet with co-workers from other disciplines	3.27	1.02
do you share work-related knowledge with each other via the internet	3.32	0.95
do you use the internet to give feedback to co-workers	3.02	1.09
does the internet help you use other professionals' expertise	3.18	0.89

Table 5.2. Continued

	M	SD
<i>The next statements are about having online discussions (e.g., e-mail, Skype, online forums) for work-related purposes. At work, how often...</i>		
Critical thinking ($\alpha = .94$)	3.36	0.69
do you give substantiated arguments or reasoning	3.53	0.93
do you give proof or examples of arguments you give	3.33	0.91
do you give a justification for your point of view	3.44	0.93
are you able to put the discussion into a new perspective	3.20	0.87
do you ask questions to understand other people's viewpoint	3.48	0.95
do you consider various arguments to formulate your own point of view	3.53	0.87
do you connect viewpoints to give a new turn to the discussion	3.19	0.90
do you suggest new related points	3.12	0.86
do you filter the most important points from discussions	3.58	0.92
do you generate new input from a discussion	3.23	0.84
are you open for ideas that challenge some of your held beliefs	3.47	0.88
do you use the internet to justify your choices	3.26	0.91
<i>At work, how often...</i>		
Creativity ($\alpha = .89$)	3.28	0.74
do you give a creative turn to existing processes using the internet	3.13	0.88
do you use the internet to generate innovative ideas for your field	3.31	0.92
do you show originality in your work using the internet	3.20	0.92
do you use the internet to execute your tasks creatively	3.39	0.88
do you follow trends on the internet to generate original ideas	3.46	0.95
do you use the internet to evaluate the usability of your ideas	3.19	0.93
<i>The next statements are about problems at work that you want to solve by using the Internet. At work, how often...</i>		
Problem solving ($\alpha = .92$)	3.53	0.63
does the internet help you find the best way to solve the problem	3.57	0.76
do you solve the problem using the internet	3.47	0.84
do you come up with solutions to the problem via the internet	3.60	0.78
does the internet help you find ways to solve problems	3.72	0.77
are you confronted with a problem that you are sure you can solve using the internet	3.39	0.85
do you make a decision using the internet that makes you feel happy afterwards	3.56	0.76

Table 5.2. Continued

	M	SD
do you find the solution via the internet even though initially no solution is immediately apparent	3.34	0.78
does the actual outcome you achieved via the internet match what you expected	3.56	0.73

Note. The items were asked in Dutch on a 5-point Likert scale: 1=never, 2=rarely, 3=sometimes, 4=often, 5=(almost) always

Organizational factors were measured using a combination of measures, which are described for each individual factor. All measures with the exception of *team variety* were measured on a 5-point Likert scale (1=*completely disagree*, 2=*disagree*, 3=*neither agree/disagree*, 4=*agree*, 5=*completely agree*).

Transformational leadership was measured with 12 items using an adapted version of the Multifactor Leadership Questionnaire (Avolio et al., 1991). Each of the four components of transformational leadership (i.e., *individual consideration*, *intellectual stimulation*, *inspirational motivation* and *idealized influence*) was measured with three items. From these four values one average score for transformational leadership (of 1 – 5) was calculated. *Adhocracy* and *market organizational cultures* were measured with an adapted version of the Organizational Culture Assessment Instrument (OCAI) (Cameron & Quinn, 2006). Both organizational cultures were measured with 6 adapted items drawn from the original OCAI, and these items were translated into Dutch and measured on a 5-point Likert-scale. From these 6 items, a single score was calculated for both ‘organizational culture – adhocracy’ and ‘organizational culture – market’. For *spatial autonomy*, two items were constructed by the authors. *Content related autonomy* was measured with six items of which four were adapted from Weifeng et al. (2011), Yeh and Huan (2017) and Mathisen (2011). *Personal development* was measured with four items, which were adapted from Weifeng et al. (2011). *Team variety* was measured from the average number of different disciplines under which a respondent worked within a team. In the analysis phase, the answers were subdivided into four categories: (1) 1 or 2 disciplines; (2) 3 disciplines; (3) 4 disciplines; and (4) 5 or more disciplines. *Rewards* was measured with four items. These included a combination of items adapted from Lu, Leung, and Koch (2006) and Deckop, Mangel, and Cirka (1999). Finally, *ICT advancement* was measured with six items, of which three were inspired by Weifeng et al. (2011) and Gupta, Dasgupta, and Gupta (2008).

A principal component analysis with varimax rotation and Kaiser normalization was used to identify the organizational factors, resulting in 8 factors with eigenvalues

of over 1.0, which together explained for 60% of the variance. Since team variety was an ordinal item, this factor was not included in the factor analysis. The items, means, standard deviations, and reliability are presented in Table 5.3.

Table 5.3. Means, standard deviations and reliability of the organizational factor measures

	M	SD
<i>Indicate to what extent you agree with the following statements.</i>		
Organizational culture – Adhocracy ($\alpha = .85$)	3.40	0.70
The management style in the organization is characterized by individual risk-taking, freedom and uniqueness	3.15	0.95
The organization emphasizes acquiring new resources and creating new challenges	3.40	0.90
The glue that holds the organization together is commitment to innovation and development. There is an emphasis on being on the cutting edge	3.32	0.97
The organization defines success on the basis of product leadership and innovation	3.59	0.89
The leadership in the organization is generally considered to exemplify entrepreneurship, innovating and risk taking	3.43	0.94
The organization is a dynamic and entrepreneurial place, people are willing to take risks	3.48	0.88
Organizational culture – Market ($\alpha = .80$)	3.29	0.67
The management style in the organization is characterized by hard-driving competitiveness, high demands, and achievement	2.90	1.05
The organization emphasizes competitive actions and achievement	3.26	0.93
The glue that holds the organization together is the emphasis on achievement and goal accomplishment	3.47	0.85
The organization defines success on the basis of competitive market leadership	3.22	1.02
The leadership in the organization is generally considered to exemplify a no-nonsense and results-oriented focus	3.47	0.90
The organization is a results oriented place, people are competitive and achievement oriented	3.39	0.92
<i>Indicate to what extent you agree with the following statements.</i>		
<i>My employer...</i>		
Transformational leadership ($\alpha = .93$)	3.47	0.67
feels good to be around	3.72	0.84
gets the complete faith of others	3.54	0.94

Table 5.3. Continued

	M	SD
is somebody people like to be associated with	3.43	0.92
expresses with a few simple words what we could and should do	3.48	0.92
provides appealing images about what we can achieve	3.37	0.87
helps people find meaning in their work	3.47	0.90
helps people to develop themselves	3.56	0.93
let's people know how they are doing	3.50	0.86
gives personal attention to people who feel rejected	3.24	0.94
helps to think about old problems in new ways	3.39	0.87
provides new ways of looking at complicated things	3.52	0.86
gets people to rethink ideas that they have never questioned before	3.45	0.91
<i>Indicate to what extent you agree with the following statements.</i>		
<i>Employees in my organization...</i>		
Spatial autonomy ($\alpha=.80$)	2.78	0.95
are free to determine when they want to work	2.77	1.04
are free to determine where they want to work	2.78	1.05
Content related autonomy ($\alpha=.76$)	3.65	1.48
are free to schedule their work as they see fit	3.49	0.89
are free to determine how they execute their work	3.49	0.82
have influence over the execution of their job	3.92	0.65
are encouraged to make their own decisions	3.69	0.81
<i>Indicate to what extent you agree with the following statements.</i>		
<i>My organization ...</i>		
Rewards ($\alpha=.80$)	2.98	0.80
rewards skills of employees	3.25	0.91
rewards extra effort of employees	2.84	1.01
rewards individual accomplishments with extra salary	2.40	1.08
<i>Indicate to what extent you agree with the following statements.</i>		
<i>My organization ...</i>		
Personal development ($\alpha=.77$)	3.17	0.77
provides in formal training programs to improve my skills	3.16	1.03
provides opportunities for informal training (e.g. help from colleagues or job rotation)	3.45	0.96
encourages employees to attend seminars, symposia etc	3.11	1.03
provides various social program's such as clubs and informal gatherings	2.96	1.01

Table 5.3. Continued

	M	SD
<i>Indicate to what extent you agree with the following statements.</i>		
ICT advancement ($\alpha = .82$)	3.38	0.66
My organization is front runner with regards to internet applications	3.12	0.97
My organization is committed to employees whom want to develop ICT skills	3.30	0.94
Employees in my organization are content with the ICT that is offered	3.45	0.81
When new ICT is needed for a project, this is quickly arranged by my organization	3.30	0.97
My organization offers ICT for cooperation, no matter the time and place	3.48	0.91
The ICT that is offered by my organization is compatible with my own systems	3.60	0.84

Note. The items were asked in Dutch on a 5-point Likert scale: 1=totally disagree, 2=disagree, 3=neither agree/disagree, 4=agree, 5=totally agree

5.4 Results

To test our hypotheses and answer the research questions, we performed a linear regression analysis using the individual *21st-century digital skills* as dependent variables. Table 5.4 shows the standardized beta-coefficients for each organizational factor on all 21st-century digital skill components. This table shows that *market culture*, *personal development opportunities*, and *team variety* make a significantly positive contribution to creative digital skills, and therefore hypotheses 1a and 6b are supported. Hypothesis 5 states that *personal development opportunities* are expected to influence information management, which is not supported. *Team variety* makes a significantly positive contribution to collaborative digital skills, thereby supporting hypothesis 6a.

Table 5.4 also shows the contributions of organizational factors to the other 21st-century digital skills. Organizational factor *adhocracy culture* does not contribute to any of the skills, but *market culture* contributes to both collaboration and creative digital skills. *Transformational leadership* contributes positively to problem solving digital skills and *rewards* also contributes to one skill component, namely building digital skills. *Spatial autonomy* contributes positively to sharing digital skills and *content related autonomy* contributes to expressiveness digital skills. *Personal development* contributes positively to creative digital skills. *Team variety* contributes

positively to networking and building digital skills, collaborative digital skills, and creative digital skills while *ICT advancement* has a positive effect on evaluation, expressiveness, collaboration and problem solving digital skills.

5.5 Discussion

5.5.1 Main Findings

The CIs employ a large share of knowledge workers and their knowledge is seen as a commodity, which makes having 21st-century digital skills even more critical. However, little is known about how organizations can support the development of 21st-century digital skills for their employees. The present work explores this issue by answering the following question: *What organizational factors influence the level of 21st-century digital skills of an individual employee working in the CIs in the Netherlands?*

Based on our results, most of the studied factors play a role in the development of 21st-century digital skills. First, an organizational culture characterized by a *market culture* contributes to the level of collaboration and creative digital skills. In adopting a market culture, an organization is externally focused and works through economic market mechanisms (i.e. “profitability, bottom-line results, strength in market niches, stretch targets, and secure customer bases are primary objectives of the organization” (Cameron & Quinn, 2006, p. 39)). Organizations in the CIs often work at innovative solutions on external demand. Customer demand is a central driver for these organizations, and this driver is in line with their externally focused market culture. Employees are challenged to develop themselves to solve problems in a creative and innovative manner. However, the CIs deal with complex problems, which are rarely solved in isolation (Jacobs, 2017). This complexity might explain why a market culture helps develop collaboration digital skills.

Second, *transformational leadership* styles seem to support problem solving digital skills. *Intellectual stimulation*, one of the four components of transformation leadership (Avolio et al., 1991), supports employees in feeling safe to challenge existing work patterns. This support could lead to new and innovative ways of solving problems. Additionally, the provision of *rewards* in an organization contributes to building new connections online. This could be explained by the fact that connecting with other professionals online is fairly easy to achieve and measure.

Table 5.4. Linear Regression Analysis of Organizational Factors on 21st-Century Digital Skills for Workers

	Manage	Evaluate	Network	Building	Sharing	Expressiveness	Collaboration	Critical Thinking	Creativity	Problem Solving
Cult – Adhocracy	.069	-.098	-.004	-.055	.018	-.069	.100	.029	.115	-.108
Cult – Market	.015	.084	.069	.072	.071	.091	.116*	.058	.126*	.095
Transformational leadership	-.026	.124	.022	-.007	-.002	.031	.034	-.015	.107	.171**
Rewards	-.110	-.028	.113	.136*	.049	-.014	-.039	-.075	.015	-.006
Spatial autonomy	-.089	.028	.066	.068	.170**	-.088	-.028	.008	.003	.006
Content related autonomy	.033	.073	.030	.095	.000	.202***	.064	.121	.046	.010
Personal development	.018	.004	.119	.020	.086	-.061	.067	.059	.127*	-.070
Team variety	-.050	.033	.123*	.132**	.068	.064	.201***	.068	.101*	.020
ICT advancement	.087	.153**	-.082	.004	.018	.259***	.164**	.084	-.062	.267***
F	1.110	2.599**	3.565***	3.122***	3.666***	4.985***	7.568***	2.012*	6.141***	4.584***
R ²	.025	.057	.077	.068	.079	.104	.150	.045	.126	.097

Note. * p ≤ .05; ** p ≤ .01; *** p ≤ .001

Spatial autonomy contributes to another component of communication digital skills; sharing, which measures whether employees share new content online. This could be the case because whenever employees are given considerable *spatial autonomy*, they are inclined to be flexible in where they work, and this flexibility in turn would require them to share information online more often. *Content related autonomy* affects employees' abilities to communicate online such that they can achieve what they initially intended through such interactions. Furthermore, *personal development* contributes to creative digital skills. This is the only organizational factor that we did not hypothesize to affect creativity, but to instead affect information management digital skills. Therefore, this is an interesting and unexpected finding. Even more since many believe that creativity is an inherent skill that is difficult to learn or develop. However, Arthur et al. (2003) did find training to be most effective for developing cognitive skills, of which creativity is an example.

We also found that higher levels of *team variety* play an important role in the development of networking, building, collaboration, and creative digital skills. *Team variety* is high when employees work together in teams of many different disciplines. High diversity in disciplines and expertise also increases diversity in knowledge and working styles. This diversity can enable teams to solve complex problems (Jablokow & Booth, 2006). Thus, organizations should attempt to have employees with different strengths and areas of expertise work together in teams. As a result, spillovers of knowledge and problem-solving styles can occur. It is, however, important to ensure that goals and tasks are agreed upon by all team members (Jehn et al., 1999). The importance of this communal goal and task orientation might explain why high team variety facilitates the development of collaboration digital skills. However, to assume that a higher degree of team variety will always result in a higher level of 21st-century digital skills is likely too simplistic. There may be an optimal level of team variety relative to the size of a team.

Finally, *ICT advancement* – which refers to a combination of sufficient ICT resources and a positive organizational attitude towards ICTs – plays an important role in the development of information evaluation, expressiveness, collaboration and problem solving digital skills. Employee exposure to ICTs is necessary for workers to even come to perform 21st-century digital skills. However, this effect seems to be moderated by ICT support and a positive organizational attitude towards ICTs, giving employees the impression that the work they do is valued (Hsu & Fan, 2010). Our results support the fact that resources are a necessary but insufficient condition for improving 21st-century digital skills. Organizations should also support and motivate their employees to develop these skills.

Although factors of *transformation leadership*, *rewards*, *spatial autonomy*, *content related autonomy*, and *personal development* only contribute to one of the measured

skills components, organizations are advised to consider how they can be adapted and integrated into their leadership, working processes and culture to support the development of 21st-century digital skills among their employees. However, to institutionalize these adaptations, more specific and comprehensive advice is needed. Recent studies reveal that 21st-century digital skills are sequential and conditional in nature (Van Laar et al., 2019a), indicating that improving some skills might in the long run result in the enhancement of other skills, as well. Changing an organizational culture is a very complicated endeavor, for which adapting HR-policies regarding *autonomy* and *personal development* opportunities is a fairly obvious adaptation.

Surprisingly, the presence of an *adhocracy culture* did not contribute to any of the skills components. We expected to find organizations that are ad hoc – very responsive to external demands – to force employees to be flexible, therefore necessitating the development of cognitive skills. It might be that even though we expected that respondents could identify their organizational culture with *adhocracy* due to the nature of work in the CIs, the importance of *market* forces has an unexpectedly large influence on how their organizational cultures are perceived.

Due to the rapid development of global markets, organizations should pay attention to the development of the 21st-century digital skillset among their employees. Attempting to achieve a *market culture* in their organizations might be an effective way to accomplish this goal. However, changing the culture of an organization is very difficult to achieve. Paying attention to the composition of their working teams might be a more feasible way to achieve better developed skills among their employees. Additionally, ensuring that adequate resources are available in combination with using the right HR policies and motivating *transformational leadership* might prompt employees to develop their 21st-century digital skills. Finally, even though some organizational factors contribute to only one skills component, it might still be worth paying attention to these, since the sequential and conditional nature of certain skills might help improve other skills in the long run as well.

5.5.2 Limitations and future research

Although the findings of this study show some significant effects of organizational factors on individual skills within the 21st-century digital skills framework, none of them significantly contribute to all skills components. Research by (Van Laar et al., 2019a) shows that 21st-century digital skills are developed in a sequential manner through which information management and communication digital skills influence the development of problem solving digital skills, and some components of these skills are moderated by creative and collaboration digital skills. These sequential effects could also be researched with regard to the organizational factors that

influence these skills. Additionally, as discussed above, we could not find enough previous research to formulate a hypothesis for all individual skills components. This complicated our efforts to explain some of our findings. Future research should attempt to elaborate on our findings to try and find an explanation. A more in-depth approach by means of interviews with managers might shed some light on the mechanics behind our findings.

To measure 21st-century digital skills, we used an instrument that applies frequency scales to measure how often certain tasks or actions are performed. Although self-assessments have their drawbacks, frequency scales have been found to be more subjective than self-assessment scales (Authors, 2012). Performance tests would be a more valid means to measure skills development. However, due to time and resource constraints, a survey study was more feasible at the time of this study. In future research, performance tests of a smaller sample could help explain the level of 21st-century digital skills found in this research.

This study focused on the creative industries in the Netherlands. This sector is known to be a knowledge-dense sector in which human capital is heavily responsible for its competitive strength. Survey respondents were selected using the model developed in chapter 2 and included only professionals who are actively involved in the process of creation. In the Netherlands, 6,000 professionals are educated in post-secondary programs connected to the CIs each year. Among these professionals are both bachelor and master graduates (Topsector Creatieve Industrie, 2012). Research conducted over the last 25 years shows that highly educated people not only have the physical resources to use digital media but also are more motivated and have more positive attitudes towards using digital media (Van Dijk, 2019). Given our use of convenience sampling in selecting a generally highly educated sample, our results might not be generalizable to other industries or workers in the CIs who are not involved in the creation of a principal product. Due to the explorative nature of this research, repetitive studies with random samples are advised. Additionally, further research on other industries is needed to determine if the same organizational factors influence the level of 21st-century digital skills for other groups of workers. Finally, as stated in the discussion, it would be simplistic to assume that higher levels of team variety will always result in stronger skill development and outcomes. Future research should focus on the optimal composition of a team that supports the development of 21st-century digital skills.

Chapter 6

Organizational Factors Influencing 21st-Century Digital Skills: Interviews among Leaders in the Creative Industries

6 Organizational Factors Influencing 21st-Century Digital Skills: Interviews with Leaders in the Creative Industries

6.1 Introduction

Organizations in CIs use both the tacit and explicit knowledge of their employees to generate value. Tacit knowledge manifests when employees must use their previously acquired insights and experiences (Anderson, 2008; Chugh, 2015) and is very important when using digital resources to search for explicit knowledge and information. If the 21st-century digital skills of their labor force are properly developed, the CIs will be unlikely to experience a great loss of jobs due to automation, since the creative and human elements of this sector are central to the value it creates (KEA & PPMI, 2019). Therefore, the development of employees of CI organizations should not be aimed at gaining specific rote knowledge of building permits and codes, for instance, in the case of an architect. Importantly, employees develop 21st-century digital skills, which support the organizational goal of being innovative in an increasingly global and demanding market (David & Foray, 2003). Organizations that are lagging behind in the development of these skills among their employees are at risk of not being able to compete in the global market. Therefore, keeping employee skills current with the demands of the market is crucial for the survival of CI organizations.

With the current study, we aim to develop an understanding of the role that organizational factors examined in chapter 5 play in the development of 21st-century digital skills. To achieve additional validation for the 21st-century digital skills framework, our first research question is:

RQ1: What 21st-century digital skills are important for employees in the CIs according to their employers and why?

The competitive advantages of organizations of CIs mostly come from innovations that originate from human capital. An organization's human capital includes the skills that employees possess. Improving and expanding human capital supports an increase in employee productivity (Goldin, 2016). With regard to this human capital, we are specifically interested in the level and development of 21st-century digital skills. However, due to the novelty of the concept of 21st-century digital skills, very little empirical research exists on how organizations can stimulate the development of such skills. Nevertheless, the results of the survey provided in chapter 5 reveal that some organizational factors can influence the development of 21st-century

digital skills. In this chapter, we will use the same tripartite of factors as those used in chapter 5: *organizational opportunities*, *development opportunities*, and *technological opportunities* (e.g. Akdogan & Kale, 2017; Dong et al., 2016; Mathisen, 2011; Tijdens & Steijn, 2005). To better understand what organizations can do to develop these skills and how certain organizational factors influence 21st-century digital skills, we pose the following research questions:

RQ2: How do organizations in the CIs facilitate the development of 21st-century digital skills among their employees?

RQ3: How do factors relating to organizational, development and technological opportunities affect the level of 21st-century digital skills?

The final part of this study focuses on organizational, developmental, and technological opportunities for developing 21st-century digital skills. Among this tripartite of factors, we focus on factors that are most suitable for organizational policy. To address our three research questions, we conducted 31 semistructured interviews with professionals from different CI sectors.

6.2 Theoretical Framework

6.2.1 Factors Influencing the Development of 21st-Century Digital Skills

Employees in the 21st-century organization are seen less as a labor cost and more as an asset to be valued (Kochan, Orlikowski, & Cutcher-Gershenfeld, 2002). For organizations to thrive, employees should constantly improve and adapt to changes to which their work environments are exposed (Falola et al., 2014). To use and develop human capital to its full potential, it is important for organizations to create optimal conditions from which employees can grow and thrive. Unfortunately, organizations often do not provide employees with the right work environment for optimal nurturing and skills development (Bryan & Joyce, 2005). In this case, development refers to personal growth by pursuits that involve acquiring new skills or knowledge (Aguinis & Kraiger, 2009). The tripartite of factors that can influence the development of 21st-century digital skills as used in chapter 5 are discussed below.

Organizational opportunity factors.

Factors such as organizational culture, leadership, rewards, and autonomy are factors that, according to the scientific literature, are organizational opportunities that could help to improve 21st-century digital skills. These factors are related to organizational

culture and climate. In the current contribution, we explore the roles of rewards and autonomy, as both can be directly influenced by organizational policy.

Many scholars have studied the influence of rewards on the development of human capital (e.g. Amabile et al., 1996; Zhang et al., 2015). A distinction can be made between monetary and nonmonetary rewards. Monetary rewards can be structural such as salaries or can be incidental such as performance-dependent bonuses. Examples of nonmonetary rewards include fringe benefits, organizational outings, and extra opportunities for development. Studies on the effect of rewards for performance and development provide varied results. Amabile (1993) found that pay for performance has a negative effect on creative performance by negatively affecting intrinsic motivation. Intrinsic motivation increases when an employee experiences a task as rewarding in itself, independent of what is acquired from the outcome of that task (Amabile, 1993). However, Hon (2012) found that pay for performance has a positive effect on employee creativity. To comprehend the variety of different rewards, in the current study, we explore how employees are rewarded by an organization for the development or possession of certain skills in general.

Job autonomy is defined as the extent to which an employee has the opportunity to freely and independently schedule and perform a job as they see fit (Hackman & Oldham, 1976). High autonomy is often an attribute of organizations with innovative cultures (Akdogan & Kale, 2017), and multiple researchers have found that autonomy positively influences creative self-efficacy (Mathisen, 2011; Tierney & Farmer, 2002b). Autonomy granted by an organization also gives employees the freedom to use ICTs in a way they deem suitable. For this reason, autonomy is one of the factors we account for in the current contribution.

Development opportunity factors.

The development of human capital is beneficial for organizations since it enhances employee productivity (Goldin, 2016). Another important means to develop human capital and 21st-century digital skills in particular is through formal training opportunities provided by an organization. Training is a form of formal human capital development through which knowledge is transferred from an expert figure to students completing the training. Formal development can systematically progress the effectiveness of (groups of) individuals (Goldstein & Ford, 2002) and has a positive effect on job performance (Arthur et al., 2003). Although formal training might appear to be an obvious mode of human capital development, informal development opportunities should not be overlooked. Examples of informal development include seminars and symposia, knowledge transfer among colleagues by means of clubs and informal gatherings, and learning on the job (Weifeng et al., 2011). The latter is promoted by working in teams from a wide variety

of different disciplines and backgrounds, since this approach exposes the individuals in such teams to paradigms different from their own (Van der Vegt & Bunderson, 2005). Therefore, so-called multidisciplinary teams are often used to solve complex problems. The solving of complex problems creates some conditions important for the optimal functioning of multidisciplinary teams. Due to the complexities of these problems, tasks are nonroutine, which is one of the conditions for effective collaboration (Hambrick et al., 1996), and even though team members differ in their disciplines of expertise, such teams should have a common goal (Jehn et al., 1999). The creative potential of multidisciplinary teams is higher since they are better equipped to change (Milliken & Martins, 1996; Murray, 1989; Van der Vegt & Bunderson, 2005). Team variety is an organizational factor that can be easily impacted by organizational policy. For this reason, this factor is investigated in this study.

Technological opportunity factors.

Organizations can support employee creativity by providing adequate resources (Amabile et al., 2002; Scott & Bruce, 1994; Yeh & Huan, 2017). In this regard, providing sufficient ICT facilitation is an obvious choice for organizations (Hunter et al., 2007). Additionally, an informed strategy with regard to ICT has shown that employees are more willing to develop ICT competencies (Tijdens & Steijn, 2005). The latter implies that merely acquiring the right ICT resources only supports the development of 21st-century digital skills to a certain degree. An organization should provide support for employees in using ICTs through, for example, a well-informed ICT policy (Tijdens & Steijn, 2005). This support for work-related problems positively influences creative cognitive processes among employees (Hsu & Fan, 2010).

6.3 Method

Through this study, we aimed to develop a stronger understanding of what skills are considered important; the development of 21st-century digital skills; and the role of factors such as autonomy, rewards and ICT facilitation in this development. To this end, semistructured interviews were held among highly ranked CI professionals in the Netherlands. The interviews took place in the spring/summer of 2019.

6.3.1 Sample

As participants, we selected managers, owners, and other highly ranked CI professionals with a comprehensive outlook on or participating in workplace processes. This selection was important because the participants needed to

understand what skills were important for their employees, the level of such skills and development opportunities available to their employees.

Participants were selected using *criterion-based sampling* and *convenience sampling*. Criterion-based sampling was used to ensure that the sample represented the heterogeneity of CIs. Based on the subsector classification of the Ministries of Economic Affairs (EZ) and Education, Culture, and Science (OCW) of the Dutch government, the researchers used company, LinkedIn and personal websites to select participants. Thirty-one interviews were conducted with participants from the following subsectors: architecture ($n=4$), advertising ($n=4$), film ($n=2$), gaming ($n=3$), design ($n=5$), industrial design ($n=3$), (new) media ($n=3$), cultural heritage ($n=1$), the performing arts ($n=4$) and radio/television ($n=2$). Of the 31 participants selected, 22.6% were female ($n=7$). Participants were from all levels of management; 71.0% were top-level ($n=22$), 9.7% were mid-level ($n=3$) and 19.3% were first-level managers ($n=6$). Table 6.1 lists information on all of the participants with corresponding functions, management levels and organization sizes.

Table 6.1. Participant characteristics and the number of employees in their organization

Industry	Function interviewee	Management level	Size org.
Architecture	Senior project manager	Middle/first	70
Architecture	Partner	Top	2 ⁺
Architecture	Project manager/ Associate partner	Top	30
Architecture	Architect/Project leader	First	45
Advertising/New media	Founder/Owner	Top	
Advertisement	Managing director	Top	25
Advertisement	Studio manager/Graphic designer	First	13
Advertisement/ Design/New media	Brand manager	Middle	Self-employed ⁱ
Film	Producer/Associate	Top	8
Film	Producer	Top	25 ⁺
Games	Founder/Owner	Top	45
Games	CEO	Top	8
Games	Co-founder/Technical artist	Top	11
Graphic design	Director	Top	40
Service design	Managing director	Top	12

Table 6.1. Continued

Industry	Function interviewee	Management level	Size org.
Strategic design	Creative director/Owner	Top	44
Design	Designer/Founder	Top	9
Design	Founder/Product designer	Top	6 ⁺
Industrial design	Partner/Managing director	Top	15
Industrial design	CEO	Top	100
Industrial design	Founder/Industrial designer	Top	20
Media	COO	Top	30 ⁺ /100 [*]
Museum/(New) media	Manager creative industry and media	Top	n/a
New media/Software	Developer/Co-owner	Top	16
New media/Software	Managing partner	Top	45
Performing arts	Head development and events	Middle	28/150 [*]
Performing arts	Manager orchestra	First	5 (65)
Performing arts	Manager engineering and facility	First	40 (35)
Performing arts	Director	Top	32 (88)/600 [*]
Radio/Television	Crew manager	First	33
Radio/Television	Editor-in-chief	First	20/390 [*]

Note. Internships are included in these numbers; numbers in between parentheses are the number of performers at the company; ⁺ this organization uses freelancers on a regular basis; ^{*} the first number is the department which is overseen by the participant, the second number is the size of the total organization (including subsidiary companies). ¹ = This participant worked in a collective of freelancers that worked on assignments together under a general name, however, they were all self-employed.

6.3.2 Procedure

Potential participants were contacted by e-mail or, if this approach was not possible, via LinkedIn messages. After an interest in participation was confirmed, appointments were made via e-mail for a phone interview. The interviews were semistructured, as this method supported minor adaptations to the ordering of questions in response to answers provided by the participants. The interviews were recorded and later transcribed.

After recording informed consent, the interviews started with general questions about the organization with which each participant was affiliated and his or her role in the organization. These questions were posed to become familiar with the participants and to be able to describe the sample. The interviews started with a general question ("What skills do you consider important for the people working in your team?"). The term 'team' was used because the size of some organizations resulted in the participants only being responsible for certain subsections of their organizations. After this, the different skills frameworks and concepts were explored, from digital skills and 21st-century skills to 21st-century digital skills. This gradual approach was used to ensure a mutual understanding between each participant and the interviewer about the subject matter being discussed. After introducing 21st-century digital skills, the questions concentrated on attention to and the development of 21st-century digital skills within each organization. However, due to the semistructured approach used, participants were also able to discuss the development of their employees in general. In the third part of the interviews, questions focused on the tripartite classification of organizational factors that might influence the level of (21st-century digital) skills of employees. These questions not only focused on the role played by these factors but also sought to study how they had an effect.

6.3.3 Data Analysis

The interviews were automatically transcribed using Amberscript, after which the transcripts were thoroughly reviewed and manually improved. ATLAS.ti was used to analyze the transcripts. Content analysis was used to create a codebook consisting of 18 code groups for each theme. A codebook was created through a content analysis. The code groups were used to categorize the codes created during the content analysis. The names of the code groups corresponded to the themes, which were mostly based on the interview scheme. However, when a subject was raised repeatedly, a code group was created for the codes that corresponded with that subject. Codes were added to quotes (portions of text from the interviews) with content corresponding to the code construct. After the initial content analysis, similarities between codes were identified through a relational analysis, after which overlapping codes were combined. From the analysis of the 31 transcripts, 18 themes with 230 codes were identified (Appendix D). Table 6.2 shows the names and the number of codes for each code group.

Table 6.2. Code groups of the codebook with the number of codes

Code group	# of codes	Code group	# of codes
Autonomy	6	Organizational culture	11
Change	3	Prior education	8
Characteristics organization	9	Rewards	9
Characteristics participant	3	Skill concepts	7
Development	29	Skills	33
Difference (between employees)	8	Team	14
Evaluation	10	Technology	8
ICT facilitation	17	Work environment	4
Job functions	25	Work process	13

Answers given to questions concerning the skills concepts and frameworks (i.e., general skills, digital skills, 21st-century skills, and 21st-century digital skills) were coded with corresponding codes (i.e., 'general,' 'digital skills,' '21st-cent,' and 21st-cent DIGITAL') together with codes for the corresponding skills (see Table 6.3). For the remaining questions, codes for the skills concepts were only used when we could clearly determine which concept the participant was discussing.

For the second research question, a code group titled "develop" was created. This code group contained 29 codes addressing different aspects of development. The quotations to which the codes were attached were analyzed to determine what the organizations had done to develop their employees.

6.4 Results

6.4.1 Skills Mentioned by Participants

To address the first research question (*What 21st-century digital skills are important for CI employees according to their employers and why?*), we analyzed the number of quotes focused on the different skills, which, in descending order of reference frequency in the interviews, include *general skills*, *digital skills*, *21st-century skills*, and *21st-century digital skills*. Table 6.3 shows the number of times a skill was mentioned by the participants in combination with the different skill concepts. The column titled 'Groundedness' shows the number of times a skills code is used throughout all transcripts regardless of its combination with other codes.

Skills shown in bold are part of the 21st-century digital skills framework. Due to overlap between the most mentioned skills those of the 21st-century digital skills

framework, these results can be regarded as a validation of the framework. What is also remarkable is that without any frame of reference about the skills, customer orientation was mentioned second most often (only after communication), and social skills came in fifth place immediately after design skills, which can be viewed as cognitive skills or even 21st-century digital skills.

Table 6.3. Skills mentioned in combination with skills concepts

Skills concepts / Skills code	General skills	Digital skills	21 st -century skills	21 st -century digital skills	Groundedness ¹
Communication	15	5	13	31	160
Collaboration	10	1	16	11	91
Information management	2	3	3	22	59
Software specific *	4	31	1	1	57
Critical thinking	0	0	9	13	50
Creativity	4	4	9	5	45
Customer oriented	11	2	1	1	42
Design skills	9	3	1	1	29
Independence	3	0	1	1	23
Problem solving skills	3	0	6	3	19
Multidisciplinary awareness	0	0	0	2	17
Technical basic skills	3	2	1	3	16
Empathy	5	2	1	0	15
Other	8	1	2	1	15
Planning/organizing	4	0	1	1	15
Analytical skills	3	1	5	1	14
Programming	2	9	0	3	14
Social skills	8	0	1	0	14
Entrepreneurial	1	0	2	0	11
Flexibility	2	0	0	1	9
Inquisitive	3	0	1	0	9
Basic skills	1	2	1	0	8
Accuracy	6	0	0	1	8
Reflection	2	0	1	1	8
Commercial thinking	2	0	1	0	7

Table 6.3. Continued

Skills concepts / Skills code	General skills	Digital skills	21st-century skills	21st-century digital skills	Groundedness¹
Advisory skills	3	1	0	0	4
Cultural awareness	0	0	1	0	4
Leadership	0	0	1	0	4
Professionalism	2	0	0	1	3
Involvement	1	0	0	0	2
Management identification	0	0	2	0	2

Note. The skills in bold are part of the 21st-century digital skills framework.

¹Groundedness is the amount of times the code for that skill is used in all transcripts combined.

6.4.2 Employee Development

In all of the organizations, human capital development played an important role with two exceptions. The first is a starting company with only two partners, and the second is an organization in which the managers believed that their employees had learned everything they needed to know by performing their jobs and discussing their tasks with colleagues. All other organizations were putting deliberate effort into the development of their employees' skills, including 21st-century digital skills. However, the explicit development of 21st-century digital skills was rarely reported to be a priority. Table 6.4 provides an overview of development opportunities that the participants mentioned.

Table 6.4. Number of participants that mentioned different development opportunities

Development opportunity	# of documents with code
On the job*	27
Specific training (other)	27
(Internal) knowledge exchange*	25
Software specific training	13
Online self-study	11
Fair/conference	6

Note. * 'On the job' development occurs while performing tasks associated with the job. (Internal) knowledge exchange is the deliberate exchange of knowledge among people within or outside the organization.

Organizations used different methods to determine the kinds of development that their employees needed. Many organizations used formal evaluation methods such as annual interviews. Input for such evaluations mostly came from employees and management, but sometimes peer review was also used. Organizations that worked on a project basis, especially when using the SCRUM method of working, mostly used team- or organization-wide evaluations after each project. However, next to these formal moments, organizations were generally very open to having more informal conversations with their employees when there were questions or comments from both parties (i.e., the employee or the employer). Learning goals or personal development plans as means to monitor development were very common, as were budgets for employee development:

"We still have a collective labor agreement, and you can request a personal development budget. I think it is approximately 1200 euros. That is something you do in agreement with your superior, because it is nice when this is also beneficial for the company. In addition, next to that there is also a budget for courses in general, and management encourages this."

Development occurred not only on an individual level but also on the team level, especially within organizations that create new products or services in teams with SCRUM-like processes. For these methods of creation, continuously reviewing progress is part of the process, which results in continuous learning opportunities for those involved. Some organizations invite external coaches or educators to the organization itself. This process ranges from training provided in a group setting for which individual employees can enroll to one-on-one sessions with coaches. Focuses include, for instance, the development of competencies regarding collaboration and leadership. Multiple organizations had also invested in the assessment of the characteristics and collaboration styles of team members to develop understanding among peers and to encourage collaboration.

Many participants felt that their organizations had a responsibility to create the right environment for their employees to flourish and thrive. However, employees in their turn had to show a motivation and willingness to develop themselves. In this regard, they assigned responsibility to both the organization and the employee:

"The organization should create opportunities for an environment and climate in which development is possible. However, the employee also has to make steps to relate to this, to be open and see the importance of it, and to grow and move along with it. Things change, and they keep changing faster. As an organization you have to... yeah, take your employees with you through this, as otherwise you will stagnate. Then, you are no longer viable. You are no longer playing."

“The employee himself obviously plays an important part, because ICTs and technologies are not just present specifically within your function or company, but you get exposed to them everywhere in your daily life. So you will have to play a part in this. You can no longer close yourself off from this, so the responsibility can’t just be on either one or other. What is essential here is that, for example, an HR department has a vision about this [employee development].”

Participants generally viewed their organizations as being obligated to develop their employees for both the present and the future, even if they did not intend stay with their organizations. However, the degree to which employees are guided or receive encouragement differs by organization depending on its vision. Nonetheless, costs for development were mostly considered an investment and not a cost item. Despite having a budget available, one of the organizations noticed that employees were not very inclined to use it. To solve this problem, the organization created the following initiative:

“Everybody has a certain budget for taking courses per year [...] and a certain amount of free days that they can use for that purpose. [...] when new projects come in, we do our biweekly team meeting and then discuss what upcoming projects are about. In addition, people can then apply for a project a day in advance based on what they think fits into their development plans and what they find interesting. Of course, the team managers check if they have the time for this. Then, if a project is actually funded, the team managers together with the managers check if there is a component of this project that fits a person’s development plan and if we can link a course to it [...] We have also done this because we had been using this budget for self-development for quite some time... but hardly anybody used it. People were just not interested. However, once we asked a little more proactively for every project if they wanted this or that or if they could take a look at something, we found that people started to use it.”

Linking employee development to existing projects allows knowledge learned through courses to be utilized immediately. Furthermore, the organization and its employees share in responsibilities for development, which, as shown above, was viewed by most participants as the most desired situation.

6.4.3 Formal Education as a Development Opportunity

Formal education was identified as a very popular means to develop employees. Examples of formal education given by participants included courses or training provided by an external party such as an official educational institute, an industry association, an independent educator, or even a friendly competitor. These courses

can take place at the organization itself or at another location. Over a third of the participants mentioned that formal education mostly concerned courses specific to the participant's field of work, including certification. However, specific courses for particular software were often mentioned. With regard to soft skills, communication (especially presentation skills) and (project) management courses were popular. Language courses were also mentioned a few times for foreign employees working in the Netherlands. Only a few organizations mentioned there possibly being too little attention to formal training. However, developing employees through formal training and courses was something that the organizations were very open to.

Over half of the participants talked about external courses that could be followed by their employees that were paid for by the organization. Multiple organizations mentioned that these courses did not need to be job specific or to directly benefit the organization. Some believed that investing in human capital would benefit the organization by giving employees a broader view of the world and more curiosity about the world around them, which would make for the development of interesting products:

"We also think it is very important that people experience other things in life outside of working here. Because with this they bring other insights back to the studio, which is truly dynamic."

An example of an employee attending a course not specific to his job was described by the following participant:

"[...] he would like to do a course in Illustrator. I thought to myself 'Illustrator? What on earth do you need Illustrator for?' Then my girlfriend working in social pedagogic care said: 'Uh, if you don't do this – it is an investment of 2000 euros, so that is not that much – if you don't do this and you say no to him, then you have to wonder... if you say yes and he is happy and appreciates for you saying yes in spite of him not needing it for his job, it might improve his work attitude. So let it go, the fact that he is not going to use it, and try to say to your employees: 'I'll give you this even though you don't need it.' It has more to do with employment satisfaction. Do you see what I mean?"

One participant viewed it as common sense to offer employees the best skills development opportunities possible even when other organizations will eventually benefit from it. He was of the opinion that if all organizations took this approach, everyone would benefit. However, another participant described how employees once had to sign a contract stating that if they were to leave the organization shortly after completing an expensive course, they had to reimburse a percentage of the course costs:

"You can put forward what you need and make a proposition in the form of what course you want to do. Attach a financial plan to it and talk it over with the employer. However, often when we make an investment, we will also.... Look, if somebody decides to leave the agency a year after the course, then we say we want compensation for the investment we made..."

How development is organized differs from organization to organization. Furthermore, in subsectors concerned with the creation of new goods and services such as industrial design, marketing, new media and software, and gaming, there was more emphasis on working in teams. Here, the prevalence of internal knowledge transfer, buddy systems and peer review was higher. For cultural organizations and especially dance companies and orchestras, the need for digital skills among performing staff was less significant. The back offices of these organizations were more concerned with these digital skills than the performers. Many of these organizations are funded by subsidies or private beneficiaries, and their offices operate with minimal staff. Many organizations in other subsectors regarded it preferable to have multiple employees with similar disciplines so that they could learn from each other. However, this approach simply cannot be applied by organizations in the performing arts due to financial restrictions.

Another way in which the performing arts differ in the development of staff is that many occupations cannot be performed until old age. These organizations are very deliberate in preparing their employees for the time when they will have to switch professions. One participant reported:

"The idea is to protect them against the fact that the profession is changing, because it is not, like I said before, that you can only do that [job]. You are also working in a broader society, which is developing at a truly fast pace and in which appreciation for this trade is visibly diminishing. So you have to do other things besides this [...]."

Another example of employee development came from a participant working in television/radio. Educational programs have not effectively prepared employees for careers in media. Therefore, competing organizations have developed their own educational programs to teach current employees what they need to know to perform effectively in their jobs:

"However, there are hardly any educational programs that can deliver something like that, so then you get the question that was already there in the early days, which is: shouldn't we start our own educational institute or some sort of company education or something? [...] Well, that is what happened in this case and the unique thing is that they did that with their competitor – there is a comparable company of about the same size and a competitor with

the same kind of question – they are now cooperating with media educational programs which are present at the Mediapark as well, and we brought them together a while ago. On that media campus, they have realized an internal educational program for existing employees.”

Online resources were also mentioned as a major contributor to employee development. Especially for organizations with many younger employees (millennial and gen X employees), there was often a great intrinsic motivation to create new and fashionable products. These employees were very self-reliant with regard to searching for and finding the right information online. Almost one-third of the participants mentioned this means of development as something that they saw happening on a regular basis:

“I have to say, currently, these guys truly develop themselves in that regard, because you can also find many that find information on the internet. Everything is open source currently; you have forums, expertise forums. Those guys, in the late hours they search on their own and find, “I can do this, I can do that,” and this is actually nicer than when they follow a course that tells them how to do something.”

Some organizations were very open to their employees developing in different areas or professions than those they actually held. They valued the fact that their employees were already familiar with the organization and were good team members. They did their best to help their employees make the most of their talents and interests and viewed employee satisfaction as very important. These employees were given the opportunity to experience different jobs their organizations had to offer. Additionally, multidisciplinary teams made it possible for different professions to learn from each other and made collaboration easier, as employees learned to understand what was important for their peers in performing their jobs, resulting in a better understanding of each other’s professions. Almost three-quarters of the participants mentioned learning on the job as a way in which human capital development took place. Many participants also mentioned that they preferred their staff to work in the office, as employees could then easily ask quick questions and interact and collaborate with coworkers.

Internal knowledge transfer was identified as an important part of learning on the job. Almost 70% of the participants mentioned this idea as a way for employees to develop. The interviewees described many different ways in which internal knowledge transfer could take place. However, the organizations had also made sure that the office environment was arranged to enable ease of communication. This approach again stresses how the participants preferred employees to work in the office. Other methods of internal knowledge transfer described included

buddy systems and colleagues reviewing one another's work. Some organizations reported using systems or models in which a junior employee was coached by a senior employee:

"What we have done is, for approximately half a year, we have used a buddy system. When a trainee comes in, he or she gets paired with a junior architect who familiarizes him or her with the organization and who regularly sits down with him or her. This isn't scheduled, but the junior architect will check in... and see how it is going and show the trainee how to communicate and where to find staff, files, and resources."

Being part of the team and gaining work experience was deemed very important:

"I think it is very much about mentorship... if we want an intern, we don't want to have to tell that person "you have to do such and such this way." Preferably, you remain active as a programmer, and you kind of lead by example, and you let somebody just be a part of the whole process... fully a part of the process. Then, we let them encounter things on their own. That is the style that we use."

Knowledge was sometimes also transferred in a more deliberate way through (informal) gatherings. For example, an employee of one company told others about new findings or knowledge learned through courses or seminars:

"For approximately a year, we have held company consultations in which we show what other teams do. Therefore, in this sense you also learn from each other. In addition, in the afternoon, we hold open workshops, which are project discussions that everybody can participate in. So if you are interested in a different project, well, then you are always welcome... or if we think you have certain expertise and you can make an interesting contribution, then you can always come by [...] and this is also nice for the project team. You then get feedback even before you present to a client."

However, this can also involve individual coaching:

"We also have a next step so to speak, which we call the 'competence lead.' We have an Android developer... who leads his discipline, and he makes sure that all other Android developers are informed of the latest developments and that they meet certain quality standards. [...] When somebody is not strong enough content wise, we plan some sort of... we go through his or her code every other day and thoroughly review what can be improved."

However, these gatherings were not limited to speakers from within the organizations. Participants also mentioned inviting friendly competitors to share interesting knowledge. This collaboration with competitors was not uncommon, and multiple participants mentioned regularly meeting with professionals from other organizations.

A final avenue for development involved attending conferences and seminars. However, this avenue was mentioned by less than a quarter of the participants. Furthermore, one organization mentioned organizing inspiring trips for the whole organization designed to give its employees new ideas and renewed motivation. Of course, most organizations provided a combination of the abovementioned development opportunities. The following quote reflects this approach:

"So you have the possibility to do something with your own budget. Collective opportunities are being organized among the editorial staff, and in a larger context, lunch meetings are organized. These are approximately the levels at which it [development] is happening: at the individual and editorial levels and for the whole company."

6.4.4 Development of 21st-Century Digital Skills

As is clear from the development opportunities described above, some attention is given to the development of 21st-century digital skills. However, most of the participants are not deliberate in the development of these skills. They either do not think about the development of 21st-century digital skills specifically, or they have thought about it, but do not know how to execute this form of development. Table 4 shows that communication, collaboration and information management are mentioned not only individually but also in reference to 21st-century digital skills. However, related development has mostly occurred while introducing new employees to organization work processes or where intertwined with work processes such as SCRUM. In particular, digital critical thinking skills were mentioned multiple times by participants as skills to learn on the job rather than from a course.

"To be honest, it is not like we consciously or practically do things like that. It is not like we specifically offer everybody an education for that [21st-century digital skills]. We sent a product owner for SCRUM product owner training during which you also learn skills like that. Yeah, we do more informal things too that are a little bit cliché, such as teambuilding exercises, to get people used to each other."

A participant working in industrial design felt that 21st-century (digital) skills were so intertwined with what s/he did, that s/he felt that they did not require any extra attention for formal development as shown by the following quote:

“With regards to those soft skills, that is something we have been educated in for 10 years. I’ve taken those kinds of courses and I don’t learn anything. It only makes me dumber if I’m honest. This is something we do every day. We are so attuned to that, so we invent new things every day and if I think of critical thinking, creative thinking, problem solving and things like that, those practices are so ingrained in our process. I see less need for development there, it was the focus of our education.”

This was less the case for organizations in the visual and performing arts such as museums and dance companies. In particular, the latter had large groups of performers who were mostly concerned with their nondigital craft with a minimal back office to coordinate this core business. For them, 21st-century digital skills were more important in the personal sphere (e.g., critical thinking about what content to put on social media). However, an improper use of social media can have organizational consequences due to the nature of their work.

6

6.4.5 Organizational Factors Influencing Development

In the following section, results regarding the influence of rewards and autonomy (organizational opportunities), team variety (development opportunities) and ICT facilitation (technological opportunities) on 21st-century digital skills are discussed.

Rewards.

Very few organizations give out bonuses for individuals, let alone for the development of skills. Only one participant claimed to reward individuals for their ‘unique and creative talents.’ However, the same participant described having stopped providing financial bonuses, as s/he did not believe this created the right incentives for employees. Instead, the company rewards talented employees with fringe benefits. Many participants mentioned that for employees, the development of skills, which in turn comes with performing better on the job and being able to do more advanced tasks, is a reward in itself. A positive working atmosphere and more desirable assignments were also mentioned as rewards as illustrated by the following quote:

“(...) we make sure that everybody is rewarded well and I think that these kinds of development opportunities are a part of that and not something that has to be rewarded in itself”

Furthermore, receiving compliments or better reviews in response to personal development was also seen as a reward.

When employees had received bonuses, this had mostly occurred when they had reached personal targets based on personal development plans. However, structural higher pay, which was mentioned as a reward by 13 of the participants, was the most widely applied reward for employees with stronger skills. One organization reported providing bonuses for successful product launches for the following reason:

"(...) otherwise it would not be correct. Then, you say [as an employer] "You are partially responsible for the success of this project," but if you don't follow words with deeds, I don't think they will truly believe you."

Finally, multiple participants reported feeling that rewarding individuals was unfair to their teams:

"I don't believe in that at all [bonuses] because we are doing this together and everybody works within their abilities. No, that would be truly weird in our case."

Rewards were often given on a team or organizational level, sometimes through the distribution of partial profits, but more often by organizing team activities or investing in a positive office atmosphere:

"That [bonuses] is just not part of our corporate culture. We mostly just buy stuff for the company. At the end of the year we always have a big Christmas dinner where the significant others are invited and which is a big party. We have nice lunches. We have great coffee and yeah, that is a kind of bonus throughout the year."

Autonomy.

When the participants were asked about *autonomy*, almost all of them believed it to aid in the development of their employees. When asked what role autonomy played in the development and what the effect of autonomy was, participants used their own words, but recurring themes included independence and responsibility. In general, it was believed that autonomy helped afford employees a greater sense of responsibility for their own development and allowed them to better execute assignments or projects. An explicit link was made to creativity. Autonomy helped employees think outside of the box and develop creative solutions.

Multiple participants described autonomy as independence, and almost a fourth of the participants mentioned independence in their answers concerning autonomy. Participants discussed how autonomy might give employees a sense of being truly a

part of the organization and of truly doing what they wanted to do. One participant said the following:

"... eventually those guys need to have the sense that this is their own company and that they can do what they want (...) Then, they can do what they are interested in as much as possible (...) That is how you get the best personnel and the best stuff. Then, the passion comes out (...) and that is what keeps a programmer or creative person going..."

Two participants also viewed autonomy as important for morale and in affording staff opportunities to perform tasks they enjoy through a different kind of drive:

"In general, you could say that at the moment people have the desire to do thing independently, that this motivates them to pick up on those skills that are needed to do a task and those are the things they like to do... I think that people like to be able to do things autonomously because they can then experience feelings of freedom and independence, which is rewarding. So I encourage this on the condition that the client is happy, the employees are happy and we can make some money off of it."

Multiple participants also reported that due to hiring people for their talent, it made sense to give them the freedom to exploit their talent:

"...of course you try to give your people as much independence and space to optimally utilize their talent. That is what you hire them for. So yeah, the more talent somebody has, the more freedom they get."

"They are all highly educated people. If you tell highly educated people what to do you get into a downward spiral. In addition, that approach is just not smart, because you hire people to think for themselves"

The following quote also illustrates how autonomy helps employees develop problem-solving skills by encouraging independence:

"(...) I think loving neglect is the best way to stimulate self-resolving skills in people"

6.4.6 Development Opportunities

Team variety.

One factor that appears to have a large influence on the development of skills is team variety and composition. Such variety is not just related to different disciplines working together but also to different personalities or employees of different cultural

backgrounds working collaboratively. However, team composition must also be practical with regard to available time and employee skills. Furthermore, even though team size is primarily determined by the kind of project involved and the availability of employees, according to the participants, it does play a role in how employees develop their skills. Some participants mentioned that when a team is larger, it is more important to be able to (digitally) communicate properly and to have sufficient organization skills. However, smaller teams give employees a greater sense of responsibility both for those involved and for the product that is being developed:

"I do think that the larger your team is, the more important it is for team members to have certain skills to among each other and to have organizational skills. So... I think that if a team is very small, then communication is obviously easier and you know more about what everybody is doing. If the team is larger, and if the organization is larger, it is more important to apply your digital skills properly. In addition, as an organization you need to make sure that there are proper guidelines on how you want people to relate to each other and use resources."

With regard to working in multidisciplinary teams and the development of skills, one participant mentioned the following:

"So what you see more and more is cocreation between companies and organizations, which means that you have programs or projects that transcend companies or organizations. So you are dealing with people from different organizations, often with different cultures. I don't just refer to culture in the sense of cultural background but also in terms of organizational culture. In addition, interdisciplinary teams of different disciplines with project leaders that might be generally schooled and three technicians and a marketer and the need to function properly with a mix of people from different organizations is something that is happening more and more, which requires all sorts of skills."

Coworkers of different disciplines must have an understanding of the work of their colleagues. Valuing and understanding one another's work facilitates collaboration, communication and eventually the creation of a better product. The following quote illustrates the importance of those of different disciplines understanding one another's work:

"To innovate you need different stakeholders and you have different disciplines and you have different perspectives. The only way to successfully do such a project is if those people understand each other. So what you want to achieve is that when a designer is sitting next to an engineer, they understand the effect of their work and of the work of the other. They see that when they are next to each other."

Another important aspect of successful teamwork relates to feedback and team atmosphere. Working in teams affords employees more coaching and feedback opportunities, which furthers the development of skills. Multiple participants mentioned that less experienced staff can learn from more senior staff and are encouraged to do so.

"I have a fairly young group of people, and there are a few guys that lag behind with regards to skills. They have not been working that long. In general, I partner them as much as possible with experienced staff. In addition, the experienced staff truly understand the assignments and can teach everything they know and the less experienced staff will no longer receive an assignment and ask questions until the former say 'Not right now!' [laughs] and then wait for five minutes and continue."

However, one participant mentioned that a mix of experienced and less experienced employees is also used to cut costs, since junior employees are generally paid less. However, this does also pose greater risks for organizations.

Peer coaching and feedback must not be provided in an atmosphere is too familiar, as this might cause team members to become too lenient. Multiple other participants also mentioned that the chemistry between employees is important and that employees should have different personalities:

"A good team helps people develop themselves individually, and a bad team brings out the worst in people. Team that are one-sided with the same people are also not challenged enough."

One participant specifically mentioned that a sense of trust and space to make mistakes and give feedback can facilitate the development of creativity. This has the following positive result:

"When a team works and collaborates well... the results also come faster and easier. Campaigns are more easily established, strategies are formed faster, the results are better, and you develop nicer campaigns that you can sell to clients more easily and that get more appreciation. So yeah, you notice that very quickly."

Although many participants mentioned that availability and existing skills were considered most when putting a team together, some do keep employee development plans in mind:

"They sit together and do the planning. They take into account all kinds of factors. They won't always go for the 'usual suspects,' but they will also take development plans into account and say: 'That person needs to be challenged.'"

One participant reported that the development of skills was pursued by using alternative ways of forming groups, such as per discipline or even per theme, to discuss matters from different viewpoints. One participant, however, described his/her organization as not truly considering what staff can learn from each other when creating teams. It is believed that when someone is better in a given area, other people can always learn from his/her skills.

6.4.7 Technological Opportunity Factors

ICT facilitation.

When participants were asked about the role of ICT facilitation and about how their organizations handled ICT-related questions, most participants argued that in large part, a properly working ICT infrastructure helped with employee motivation and made work more pleasurable.

"I think we spend between 1,500,000 and 2,000,000 euros a year on the server and on software stored on the server. We also spend that amount on laptop software and things like that. I think that we spend 4,000,000 euros per year on ICTs as a company of 100 people. However, if we were skimpy we would be more careful; we would not spend 4,000,000 but 2,500,000 or 2,000,000 euros. In terms of total costs and what we do in labor, those savings are not strategic because you immediately lose them on the other side; people are less motivated in their jobs, can't move forward, and are not able to work as fast; and we deliver lesser quality to our clients. So buildings, desks and workplaces and ICTs are essential. Eventually, relative to personnel costs, it comes to a relatively low cost."

One participant reported that developments in the market (such as the introduction of the iPad) can drive employees to complete courses or workshops to respond to customer demands. How ICT facilitation can support the development of information management digital skills is also illustrated by the following quote:

"We also have a complete knowledge database with shared knowledge that people can use. The database standardizes all kinds of products and materials. Therefore, all old projects are also available under a certain folder. When we create an internal briefing for a new project, we refer to that [folder]. For example, when a project for a medical device is approved, it is assigned to the internal briefing for past similar projects, and on the server you can find these here, here, and here. Staff can then identify program requirements, what was learned, who worked on different projects, and who they can ask questions about past problem solving..."

The same participant stated that maintaining and using such a database had facilitated the development of skills by allowing employees to gather knowledge faster.

Multiple participants discussed the dependence of organizations on ICTs. They are aware that their organizations heavily depend on ICTs and that this has major consequences when such technologies do not work properly. This had led some participants to develop their own systems to be less dependent on licenses that they believe make it more difficult to change systems or software when necessary. Participants also viewed dependence on other companies to address problems as a possible source of new problems. Since ICTs are so closely intertwined with the work that is being done in CIs, and due to the need for ICTs to perform such jobs, multiple participants viewed effective ICT facilitation was a prerequisite to developing skills.

6.5 Discussion

6.5.1 Main Findings

Work methods and the resources used to do work are constantly changing. For this reason, it is not just important that employees have rote knowledge about the ins and outs of their professions but also that they can constantly adapt and develop within their changing surroundings, especially with regard to ICTs. For this reason, this study set out to explore what organizations are undertaking to develop 21st-century digital skills in their employees and the roles of certain factors in the development of such skills.

First, we wanted to determine what 21st-century digital skills our participants regarded as important for their employees. As shown in Table 6.4, communication, collaboration, and customer orientation were the three most mentioned skills when asking the participants about general skills. Even though participants mentioned customer orientation as an important skill, being customer oriented actually encompasses a set of skills of which communication and problem solving form a large part. We were also able to validate the skills in the 21st-century digital skills framework. The skills in bold in Table 6.4 are part of the 21st-century digital skills framework. The amount of times these skills are mentioned in combination with the 21st-century digital skills concept, and the groundedness of these skills in comparison to other mentioned skills validates this framework.

In descending order, the most mentioned skills included communication, information management and critical thinking with collaboration being a close fourth. What is notable is that communication is by far the most mentioned skill

not only as a 21st-century digital skill but also as a general skill and 21st-century skill. Even though the interviews were conducted in the CIs, creativity and problem solving were mentioned considerably less than communication and collaboration. We suspect that these skills were difficult for the participants to understand as a construct. Furthermore, research by Van Laar et al. (2019a) shows that these skills are developed sequentially. To truly understand the development of 21st-century digital skills, an understanding is needed of how these skills interrelate. Communication and information management influence problem-solving skills directly but are also intermediated by critical thinking, creativity, and collaboration (Van Laar et al., 2019a). This might explain why participants viewed communication and information management as such important skills for their employees to have.

Regarding our second research question on the facilitation of skill development, the participants were often very willing to pay courses or development opportunities. Some organizations expected such efforts to be specifically beneficial for the organization and the job that an employee was expected to carry out, but some were open to employees developing themselves in subjects not directly related to their fields of expertise. They believed that granting employees this opportunity would help with work motivation, and this was valued more than the specific skill to be developed. In general, participants believed that giving employees responsibility over their own development would ensure the best use of development opportunities by motivating employees intrinsically. Some participants had encouraged employees completing training or courses to share their knowledge so that other employees could benefit, which may also help employees better retain and remember newly attained knowledge and skills.

The participants had rarely sent employees for mandatory training unless it involved instruction on software an organization had just started using and that employees used on a regular basis (e.g., marketing software). Participants generally felt that mandating certain courses did not facilitate the development of skills due to a lack of drive from employees to complete such courses. Completing courses for rote knowledge was mostly seen in light of acquiring credentials, but this was not seen as particularly valuable but as something that needed to be done. The observed lack of motivation to complete such courses might explain why the participants reported employees not feeling as if they had learned much. However, this effect might also work in the opposite direction. This means that motivation is lower when completing specific courses will not result in the acquisition of additional skills or knowledge. Employee motivation was highly regarded when discussing learning and development. Employees were given much autonomy with regard to their development. Participants believed that this would result in the highest returns.

How the development of 21st-century digital skills is occurring echoes that of development in general and can often not be seen as separate from other development attempts. Often, it involves a combination of development opportunities. Our participants are of the opinion that both the organization and the employee are responsible for the development of 21st-century digital skills but that the employer must create a work environment that enables employees to develop themselves. However, as one participant mentioned, employees do not just encounter ICTs and technology at work but also in daily life, so they also have to play their part. Due to the novelty of 21st-century digital skills, there has been little attention to the development of these skills specifically. However, as shown in Table 4, social skills such as communication and collaboration as well as cognitive skills such as information management are highly appraised by the participants. For them, naming these skills is hardly relevant, so they might not call them 21st-century digital skills, but they are regarded as important. Many organizations have their own processes or protocols for the management of information. Completing a general course on saving and retrieving information would be counterintuitive, so this knowledge is generally transferred internally among colleagues.

The extent to which development opportunities in an organization were related to 21st-century digital skills was somewhat dependent on the kinds of work employees did and the kinds of products or services an organization offered. In, for example, (industrial) design, new media and software, gaming and architecture, the use of ICTs was especially prevalent, meaning that employees are more tech savvy by default. Due to the nature of their work, these professionals had generally engaged in learning on the job to develop. This was often not a very deliberate effort, although some organizations had designed work environments in such a way that knowledge transfer and learning on the job were facilitated, and they generally expected employees to be at the office. Furthermore, organizations often have protocols for saving and updating information. New employees are often familiarized with these structures and processes in a more or less formal manner by internal knowledge transfer. Therefore, when participants were asked about the development of 21st-century skills, learning on the job and knowledge transfer were often cited as the most significant aspects of this development. Learning on the job allows knowledge to be immediately applied and appropriated. However, in hectic work environments, such development can be easily overlooked or set aside to prioritize the job at hand. Therefore, it is important to be deliberate with actions to develop such skills on the job.

For our final research question on the role of organizational factors in 21st-century digital skills, we focused specifically on factors that can be influenced by organizational policy. These factors include rewards, autonomy, team variety and ICT

facilitation. For rewards, most participants did not believe that monetary rewards motivate employees to develop skills or to become better at their jobs. Rewards were not regarded as a suitable incentive for employees to develop themselves. However, participants did mention that employees deserved good pay, especially when having or developing exemplary skills or expertise. Therefore, monetary rewards mostly came in the form of a structural raise, for example, after a yearly evaluation. Nonetheless, incidental pay for individuals based on developed skills was not provided. Even though many organizations were very keen on retaining talent, participants seemed to believe that intrinsic motivation was far more efficient for the development of skills than extrinsic incentives such as rewards. Additionally, while in other sectors competitiveness among employees might play a large role in a reward culture, the CIs rely heavily on teamwork. Many participants felt that rewarding only certain employees for tangible results would not send the right message to other employees. They believed that teamwork deserved to be rewarded as such. Favoring certain employees over others can also be detrimental for intrinsic motivation, which participants viewed as far more important for the successful development of skills. It was mentioned multiple times that when employees developed themselves out of curiosity about a subject or found online on their own initiative, this was far more effective than forcing them to complete a course.

Autonomy was believed to be very important for employees in the CIs. Since they are often highly educated, the participants expected such employees to be able to determine the best way to execute an assignment. Participants believed that micromanaging these employees would not result in better or more innovative projects, so they give their employees the space to handle assignments as they see fit. Participants believed that autonomy could facilitate the development of skills, although this might be indirect. Autonomy gives employees a sense of responsibility over their work, which in turn gives them the drive to do their jobs as well as possible. This can result in them deliberately or subconsciously developing and improving their skills. Even though we were unable to determine whether autonomy specifically facilitated the development of certain 21st-century digital skills based on data gathered from the interviews, it does seem that more responsibility over one's own work results in an intrinsic motivation to develop skills.

Of all of the investigated factors, team variety seemed to play the largest role in developing not only skills in general but also 21st-century digital skills. Although the development of employees during teamwork is not as explicit as, for instance, formal training, it seems that working in teams plays a large role in skill development. While working in teams, employees of varied disciplines and tenure can collaborate. This implies a variety of knowledge being transferred among coworkers. Participants seem to be aware of this fact and to use it to improve the skills of junior employees.

Deliberate actions were taken to ensure that employees in teams could learn as much from each other as possible. With regard to the development of 21st-century digital skills, communication, collaboration and information management seemed to play a central role in teamwork. When coworkers have different expertise or backgrounds, more deliberate action might need to be taken to understand each other, which results in a better understanding of other disciplines and the continuous development of communication and collaboration skills.

ICT facilitation was seen as a prerequisite for skill development. Participants were unsure about the extent to which ICT facilitation helped with the development of skills, but the consensus was that when ICT resources were not adequate, this was detrimental to job performance and therefore to the development of skills. In short, ICT facilitation is a necessary but not sufficient condition for the development of 21st-century digital skills.

When asked about other factors they believed to be important for skill development, many participants reported organizational culture and the organizational environment. Participants viewed these as very important considered their organizations inviting places for employees to work. They believed this to help with motivation by making going to work and work itself more pleasurable. A stimulating work environment was not the only way in which they attempted to make work more enjoyable and rewarding. Multiple participants mentioned attempting to secure the most interesting projects so that their employees remained challenged. In this way, employees were intrinsically motivated by their jobs instead of being extrinsically motivated by monetary rewards. In acquiring interesting projects, successfully finishing such projects was seen as a reward in itself.

6.5.2 Limitations and Future Research

Even though we believe to have used an inclusive sample for all parts of the CIs, some self-selection might have occurred. Due to the expected time investment, respondents that thought the subject was interesting applied themselves to participate in this research, risking the exclusion of some criterion. This might mean that they had already put thought into the subject of employee development, which might cause a somewhat positive image of the state of development in organizations in the CIs. So, the sample is inclusive in term of spread throughout the CIs, however it might not be inclusive in terms of the awareness of the relevance of 21st-century digital skills. Since the concept of 21st-century digital skills is fairly new, the subject might be difficult to comprehend and not a priority for many employers in the CIs. This might have resulted in managers that are on the forefront of human capital development are overrepresented in our sample. Therefore our results might not be representative for the current situation in the CIs. However, as a explorative study

of a potentially important subject this study sheds light on issues that might grow in importance in the future.

During analysis, the codes for the different skills concepts and frameworks (i.e. general skills, digital skills, 21st-century skills, and 21st-century digital skills) were mostly applied at the beginning of the transcripts. This is due to the funnel-like design of the interview questions, in which these concepts were introduced in a specific order. This resulted in the respondents answering the questions in the beginning of the interview more specifically to those concepts. However, in the later stages of the interviews – when the respondents talked about the organizational factors – the different skills-concepts (i.e. general skills, digital skills, 21st-century skills, 21st-century digital skills) were more often used interchangeably. For this reason the corresponding codes were applied less for analysis near the end of the transcripts.

Since not all respondents were familiar with the concept of 21st-century skills and 21st-century digital skills, examples of some of these skills were given when these concepts were introduced. For this reason the skills that are mentioned as examples to introduce the concept of 21st-century digital skills might be reflected in the answers of the respondents.

6.5.3 Concluding Remarks

With this research, we attempted to explore how organizations in CIs can start to facilitate the development of their employees, especially with regard to 21st-century digital skills. We also explored how certain factors proposed by the classification given in Chapter 4 influence the development and levels of these skills. Even though the development of 21st-century digital skills is two-fold (both basic technological knowledge and cognitive skills are needed), the development of basic technological knowledge was hardly discussed during the interviews. It appears that little attention was given to this kind of development. This might be because employees graduating now have grown up with ICTs while older employees who are still working in the CIs today have developed these skills, since without them working in the CIs is not possible. However, participants also mentioned that younger staff sometimes lack the ability to spontaneously sketch something for a client by hand without hiding behind a computer screen, implying a shortage of analog artistic skills. Some employees and participants reported providing drawing courses within an organization. This shows that nondigital cognitive skills are still important. ICTs have added new dimensions to these skills communication, including information management, critical thinking, creativity, collaboration and problem solving. Digital environments create more opportunities to find information, collaborate and communicate, but these new options have not rendered pre-existing options

obsolete. This shows that employees in the current work environments must adapt to different modes of communication for different media, which demands more cognitive processing skills and flexibility from employees. For this reason, extra attention should be given to these skills to monitor whether employees need additional opportunities for the development of such skills. A specific and directed policy on developing these 21st-century digital skills could help organizations implement effective changes. From our exploratory research, a few results stand out. First, the studied organizations have been very willing to take action and assume responsibility in the development of skills, but motivation from employees to develop themselves is considered crucial for effective improvement. To achieve this, organizations should give employees a high degree of autonomy over their work and their own development. When employees feel that they have autonomy, they feel responsible for delivering high-quality work, which in turn could imply that they are intrinsically motivated to develop advanced skills. To stimulate this drive further, organizations should create open work environments that encourage knowledge transfer and learning on the job, which here were identified as some of the most utilized and efficient means of employee development.

Chapter 7

General Conclusion and Discussion

7 General Conclusion and Discussion

7.1 Introduction

Knowledge workers perform nonroutine tasks during which they continuously improve their skills. They valorize information in a continuous process of learning, applying new knowledge in novel situations, and they find solutions for problems that are not clearly predetermined. The skills required for such knowledge work are often referred to as cognitive skills or 21st-century skills, i.e., the skills needed by citizens and employees of the 21st century. Examples of 21st-century skills are communication, creativity, collaboration, flexibility, and media and information literacy.

These general 21st-century skills can be defined and reframed in a digital version: while using digital media or ICTs. For knowledge workers to use the internet and ICTs to their full advantage, certain skills are required. For a long time, it was assumed that the ability to use ICTs would be sufficiently developed by exposure to ICTs. However, the skills needed to use ICTs do not necessarily lead to improved outcomes (Van Dijk, 2017). For individuals to be able to use ICTs to their advantage, cognitive skills are also needed. However, ICT-related skills are often mentioned separately from cognitive skills in 21st-century skills frameworks. In most frameworks considering 21st-century skills, the skills related to the use of ICT have many different names (e.g., technical operations, internet literacy, digital competency, ICT literacy, information literacy, etc.) (e.g. Dede, 2010; Ferrari, 2012). Some refer to “the skills to operate computer and network hardware and software” (Van Deursen & Van Dijk, 2010, p. 894), while others refer to the use and outcomes of those skills. However, 21st-century skills can no longer be viewed as separate from ICT-related skills. The rise of technology and the internet demands different skills that acknowledge the importance of the diverse set of abilities that are required when people process the information retrieved from online environments. These skills are called *21st-century digital skills* (Van Laar et al., 2017). Examples of these skills are *online* communication and critical thinking; only a person who has sufficient communication skills can effectively and efficiently communicate their intentions online and select the right medium to do so, and only when somebody is critical can they differentiate between unreliable and reliable online sources and detect fake news.

In this dissertation, we used the concept of 21st-century digital skills to study the level of these skills among professionals in the creative industries (CIs) in the Netherlands and to explore how organizations can contribute to developing and improving these skills. The CI sector is a knowledge-dense sector in which human capital and knowledge are what generates value. Ultimately, we set out to explore what strategies should be employed to develop those skills among professionals

in the CIs in such a way that it will benefit the Dutch economy. To reach the final research goal – *To provide practical recommendations to organizations and policy makers on how to improve the level of 21st-century digital skills of employees* – multiple steps were taken, which all provide their own insights and recommendations. These will be discussed in this chapter.

7.2 A Work-Process of Creation in the Creative Industries

The CI sector in the Netherlands is one of nine knowledge intensive sectors in which great growth can be achieved, according to the Dutch government. Many Western countries invest in their CIs, since it is believed that developing these industries can generate great commercial value. However, there is no uniform understanding of what is considered part of the CIs; in addition, since the CIs are at the forefront of innovation, the sector keeps reinventing itself. This innovation results in the rise of new industries that could not have been foreseen in the past, which makes it very difficult to write general and effective policies for this sector, not only because of innovation but also because it houses both private and public industries that differ a great deal in the way they do business.

To obtain a better understanding of the context in which the empirical research of this dissertation was performed, a more dynamic approach to understanding the CIs was proposed. This addressed the first research goal, namely, *to construct a conceptual model for the work process of creation within the CIs*:

- a. *For the selection of participants by linking job-function groups to the process model;*
- b. *For efficient assimilation of research findings in regard to recommendations and policy formulation; and*
- c. *That can be used to redefine the CIs in the Netherlands.*

The process model that resulted from these efforts is repeated in Figure 8.1.

Figure 7.1. Process-model characteristic for product or service development in the CIs, supplemented with job-function groups.

Using a process model instead of a distinction based on job functions or organizational lines:

1. does not require adapting the existing model every time a new industry or subsector arises due to innovation.
2. can also be used to describe creative endeavors embedded in other industries, as described by Rutten et al. (2019)
3. focuses on the similarities in the subsectors of the CIs instead of focusing on the differences.

The general nature of the process model can be used to describe a wide variety of creative processes. There is no uniform understanding of what is considered part of the CI sector; what became clear from conducting fifty-four interviews and four focus groups is that what the respondents view as ‘the CIs’ is very dependent on their own context. Where many cultural organizations, such as museums, theaters and music venues, rely on public funding and their missions are mostly focused on catering to and educating their public, there is another side of the CIs that exploits their creative endeavors for commercial gain. Noticing that the efforts to demarcate these seemingly contradictory sides of the CIs resulted in a general process model might not necessarily imply that this is a shortcoming of the model but that rigidly trying to unify these contradictory sectors is not the best approach for the CIs. It might be that even though creativity is part of their business, they need different policies and are, in that regard, not unifiable. The practical implication of these findings is that – when considering 21st-century digital skills – it is recommended to distinguish between organizations that use their creative endeavors for commercial

gain and organizations that use cultural heritage to inform, educate and entertain the public. The vision and mission statements of those organizations clearly differ, which will influence the emphasis of the importance of different 21st-century digital skills. Policies and recommendations should reflect those differences.

7.3 21st-Century Digital Skills

Before steps can be taken to improve the level of the 21st-century digital skills of the professionals in the CIs, there has to be a uniform understanding of what skills the professionals in the CIs need. For the second research goal, *to explore what 21st-century digital skills are needed within the work process for the CIs, by linking them to the different phases of the process model*, we used a classification of skills derived from a systematic literature review (Van Laar et al., 2017). The 21st-century digital skills framework was composed by operationalizing the seven core skills most found in the academic literature with a digital component (Table 8.1).

Table 7.1. 21st-century digital skills framework with conceptual definitions and examples

21 st -century digital skills dimensions	Conceptual definition	Examples
Operational skills	The skills to use (mobile) devices and applications to accomplish practical tasks and recognize specific online environments to navigate and maintain orientation.	Being able to access digital resources by operating mobile applications. Being able to navigate online environments.
Information management	The skills to use ICT to efficiently search, select, organize information to make informed decisions about the most suitable sources of information for a given task.	Selecting the right key words when using Google to search for information. Using a folder structure to save and organize information.
Communication	The skills to use ICT to transmit information to others, ensuring that the meaning is expressed effectively.	Adapting your communication style to the medium (i.e. WhatsApp, e-mail, Skype).

Table 7.1. Continued

21st-century digital skills dimensions	Conceptual definition	Examples
Collaboration	The skills to use ICT to develop a social network and work in a team to exchange information, negotiate agreements, and make decisions with mutual respect for each other towards achieving a common goal.	Using online applications and cloud services like Trello, Google docs or Dropbox. Being able to use applications for videoconferencing, like Zoom or Microsoft Teams.
Creativity	The skills to use ICT to generate new or previously unknown ideas, or treat familiar ideas in a new way and transform such ideas into a product, service or process that is recognized as novel within a particular domain.	Using internet to find inspiration and know what applications you can use to execute ideas (e.g. Photoshop or Illustrator for visuals; Logic, Pro Tools or Cubase for audio).
Critical thinking	The skills to use ICT to make informed judgements and choices about obtained information and communication using reflective reasoning and sufficient evidence to support the claims.	Look for multiple sources online and determine whether the information is accurate and reliable based on e.g. publication time or sources used.
Problem solving	The skills to use ICT to cognitively process and understand a problem situation in combination with the active use of knowledge to find a solution to a problem.	A combination of the above mentioned skills and examples (Van Laar et al., 2019a)

Note. Adapted from “The Relation Between 21st-Century Skills and Digital Skills: A Systematic Literature Review,” by E. van Laar, A.J.A.M. van Deursen, J.A.G.M. van Dijk, and J. de Haan, 2017, *Computers in Human Behavior*, 72, p. 583.

An explorative follow-up study among managers in the CIs showed that when asked about required skills, the operational skills were mentioned most often. In this case, the respondents most often referred to specific software types used in the development of the final product. Even though the participants regarded the development of new digital skills as instrumental for a successful knowledge worker, they had difficulty relating the use of digital environments and digital tools with cognitive skills as described in the framework. However, after operational skills, the participants also regarded creativity, communication, collaboration and problem-solving skills – which were often referred to as analytical skills by the participants – as important for CI employees (Van Laar et al., 2019b). The reason for the participants' complications in linking digital skills – which they regarded as employees being able to handle certain software or tools – with cognitive skills might be that these soft skills are more difficult to measure and the terminology used for these skills is not standardized (Cobo, 2013; Dede, 2010).

21st-Century skills appear to be more commonly known and accepted by the participants. Even if they were not familiar with the terminology, they were familiar with these skills. This did not imply, however, that these skills were given special attention when considering employee development. Furthermore, the concept of 21st-century *digital* skills seemed to be something that participants had great difficulty in understanding. The difficulty participants showed regarding the understanding of the framework was noticed during all the qualitative research performed for this dissertation. Although most of the participants had a conceptual understanding of 21st-century skills as being social or cognitive skills and were aware of skills such as media literacy or similar skills, the combination of 21st-century skills and digital skills was difficult for them to comprehend. This became clear from the onset, when the participants were asked about those skills in the first interview round. Analysis of these interviews showed that the participants had great difficulty not seeing operational or technical skills separate from cognitive skills. This is in line with how skills relating to new technology are operationalized in most 21st-century skills frameworks (Dede, 2010). However, without deeper cognitive processing, the information that is found using ICTs cannot be used by subjects to obtain the desired outcomes. On the other hand, not having well-developed 21st-century digital skills can even result in negative outcomes. An example is when architects and engineers work together in a cloud-based application for the design of a building. To prevent errors, they have to be both aware of the abilities and shortcomings of the application and be able to communicate clearly and understand each other's disciplines, even though they might not be physically near each other. When these professionals are unable to develop these skills, the results can have severe implications for the users for which the building was designed.

Conveying the importance of 21st-century digital skills and the steps that have to be taken to foster the development of these skills among the employees in the CIs is one of the most important contributions of this dissertation. Since the number of jobs in which 21st-century digital skills are needed is expected to grow (Bakhshi et al., 2019) and a shortage of employees having this combination of digital and complex analytical skills is already reported (Winterbotham et al., 2018), directed efforts should be made to stimulate the organizations in the CI sector to develop an understanding of the skills their employees need. Since the understanding of 21st-century digital skills is so low, first, the understanding of 21st-century skills in general should be improved, after which the importance of the application of these skills in digital environments should receive attention. The latter is an indispensable step, since mere exposure to ICTs does not imply that employees can take advantage of all benefits digital environments have to offer. Organizations have to be educated on how the level and development of both 21st-century skills and 21st-century digital skills can be monitored to manage these talents and so that the skills and knowledge are retained and improved.

The managers in the CIs should be made aware of the importance of 21st-century digital skills for their workers and what the benefits of developing these skills will be. Without this awareness, the policies directed at organizations to improve the skills level among employees might be ignored. When responsible managers are not convinced of the use and importance of such recommendations or policies, it is unlikely they will be adopted. Therefore, a foundation of recognizing that these skills are important has to be created before a policy is written and implemented. In this regard the Roadmap Human Capital 2020-2023 of the top sectors could be used (Topsectoren, 2019). One of their approaches is to develop and assimilate knowledge. Their desire is to increase insights with scientific research, and share analyses for the sector, governance and policy. One of the aims to do so, is to develop digital learning- and development environments, and realize research-programs into learning communities (Topsectoren, 2019). These initiatives, and the network of the top sectors could be used to assimilate our findings among organizations and managers in the CIs.

7.4 Determinants of 21st-Century Skills (Digital) Skills

With a clear overview of what skills are important for workers in the CIs and an understanding of how managers in the CIs view these skills, the next step was to determine what organizational factors could influence the level of these skills for the

individual employee. Therefore, our third research goal was *to review the academic literature to identify the potential organizational factors that determine the 21st-century digital skills level of the individual employee.*

Since the concept of 21st-century digital skills was new at the time that this study was performed, the search was performed for 21st-century skills without the operationalization of digital environments. Due to the cognitive nature of both skillsets, it was assumed that determinants of 21st-century skills would also play a role in the level of 21st-century *digital* skills. From the review, it became very clear that even though Van Laar et al. (2017) found the skills mentioned in the framework using a similar methodology, with the exception of creativity, for many of these (and related) skills, very little research was conducted in the context of the organization with outcomes on the level of the individual employee. Even after adapting and adding related terms for multiple skills, no articles were found for communication, critical thinking, information management and problem solving that adhered to the inclusion criteria. It was also noticed that the research into creativity often focused on creative outcomes, since this is often how creativity is measured. Indeed, it is difficult to measure an individual's level of creative skill without examining the outcomes of the creative endeavors.

Most determinants found in the systematic literature review related to different styles of leadership, of which transformational leadership was by far the most discussed determinant in this study. The other determinants mentioned included the following:

- job-related determinants, such as freedom, job autonomy and job complexity;
- organization-related determinants, among which;
 - social-organizational factors, such as social support and climate, and
 - determinants related to organizational policies, such as rewards and pay for performance, resources and organizational formality.

Although a plentitude of research on internet skills has been conducted among citizens (e.g. Van Deursen & Van Dijk, 2015), our systematic literature review could not identify such research among professionals, even while using the general terms 'skills' and 'competences' and other related terms. Another problem that was encountered was that the articles found regarding critical thinking were mostly in the context of education and not in the context of the professionals working in an organization. Finally, problem solving was mostly linked to creativity (i.e., creativity in terms of creative problem solving). Therefore, to obtain a better understanding

of how different organizational factors influence those skills, more research should be conducted in the specific context of the organization. Additionally, the research should not focus only on the organizational output or outcomes but also on the individual employee within that organization.

All the research found in the systematic literature review focused on a single skill, even though the search string also included generic terms to be able to include sets of skills. Van Laar et al. (2019a) showed that the skills in the 21st-century digital skills framework are conditional and sequential in nature. This implies that these skills, when developed, will influence each other in a sequential manner. Therefore, it is recommended that research is also performed on multiple skills simultaneously. However, no research (in an organizational) context regarding skillsets such as 21st-century skills surfaced.

7.5 The Influence of Organizational Determinants on the Level of 21st-Century Digital Skills

The fourth goal was *to estimate the actual influence that organizational factors have on the level of 21st-century digital skills*. In order to achieve that, we used the factors found in the systematic literature review discussed above as a point of departure. A decision was made to focus on the determinants that organizations can control comparatively easily. An instrument to measure these factors was designed based on both existing items and questionnaires and items designed by the researchers themselves. The factors that were measured were subdivided into the following three categories: organizational opportunities, with the factors organizational culture, transformational leadership, spatial and content related autonomy, and rewards; development opportunities, with the factors personal development opportunities and team variety; and technological opportunities, with the factor ICT advancement. The systematic literature review revealed large gaps in the academic research concerning the organizational determinants of 21st-century skills. Therefore, despite our efforts, we were not able to formulate hypotheses for most of the expected causations based on the literature. Therefore, exploratory research questions were suggested based on the determinants found in the systematic literature review. To measure the level of 21st-century digital skills, we used the instrument of Van Laar et al. (2018).

The intention of the survey was to measure both the current 21st-century digital skills level of the individual employee working in the CIs and the organizational determinants that might influence this skill level. For this reason, professionals who were self-employed were not included in the sample. The results of the survey

showed that an organizational market culture, transformational leadership, rewards, spatial and content-related autonomy, personal development, team variety and ICT advancement all contribute to one or more of the components of 21st-century digital skills.

ICT advancement was high when an organization has both sufficient resources and a positive attitude towards ICTs. This determinant had a very significant influence on a multitude of 21st-century digital skills components. The role of a positive attitude of the organization towards ICTs deserves extra attention, since it was stated earlier that improved outcomes while using ICTs do not result directly from exposing employees to ICTs (Van Dijk, 2017). Therefore, the positive relation between ICT advancement and four of the 21st-century digital skills components can at least in part be explained by the support and motivation of organizations while employees use ICTs. This shows that besides managers, employees themselves should be aware of the importance of 21st-century digital skills, since the effectiveness depends on their motivation. This could be linked the current plans of the Topsectoren (2019) to start a network of 'professionals of the future', who can serve as role models and inspirators for future developments.

Team variety also had an effect on a multitude of 21st-century digital skills components, including collaboration and creativity. Team variety can play a large role in the development of skills. By working together, employees are continuously exposed to new knowledge and different problem-solving styles. The development of skills that occurs when working in teams is very efficient, since learning occurs in a working environment and new knowledge is likely to be related to the problem at hand and can therefore be directly valorized. A personal development plan for employees, with which some participants were already familiar, might aid in making the development insightful. When such a plan is in place, it is easier for employers to place the employee in teams with colleagues that are likely to be most valuable in terms of their development.

7.6 Explaining the level of 21st-Century Digital Skills among Workers in the CIs

The outcomes of the survey were used as input for the interviews of thirty-one high-placed professionals in the CIs. First, the importance of 21st-century skills and the framework of 21st-century digital skills were revalidated by asking the participants about the skills they wanted their employees to possess. Of all the skills mentioned, the skills in the 21st-century digital skills framework were all in the top 11 (Table 6.3), indicating a high level of consensus between the participants in the two rounds

of data collection. Communication was most often mentioned when asked about skills in general, 21st-century skills and 21st-century digital skills. Problem solving was mentioned least of all for 21st-century digital skills.

To address our fifth research goal – *to gain insight into how these factors influence 21st-century digital skills* – we asked the participants how they believed certain determinants influenced the skill levels of their employees. First, we asked about development opportunities within the organization. In general, the participants believed that employee development is a joint effort and responsibility of the organization and the employee. The organization needed to facilitate certain development opportunities, but employees were expected to be pro-active in their own development. Employee motivation appeared to play a large role in development; highly motivated employees are more concerned with their own development and, therefore, are able to optimally benefit from these opportunities. For the same reason, many of the participants did not advocate for mandatory training since they believed that the effect of such training was diminished by the low motivation of their employees.

On the subject of development opportunities, training and learning on the job were most prevalent in the answers of the participants, with knowledge exchange between members both inside and outside of the organizations being a close third. Knowledge exchange is closely related to teamwork and collaboration. The participants stated that next to practical considerations, they would try to compose teams in such a manner that the team members could learn from each other, thus facilitating knowledge transfer.

Team variety was also one of the factors that, according to the survey, most influenced the 21st-century digital skills concepts. It appears that – even when not deliberately trying to develop these skills – participants were aware of the added value of varied teams, which may be in terms of discipline, cultural background, or styles of working. This was viewed as an opportunity for employees to be motivated and creatively challenged.

Organizations spend considerable amounts of effort in the development of their employees. When mentioning specific courses their employees had taken, some soft skills and cognitive skills, such as communication and presentation skills, were mentioned. However, there was no deliberate effort to develop 21st-century digital skills.

The development opportunities provided by the organization were one of the determinants asked about during the interviews. Regarding the influence of rewards, the participants were pretty much unanimous in their view that monetary rewards did not have the desired effect on employee skills. Again, motivation seemed to play a large role. The participants believed that rewarding employees with bonuses would not intrinsically motivate employees. Furthermore, they

believed that rewarding one person would be detrimental for team cohesion. They realized that the process of creation was a team effort in which each team member played an indispensable role. Rewarding one person would endanger the unity in a team and would be harmful for collaboration among colleagues. In addition to good structural pay, the participants aimed to make the organizational culture and climate a rewarding and motivating place for employees so that the employees would know they were appreciated.

Most employees in CIs are highly educated, and the work they perform is often very specialized. Managers must leave it to the discretion of the employee to determine how they execute tasks. Therefore, employees in CIs often have a high degree of autonomy. The participants acknowledge that granting employees autonomy over their jobs would result in more creativity and innovation. The survey showed that the two components of autonomy (spatial and content-related autonomy) both had a positive effect on one component of communication (sharing and expressiveness, respectively). Although the mechanism in which autonomy helps the improvement of 21st-century skills cannot be explained based on the interviews, it can be expected that intrinsic motivation also plays a significant role here. Having autonomy conveys trust from leadership to the employee. Being allowed to execute a task independently intrinsically motivates the employee to do a good job, which might help in the development of skills.

As noted before, ICT advancement had the strongest influence on the highest number of skill components. During the interviews, the participants mentioned that sufficient ICT resources were crucial, since problems with ICTs not only make much of the work impossible and significantly slow down the process but also incite frustration among employees, which had negative effects on motivation. For this reason, many participants did not spare costs on resources, whether hardware, software or servers and accessibility. They seemed to realize that the costs for such resources easily outweighed the costs of stalled projects and unmotivated employees. In this regard, the link between ICT resources and a positive attitude towards ICTs appeared to be clearly present.

7.7 Recommendations for Organizations and Policy Makers

In Chapter 6 we discussed how managers in the CIs believed organizational factors such as autonomy, rewards and ICT facilitation could influence the level of 21st-century digital skills of employees. However, knowing what the mechanisms behind these effect are is not useful on its own. The knowledge should be valorized for

organizations in the CIs. By writing policy, regulations, objectives and incentives to develop the level of skills for employees can be described. Many organizations have clear views regarding the development of their employees. However, some organizations lack the knowledge or resources to optimally execute development plans. Writing local or national policy and recommendations for (sub)sectors might incentivize or aid those organizations that want to improve the development of 21st-century digital skills of their employees.

The *Topteam Creatieve Industrie*¹ is responsible for the human capital agenda of the Dutch CIs, and its goal for 2020 was for the sector to become the most creative economy of Europe, by integrating research, education and government (Ministry of Education Culture and Science, 2014). However, since 2015 all top sectors are cooperating to increase the impact of the their individual human capital agendas. Therefore, the CIs are involved in the 'Roadmap Human Capital Topsectoren 2020-2023' (Topsectoren, 2019). This most recent roadmap consists of three approaches:

1. Increase impact; to increase the impact and reach of learning communities, with involved partners.
2. Develop and assimilate knowledge: to incorporate the fact bases, share analyses and put cross-over developments on the agenda for the own sector, governance and policy. Increase insights with scientific research.
3. Mobilize and accelerate: Increase the circle with focused events and smart tools, so the results of the top sectors can be valorized by partners.

With the first approach – increase impact – the roadmap wants to achieve 100 extra learning communities, which among other things, enables the combination of learning and innovation in a work environments and education by creating – for example – skills labs. However, very little concrete ideas are given on how to develop employee skills in the work environment, what skills are needed and how these skills could be developed efficiently, other than the valorization and sharing of knowledge.

It has become apparent that many organizations have systems in place with regard to the development of their employees. This might cause organizations to be hesitant to make suggestions for national or regional policy instigated from a governmental body. It appeared that they viewed employee development a matter for organizations. Furthermore, due to the issues encountered regarding

1 www.creative-council.nl

the comprehension of the framework, it might be difficult for organizations to know what skills should be developed among their employees.

For the development of human capital in the top sectors, lot of emphasis is given to cooperation between knowledge institutes, business and government (Ministry of Education Culture and Science, 2014; Topsectoren, 2019). There is also an emphasis on talent development within the CIs, but it appears that these efforts mainly focus on collaboration between stakeholders, for example with organizations outside the CIs (Ministry of Education Culture and Science, 2014). However, even though there is attention for talent development in schools and general support for organizations in the CIs, there is little mention of enforcing alternatives for talent development at an organizational level. The development of competencies and skills of professionals already employed in the CIs appears to be left to the responsibility of organizations.

With extra learning communities, the 'Roadmap Human Capital 2020-2023' is implemented to realize extra development opportunities at work. Nevertheless, to achieve such aims, a concrete idea about what skills should be developed and how these skills can be developed should exist. Especially considering the fact that the human capital agenda proposed by the roadmap is overarching for all top sectors, it should be clear what kind of skills are indispensable for all knowledge workers. 21st-century digital skills are such skills and the development of these skills would be a great start to create a contemporary workforce. Unfortunately, based on the empirical results discussed in this dissertation, it appears that even stakeholders in the CIs are not aware of the importance of these skills. So, for efforts to improve these skills to be successful, policy with regards to raising the awareness of these skills should be written and executed first.

It would be ill advised to design a policy to improve the level of 21st-century digital skills without considering the level of comprehension and awareness of these skills among managers in the CIs. These managers will eventually have to implement these policies within organizations. To improve this comprehension, one should not only focus on 21st-century digital skills but should also focus on 21st-century skills in general, since the adoption of 21st-century digital skills might be too difficult when the concept of 21st-century skills is not understood.

To achieve these objectives the process model can serve as a base for providing skill-related policy recommendations. The process shows that not every professional in the CIs needs all skills to the same degree. That is why, during the interview sessions, the participants were asked what professionals played a significant role in the different steps of the process. By doing so, we were able to link general job-function groups to the process model (Figure 8.2). Based on the descriptions of the participants regarding the different steps, the skills they considered important, and

exploration of the literature, a basic idea regarding what skills are needed in the different steps of the process could be deduced.

Figure 7.2. Process model characteristic for product or service development in the CIs supplemented with job functions and skills important for each step of the process.

Table 8.2 shows what 21st-century digital skills are most required per phase of the model. By comparing these skills with the job-function groups linked to the process model (Figure 8.2), a general and explorative overview of the skills needed per discipline can be extracted (Table 8.3). This overview is based on the skills in the 21st-century digital skills framework and the process model developed in this dissertation.

Table 7.2. Explorative overview of 21st-century digital skills needed per phase in the process-model of creation.

	Problem Analysis	Concept	Provisional Design	Final Design	Production/ Execution	Product Introduction
Operational skills		.	.	.	.	
Information management	.	.	.	.		
Communication	.	.	.	.	.	.
Collaboration	.	.	.	.	.	.
Creativity		.	.	.	.	
Critical thinking	.					
Problem solving		.	.	.	.	

Table 7.3. A general and explorative overview of essential skills per job-function group.

	Problem Analysis	Concept Design	Provisional Design	Final Design	Production/ Execution	Product Introduction	Skills*
Marketing manager					.	.	1, 3, 4, 5, 7
Designer	•	•	•	•			All
Strategist	•	•			•	•	All
Engineer				.	.		1, 2, 3, 4, 5, 7
Project manager	•	•	•	•	•	•	All

Note. *1 = Operational skills, 2 = Information management, 3 = Communication, 4 = Collaboration, 5 = Creativity, 6 = Critical Thinking, 7 = Problem Solving

We propose to take this overview as a guideline for policy makers and managers aiming to improve 21st-century skills and digital skills selectively and effectively. When searching for methods to improve these skills, organizational determinants such as ICT advancement, autonomy, transformational leadership, team variety and opportunities for learning on the job and knowledge transfer should be considered, next to the obvious choice of formal training. What became very clear from multiple quantitative studies is that the intrinsic motivation of employees is essential for successful and efficient development, and the organizational determinants should be employed in such a way that helps in improving this motivation or drive for creativity and innovation. In the current Roadmap Human Capital Topsectoren 2020-2023 a lot of attention is given to the assimilation of knowledge among knowledge institutes, government and organizations within the top sectors. The findings in this dissertation can be used as concrete recommendations and knowledge to share and valorize within the sector. To achieve the aim of the *Topteam Creatieve Industrie* of becoming the most creative economy in Europe, investments should be made to help organizations in providing sufficient resources for the nurturing of 21st-century digital skills. For instance, by providing state-of-the-art ICT resources, which support employee motivation, and therefore the development of skills. The learning communities could be used to assimilate the knowledge regarding the importance of 21st-century digital skills, and managers in the CIs could be provided with courses in how to best nurture an organizational culture and climate preferred for employee autonomy and development.

Furthermore, to develop 21st-century digital skills among employees, efforts should not be left to individual organizations, as is now often the case. Even though the development of employees is important for many organizations, efforts are

mostly subordinate to the issues of the day. Furthermore, many organizations do not possess specific knowledge regarding effective employee development, and, as mentioned earlier, are mostly unaware of the existence of 21st-century digital skills, let alone the level of these skills among their employees. Therefore, programs to improve upon these skills among the creative workforce should be initiated by a higher governing body, or overarching bodies such as the *Topteam Creative Industrie*. An additional advantage is the expansion of the participants' networks and knowledge transfer among professionals that would otherwise not meet. Ideally, these efforts might even result in interesting collaborations that might otherwise not have come to fruition.

7.8 Limitations and Future Research

All the research in this dissertation was performed in the context of the CIs in the Netherlands. The process model presented in this dissertation is not just intended as a more dynamic and sustainable approach towards CIs but carries the potential of relevance beyond these industries. It enables a targeted general strategy to improve the level of 21st-century (digital) skills by linking job functions and skills. However, since this approach was recently developed, it is still in its infancy and in need of elaboration and additional testing. Through further research, this process model could be refined, specified and improved to make it even more suitable for use in the way it is intended; providing a dynamic and therefore sustainable approach to define the CIs, and serve as a guideline for policy by linking job-function groups with 21st-century digital skills.

In the second study, a few gaps in research were observed. When searching for academic literature regarding organizational determinants that influence skills, the outcomes were mostly reported on an organizational level as well. However, we were more interested in the effects of these determinants on the individual employee. Furthermore, almost all research selected for this study focused on creativity. More research to other skills should be performed to remedy the overrepresentation of creativity in academic literature. Furthermore, with regard to critical thinking, almost all research was performed in the context of education, but for some reason, interest in this skill diminishes when students enter the workforce. Therefore, for future research, it would be interesting to study the level of critical thinking (digital) skills in an organizational context as well.

The 21st-century digital skills framework is very novel, which is why a systematic literature review could not be performed with the operationalization as intended. Therefore, the search was performed with 21st-century skills, without

operationalization in the digital context. A small risk exists that the organizational determinants found are not generalizable to 21st-century digital skills. More empirical research should be performed using the measures used in this dissertation, both inside and outside the CIs, to determine the generalizable characteristics and validity of the framework, the measures used, and the organizational determinants.

A consequence of the novelty of the process model and the framework of 21st-century digital skills is that multiple studies in this dissertation were explorative in nature. This resulted in some very interesting insights; however, more research is needed to comment on the generalizability of the findings. Policies developed based on these findings create a wonderful opportunity to not only improve the essential skills of employees, resulting in a favorable position of the Dutch CIs in the global creative economy but also for further research and improvements, as suggested in this final chapter.

By improving 21st-century digital skills among employees in the CIs the Dutch creative economy could truly be among the most successful in Europe. This would not only result in economic growth but in improved quality of life by realizing innovative solutions for important societal challenges by fostering collaboration between knowledge and creativity.

8

References

8 References

- Aguinis, H., & Kraiger, K. (2009). Benefits of Training and Development for Individuals and Teams, Organizations, and Society. *Annual Review of Psychology*, 60, 451-474. doi:10.1146/annurev.psych.60.110707.163505
- Ahmad, M., Karim, A. A., Din, R., & Albakri, I. S. M. A. (2013). Assessing ICT competencies among postgraduate students based on the 21st century ICT competency model. *Asian Social Science*, 9(16), 32-39.
- Ahonen, A. K., & Kinnunen, P. (2015). How do students value the importance of twenty-first century skills? *Scandinavian Journal of Educational Research*, 59(4), 1-18. doi:10.1080/00313831.2014.904423
- Akdogan, A., & Kale, E. (2017). Impacts of internal factors in organisations on creative and innovative performance in hospitality companies. *International Journal of Innovation Management*, 21(6). doi:10.1142/s1363919617500499
- Amabile, T. M. (1993). Motivational Synergy: Toward New Conceptualizations of Intrinsic and Extrinsic Motivation in the Workplace. *Human Resource Management Review*, 3(3), 185-201.
- Amabile, T. M., Conti, R., Coon, H., Lazenby, J., & Herron, M. (1996). Assessing the work environment for creativity. *The Academy of Management Journal*, 39(5), 1154-1184.
- Amabile, T. M., Hadley, C. N., & Kramer, S. J. (2002). Creativity Under the Gun. *Harvard Business Review*, 80, 52-61.
- Amabile, T. M., & Pratt, M. G. (2016). The dynamic componential model of creativity and innovation in organizations: Making progress, making meaning. *Research in Organizational Behavior*, 36, 157-183.
- Ananiadou, K., & Claro, M. (2009). 21st Century Skills and Competences for New Millennium Learners in OECD Countries. *OECD Education Working Papers*, 41, OECD Publishing. doi: 10.1787/218525261154
- Anderson, R. (2008). *Implications of the information and knowledge society for education*. New York: Springer.
- Andriopoulos, C. (2001). Determinants of organisational creativity: A literature review. *Management Decision*, 39(10), 834-841. doi:10.1108/00251740110402328
- Appu, A. V., & Kumar Sia, S. (2015). Organizational Social Support: A predictor of Employees Workplace Creativity. *Annamalai International Journal of Business Studies & Research*, 1-5.
- Arthur, W. J., Bennett, W. J., Edens, P. S., & Bell, S. T. (2003). Effectiveness of Training in Organizations: A Meta-Analysis of Design and Evaluation Features. *Journal of Applied Psychology*, 88(2), 234-245. doi:10.1037/0021-9010.88.2.234

- Avolio, B. J., Waldman, D. A., & Yammarino, F. J. (1991). Leading in the 1990s: The Four I's of Transformational Leadership. *Journal of European Industrial Training*, 15(4), 9-16.
- Azim, S., Gale, A., Lawlor-Wright, T., Kirkham, R., Khan, A., & Alam, M. (2010). The importance of soft skills in complex projects. *International Journal of Managing Projects in Business*, 3(3), 387-401.
- Baker, N. R., Winkofsky, E., Langmeyer, L., & Sweeney, D. J. (1976). *Idea generation: A procrustean bed of variables, hypotheses and implications* (Vol. June 28). Univ. of Cincinnati: College of Business Administration.
- Bakhshi, H., Djumalieva, J., & Easton, E. (2019). *The Creative Digital Skills Revolution*. Retrieved from the Creative Industries Policy & Evidence Centre website: <https://pec.ac.uk/assets/publications/The-Creative-Digital-Skills-Revolution-the-PEC-and-Nesta-24-Oct-2019.pdf>
- Bakhshi, H., Freeman, A., & Higgs, P. (2013). *A dynamic mapping of the UK's creative industries*. Retrieved from the Nesta website: <http://www.nesta.org.uk/publications/dynamic-mapping-uks-creative-industries>
- Bakhshi, H., Frey, C. B., & Osborne, M. (2015). *Creativity vs. Robots. The creative economy and the future of employment*. Retrieved from the Nesta website: https://media.nesta.org.uk/documents/creativity_vs._robots_wv.pdf
- Bannerot, R. (2003). *An exercise in problem definition in an early design course*. Paper presented at the American Society for Engineering Education Annual Conference & Exposition, Nashville, Tennessee.
- Basadur, M., & Graen, G. B. (1982). Training in Creative Problem Solving: Effects on Ideation and Problem Finding and Solving in an Industrial Research Organization. *Organizational Behavior and Human Performance*, 30, 41-70.
- Bass, B. M. (1990a). From transactional to transformation leadership: Learning to share the vision. *Organizational Dynamics*, 18(3), 19-31.
- Bass, B. M. (1990b). From transactional to transformational leadership: Learning to share the vision. *Organizational Dynamics*, 18(3), 19-31. doi:[https://doi.org/10.1016/0090-2616\(90\)90061-S](https://doi.org/10.1016/0090-2616(90)90061-S)
- Bass, B. M., & Avolio, B. J. (1993). Transformational leadership and organizational culture. *Public Administration Quarterly*, 17, 112-121.
- Bejinaru, R. (2016). Knowledge Dynamics Impact on Intellectual Capital in Organizations. *Management Dynamics in the Knowledge Economy*, 4(4), 515-534.
- Bell, D. (1973). *The Coming of Post-Industrial Society*. New York: Basic Books.
- Bell, D. (1979). The Social Framework of the Information Society. In M. L. Dertouzos & J. Moses (Eds.), *The Computer Age: A Twenty-year View* (pp. 163-211). Cambridge, MA: The MIT Press.

- Black, S. E., & Lynch, L. M. (1996). *Human-Captial Investments and Productivity*. Paper presented at the Hundredth and Eighth Annual Meeting of the American Economic Association, San Francisco, CA.
- Braams, N. (2011). *Onderzoeksrapportage creatieve industrie*. Retrieved from the Statistics Netherlands website: <https://www.cbs.nl/nl-nl/onze-diensten/methoden/onderzoeksomschrijvingen/aanvullende%20onderzoeksbeschrijvingen/onderzoeksrapportage-creatieve-industrie>
- Bryan, L. L., & Joyce, C. (2005). The 21st-century organization. *The McKinsey Quarterly*(3), 25-33.
- Burnside-Lawry, J. (2012). Listening and Participatory Communication: A Model to Assess Organization Listening Competency. *International Journal of Listening*, 26(2), 102-121. doi:10.1080/10904018.2012.678092
- Cameron, K. S., & Quinn, R. E. (2006). *Diagnosing and changing organizational culture Based on the competing values framework (revised edition)*. San Francisco, CA: Jossey-Bass.
- Caniëls, M. C. J., De Stobbeleir, K., & De Clippeleer, I. (2014). The antecedents of creativity revisited: A process perspective. *Creativity and Innovation Management*, 23(2), 96-110. doi:10.1111/caim.12051
- Carey, H., Florisson, R., & Giles, L. (2019). *Skills, talent and diversity in the creative industries. Evidence synthesis and scoping: summary report*. Retrieved from the Creative Industries Council website: https://www.thecreativeindustries.co.uk/media/549033/pec-evidence-synthesis-scoping_work-foundation-final-1-.pdf
- Carnevale, A. P., & Smith, N. (2013). Workplace basics: The skills employees need and employers want. *Human Resource Development International*, 16(5), 491-501. doi:10.1080/13678868.2013.821267
- Centraal Bureau voor de Statistiek. (2018). *Monitor topsectoren 2018, Methodebeschrijving en tabellenset*. Retrieved from: <https://www.cbs.nl/nl-nl/maatwerk/2018/41/monitor-topsectoren-2018>
- Chang, J. H., & Teng, C. C. (2017). Intrinsic or extrinsic motivations for hospitality employees' creativity: The moderating role of organization-level regulatory focus. *International Journal of Hospitality Management*, 60, 133-141. doi:10.1016/j.ijhm.2016.10.003
- Chugh, R. (2015). *Do Australian Universities Encourage Tacit Knowledge Transfer?* Paper presented at the the 7th International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management.

- Claro, M., Preiss, D. D., San Martín, E., Jara, I., Hinostroza, J. E., Valenzuela, S., ... Nussbaum, M. (2012). Assessment of 21st century ICT skills in Chile: Test design and results from high school level students. *Computers & Education*, 59(3), 1042-1053. doi:10.1016/j.compedu.2012.04.004.
- Cobo, C. (2013). Mechanisms to identify and study the demand for innovation skills in world-renowned organizations. *On the Horizon*, 21(2), 96-106. doi:10.1108/10748121311322996
- Coelho, F., Augusto, M., & Lages, L. F. (2011). Contextual Factors and the Creativity of Frontline Employees: The Mediating Effects of Role Stress and Intrinsic Motivation. *Journal of Retailing*, 87(1), 31-45. doi:10.1016/j.jretai.2010.11.004
- David, P. A., & Foray, D. (2003). Economic fundamental of the knowledge society. *Policy Futures in Education - An e-Journal*, 1(1), 1-22.
- Dayan, M., Zacca, R., & Di Benedetto, A. (2013). An exploratory study of entrepreneurial creativity: Its antecedents and mediators in the context of UAE firms. *Creativity and Innovation Management*, 22(3), 223-240. doi:10.1111/caim.12036
- DCMS. (1998). *Creative Industries Mapping Documents 1998*. Retrieved from <https://www.gov.uk/government/publications/creative-industries-mapping-documents-1998>
- Deckop, J. R., Mangel, R., & Cirka, C. C. (1999). Getting more than you pay for: Organizational citizenship behavior and pay-for-performance plans. *Academy of Management Journal*, 42, 402-428.
- Dede, C. (2010). Comparing Frameworks for 21st Century Skills. In J. Bellanca & R. Brandt (Eds.), *21st Century Skills: Rethinking How Students Learn* (pp. 51-76). Bloomington, IN: Solution Tree Press.
- Deog-Ro, L. E. E. (2015). The Impact of Leader's Humor on Employees' Creativity: The Moderating Role of Trust in Leader. *Seoul Journal of Business*, 21(1), 59-86.
- Department for Culture Media & Sport. (2014). *Creative industries economic estimates*. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/271008/Creative_Industries_Economic_Estimates_-_January_2014.pdf
- Department for Culture Media & Sport. (2015). *Creative Industries: Focus on employment*. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/439714/Annex_C_-_Creative_Industries_Focus_on_Employment_2015.pdf
- Dong, Bartol, K. M., Zhang, Z. X., & Li, C. (2016). Enhancing employee creativity via individual skill development and team knowledge sharing: Influences of dual-focused transformational leadership. *Journal of Organizational Behavior*, 38(3), 539-458. doi:10.1002/job.2134

- Donovan, L., Green, T. D., & Mason, C. (2014). Examining the 21st century classroom: Developing an innovation configuration map. *Journal of Educational Computing Research*, 50(2), 161-178. doi:<http://dx.doi.org/10.2190/EC.50.2.a>.
- Drucker, P. (1993). *Post-Capitalist Society*. New York: Harper Business.
- Dvir, T., Eden, D., Avolio, B. J., & Shamir, B. (2002). Impact of Transformational Leadership on Follower Development and Performance: A Field Experiment. *The Academy of Management Journal*, 45(4), 735-744.
- Dym, C. L., Agogino, A. M., Eris, O., Frey, D. D., & Leifer, L. J. (2005). Engineering Design Thinking, Teaching, and Learning. *Journal of Engineering Education*, 94(1), 103-120.
- Ekore, J. O. (2014). Impact of key organizational factors on knowledge transfer success in multi-national enterprises. *Management (Croatia)*, 19(2), 3-18.
- Ernst, H., Hoyer, W. D., Krafft, M., & Soll, J.-H. (2017). Virtual Co-Creation with Customers in the Early Stages of New Product Development. Retrieved from <http://dx.doi.org/10.2139/ssrn.3053800>
- European Commission. (2016). *Competence frameworks: the European approach to teach and learn 21st century skills*. Retrieved from <https://ec.europa.eu/jrc/en/news/competence-frameworks-european-approach-teach-and-learn-21st-century-skills>
- European Commission. (2017). *Mapping the Creative Value Chains. A study on the economy of culture in the digital age*. Retrieved <https://op.europa.eu/en/publication-detail/-/publication/4737f41d-45ac-11e7-aea8-01aa75ed71a1>
- Falola, H. O., Osibanjo, A. O., & Ojo, S. I. (2014). Effectiveness of Training and Development on Employees' Performance and Organisation Competitiveness in the Nigerian Banking Industry. *Bulletin of the Transilvania University of Brasov*, 7(56), 161-170.
- Ferrari, A. (2012). *Digital Competence in Practice: An Analysis of Frameworks*. Seville, Spain: Joint Research Centre, Institute for Prospective Technological Studies. doi:10.2791/82116.
- Flew, T., & Cunningham, S. (2010). Creative Industries after the First Decade of Debate. *The Information Society*, 26(2), 113-123. doi:10.1080/01972240903562753
- Florida, R. (2012). *The Rise of the Creative Class, Revisited*. New York: Basic Books.
- Garcia, J. M., Klinger, J., & Sathoulapoulos, K. (2018). *Creative Nation. How the creative industries are powering the UK's nations and regions*. Retrieved from the Nesta website: https://media.nesta.org.uk/documents/creative_nation-2018.pdf
- Gardiner, P., Leat, M., & Sadler-Smith, E. (2001). Learning in organizations: HR implications and considerations. *Human Resource Development International*, 4(3), 391-405.

- Gekara, V. O., & Nguyen, V.-X. T. (2018). New technologies and the transformation of work and skills: a study of computerisation and automation of Australian container terminals. *New Technology Work and Employment*, 33, 219-233. doi:10.1111/ntwe.12118
- George, J. M., & Zhou, J. (2007). Dual tuning in a supportive context: Joint contributions of positive mood, negative mood, and supervisory behaviors to employee creativity. *Academy of Management Journal*, 50(3), 605-622.
- Gilmore, P. L., Hu, X., Wei, F., Tetrick, L. E., & Zaccaro, S. J. (2013). Positive affectivity neutralizes transformational leadership's influence on creative performance and organizational citizenship behaviors. *Journal of Organizational Behavior*, 34(8), 1061-1075. doi:10.1002/job.1833
- Glaeser, E. L. (2004). Review of Richard Florida's *The rise of the creative class*. *Regional Science and Urban Economics*, 35, 593-596.
- Global Partnership for Education. (2020). *21st-Century Skills: What potential role for the Global Partnership for Education?* Retrieved from <https://www.globalpartnership.org/sites/default/files/document/file/2020-01-GPE-21-century-skills-report.pdf>
- Goldin, C. (2016). Human Capital. In C. Diebolt & M. Hupert (Eds.), *Handbook of Cliometrics*. Berlin Heidelberg: Springer-Verlag.
- Goldstein, I. L., & Ford, K. (2002). *Training in Organizations: Needs assessment, Development and Evaluation* (4 ed.). Belmont, CA: Wadsworth.
- Guilford, J. P. (1950). Creativity. *American Psychologist*, 5, 444-454.
- Gupta, B., Dasgupta, S., & Gupta, A. (2008). Adoption of ICT in a government organization in a developing country: An empirical study. *The Journal of Strategic Information Systems*, 17, 140-154. doi:10.1016/j.jsis.2007.12.004
- Hackman, J. R., & Oldham, G. R. (1975). Development of the Job Diagnostic Survey. *Journal of Applied Psychology*, 60(2), 159-170.
- Hackman, J. R., & Oldham, G. R. (1976). Motivation through the Design of Work: Test of a Theory. *Organizational Behavior and Human Performance*, 16, 250-279.
- Hadad, S. (2017). Knowledge Economy: Characteristics and Dimensions. *Management Dynamics in the Knowledge Economy*, 5(2), 203-225.
- Hambrick, D. C., Cho, T. S., & Chen, M. J. (1996). The Influence of Top Management Team Heterogeneity on Firms' Competitive Moves. *Administration Science Quarterly*, 41, 659-684.
- Hammami, H., Amara, N., & Landry, R. (2013). Organizational climate and its influence on brokers' knowledge transfer activities: A structural equation modeling. *International Journal of Information Management*, 33(1), 105-118. doi:10.1016/j.ijinfomgt.2012.07.008

- Han, Y., Hao, P., Yang, B. Y., & Liu, W. X. (2017). How Leaders' Transparent Behavior Influences Employee Creativity: The Mediating Roles of Psychological Safety and Ability to Focus Attention. *Journal of Leadership & Organizational Studies*, 24(3), 335-344. doi:10.1177/1548051816670306
- Herrmann, D., & Felfe, J. (2013). Moderators of the Relationship Between Leadership Style and Employee Creativity: The Role of Task Novelty and Personal Initiative. *Creativity Research Journal*, 25(2), 172-181. doi:10.1080/10400419.2013.783743
- Hitt, M. A., Keats, B. W., & DeMarie, S. M. (1998). Navigating in the new competitive landscape: Building strategic flexibility and competitive advantage in the 21st century. *Academy of Management Executive*, 12(4), 22-42.
- Hofstede, G. (2011). Dimensionalizing Cultures: The Hofstede Model in Context. *Online Readings in Psychology and Culture*, 2(1), 3-25. doi:10.9707/2307-0919.1014
- Holgaard, J. E., Guerra, A., Kolmos, A., & Petersen, L. S. (2017). Getting a hold on the problem in a problem-based learning environment *International Journal of Engineering Education*, 33(3), 1070-1085.
- Hon, A. H. Y. (2012). When competency-based pay relates to creative performance: The moderating role of employee psychological need. *International Journal of Hospitality Management*, 31(1), 130-138. doi:10.1016/j.ijhm.2011.04.004
- Hon, A. H. Y., Chan, W. W. H., & Lu, L. (2013). Overcoming work-related stress and promoting employee creativity in hotel industry: The role of task feedback from supervisor. *International Journal of Hospitality Management*, 33(1), 416-424. doi:10.1016/j.ijhm.2012.11.001
- Howard, M., Steensma, H. K., Lyles, M., & Dhanaraj, C. (2016). Learning to collaborate through collaboration: How allying with expert firms influences collaborative innovation within novice firms. *Strategic Management Journal*, 37(10), 2092-2103. doi:10.1002/smj.2424
- Hsu, M. L. A., & Fan, H. L. (2010). Organizational innovation climate and creative outcomes: Exploring the moderating effect of time pressure. *Creativity Research Journal*, 22(4), 378-386. doi:10.1080/10400419.2010.523400
- Hunter, S. T., Bedell, K. E., & Mumford, M. D. (2007). Climate for Creativity: A Quantitative Review. *Creativity Research Journal*, 19(1), 69-90. doi:10.1080/10400410709336883
- Idris, K. M., Ali, K. N., & Godwin, A. U. (2015). Influence of organizational leadership on knowledge transfer in construction. *Asian Social Science*, 11(21), 102-110. doi:10.5539/ass.v11n21p102
- Jablokow, K. W., & Booth, D. E. (2006). The impact and management of cognitive gap in high performance product development organizations. *Journal of Engineering and Technology Management*, 23, 313-336.

- Jacobs, R. L. (2017). Knowledge Work and Human Resource Development. *Human Resource Development Review*, 16(2), 176-202. doi:10.1177/1534484317704293
- Jaiswal, N. K., & Dhar, R. L. (2016). Fostering Employee Creativity through Transformational Leadership: Moderating Role of Creative Self-Efficacy. *Creativity Research Journal*, 28(3), 367-371. doi:10.1080/10400419.2016.1195631
- Jaiswal, N. K., & Dhar, R. L. (2017). The influence of servant leadership, trust in leader and thriving on employee creativity. *Leadership and Organization Development Journal*, 38(1), 2-21. doi:10.1108/LODJ-02-2015-0017
- Jaskyte, K., & Kisieliene, A. (2006). Determinants of employee creativity: A survey of Lithuanian nonprofit organizations. *Voluntas*, 17(2), 128-136. doi:10.1007/s11266-006-9008-2
- Jehn, K. A., Northcraft, G. B., & Neale, M. A. (1999). Why Differences Make a Difference: A Field Study of Diversity, Conflict, and Performance in Workgroups. *Administrative Science Quarterly*, 44(4), 741-763.
- Jiang, W., & Gu, Q. X. (2017). Leader creativity expectations motivate employee creativity: a moderated mediation examination. *International Journal of Human Resource Management*, 28(5), 724-749. doi:10.1080/09585192.2015.1109535
- Jones, C., Lorenzen, M., & Sapsed, J. (2015). Creative Industries: A Typology of Change. In C. Jones, M. Lorenzen, & J. Sapsed (Eds.), *Oxford Handbook of Creative Industries*. Oxford: Oxford University Press.
- KEA, & PPMI. (2019). *Research for CULT Committee - Culture and creative sectors in the European Union - key future developments, challenges and opportunities*. Brussels: Policy Department for Structural and Cohesion Policies. Retrieved from [https://www.europarl.europa.eu/RegData/etudes/STUD/2019/629203/IPOL_STU\(2019\)629203_EN.pdf/](https://www.europarl.europa.eu/RegData/etudes/STUD/2019/629203/IPOL_STU(2019)629203_EN.pdf/)
- Kelly, K. (2016). *The Inevitable. Understanding the 12 Technological Forces that Will Shape Our Future*. New York: Penguin Books.
- Kochan, T., Orlikowski, W., & Cutcher-Gershenfeld, J. (2002). *Beyond McGregor's Theory Y: Human Capital and Knowledge-Based Work in the 21st Century Organization*. Paper presented at the Sloan School 50th Anniversary Session.
- Koehorst, M. M., Van Deursen, A. J. A. M., Van Dijk, J. A. G. M., & De Haan, J. (2019). Exploring the Creative Industries: Toward a Classification by Process and Job Functions. *Journal of Innovation Management*, 7(3), 69-95. doi:10.24840/2183-0606_007.003_0005
- Kraimer, M. L., Seibert, S. E., Wayne, S. J., Liden, R. C., & Bravo, J. (2011). Antecedents and Outcomes of Organizational Support for Development: the Critical Role of Career Opportunities. *Journal of Applied Psychology*, 96(3), 485-500. doi:10.1037/a0021452

- Lee, K. S., & Chen, W. (2017). A long shadow: cultural capital, techno-capital and networking skills of college students. *Computers in Human Behavior*, 70, 67-73.
- Lepper, M. R., Greene, D., & Nisbett, R. E. (1973). Undermining Children's Intrinsic Interest with Extrinsic Reward: A Test of the Overjustification Hypothesis. *Journal of Personality and Social Psychology*, 28, 129-137.
- Levy, F., & Murnane, R. J. (2004). *The new division of labor: How computers are creating the next job market*. Princeton, NJ: Princeton University Press.
- Lewin, C., & McNicol, S. (2015). Supporting the development of 21st century skills through ICT. In T. Brinda, N. Reynolds, R. Romeike, & A. Schwill (Eds.), *KEYCIT 2014: Key competencies in informatics and ICT* (pp. 181 - 198). Potsdam: Universitätsverlag Potsdam.
- Lewis, W. P., & Bonollo, E. (2002). An analysis of professional skills in design: implications for education and research. *Design Studies*, 23, 385-406.
- Liu, D., Gong, Y., Zhou, J., & Huang, J. C. (2017). Human resource systems, employee creativity, and firm innovation: The moderating role of firm ownership. *Academy of Management Journal*, 60(3), 1164-1188. doi:10.5465/amj.2015.0230
- Lu, L., Leung, K., & Koch, P. T. (2006). Managerial knowledge sharing: the rol of individual, interpersonal, and organisational factors. *Management and Organisation Review*, 2 909(1), 15-41.
- Lubart, T. I. (2000-2001). Models of the creative process: Past, present and future. *Creativity Research Journal*, 13(3 & 4), 295-308.
- Lukić, T., Džamić, V., Knežević, G., Alčaković, S., & Bošković, V. (2014). The Influence of Organizational Culture on Business Creativity, Innovation and Satisfaction. *Management*, 73, 49-57. doi:10.7595/management.fon.2014.0027
- Malik, R. M. A., Butt, A. N., & Choi, J. N. (2015). Rewards and employee creative performance: Moderating effects of creative self-efficacy, reward importance, and locus of control. *Journal of Organizational Behavior*, 36(1), 59-74. doi:10.1002/job.1943
- Martín-Pérez, V., Martín-Cruz, N., & Estrada-Vaquero, I. (2012). The influence of organizational design on knowledge transfer. *Journal of Knowledge Management*, 16(3), 418-434. doi:10.1108/13673271211238742
- Mathisen, G. E. (2011). Organizational Antecedents of Creative Self-Efficacy. *Creativity and Innovation Management*, 20(3), 185-195. doi:10.1111/j.1467-8691.2011.00606.x
- McDermott. (2005). Knowledge workers: you can gauge their effectiveness. *Leadership Excellence*, 22(10), 15-17.

- McKinsey & Company, & Business of Fashion (BoF). (2019). *The State of Fashion, 2019*. Retrieved from <https://www.mckinsey.com/~media/McKinsey/Industries/Retail/Our%20Insights/The%20State%20of%20Fashion%202019%20A%20year%20of%20awakening/The-State-of-Fashion-2019-final.pdf>
- McMullen, J. S., & Shepherd, D. A. (2006). Entrepreneurial Action and the Role of Uncertainty in the Theory of the Entrepreneur. *The Academy of Management Review*, 31(1), 132-152.
- Milliken, F. J., & Martins, L. L. (1996). Searching for Common Threads: Understanding the Multiple Effects of Diversity in Organizational Groups. *The Academy of Management Review*, 21(2), 402-433.
- Ministry of Economic Affairs, & Ministry of Education, Culture and Science (2005). *Creativiteit in kaart gebracht. Mapping document creatieve bedrijvigheid in Nederland*. Paper presented at the Cultuur en Economie, Den Haag.
- Ministry of Education Culture and Science. (2014). *Designing a country. De creatieve industrie in Nederland*. Retrieved from https://content.stimuleringsfonds.nl/files/nws/i_535/CreatieveIndustrieinNederlandNL.pdf
- Mittal, S., & Dhar, R. L. (2015). Transformational leadership and employee creativity: Mediating role of creative self-efficacy and moderating role of knowledge sharing. *Management Decision*, 53(5), 894-910. doi:10.1108/MD-07-2014-0464
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & The PRISMA Group. (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. *PLoS Med*, 6(7), 1-6. doi:doi:10.1371/journal.pmed.1000097
- Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., . . . PRISMA-P Group. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews*, 4(1), 1-9.
- Montes, F. J. L., Moreno, A. R., & Morales, V. G. (2005). Influence of support leadership and teamwork cohesion on organizational learning, innovation and performance: an empirical examination. *Technovation*, 25(10), 1159-1172. doi:10.1016/j.technovation.2004.05.002
- Motlagh, V. S., & Hassani, M. (2013). Organizational formality and its relation with empowerment, innovation and creativity of the employees of education organization: A case study. *Life Science Journal*, 10(SUPPL. 7), 43-49.
- Mumford, M. D., Whetzel, D. L., & Reiter-Palmon, R. (1997). Thinking creatively at work: Organization influences on creative problem solving. *Journal of Creative Behavior*, 31(1), 7-17.
- Murray, A. I. (1989). Top Management Group Heterogeneity and Firm Performance. *Strategic Management Journal*, 10, 125-141.

- Naranjo-Valencia, J. C., Jiménez-Jiménez, D., & Sanz-Valle, R. (2016). Studying the links between organizational culture, innovation, and performance in Spanish companies. *Revista Latinoamericana de Psicología*, 48, 30-41.
- Navarrese, D. O., Yauch, C. A., Goff, K., & Fonseca, D. J. (2014). Assessing the Effects of Organizational Culture, Rewards, and Individual Creativity on Technical Workgroup Performance. *Creativity Research Journal*, 26(4), 439-455. doi:10.1080/10400419.2014.929428
- Nesta. (2006). *Creating growth. How the UK can develop world class creative businesses*. Retrieved from <http://www.nesta.org.uk/publications/creating-growth>
- Noefer, K., Stegmaier, R., Molter, B., & Sonntag, K. (2009). A great many things to do and not a minute to spare: Can feedback from supervisors moderate the relationship between skill variety, time pressure, and employees' innovative behavior? *Creativity Research Journal*, 21(4), 384-393. doi:10.1080/10400410903297964
- OECD. (2017). *OECD Skills Outlook 2017: Skills and Global Value Chains*. Retrieved from https://read.oecd-ilibrary.org/education/oecd-skills-outlook-2017_9789264273351-en#page1
- Oldham, G. R., & Cummings, A. (1996). Employee creativity: Personal and contextual factors at work. *Academy of Management Journal*, 39(3), 607-634.
- Parkhurst, H. B. (1999). Confusion, lack of consensus, and the definition of creativity as a construct. *The Journal of Creative Behavior*, 33(1), 1-21.
- Peng, H., & Wei, F. (2016). Trickle-down effects of perceived leader integrity on employee creativity: A moderated mediation model. *Journal of Business Ethics*. doi:10.1007/s10551-016-3226-3
- Potts, & Cunningham, S. (2008). Four models of the creative industries. *International Journal of Cultural Policy*, 120(1), 163-180. doi:10.1080/10286630802281780
- Potts, Cunningham, S. D., Hartley, J., & Ormerod, P. (2008). Social network markets: a new definition of the creative industries. *Journal of Cultural Economics*, 32(3), 167-185.
- Reinhardt, W., Schmidt, B., Sloep, P., & Drachsler, H. (2011). Knowledge Worker Roles and Actions - Results of Two Empirical Studies. *Knowledge & Process Management*, 18(3), 150 - 174. doi:10.1002/kpm.378
- Ritchie, J., Lewis, J., & Elam, G. (2003). Designing and Selecting Samples. In J. Ritchie & J. Lewis (Eds.), *Qualitative Research Practice. A Guide for Social Science Students and Researchers* (pp. 77-108). London: SAGE Publications.
- Römer, A., Leinert, S., & Sachse, P. (2000). External support of problem analysis in design problem solving. *Research in Engineering Design - Theory, Applications, and Concurrent Engineering*, 12(3), 144-151. doi:10.1007/s001630050029

- Romero, M., Usart, M., & Ott, M. (2015). Can serious games contribute to developing and sustaining 21st century skills? *Games & Culture*, 10(2), 148-177. doi:10.1177/1555412014548919.
- Roos, P. A., & Treiman, D. J. (1980). DOT scales for the 1970 census classification. In A. R. Miller, D. J. Treiman, P. S. Cain, & P. A. Roos (Eds.), *Work, jobs, and occupations: A critical review of the Dictionary of Occupational Titles* (pp. 336-389). Washington, DC: National Academy Press.
- Runco, M. A., & Garrett, J. J. (2012). The standard definition of creativity. *Creativity Research Journal*, 24(1), 92-96. doi:10.1080/10400419.2012.650092
- Rutten, P., Koops, O., & Roso, M. (2010). *Creatieve industrie in de SBI 2008 bedrijfsindeling*. Retrieved from <http://docplayer.nl/3225909-Creatieve-industrie-in-de-sbi-2008-bedrijfsindeling.html>
- Rutten, P., Koops, O., & Visser, F. (2019). *Monitor creatieve industrie 2019 Nederland, top-10 steden, creatieve bedrijven en beroepen*. Retrieved from Media Perspectives website: https://mediaperspectives.nl/app/uploads/2020/01/MCI19_Monitor_DEF.pdf
- Sarooghi, H., Libaers, D., & Burkemper, A. (2015). Examining the relationship between creativity and innovation: A meta-analysis of organizational, cultural, and environmental factors. *Journal of Business Venturing*, 30(5), 714-731. doi:10.1016/j.jbusvent.2014.12.003
- Scott, S. G., & Bruce, R. A. (1994). Determinants of Innovative Behavior: A Path Model of Individual Innovation in the Workplace. *The Academy of Management Journal*, 37(3), 580-607.
- Serrat, O. (2017). Managing Knowledge Workers. In *Knowledge Solutions: Tools, Methods, and Approaches to Drive Organizational Performance* (pp. 285-287). Singapore: Springer Singapore.
- Simmons, A. L. (2011). The influence of openness to experience and organizational justice on creativity. *Creativity Research Journal*, 23(1), 9-23. doi:10.1080/10400419.2011.545707
- Slåtten, T. (2014). Determinants and effects of employee's creative self-efficacy on innovative activities. *International Journal of Quality and Service Sciences*, 6(4), 326-347. doi:10.1108/IJQSS-03-2013-0013
- Sokół, A., & Figurska, I. (2017). Creativity as one of the core competencies of studying knowledge workers. *Entrepreneurship and sustainability issues*, 5(1), 23-35. doi:10.9770/jesi.2017.5.1(2)
- Stam, E., de Jong, J. P. J., & Marlet, G. (2008). Creative Industries in the Netherlands: Structure, Development, Innovativeness and Effects on Urban Growth. *Geografiska Annaler. Series B, Human Geography*, 90(2), 119-132.
- Stein, M. I. (1953). Creativity and culture. *Journal of Psychology*, 36, 31-322.

- Stuhlman, D. D. (August 8, 2016). Knowledge Management Terms. Retrieved from <http://home.earthlink.net/~ddstuhlman/defin1.htm>
- Sung, S. Y., Antefelt, A., & Choi, J. N. (2017). Dual Effects of Job Complexity on Proactive and Responsive Creativity: Moderating Role of Employee Ambiguity Tolerance. *Group and Organization Management*, 42(3), 388-418. doi:10.1177/1059601115619081
- Swieringa, J., & Wierdsma, A. F. M. (1990). *Op weg naar een lerende organisatie*. Groningen: Wolters Noordhoff Management.
- Tapscott, D. (2014). *The digital economy. Anniversary Edition: Rethinking the promise and peril in the age of networked intelligence*. New York: McGraw-Hill.
- Thron Dahl, K. L., Velmurugan, G., & Stentoft, D. (2018). *The Significance of Problem Analysis for Critical Thinking in Problem-Based Project Work*. Paper presented at the 7th International Research Symposium on PBL, Aalborg.
- Tierney, P., & Farmer, S. M. (2002a). Creative Self-Efficacy: Its Potential Antecedents and Relationship to Creative Performance. *The Academy of Management Journal*, 45(6), 1137-1148.
- Tierney, P., & Farmer, S. M. (2002b). Creative self-efficacy: Its potential antecedents and relationship to creative performance. *Academy of Management Journal*, 45(6), 1137-1148. doi:10.2307/3069429
- Tijdens, K., & Steijn, B. (2005). The determinants of ICT competencies among employees. *New Technology, Work and Employment*, 20(1), 60-73. doi:10.1111/j.1468-005X.2005.00144.x
- Topsector Creatieve Industrie. (2012). *Smart and creative human capital*. Retrieved from <http://docplayer.nl/2737523-Smart-and-creative-human-capital-talent-voor-de-topsector-creatieve-industrie.html>
- Topsectoren. (2019). *Samen aan de slag - Roadmap Human Capital Topsectoren 2020-2023*. Retrieved from <https://www.topsectoren.nl/publicaties/kamerstukken/2019/november/12-11-19/roadmap-hc-topsectoren>
- Torrance, E. P. (1965). *Rewarding creative behavior: Experiments in classroom creativity*. Englewood Cliffs, NJ: Prentice-Hall.
- UNCTAD. (2008). *Summary Creative Economy Report 2008 - The challenge of assessing the creative economy: towards informed policy-making*. Retrieved from http://unctad.org/en/docs/ditc20082cer_en.pdf
- UNCTAD. (2018). *Creative Economy Outlook: Trends in international trade in creative industries*. Retrieved from https://unctad.org/en/PublicationsLibrary/ditcted2018d3_en.pdf
- UNESCO. (2005). *Towards knowledge societies: UNESCO world report*. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000141843>

- Urlings, N., & Braams, N. (2011). *Creatieve industrie in Nederland. Creatieve beroepen*. Retrieved from the Statistics Netherlands website: <https://www.cbs.nl/-/media/imported/documents/2011/09/2011-creatieve-industrie-creatieve-beroepen.pdf>
- Van der Vegt, G. S., & Bunderson, J. S. (2005). Learning and Performance in Multidisciplinary teams: the Importance of Collective Team Identification. *Academy of Management Journal*, 48(3), 532-547.
- Van Deursen, A. J. A. M., Helsper, E., Eynon, R., & Van Dijk, J. A. G. M. (2017). The compoundness and sequentiality of digital inequality. *International Journal of Communication*, 11, 452-473.
- Van Deursen, A. J. A. M., & Van Dijk, J. A. G. M. (2010). Measuring Internet Skills. *International Journal of Human-Computer Interaction*, 26(10), 891-916. doi:doi.org/10.1080/10447318.2010.496338
- Van Deursen, A. J. A. M., & Van Dijk, J. A. G. M. (2015). Internet skill levels increase, but gaps widen: a longitudinal cross-sectional analysis (2010-2013) among the Dutch population. *Communication & Society*, 18(7), 782-797. doi:10.1080/1369118X.2014.994544
- Van Dijk, J. A. G. M. (2017). Digital Divide: Impact of Access. In P. Rössler (Eds.), *The International Encyclopedia of Media Effects*. Wiley: Thomson Reuters.
- Van Dijk, J. A. G. M. (2019). *The Digital Divide*. Cambridge UK, Malden MA: Polity Press.
- Van Laar, E. (2019). *What are E-ssentail skills? A multimethod approach to 21st-century digital skills within the creative industries* (Docotoral dissertation, University of Twente, Enschede, the Netherlands). Retrieved from https://ris.utwente.nl/ws/portalfiles/portal/146623249/Dissertation_Ester_van_Laar.pdf
- Van Laar, E., Van Deursen, A. J. A. M., Van Dijk, J. A. G. M., & De Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior*, 72, 577-588. doi:http://dx.doi.org/10.1016/j.chb.2017.03.010
- Van Laar, E., Van Deursen, A. J. A. M., Van Dijk, J. A. G. M., & De Haan, J. (2018). 21st-Century Digital Skills Instrument Aimed at Working Professionals: Conceptual Development and Empirical Validation. *Telematics and Informatics*, 35, 2184-2200.
- Van Laar, E., Van Deursen, A. J. A. M., Van Dijk, J. A. G. M., & De Haan, J. (2019a). The sequential and conditional nature of 21st-century digital skills. *International Journal of Communications*, 13, 3462-3487.
- Van Laar, E., Van Deursen, A. J. A. M., Van Dijk, J. A. G. M., & de Haan, J. (2019b). Twenty-first century digital skills for the creative industries workforce: Perspectives from industry experts. *First Monday*, 24(1). doi:https://doi.org/10.5210/fm.v24i1.9476

- Voogt, J., & Roblin, N. P. (2012). A comparative analysis of international frameworks for 21st century competences: Implications for national curriculum policies. *Journal of Curriculum Studies*, 44(3), 299-321. doi:10.1080/00220272.2012.668938
- Vyssotsky, V. A. (1979). The Use of Computers for Business Functions. In M. L. Dertouzos & J. Moses (Eds.), *The Computer Age: a Twenty-Year View*. Cambridge, Mass: MIT Press.
- Wang, C. J., Tsai, H. T., & Tsai, M. T. (2014). Linking transformational leadership and employee creativity in the hospitality industry: The influences of creative role identity, creative self-efficacy, and job complexity. *Tourism Management*, 40, 79-89. doi:10.1016/j.tourman.2013.05.008
- Wang, H. H. (2013). A case study on design with conceptual blending. *International Journal of Design Creativity and Innovation*, 2(2), 109-122. doi:10.1080/21650349.2013.830352
- Wang, P., & Rode, J. C. (2010). Transformational leadership and follower creativity: The moderating effects of identification with leader and organizational climate. *Human Relations*, 63(8), 1105-1128. doi:10.1177/0018726709354132
- Weifeng, C., Elnaghi, M., & Hatzakis, T. (2011). Investigating Knowledge Management Factors Affecting Chinese ICT Firms Performance: An Integrated KM Framework. *Information Systems Management*, 28(1), 19-29. doi:10.1080/10580530.2011.536107
- Wheeler, S., Waite, S. J., & Bromfield, C. (2002). Promoting creative thinking through the use of ICT. *Journal of Computer Assisted Learning*, 18, 367-378.
- Willis, G. B. (2005). *Cognitive interviewing: A tool for improving questionnaire design*. Thousand Oaks: Sage Publications.
- Winterbotham, M., Vivian, D., Kik, G., Huntley Hewitt, J., Twedde, M., Downing, C., . . . Stroud, S. (2018). *Employer skills survey 2017*. Retrieved from the UK Government website: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/746493/ESS_2017_UK_Report_Controlled_v06.00.pdf
- Wu, C., McMullen, J. S., Neubert, M. J., & Yi, X. (2008). The influence of leader regulatory focus on employee creativity. *Journal of Business Venturing*, 23(5), 587-602. doi:10.1016/j.jbusvent.2007.09.005
- Yeh, S. S., & Huan, T. C. (2017). Assessing the impact of work environment factors on employee creative performance of fine-dining restaurants. *Tourism Management*, 58, 119-131. doi:10.1016/j.tourman.2016.10.006
- Yue, A. (2006). Cultural governance and creative industries in Singapore. *International Journal of Cultural Policy*, 12(1), 17-33. doi:10.1080/10286630600613176

- Zeqiri, J., & Alija, S. (2016). The organizational culture dimensions - The case of an independent private university in Macedonia. *Studia Ubb Oeconomica*, 61(3), 20-31. doi:10.1515/subboec-2016-0002
- Zhang, Y., Long, L., Wu, T. Y., & Huang, X. (2015). When is pay for performance related to employee creativity in the Chinese context? The role of guanxi HRM practice, trust in management, and intrinsic motivation. *Journal of Organizational Behavior*, 36(5), 698-719. doi:10.1002/job.2012
- Zubair, A., & Kamal, A. (2015). Work Related Flow, Psychological Capital, and Creativity Among Employees of Software Houses. *Psychological Studies*, 60(3), 321-331. doi:10.1007/s12646-015-0330-x

9

Appendices

Appendix A

Creation	Material production	Distribution and retail
<u>Arts</u> • <u>Visual arts and photography</u> • <u>Performing arts: music, dance and theatre</u> • <u>Recreation centres, organization of cultural events</u>	• Visual arts and photography • Production of performing arts: music, dance and theatre • Reproduction and publisher of CDs and DVDs • Recreation centres, event halls	• Museums and exposition rooms, exhibitions, art auctions, art lending, galleries • Theatres and concert halls, event halls • CD- and DVD-stores • Recreation centres, cultural events, event halls
<u>Media and entertainment</u> • <u>Movie: Scenario, scriptwriting and other pre-production</u> • <u>Same for radio and television</u> • <u>Writing: novels, poetry, non-fiction</u> • <u>Journalism</u>	• Film production, including supporting activities • Production of radio- and television programmes • Publishing and book printing • Publishing and printing of newspapers	• Film distribution, cinemas, film theatres and video stores • Broadcasting organizations • Public libraries, book stores • Public libraries, shops in book, magazines and newspapers
<u>Creative and business services</u> • <u>Industrial design, fashion design, graphical design</u> • <u>Creative ICT: games, new media</u> • <u>Architecture, urban design, landscape architecture</u> • <u>Advertising</u>	• Manufacturing of furniture, clothing, eyeglass frames, cars, etc. • Creative ICT: games, new media • General civil and utility building, project development • Printing houses	• Trade in clothing, glasses, furniture, cars, etc. • Trade in computers and software • Project development, trade in real estate • Other advertising services

Note. Underlined text is part of the limited classification of the creative sector, namely creation. Bold text is part of the broad classification: creation, material production, distribution and retail. Adapted from “Creativiteit in kaart gebracht. Mapping document creatieve bedrijvigheid in Nederland” by Ministerie van Economische Zaken and Ministerie van Onderwijs, Cultuur en Wetenschap, 2005, p. 9.

Appendix B

Codebook for the labelling and analysis of the interviews and drawings of chapter 2

Code Group	Codes
Creative Industries (CI)	CI: Demarcation CI: Culture/Museums CI: Definition CI – personal CI: Definition CI – political CI: Financial interests CI: Trademarks CI CI: Music industry CI: What industry does your organization belong to? CI: Education CI: Output CI: Top sector/Human Capital Agenda CI: Why does your organization belong to the CI?
Creativity	Creativity: Importance of creativity Creativity: Difference between creativity and creation Creativity: What is creativity?
Culture	Culture: Cultural education Culture: Societal interest Culture: Museums Culture: What is culture to you?

Appendix B. Continued

Code Group	Codes	
Job	Functions: C_Not creative	Functions: F_Presenter
Functions	Functions: C_Creative	Functions: F_Producer
		Functions: F_Product development
	Functions: F_Architect	Functions: F_Programmer
	Functions: F_Art/creative director	Functions: F_Projectleader/ Management
	Functions: F_Business developer	Functions: F_Recruiter
	Functions: F_Senior editor	Functions: F_Editorial staff
	Functions: F_Founder	Functions: F_Sales
	Functions: F_Job functions in fashion	Functions: F_Strategist
	Functions: F_Journalist	Functions: KM_Necessary skills
	Functions: F_Junior functions	Functions: KM_Creative job functions
	Functions: F_Manager	Functions: KM_Extern/Freelance
	Functions: F_Marketing	Functions: KM_Flexible deployable
	Functions: F_Museums	Functions: KM_Intern/Tenure
	Functions: F_Music industry	Functions: KM_Internships
	Functions: F_Designer	Functions: KM_Team/Cooperation
	Functions: F_Other architectural firm	Functions: KM_Support
	Functions: F_Other gamedesign	
Organisation	Organisation: Data usage	Organisation: Structure
	Organisation: Financial interests	Organisation: Changes
	Organisation: Milestones	Organisation: Activities interviewee
	Organisation: Educating	Organisation: Activities organisation
	Organisation: Convictions/Vision	
Other	Other	

Appendix B. Continued

Code Group	Codes
Process	Process: DG_Consumer behavior Process: DG_Consumer demand Process: DG_Market demand Process: DG_Client demand Process: KM_Competition/ Tender Process: KM_Concept Process: KM_Context Process: KM_Creative intensity Process: KM_Diverging/ Converging Process: KM_Innovation Process: KM_Iterations Process: KM_Trademarks Process: KM_Linear Process: KM_Motive Process: KM_Problemanalysis output Process: KM_Working by means of a process Process: KM_Differences Process: KM_Different ways of thinking Process: KM_Vision Process: KM_Waterfall method Process: MW_Agile/scrum
	Process: MW_Briefing/Meeting Process: MW_Content creation and management Process: MW_Game design Process: MW_Inspirations Process: MW_Design process Process: MW_Parallel activities Process: MW_What is the creative process? Process: ST_Assemble (external) team Process: ST_(Problem)analysis Process: ST_Final design Process: ST_Introduction Process: ST_Design phases Process: ST_Parametrisation Process: ST_Presentation Process: ST_Prototype/Testing Process: ST_Reflection Process: ST_Sketching Process: ST_Strategy defenition Process: ST_Technical design Process: ST_Mid-term analysis Process: ST_Execution/Production Process: ST_Preliminary design
Process	PS: Step 1
Steps (PS)	PS: Step 2
	PS: Step 3
	PS: Step 4
	PS: Step 5

Appendix B. Continued

Code Group	Codes
Skills	Skills: Context_Cultural awareness
	Skills: Context_Ethical awareness
	Skills: Context_Flexibility
	Skills: Context_Lifelong learning
	Skills: Context_Self-direction
	Skills: Core_Collaboration
	Skills: Core_Communication
	Skills: Core_Creativity
	Skills: Core_Critical thinking
	Skills: Core_Information management
	Skills: Core_Problem-solving
	Skills: Core_Technical
	Skills: General_21st century skills
	Skills: General_Function aspecific
	Skills: General_Function specific
	Skills: I_Analytic ability
	Skills: I_Broadly oriented
	Skills: I_Empathy
	Skills: I_Higher priority
	Skills: I_Initiative
	Skills: I_Lower priority
	Skills: I_Curious
	Skills: I_Broad-minded
	Skills: I_Tenacity
	Skills: I_Business sense
	Skills: Interviewee
	Skills: Digital skill

Appendix C

Included studies with dependent and independent variables and their influence

Author (year)	Dependent variable	Independent variable	Influence
Yeh and Huan (2017)	Creativity • Quantity (QT) • Quality (QL)	Freedom (FR)	+
		Social support (SS)	+
		Resources (RS)	+
		Freedom (FR)	+
		Social support (SS)	+
		Resources (RS)	+
Sung et al. (2017)	Creativity • Proactive • Responsive	Job complexity	+
		Job complexity ^a	x
Liu, Gong, Zhou, and Huang (2017)	Creativity	HR systems • Performance oriented ^{±,b} • Maintenance oriented ^{±,b} Firm ownership ^{±,b}	+
Jiang and Gu (2017)	Creativity	Leader creativity expectations ^{c,1}	+
Han, Hao, Yang, and Liu (2017)	Creativity	Leaders' transparent behaviour ^d	+
Chang and Teng (2017)	Creativity	Transformational leadership ²	+
Akdogan and Kale (2017)	Creative performance	Resources and incentive	x
		Project development climate	+
		Top management support	x
		Communication	+
		Target-focused	+
		Bureaucratic structure	-
		Team spirit	+
Peng and Wei (2016)	Creativity	Leader integrity	+
Jaiswal and Dhar (2016)	Creativity	Transformational leadership	+
Howard, Steensma, Lyles, and Dhanaraj (2016)	Collaboration	External collaboration	+
Dong et al. (2016)	Skill development	Individual focused transformational leadership	+

Appendix C. Continued

Author (year)	Dependent variable	Independent variable	Influence
Zubair and Kamal (2015)	Creativity	Job tenure	+
Zhang, Long, Wu, and Huang (2015)	Creativity	Pay for performance ^{3,e}	+
Malik et al. (2015)	Creativity	Extrinsic rewards ⁴	+
Mittal and Dhar (2015)	Creativity	Transformational leadership ⁵	=
İdris et al. (2015)	Knowledge transfer	Organizational leadership	+
Deog-Ro (2015)	Creativity	Leader humour style	• +
		• Self-enhancing humour	• x
		• Affiliative humour	• x
		• Aggressive humour	
Appu and Kumar Sia (2015)	Workplace creativity	Organizational social support	+
		Co-workers social support	+
		Supervisors social support	+
Wang et al. (2014)	Creativity	Transformational leadership ^{6,f}	+
Slåtten (2014)	Creative self-efficacy	Transformational leadership	+
		Job autonomy	+
Navarrese, Yauch, Goff, and Fonseca (2014)	Individual creative behavior	Innovation orientation of the organizational culture (IOC)	+ [#]
Lukić, Džamić, Knežević, Alčaković, and Bošković (2014)	Employee creativity	Strength of organizational culture	x
Ekore (2014)	Knowledge transfer success	Organisational culture	x
		Organisational strategy	x
		Training	+
		Information technology	x
		Organisational performance	x
Motlagh and Hassani (2013)	Creativity and innovation	Organizational formality	+
		Empowerment	+
Hon, Chan, and Lu (2013)	Creativity	Work stress	• +
		• Challenge-related stress ^{7,8}	• -
		• Hindrance-related stress ^{7,8}	

Appendix C. Continued

Author (year)	Dependent variable	Independent variable	Influence
Herrmann and Felfe (2013)	Creativity	Transformational leadership style ⁹ High task novelty	+ +
Hammami, Amara, and Landry (2013)	Knowledge transfer activities	Positive (perception of) organizational climate • Interactive cooperation • High degree of autonomy • Organizational support • Innovation and creativity	+ • x • x • + • +
Gilmore et al. (2013)	Creative performance	Transformational leadership ¹⁰	+
Dayan, Zacca, and Di Benedetto (2013)	Entrepreneurial creativity	Access to resources	x
Martín-Pérez, Martín-Cruz, and Estrada-Vaquero (2012)	Knowledge transfer	Intrinsic rewards Extrinsic rewards	+ +
Hon (2012)	Creativity	Competency based pay • For knowledge ¹¹ • For skill ¹²	• + • +
Simmons (2011)	Creative performance	Perceptions of • Distributive justice • Procedural justice • Interactional justice	• + [#] • + • -
Mathisen (2011)	Creative self-efficacy	Tasks requiring creative thinking Autonomy ^{*,^} Leader-member exchange* Collegial support for creativity ^{^, 13}	+ + + +
Coelho et al. (2011)	Creativity	Role ambiguity Role conflict Job complexity The relationship with • Supervisor • Co-workers • Customers	- + + • x • x • +
Wang and Rode (2010)	Creativity	Transformational leadership	x

Appendix C. Continued

Author (year)	Dependent variable	Independent variable	Influence
Wang et al. (2010)	Creativity	Supervisors' support	+
		Co-workers' support	+
Hsu and Fan (2010)	Creative outcome	Organizational innovation climate ¹⁴	+
Noefer, Stegmaier, Molter, and Sonntag (2009)	Idea generation	Time pressure	x
		Skill variety	+
Wu et al. (2008)	Creativity	Leader behaviour	• +
		• Promotion focus	• x
		• Prevention focus	
George and Zhou (2007)	Creativity	Supervisor support	• +
		• Developmental feedback ¹	• +
		• Interactional justice ¹	• +
		• Cognitive trust ¹	
Jaskyte and Kisieliene (2006)	Creativity	Job design	+
		Leadership behaviors	
		• Tolerance of freedom	• +
		• Consideration	• +
		Cultural norms	+
		Work group relations	+

Appendix C. Continued

Author (year)	Dependent variable	Independent variable	Influence
Tijdens and Steijn (2005)	ICT adaptability	Job characteristics	• x
		• Permanent contract	• x
	• Willingness to acquire	• Job security	• x
		• Position	• x
	• Mastery of device	• High workload	+
		ICT work intensity	
	• Mastery of software	Nature of technology	• x
		• Embedded	• x
		• Programmable	x
		Workplace design	+
		Intense personnel policy	+
		Informed ICT-strategy	
			• x
		Job characteristics	• x
		• Permanent contract	• x
		• Job security	• -
		• Position	+
		• High workload	
		ICT work intensity	• +
		Nature of technology	• x
		• Embedded	x
		• Programmable	+
		Workplace design	+
		Intense personnel policy	
		Informed ICT-strategy	• x
			• x
		Job characteristics	• x
		• Permanent contract	• x
		• Job security	+
		• Position	
		• High workload	• x
		ICT work intensity	• x
		Nature of technology	x
		• Embedded	+
		• Programmable	+
		Workplace design	
		Intense personnel policy	
		Informed ICT-strategy	

Appendix D

Codebook for the labelling and analysis of the interviews of chapter 6

Code group	Codes	
Autonomy	Autonomy: effect	Autonomy: role
	Autonomy: extent	Autonomy: trust
	Autonomy: explanation concept	
Change	Change: after the crisis	Change: role professional
	Change: globalization	
Characteristics organization (Char org)	Char org: activities	Char org: society
	Char org: sector	Char org: structure
	Char org: size department	Char org: team
	Char org: size org	Char org: vision
Characteristics respondent (Char res)	Char res: activities	
	Char res: education	
Concepts	Concepts: *literacy	Concepts: digital skills
	Concepts: 21 st . cent	Concepts: general
	Concepts: 21 st cent DIGITAL	Concepts: ~ difference
Develop	Develop: (internal) knowledge transfer	Develop: leader development
	Develop: 21 st cent DIGITAL	Develop: mandatory
	Develop: coach	Develop: motivation
	Develop: conference	Develop: on the job
	Develop: daily life	Develop: optional
	Develop: developments in work field	Develop: possibilities
	Develop: education	Develop: propose self
	Develop: effects	Develop: relevance
	Develop: external	Develop: role of the employee
	Develop: finances	Develop: role of the organization
	Develop: general	Develop: software specific
	Develop: human capital	Develop: specific course
	Develop: independently online	Develop: team
	Develop: individually dependent	Develop: vision
	Develop: lack of skills	
Difference	Difference: education	Difference: skills < age
	Difference: functions	Difference: skills > age
	Difference: ICT	Difference: tenure
	Difference: individual	

Appendix D. Continued

Code group	Codes	
Education	Education: academic	Education: general
	Education: basic knowledge	Education: HBO
	Education: discrepancy	Education: MBO
	education/work	
Evaluation (Eval)	Eval: colleagues	Eval: job interview
	Eval: evaluation meeting	Eval: personality
	Eval: focus	Eval: POP
	Eval: general	Eval: what is discussed
	Eval: interim evaluation	
Factor	Factor: creative	Factor: miscellaneous
	Factor: close team	
Functions	Functions: account	Functions: intern
	Functions: art-director	Functions: leader
	Functions: CIO	Functions: manager
	Functions: copywriter	Functions: marketeer
	Functions: creative/artistic	Functions: producer
	Functions: crew manager	Functions: product owner
	Functions: CTO	Functions: programmer
	Functions: editor	Functions: project manager
	Functions: designer	Functions: sales
	Functions: developer	Functions: strategist
	Functions: director	Functions: support/executing
	Functions: DTP	Functions: technician
ICT facilitation (ICT fac)	ICT fac: cloud	ICT fac: policy
	ICT fac: effect	ICT fac: problems
	ICT fac: external	ICT fac: role
	ICT fac: costs	ICT fac: safety
	ICT fac: general	ICT fac: software
	ICT fac: hardware	ICT fac: software development
	ICT fac: ICT department	ICT fac: terms
	ICT fac: management	ICT fac: working outside the office

Appendix D. Continued

Code group	Codes	
Miscellaneous	Miscellaneous: comment respondent Miscellaneous: final/general comments Miscellaneous: freelancers Miscellaneous: individual-open view Miscellaneous: motivation	Miscellaneous: motivation/challenging assignments Miscellaneous: network Miscellaneous: sector policy
Organizational culture (Org cult)	Org cult: atmosphere Org cult: colleagues Org cult: effects Org cult: flat organization Org cult: hierarchy	Org cult: matrix Org cult: organizational culture Org cult: outings Org cult: policy/HR Org cult: working environment
Place of Work	Place of work: different office Place of work: home	Place of work: office Place of work: trust
Rewards	Rewards: bonus Rewards: effect Rewards: effect neg Rewards: effect pos	Rewards: quality work Rewards: pay Rewards: extent/appreciation Rewards: team
Skills	Skills: accuracy Skills: collaboration Skills: cultural awareness Skills: customer oriented Skills: critical thinking Skills: designing Skills: empathy Skills: entrepreneurial Skills: flexibility Skills: independency Skills: information management Skills: investigative Skills: leadership	Skills: management identification Skills: miscellaneous Skills: multidisciplinary empathy Skills: planning/organizing Skills: problem solving Skills: professionalism Skills: programming Skills: reflection Skills: social skills Skills: software specific Skills: speed Skills: technical basic skills

Appendix D. Continued

Code group	Codes	
Team	Team: composition	Team: leadership
	Team: composition different aspects	Team: multidisciplinary
	Team: composition discipline/skills	Team: self-regulation
	Team: effect	Team: size
	Team: external team members	Team: task division
	Team: flexible composition	Team: vision
Technology	Technology: AI	Technology: possibilities
	Technology: data use	Technology: impact
	Technology: developments	Technology: Internet of Things
	Technology: handling data	
Ways of Working	Ways of Working: (first)meeting	Ways of Working: general
	Ways of Working: analog	Ways of Working: knowledge management
	Ways of Working: design phases	
	Ways of Working: digital	Ways of Working: process
	Ways of Working: financial aspect	Ways of Working: quality control

10

Samenvatting (Summary)

10 Samenvatting (Summary)

De creatieve sector is één van de negen topsectoren die speciale aandacht geniet van de Nederlandse overheid. Onder andere door de focus op export draagt deze sector bij aan de economische significantie van Nederland. Daarnaast dragen creatieve oplossingen en innovaties bij aan het oplossen van sociale problemen. De creatieve sector is een kennisintensieve sector waar veel hoogopgeleide professionals werken. De werkzaamheden die zij verrichten vragen naast vakspecifieke kennis en vaardigheden om cognitieve vaardigheden zoals communicatie, kritisch denken en creativiteit. Deze cognitieve vaardigheden worden vaak gezien als onontbeerlijk in de 21^e-eeuw. Dit geldt niet alleen tijdens het werk, maar ook in het dagelijks leven. Daarnaast zijn vaardigheden gerelateerd aan het gebruik van informatie- en communicatietechnologieën (ICTs), en het internet de laatste decennia in belang toegenomen. Er zijn vele raamwerken ontwikkeld waarin digitale vaardigheden los van cognitieve vaardigheden worden genoemd. De vaardigheden in deze raamwerken worden vaak 21^e-eeuwse vaardigheden genoemd en zijn belangrijk voor iedereen die mee wil kunnen doen in de huidige maatschappij. Echter, ICTs zijn zo'n integraal onderdeel geworden van onze dagelijkse leven en werk, dat digitale vaardigheden niet meer los gezien kunnen worden van cognitieve vaardigheden. Online zijn vaardigheden zoals communicatie en kritisch denken tenslotte minstens zo belangrijk als offline, maar het vraagt wel om andere competenties. Ondanks het belang van de combinatie van deze vaardigheden, juist in de vooruitstrevende creatieve sector, is het bewustzijn met betrekking tot deze skills onder managers en leidinggevendenden gering. Dit is problematisch gezien het feit dat zij een gedeelde verantwoordelijkheid hebben met hun werknemers om vaardigheden te ontwikkelen die een belangrijke invloed hebben op de uitvoering van hun werk. Daarom wordt er in dit proefschrift gekeken naar welke vaardigheden belangrijk zijn voor kenniswerkers, en wat organisaties in de creatieve sector kunnen doen om deze vaardigheden te helpen ontwikkelen.

In **hoofdstuk 2** wordt de context van dit proefschrift beschreven en gedefinieerd met behulp van een procesmodel; enerzijds om participanten te kunnen selecteren voor vervolgonderzoek, en anderzijds om later gerichte aanbevelingen te kunnen doen. In Europa ervaart de creatieve sector een groei die ver boven het gemiddelde van de totale economische groei van de EU uitstijgt. Toch is er geen consensus over hoe deze sector afgebakend moet worden. Elk land houdt hier dan ook zijn eigen manier op na. Gehanteerde definities zijn vaak gebaseerd op industriële lijnen of op basis van beroepen, maar in een sector die op de voorgrond van innovatie staat zijn deze scheidslijnen voortdurend aan verandering onderhevig. Op basis

van bevindingen uit de literatuur en 23 interviews onder belangrijke spelers in de creatieve sector is een procesmodel ontwikkeld met zes fasen, namelijk (1) probleem analyse, (2) concept ontwikkeling, (3) voorlopig ontwerp, (4) definitief ontwerp, (5) productie/uitvoering en (6) product introductie. Het procesmodel is vervolgens aangevuld met verschillende beroepen die passen bij de zes fasen:

Figuur 1. Procesmodel aangevuld met beroepsgroepen

De meerwaarde van deze aanvulling is dat op deze manier zowel beroepen die in de kern creatief zijn (zoals ontwerpers) als ondersteunende beroepen (zoals projectmanagers) kunnen worden gekoppeld aan het procesmodel. Hierdoor worden alle beroepen die als onmisbaar worden beschouwd opgenomen. Doordat het procesmodel en de gekoppelde functies los staan van de sub-sector waarin ontwikkeling plaats vindt, kan deze helpen bij het identificeren en begrijpen van de meest belangrijke aspecten van de creatieve sector met betrekking tot hoe producten en services worden ontwikkeld.

In **hoofdstuk 3** ligt de focus op 21e-eeuwse digitale vaardigheden. In het 21^e-eeuwse digitale vaardigheden raamwerk zijn de meest voorkomende vaardigheden – genoemd in meerdere raamwerken met betrekking tot 21^e-eeuwse vaardigheden en de academische literatuur – geoperationaliseerd met een digitale component (Van Laar, Van Deursen, Van Dijk, & De Haan, 2017). De vaardigheden die gebruikt worden in het proefschrift zijn operationele vaardigheden, informatie management, communicatie, samenwerken, creativiteit, kritisch denken en probleemoplossend vermogen. Deze vaardigheden kunnen gekoppeld worden aan het procesmodel dat is beschreven in hoofdstuk 2. Door dit te doen kunnen inspanningen om 21^e-eeuwse digitale vaardigheden van professionals in de creatieve sector te verbeteren gericht worden ingezet. Het spreekt voor zich dat alle vaardigheden in meer of mindere mate belangrijk zijn voor alle professionals in elke fase van het

procesmodel. Echter, op basis van de interviews uit hoofdstuk 2 en de literatuur komt met name het volgende naar voren:

Tabel 1. Belangrijke vaardigheden per stap in het procesmodel van creatie

	Probleem Analyse	Concept Ontwikkeling	Voorlopig Ontwerp	Definitief Ontwerp	Productie/ Uitvoering	Product Introductie
Operationeel		.	.	.	.	
Informatie management	.	.	.	.		
Communicatie	.	.	.	.	.	.
Samenwerken	.	.	.	.	.	.
Creativiteit		.	.	.	.	.
Kritisch denken	.					
Probleemoplossend vermogen		.	.	.	.	

Met behulp van een systematische literatuur review wordt in **hoofdstuk 4** een overzicht gegeven van de actuele staat van academisch onderzoek. Hierbij wordt gekeken welke organisatorische factoren van invloed zijn op het niveau van 21^e-eeuwse vaardigheden van de individuele professional in de creatieve industrie. Aangezien onderzoek naar 21^e-eeuwse *digitale* vaardigheden nog in de kinderschoenen staat, is er gekozen om te focussen op determinanten van 21^e-eeuwse vaardigheden.

Op basis van de resultaten uit peer-reviewed artikelen gepubliceerd tussen 2005 en 2016 met empirische, kwantitatieve data zijn de geïdentificeerde factoren onder te verdelen in drie hoofdcategorieën; leiderschap-karakteristieken, functie-gerelateerde karakteristieken en organisatorische karakteristieken. Over de gehele review genomen is *transformational leadership* de factor die het meest naar voren komt in de academische literatuur. Tijdens het uitvoeren van de review werd er veelal onderzoek gevonden met output op het niveau van de organisatie. Hiermee is een duidelijk hiaat aan het licht gekomen met betrekking tot onderzoek naar organisatorische factoren die invloed hebben op het niveau van vaardigheden van individuele werknemers. Daarnaast waren de onderzoeken in de zoekresultaten bijna alleen maar gericht op creativiteit. Desalniettemin kunnen de resultaten aanzienlijke implicaties hebben wanneer er gekeken wordt hoe de vaardigheden van werknemers verbeterd kunnen worden door aanpassingen te doen binnen

een organisatie. De resultaten kunnen helpen gerichte acties ter verbetering van de vaardigheden van individuele werknemer te ondernemen.

In **hoofdstuk 5** worden de resultaten van eerdere hoofdstukken gecombineerd. Door middel van een survey onder 510 werknemers in de creatieve industrie is gekeken of de organisatorische factoren uit hoofdstuk 4 van invloed zijn op de verschillende 21^e-eeuwse digitale vaardigheden. Hierbij is gekeken naar organisatiecultuur, transformerend leiderschap, beloningen, autonomie, persoonlijke ontwikkelingsmogelijkheden, team variatie en ICT-vooruitstrevendheid. De resultaten laten zien dat elk van deze factoren, met uitzondering van een ad hoc organisatiecultuur, op tenminste één van de 21^e-eeuwse digital skills componenten van invloed is. Uit de resultaten kan geconcludeerd worden dat om de ontwikkeling van 21^e-eeuwse digitale vaardigheden in een organisatie te ondersteunen onder andere rekening gehouden moet worden met de samenstelling van het team, ervoor te zorgen dat er voldoende digitale middelen aanwezig zijn in combinatie met een ondersteunend HR-beleid, en dat er op een motiverende en transformationele manier leiding wordt gegeven.

Om een dieper inzicht te krijgen hoe de gevonden organisatorische factoren van invloed zijn op het niveau van vaardigheden van medewerkers, is in **hoofdstuk 6** een serie interviews uitgevoerd met managers in de creatieve industrie. Daarnaast is onderzocht wat organisaties in de creatieve sector op het moment doen aan ontwikkeling van medewerkers in het algemeen, en van 21^e-eeuwse digital vaardigheden in het bijzonder. Tevens is aan de participanten gevraagd welke vaardigheden zij belangrijk vinden voor hun werknemers. Hierbij werden de vaardigheden communicatie, klantgerichtheid en samenwerking het meest genoemd. Daarnaast hebben de interviews kunnen bijdragen aan de validatie van het 21^e-eeuwse digital vaardigheden raamwerk. Wat betreft de ontwikkeling van vaardigheden is naar voren gekomen dat volgens participanten de verantwoordelijkheid hiervoor zowel bij de organisatie als bij de werknemer ligt. Hierin speelt de motivatie van de werknemer een grote rol. Organisaties hebben vele mogelijkheden voor werknemers om zich te ontwikkelen. Daarnaast ondernemen ze actie om een cultuur, werkomgeving en leiderschap te stimuleren die ontwikkeling aanmoedigen. Organisatorische factoren zoals autonomie en beloningen hangen nauw samen met de cultuur van een organisatie. Bijna alle participanten waren van mening dat autonomie belangrijk is om een creatieve professional goed werk te kunnen laten doen. Daarnaast past een individuele beloning niet bij het belang van teamwerk wat voor zulke organisaties zo belangrijk is.

Voorbeelden van verschillende ontwikkelingsmogelijkheden zijn (in volgorde van relevantie): ontwikkeling tijdens het werk, training, (interne) kennisuitwisseling, software specifieke training, online zelfstudie, en beurzen/conferenties. Daarnaast is door de participanten onderschreven dat een gevarieerd team grote invloed kan hebben op de ontwikkeling van vaardigheden van medewerkers. Ondanks het feit dat het belang van 21^e-eeuwse digitale vaardigheden direct en indirect is onderschreven door de participanten, worstelen velen nog om digitale vaardigheden niet los te zien van 21^e-eeuwse vaardigheden. Door het tekort aan begrip is het voor organisaties dan ook lastig om gericht te focussen op de ontwikkeling van 21^e-eeuwse digitale vaardigheden.

Ten slotte worden in **hoofdstuk 7** alle bevindingen aan elkaar gekoppeld en worden een aantal aanbevelingen gedaan voor organisaties en beleidsmakers. In Nederland ontvangt de creatieve sector extra middelen om het een competitieve speler in een internationale markt te maken. Hiermee hoopt de overheid de Nederlandse economie in zijn totaliteit te stimuleren. Met behulp van het procesmodel en het hieraan koppelen van functiegroepen kan de focus verschoven worden van de professional of organisatie als losstaande entiteit naar hoe professionals interacteren binnen de sector. In veel gevallen vinden deze interacties plaats over de grenzen van organisaties heen. Aangezien het niet alleen de creatieve individu is, maar een team van professionals die de uitvoering of introductie van een product tot een succes maken kan het procesmodel gebruikt worden om dit te benaderen vanuit een hoger niveau van efficiëntie of effectiviteit. Tenslotte zijn dit de elementen die bepalen in hoeverre een organisatie in staat is de productiviteit te verbeteren en competitief te blijven. Door vervolgens de vaardigheden die in hoofdstuk 3 zijn besproken te koppelen aan het procesmodel – op basis van literatuur en de interviews besproken in hoofdstuk 2 – ontstaat een overlap van de meest prominent gevraagde vaardigheden en functiegroepen. Dit geeft een duidelijk beeld van welke vaardigheden de meeste aandacht verdienen met betrekking tot de ontwikkeling van medewerkers binnen deze functiegroepen. Door gebruikt te maken van de kennis opgedaan in hoofdstukken 4, 5 en 6 kunnen deze ontwikkelingen gericht plaatsvinden binnen organisaties.

De creatieve sector is één van de negen topsectoren die speciale aandacht geniet van de overheid in de hoop de Nederlandse economie te stimuleren. De Roadmap Human Capital Topsectoren 2020-2023 is een samenwerkingsverband tussen deze negen topsectoren die als doel heeft om de impact van de individuele human capital agenda's te vergroten onder andere voor het ontwikkelen en assimileren van kennis. De gerichte aanbevelingen uit het laatste hoofdstuk in dit proefschrift kunnen hier zeker een bijdrage aan leveren.

11

Dankwoord (Acknowledgements)

11 Dankwoord (Acknowledgements)

Ten eerste wil ik graag de persoon bedanken die dit project mogelijk heeft gemaakt. Mijn supervisor Alexander van Deursen. Naast de kennis en ondersteuning die je inbracht gerelateerd aan het werk, heb ik me ook als persoon altijd gehoord gevoeld. Dit maakte het feit dat je dacht dat een interview van 1,5 uur in 2 uur getranscribeerd kon worden meer dan goed!

WISEMAN

Ook door mijn andere begeleiders, Jan van Dijk en Jos de Haan heb ik me altijd gehoord gevoeld. Bedankt voor al jullie wijsheid en geduld. Deze waren voor mij zeker onmisbaar voor het behalen van de eindstreep.

Daarnaast wil ik Ester bedanken voor de prettige samenwerking aan het begin van dit project.

Ook tegen het NWO, die dit project heeft gefinancierd, en alle participanten die de tijd hebben genomen om de survey in te vullen of mijn vragen te beantwoorden zeg ik: "Heel erg bedankt!" Het spreekt voor zich dat ik het zonder jullie niet had gekund.

Naast mijn waardering voor alle collega's van de vakgroep Communicatie Wetenschappen, kennissen, familie en vrienden zijn er een aantal mensen waarvan ik geloof dat mijn woorden geen recht zouden doen aan mijn dankbaarheid voor hun steun tijdens dit proces. Hopelijk heb ik al deze jaren met toenemend succes kunnen overbrengen wat jullie voor mij betekenen. De volgende pagina's zijn voor jullie!

FAMILY

FRIENDS

FRIENDS

♡ HOME ♡

12

About the Author

12 About the Author

Mirjam Koehorst (1986) was born in Oldenzaal, Twente: A small town in the eastern part of the Netherlands, just a short bike ride away from the German border. After high school she settled in Enschede, where she attained her bachelor of science in Technical Medicine at the University of Twente. Following her heart, she took a detour studying Media Music at ArtEZ. This was no surprise, given her experience as a dedicated volunteer audio engineer at the local music venue Atak. Here she fell in love with the underground music culture. Meanwhile, she also learned the art and beauty of sharing knowledge. Mirjam was a teacher at ArtEZ and Saxion between 2013-2016.

Education sounded like a career path worth pursuing. So, once again she listened to a voice that was challenging her. In 2015 Mirjam found herself at the University of Twente once more, where she obtained her Master's degree in Educational Science and Technology. During her studies, she was interested in the intrinsic motivation of students, since her own intrinsic motivation drove her to continue studying.

Not finished learning, Mirjam started her PhD research in 2016 guided by Prof. Dr. ing. Alexander van Deursen, Prof. Dr. Jan van Dijk, and Prof. Dr. Jos de Haan. She immersed herself in the application of eSkills for 21st century labor in the Dutch creative industries, a project funded by the NWO.

Mirjam learned first-hand the value of intrinsic motivation in development: In a digital world, and as an aspiring triathlon athlete. This is something she would like to explore further in personal and professional life. As a kettlebellsport enthusiast she loves to see these mechanisms in practice. Her positive driven mentality has a similar effect on her research.

She also loves cats.

By Anne Koehorst | Lesja Illustraties

Twenty-first century digital skills combine the higher-order skills of information management, communication, collaboration, creativity, critical thinking, and problem solving with a digital component. These skills are now considered crucial in ICT-intensive work environments. Unfortunately, there is no evidence of what organizational factors influence the 21st-century digital skills of employees. This dissertation explores what organizations can do to support the development of twenty-first century digital skills among their workers in the Dutch creative industries.