Unlocking Entrepreneurial Potential

CO-CREATING AN ENTREPRENEURSHIP AND INNOVATION CURRICULUM FOR AGRI-FOOD PROFESSIONALS

Unlocking Entrepreneurial Potential

Application of the Technology Acceptance Model and EntreComp for the education of entrepreneurial competences in the food industry.

Student:	*Gesina van der Werf*
Registration number:	*930714940090*
Study:	*MSc Food technology – Management and Innovation*
Supervisors:	*Kim Poldner*
	Thomas Lans

Business, Management & Organization group (BMO)
Educational & Competence Studies group (ECS)

Wageningen University

Abstract

Entrepreneurship and Innovation education have become increasingly important for the food industry in recent years. Use of e-learning curricula allow for personal development in the employee's own time and have generated extensive interest in the workplace. This study examined the factors that influence the company adoption of an online leaning curriculum on Entrepreneurship and innovation by applying an integrated framework which incorporates the EntreComp framework and Technology Acceptance Model. Qualitative semi-structured interviews were the primary source of data collection and analysed with the Atlas.ti programme. Start-ups already exhibited mainly entrepreneurial behaviour, and their education needs were mainly limited to narrow entrepreneurial competences such as best practices for client communication. Large companies were already knowledge-heavy and wanted to use entrepreneurial education to expand the entrepreneurial mindset of their employees. Competences that were important to all the companies regardless of size were: creating a compelling vision and mobilising others. The main findings of the technological implications of the curriculum was that social motivation and the use of non-standardized testing are significant contributors to the perceived usefulness for multinationals. The perceived ease of use if positively contributed to by making sure that online learning is short, playful and modular. For large companies it should be possible to integrate this in their current ICT structure. The results of this study can help educators, policymakers, researchers and other relevant stakeholders to obtain a clearer understanding of how to systematically approach a specific target group and identify the entrepreneurial competences the needed technological scaffolding for implementation systematically. This study is a first step to validating the EntreComp framework for identification of important entrepreneurial competences in food companies.

Table of contents

1. Introduction

Knowledge-intensive industries such as Research and Development (R&D) facilities in food companies require continuous education as workers need to autonomously solve novel and complex work problems that arise in this field (Felstead, Jewson, Unwin, & Fuller, 2009; Fontana, Milligan, Littlejohn, & Margaryan, 2015; Hager, 2004; Illeris, 2011; Littlejohn & Margaryan, 2014). Traditionally the primary focus of R&D has been on technological advancement, but in the last few years, the value of development of other personal employee competences has also gained attention. Entrepreneurial competences are one area that is especially interesting for R&D as they are a key factor for innovation, strategic renewal and economic growth of a company (Gray, 2002; Karnouskos, 2017; Lans, Biemans, Mulder, & Verstegen, 2010). One of the primary misunderstandings of companies in the past that limited the research on entrepreneurship in corporate environments was the thought that entrepreneurship only involved empowering employees to start their own business (Gartner, 1985). Lilleväli and Täks (2017) have defined this as the narrow view on entrepreneurship. A result of this misunderstanding is that research focuses primarily on the development of competences on a personal level and research is lacking in a corporate environment. Nowadays companies are more open to equipping employees with broader entrepreneurial skills to teach them how to explore and exploit value creating opportunities (Lilleväli & Täks, 2017). Development of an entrepreneurial culture has, therefore, become increasingly important to these companies.

The EntreComp framework is a relatively new framework of entrepreneurial competences that aims to support the promotion of entrepreneurship and build a bridge between the worlds of education and work (Bacigalupo, Kampylis, Punie, & Van den Brande, 2016). However, the scientific validation for the EntreComp framework in a corporate setting is still lacking. The first aim of this study is to examine food companies and validate the relevancy of the competences described in EntreComp in a corporate setting. This is important as the definition of entrepreneurial competences has a profound impact on the educational objectives, target audiences, content design, teaching methods and assessment procedures of creating an entrepreneurial curriculum for corporate learning (Lackéus, 2015; Mwasalwiba, Dahles, & Wakkee, 2012).

It is not only relevant that the right competences for the food companies are identified, but an appropriate learning strategy is also needed to help develop these competences in employees. Conventional forms of workplace learning easily allowed for large numbers of people to reach a standardised level of expertise. However, these types of learning are less likely to meet the needs of entrepreneurial competence development in contemporary work contexts (Collin, Van der Heijden, & Lewis, 2012). A semi-recent tool that aids the development of continued learning in companies is the Massive Open Online Course (MOOCs). The possibility of increasing competences anywhere and

anytime, at the employees' own pace, mostly without cost and obligations, opens up many opportunities for companies (Chang, 2015; Karnouskos, 2017). Companies either organise their own online corporate training programmes or often refer to the many entrepreneurship and innovation courses created by external parties in internal employee communications (Dillahunt, Ng, Fiesta, & Wang, 2016; Karnouskos, 2017).

New technologies, such as open online courses are often implemented in organisations with the hope of increasing productivity and improving employee participation and satisfaction (Younghwa H Lee, Kozar, & Larsen, 2003; Marler & Dulebohn, 2005). However, not much attention is paid to the design and implementation of a new curriculum. Despite company enthusiasm for online learning, research has pointed out that one of the leading concerns is the high dropout rate. Literature regularly cites completion rates that are as low as ten percent (Hew & Cheung, 2014; Hone & El Said, 2016; Joo, So, & Kim, 2018; Xiong et al., 2015). To stimulate an entrepreneurial culture a significant number of active users of the programme is needed. The second aim of this study is therefore to identify if companies quote certain factors that contribute to the drop-out of conventional e-learning. This will be done through the lens of the Technology Acceptance Model (TAM) by Davis (1985). The TAM will be used to gain insights into the process of gaining user acceptance and the relation to the adoption of the entrepreneurial competence development programme.

These two aims lead to the research context of corporate entrepreneurship. Sharma and Chrisman (2007) have defined this as the processes in which an individual or group of individuals, in association with the existing organisation, instigate renewal or innovation within that organisation. The following research questions were defined to pursue the aim of this study and address the current gap in the literature:

(1) *To which extent does the EntreComp framework address the competences needed for the development of an entrepreneurial culture in food companies?*
(1) *How can these competences optimally be developed by using an online curriculum in food companies?*

Answering these two questions will provide a validation of the EntreComp framework for corporate environments. It will lead to an integrated model of TAM and EntreComp as a means to identify the optimal way to develop entrepreneurial competences in employees of the food sector.

The next chapter (2) outlines the methodology used for the study. It is followed by the theoretical background information (3) which is composed of the theory that was relevant to the structuring of data collection and theory that emerged during research. The following chapter (4) presents the results, which address the research questions. Chapter 5 discusses the results and limitations of the

study. The last chapter (6) will conclude the study and cite the main contributions. The references can be found in chapter 8.

2. Methodology

2.1 Research setting

This study was done from February 2018 - August 2018 with the guidance of the Business, Management & Organization group (BMO) and the Educational & Competence Studies group (ECS) at Wageningen University. The research setting was the European BoostEdu initiative, whose aim it is to increase the innovation power of the European food industry by creating a blended learning platform for food professionals. BoostEdu runs from 2017 to 2020 and is supported by a strategic partnership between the following six universities: Kopenhavn Universitet (Denmark), Universitaet fuer Bodenkultur Wien (Austria), Universita di Bologna (Italy), Danmarks Tekniske Universitet (Denmark), Universitat Politecnica de Valencia (Spain) and Wageningen University (Netherlands). BoostEdu will establish a structure and platform for co-creating and implementing flexible continuing education within innovation and entrepreneurship for food professionals across Europe. It will do this by promoting new technologies as the drivers of improvements in education and by the use of novel, innovative, pedagogical tools and learning methodologies (e.g. MOOC, gamification, blended learning, flipped classroom, co-creation, e-learning). This study took place in the first stage of the 3-staged online and blending learning platform that BoostEdu has planned. The first concrete output of this will be a blended learning platform with a programme teaching innovation and entrepreneurship as the first concrete output.

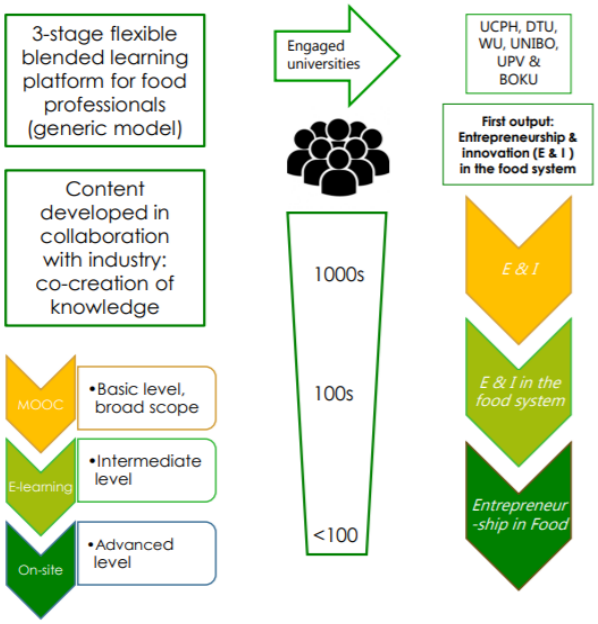

Figure 1 Set-up of the BoostEdu project

2.2 Structure of research

Several elements of this study were fixed in date and time due to the BoostEdu obligations. Primary and secondary data were collected over a period of six months (February 2018 – July 2018) for an in-depth exploration of the food industry and to formulate and answer the research questions. The function of all elements of the research will be described shortly and an overview of all activities is given in figure 1.

The research started with a study of the literature on the acceptance of MOOCs as organisational education, workplace learning and general entrepreneurship and innovation education. The information that remained relevant to the study and BoostEdu can be found in the theoretical background. After the initial study of the literature, a European survey was made with the input of all BoostEdu partners including input from the literature for this research. The survey was as a first data collection moment that gave insight in the food industry. The data of the survey was used as a direct input for the co-creation workshops. Almost all of our BoostEdu partners held the co-creation workshop in May. The goal of the co-creation workshops was to validate the outcomes of the survey and sketch a draft curriculum for the entrepreneurship and innovation curriculum. The findings of the co-creation workshops were discussed in the transnational meeting that followed in Valencia (Spain) in June. Based on the results of the preliminary study an initial conceptual framework was created on which the questions were based for the Dutch co-creation workshop. In the Dutch workshop, the curriculum that was designed in Valencia was discussed. The information of the informants of the co-creation workshop was used to structure the remaining interviews. During the data analysis of the co-creation workshop, the scope of the project was redefined to include and focus on entrepreneurial competences. The research questions and theory were redefined and further studied. Based on the new research questions, preparation for the expert interviews included new interview questions that focused on the entrepreneurial competences of employees and the technological implications for an online curriculum. After the interviews, in some cases, extra information was gathered to reliably report statements made by informants. This was done by e-mail communication and a list of follow up questions. The final data analysis resulted in the first and second order coding of all transcripts. A final proposal for a conceptual model that includes both models used in the design of the questions was made that addressed the identified gaps in the literature.

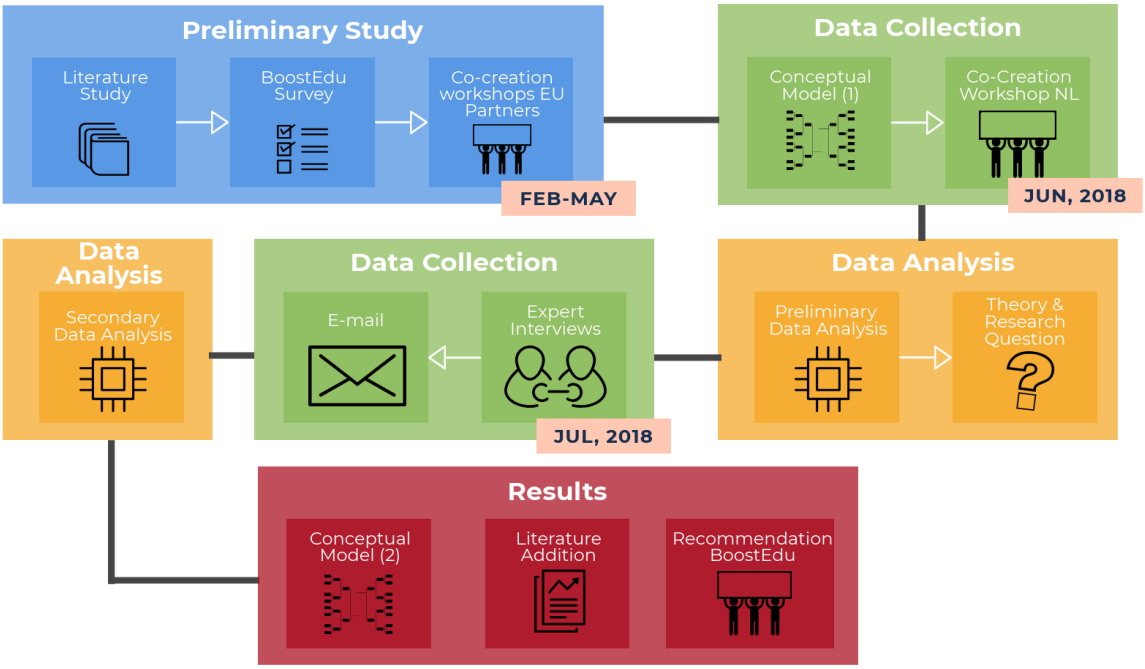

Figure 2 Research Model – An overview of the activities during the study

2.3 Strategy of inquiry

This qualitative study qualitative and used a mixed-method approach that combined participant observation, surveys, co-creation workshop, semi-structured interviews and analysis of secondary sources from literature. The participants in the interviews were employees in an HR or managerial role of food companies that were directly related to the implementation of learning for employees in R&D. A case study design was chosen because each company culture and attitude towards the development of entrepreneurial competences is unique and it should be studied in their own context (Yin, 2002). An essential part of this strategy requires getting to know the subjective experiences of individuals, but the main interest remains to be able to derive conclusions based on the abstract extrapolation of the experiences in cases (Creswell, 2009). The researcher familiarized themselves with the food companies following common recommendations for qualitative research by Gioia et al. (2012). The strategy gives an extraordinary voice has to the in-depth informants that are treated as knowledgeable agents. This strategy requires a closer engagement of the researcher with the informants, as well as closer engagement between the informants and the research. According to Bansal and Corley (2011) it is important to acquire diplomacy, discretion and transparency during research; the evolving analysis, models and even the study can be shared with the informants to foster this relationship successfully. However, confidentiality was not promised as it would prevent the information from being used. Instead, where applicable 'anonymity' was key to gaining trust in insider information. Furthermore, the flexibility of the research was preserved by adjusting the interview protocol based on the informant responses. It was also usual to 'backtrack' to prior

informants for clarifications on questions that arose during subsequent interviews. This flexibility even led to the modification of the initial research questions at a later stage to fit the new aim of the research.

2.4 Case selection

The question remains in qualitative research, whether it is possible to generalise from a case study. According to Bansal and Corley (2011), this is a definite outcome if the case generates concepts of principles with obvious relevance to another domain. Robert Yin (2002) asserts it is crucial to have a clear definition of a case when starting the research to prevent the researcher producing findings of phenomena that are not subject to the target group. To make sure of the qualitative rigour of the research, a multiple data source design was adopted to examine the learning context in the companies and arrive at the reliable interpretations of the data. The participants of this study were selected based on their affinity with the subject and availability for the data collection. The selection was indiscriminate of their age, gender or ethnicity.

Initially, the potential participants for the survey and the co-creation workshop were HR professionals. These were contacted through a list provided by Wageningen Academy. By using this approach, it was believed that the correct persons were identified who were in charge of company learning programmes. It was thought that these persons were best informed about employee learning activities and therefore able to give valuable information about the target group. However, in a later stage when more in-depth knowledge of the field was gained it became clear that limiting the research to HR professionals gave difficulties. Contacting HR professionals was tedious, and many contacts resulted in no response or standardized out of office messages. Only a small pool of participants was collected. This small pool of participants did not give a complete view of the possible data, and the selection of potential participants in the study was broadened. By using personal contacts that were made during this study and by researching relevant stakeholders, three additional companies agreed to in-depth interviews. The full contact list can be found in Appendix A.

The co-creation workshop was visited by four people from the academic world, two students and two representatives of KraftHeinz. The contacts with KraftHeinz representatives were collected by a thorough internet search of HR employees of KraftHeinz in the Netherlands. By extrapolating the company e-mail format from personal contacts e-mails were sent. Initially an HR business partner signed in for the co-creation workshop. The business partner also recruited a colleague who signed in for the co-creation workshop as well. A representative of Unilever who was willing to be an official informant was drafted by personal contacts that were made during the course of this research. After landing two multinational corporations, a contrast was needed with a start-up for a better overview

of the food industry. Adding a small company was done to address the concerns raised by KraftHeinz in the co-creation workshop about pleasing both small and large companies with one curriculum and competences profile. These three companies are shortly described in the following paragraphs. GreenFood50 was identified as a suitable start-up for this study due to the proximity to WUR and the products that they manufacture. It was found by browsing the clients of StartLife (2018). The goal of the following company descriptions and the case selection was not to know as much as possible of the company in advance, as this can interfere with unbiased gathering of data (Gioia et al., 2012). Instead it was used to correctly identify interested companies and obtain the most heterogeneous sample from the organizational point of view. Also, it was used so the researcher appeared informed about company practices, so the informants were sufficiently comfortable sharing their information.

2.4.1 KraftHeinz

KraftHeinz Company is an American food company formed by the merger of Kraft Foods and Heinz in 2015 (The Kraft Heinz Company, 2015b). It is a major food processing company of which the logo (fig. 3) is also found on many well-known products in the Netherlands such as Amoy, Honig, Brinta, De Ruijter and HP Sauce. The company has a yearly net sales price of over €4bn euro's in the United States and €600 million in Europe and spans a portfolio of over 200 brand names (The Kraft Heinz Company, 2018). KraftHeinz has three large complexes in the Netherlands; a ketchup plant in Elst, an innovation centre in Nijmegen and they just opened a new innovationcentre in Amsterdam's Zuidas. "Innovation and quality are the hallmarks of our company," said Andrea Budelli, director of R&D at Kraft Heinz (The Kraft Heinz Company, 2015a), "At Kraft Heinz, innovation rests on four pillars: one, the products we develop must be profitable; two, our products have to number 1 or 2 in their category; three, our products are always top-notch quality; and four, our people are the best in their field." Ninety per cent of the research and development for the European market is conducted at the European innovation centre in Nijmegen which was opened in 2013. When this new building was opened the focus was to create an 'Innovation machine'. "We're giving everyone an opportunity to shine," said Budelli about the workplace atmosphere. "A young employee with a great idea is given a lot of responsibility in our company. Our HR policy is intended to encourage talented people to be the best they can be. Also, our organisation is non-hierarchical, and collaboration across departments is actively encouraged. For every new project, we put together a new team. So, team composition is switched up regularly to work on new products."(The Kraft Heinz Company, 2015a). KraftHeinz is very proud of their position in innovation, doubling their innovation efforts over the last years. KraftHeinz is tracking and innovating three significant trends in particular: snacking, clean and

Figure 3 KraftHeinz Corporate Logo

healthy ingredient profiles and bold flavours (Crawford, 2017). Successful innovation is done by listening to the consumer and putting their needs first. In the words of Nina Barton, the senior vice president of marketing, innovation and R&D for KraftHeinz: '' When we have problems with innovation it is that they are not fundamentally listening to the consumer and what her needs are (…) when you put the consumer first, you win''.

Kraft Heinz was approached for this study as it is one of the leading food companies that has a significant stake on Dutch land, with most of the innovation taking place in Nijmegen. The recent focus on the innovation and new initiatives formed by the merger in 2015 make it a company that can be interested in exploring entrepreneurial opportunities.

2.4.2 Unilever

Unilever is a British-Dutch global fast-moving consumer goods (FMCG) company that has products that include food and beverages, (about 40% of the revenue), cleaning agents and personal care products. It is organised into four main divisions – foods, refreshment, home care and personal care. For this study, the foods department was the primary focus. Food includes the production and sale of soups, bouillons, sauces, snacks, mayonnaise, salad dressings, margarine, nutritionally enhanced staples sold in developing markets and spreads. Brands that are particularly well-known in the Netherlands are Knorr, Lipton, Ola ice cream and Ben and Jerry's.

Figure 4 Unilever Corporate Logo

The reason Unilever was chosen as a compelling case for this study is that it is in the midst of a massive organisational change that is almost unprecedented in such an established multinational. On the campus of Wageningen University and Research campus, a large global foods innovation centre is being built. The Global Foods Innovation Centre will consist of a pilot plant, a food and consumer experience with two floors of offices and laboratories (Lachmeijer, 2017). To effect this, three currently running R&D facilities in Poland, Germany and the largest one to date in Vlaardingen, the Netherlands will be closed down. The CEO of Unilever Paul Polman sees this as the first necessary step to fulfil the Unilever sustainable living plan (Lachmeijer, 2017). Moreover, Dijkhuizen, the head of top sector Agri & Food sums this up during the official opening in the construction site in three priorities: (1) we need healthy and safe food that is produced safely. (2) we need to do this in a climate neutral fashion using new innovations (3) we need to use our biomass optimally, by for example reusing our raw materials circularly and not producing any more waste. An interesting relation between Unilever and Kraft Heinz that should be noted is the hostile takeover attempt in 2017. Last year, Kraft Heinz made a €134bn bid to acquire Unilever. A takeover was only prevented by swift action on Unilever's part.

2.4.3 Greenfood50

Greenfood50 was chosen as a counterweight to the two large multinationals. It is a start-up from Wageningen, the Netherlands that develops, produces and supplies innovative quinoa ingredients for tasty, sustainable and healthy food for a growing world population. It co-operates closely with Wageningen University and Research and other leading research organisations to ensure the application of the latest technologies and the knowledge. (Food Valley Society, 2016; GreenFood50, 2018)

Figure 5 GreenFood50 Logo

The company exists for four years and Marc Arts, Founder and Managing director of Greenfood50 states that ''our mission is to enable tasty, sustainable and healthy food for a growing world population.'' Even though the GreenFood50 team is a relatively new player in the field, employees have a diverse and international background built on over 30 years of experience in the global food and agriculture industry (GreenFood50, 2018). The core values of this company are customer focus, teamwork, innovation, quality and sustainability. The founder of the company has also worked at DSM for many years before branching out on his own. Greenfood50 is supported by Startlife, Food Valley NL, OostNL Kadans bioscience partners and many more. Currently, their products are used by the Dutch Olympic training centre at Papendal, and it has won many prizes. At Food Matters Live 2015 in London, GreenFood50 received the runner-up open innovation award from the Institute for Manufacturing, University of Cambridge (Food Valley Society, 2016). At Health Ingredients Europe 2016 in Frankfurt, GreenFood50 won the Start-up Innovation Challenge and received in 2017 the Rabobank Start-up Award Wageningen. In 2017 GreenFood50 was a finalist in the Bridge2Food Sports & Active Nutrition summit in The Netherlands & the Protein Summit in France.

2.5 Data collection methods

The strategy of inquiry required a close relation to the field, and mixed methods for data collection achieved this. An overview of all the data collected for this study is given in table 1 and the details of the data collection moments are described in the following paragraphs. After each data collection moment, time was taken to understand what this case added to the data and what was different from the last, as well as what was missing after initial analysis to fill in the gaps in knowledge.

Table 1 Data sources used for the collection of data in this study. Modified from the ethnographic research of Stigliani & Ravasi (2012)

Data Source	Type of Data	Use in the Data Analysis
	FEB – JUN 2018	
Observations	*Recordings or notes* Observations of common practice during conferences focused on innovation in the agri-food sector. *Pictures* Visual documentation of the work product of the co-creation workshop (drawing, conclusions, references).	To keep a record of the corporate culture between start-ups and multinationals and how or if innovation and entrepreneurship is a topic commonly discussed. To keep a record of the outcome of the practices that the participants of the co-creation workshop engaged in.
Informants	*Informal conversations* Informal talks with managers, change directors, participants of conferences, ranging from brief exchanges, presentations to more extended talks before and after meetings. Meetings were recorded, or notes were made immediately afterwards to keep a record.	Familiarization with the organisational context, gain the trust of informants, discuss insights of previous data collection and support emerging interpretations of data. Identification of individuals willing to participate in the in-depth interviews and networking.
	APR – JUN 2018	
Survey	Transnational Survey created for the BoostEdu project with the input of this research and the other partners. It was circulated for two months and filled in by over 50 agri-food professionals from the 6 partner countries.	Familiarization with organizational context. Identification of relevant issues and insights in possible data.
	JUNE 2018	
BoostEdu Meeting	Transnational Meeting in Valencia on the 20th and 21st of June 2018. Discussion of Survey results and co-creation workshops of partners. Creation of a preliminary curriculum based on the theory and the findings of other European partners.	Familiarization with organizational context. Discussing insights of previous data collections and supporting emerging interpretations of data and literature.

Co-creation Workshop	Co-creation workshop/focus group on 26th of June 2018 with scholars in entrepreneurship education, students with entrepreneurial interest and two representatives of KraftHeinz.	Integrating observations from previous data collection moments with accounts of the informants, to improve our understanding of their motivations and learning curriculum. Improve understanding of which entrepreneurial competences are most needed in the R&D context.
	JULY 2018	
Interviews	*Focused interviews (2)* on the practices in the company, interest in particular entrepreneurial competences for their employees, working culture and e-learning curriculum.	Integrating observations from previous data collection moments with accounts of the informants to improve the understanding of their motivations and learning curriculum. Improve understanding of which entrepreneurial competences are most needed in the R&D context.
E-mail	*Mini-Survey* as a follow-up to order the outcomes of the entrepreneurial competences that were mentioned in the interview and co-creation workshop according to most necessary in their organization context.	Investigating the priorities of entrepreneurial competences in different work environments and validating the outcomes of the data analysis of the interview and co-creation workshop. To create the reliability and validity of the data set.
	FEB – AUG 2018	
Archival Data	*Company-related documents* Presentations of company practices, internal presentations of Unilever and Greenfood50. Folders and information packets of the conference and relevant visits to agri-food companies. *Project-related documents* Correspondence with stakeholders in BoostEdu project, presentations on company culture, company education. The website description of the companies.	Familiarization with the organisational context. Identification of relevant stakeholders for in-depth interviews. Supporting and triangulate results from observations and interviews. Used as a source of information for case selection and further guiding the research to the relevant angle for scientific study.

2.5.1 Observations

During this study, an extra effort was made to dive deeply into the company culture of food and agri-food companies. Visits were paid to the F&A Next conference on the 30th and 31st of May which hosts investors, farmers, food and agribusiness executives and opinion leaders for two days of networking and debating the dynamics in food and agriculture (F&ANext, 2018). F&A Next had panel discussions focused on corporate innovation and participants from many large food companies that were there to give their opinions. Observations were made on the presentations, panel discussions and keynote speakers as well as the type of interactions that typically takes place in these settings. Observations were also made during the co-creation workshop in the form of pictures. Pictures of the blackboard with the work product of the co-creation workshop were taken to remember what was created by first-hand account.

2.5.2 Informants

Every opportunity was taken to have informal conversations with people that are related to entrepreneurship and innovation in the food industry. Their input and vision on entrepreneurial education within their company setting was discussed and the relevancy to this study. During an internal selection process for a job in R&D at Unilever, all employees that were in charge of guiding the selection of employees were informally asked about their opinion on the research area. During this process, contacts were made by referral of the Unilever employees to the participants who were willing to be interviewed in an official capacity. Also, during the F&A Next conference, all opportunities were taken to seek out previously identified stakeholders in innovation in the food sector and speak with them informally. This included an Innovation Manager of Agri Innovation Lab GmbH, R&D Global Leader Unilever, the directors of student boards of Startlife and Starthub and other participants of the conference. The aim of the informal conversations with informants was familiarisation with the entrepreneurial culture and to further define the research direction for the co-creation workshop and interviews.

2.5.3 Survey

A survey was made by the BoostEdu partners, which was in great part contributed to by the literature study of this research. The specific input on the survey from this study was based on the validated codebook for a survey on lifelong learning (Kretzschmar, Mainert, Müller, Nedelkoska, & Patt, 2014). This codebook was developed for a survey about a MOOC for engineers in the LLLight 'in' Europe (2018) project. Questions and competences that seemed relevant to this study were derived from the codebook, and the five-point Likert scale was used as answering category, ranging from 1 (very limited extent) to 5 (very high extent). Fifty-two responses were from six countries were received during the circulation of the survey from 29th of April until 22nd of June. The respondents

were collected through the network of all the BoostEdu partner universities. The survey was circulated two months later than originally planned and there were not enough responses to derive a quantifiable result. Instead, qualitative conclusions were made from the survey and used for the research frame, the BoostEdu meeting and in addition to the results of the transcript coding. For a full overview of the circulated surveys, refer to appendix B.

2.5.4 BoostEdu meeting

A BoostEdu transnational meeting was held in Valencia on the 21st and 22nd of June 2018. The purpose of this meeting was to discuss the results of the survey with the other partner universities and draft a preparatory curriculum. Based on the results at that time, direct input was given from this study to the meeting and the project. This led to redefining the purpose of the MOOC and formulating a new direction for the technological scaffolding of the e-learning phase. The content was created with all BoostEdu partners based on micro-learning and this curriculum was presented to the informants during the Dutch co-creation workshop.

2.5.5 Dutch co-creation workshop

The Dutch co-creation workshop was held on the 28th of June 2018. Eight people with different backgrounds, ranging from academic to corporate environment, participated. The diverse background allowed for a crossover between the academic and corporate world. The job description and relevance of each participant in the workshop is described in table 2.

Table 2 Overview of all participants in the co-creation workshop with their code for the analysis, type of informant and the relevance to the study

Code	Type	Relevance to this study
AC1	Academic informant	Postdoctoral researcher at WUR with a focus on entrepreneurship education
AC2	Academic informant	Assistant Professor at WUR, currently working at the Education and Competence Studies (ECS) subdivision of the Department of Social Sciences with expertise on entrepreneurial learning.
AC3	Academic informant and co-host of co-creation workshop	Assistant professor at WUR currently working at the Business Management and Organization (BMO) subdivision of the Department of Social Sciences. Contact for BoostEdu and academic supervisor
CON1	Consultant	Consultant/Coach/Entrepreneur and programme manager for Wageningen Academy
COR1	Corporate informant	HR business partner R&D for KraftHeinz
COR2	Corporate informant	HR learning director R&D Europe
STU1	Student	Student biotechnology at WUR and project captain at Yara Sluiskil; an entrepreneurial subdivision of Yara International
STU2	Student	MSc student in sustainable consumption and food security and BSc Business and consumer studies

The co-creation workshop was structured as a focus group but reserved the flexibility to explore other aspects if the group so desired. The initial questions were based on the TAM model and were used to test the preliminary curriculum that was created in the BoostEdu transnational meeting. The co-creation workshop was recorded and transcribed within two days of the occurrence to do a preliminary analysis and reflection before the semi-structured interviews.

2.5.6 Semi-structured interviews

The semi-structured interviews were transcribed and analysed. The interviews were structured using the Technology Acceptance Model and EntreComp framework. The interview questions were designed with the help of an interview blueprint as was described by Emans (2004) and can be found in Appendix C. In the blueprint the objectives of the research questions were expressed concretely. These objectives, as well as the theory from the review of the literature were used to derive the questions. As the research evolved, the interview blueprint was adjusted according to the theoretical insights that were gained (Gioia et al., 2012). Each interviewee was interviewed once, so the developments within the organization are at a specific point in time and presented from their point of view. Interviews allows the researcher to focus the data collection directly on the study topic and collects information which has been filtered through the point of view of the interviewee (Creswell, 2009; Yin, 2002). Although unstructured interviews would have allowed for the most open approach to data collection according to Strauss and Corbin (1994), the conversation was mainly semi-structured. The flexibility of the questions was preserved by not structuring how and when the predefined topics were presented. This gives the opportunity to probe and ask for clarification as well as additions that may be considered significant to the interviewee.

2.5.7 E-mail

After the preliminary data analysis of the co-creation workshop and interviews, copies of findings were on occasion, per request, e-mailed to the contact person to give an opportunity for feedback on the analysis. This gives interviewees a second moment to reiterate their responses and provide feedback, which increased internal validity (Gioia et al., 2012). Feedback from STU1 of the co-creation workshop was that even though they were given the opportunity to speak, the respondent was unfamiliar with most of the entrepreneurial competences that were discussed and was inhibited to give an opinion during the workshop. A respondent from KraftHeinz (COR1) also expressed interest in the stage of the research and the entrepreneurial competences that were being focused on in EntreComp. The feedback from COR1 and STU1 was addressed by creating a small survey based on the hints provided with the EntreComp framework and sent by e-mail, so the responses of the co-creation workshop could be more concretely validated. The questions of this survey can be found in Appendix B.

2.5.8 Archival Data

For six months, archival data was collected where possible. The BoostEdu project has an extensive information log with deliverables to secure funding from the European Union. This information and the correspondence with partner universities was used for the definition of the research context. The contacts list that was acquired during the F&A Next conference was used for a second round of contacting food companies. Internal employee communications, PowerPoint and presentations from Unilever gave more insight to the transformation and the entrepreneurial culture of the company. GreenFood50 also supplied a PowerPoint on their company as archival data that supplemented the information on the website.

2.6 Data analysis

2.6.1 Co-creation workshop and semi-structured interviews

The real qualitative rigour started with the approach to the analysis of the collection of data. The co-creation workshop and interviews were audiotaped and transcribed within as short a time frame as possible. Atlas.ti cloud software for qualitative data was used to organise the transcripts. In this programme, the data was grouped according to the case source, and an initial selection of thought-provoking quotes for the first order coding was made. This simplified first and second order coding analysis and made it easy to cite findings and quotations at a later stage (Yin, 2002). This method was helpful during the iterative nature of the analysis, as the first order code allowed for an easy retracing of the quotes. Notes were taken and added in Atlas.ti for observations and thoughts that added to the context and supported data analysis. Most quotes were in English, but some were in Dutch. If in Dutch, the quote was translated into English by a native speaker for further analysis.

First and second order coding of informant quotes

The semi-structured interviews were interpreted and labelled according to the researchers' interpretation. The co-creation workshop was coded in the same way as the expert interviews. Only the quotes of the employee of Yara Sluiskil (STU1) and KraftHeinz (COR1 and COR2) were coded with the first and second order strategy as they belong to the corporate environment and can directly contribute to answering the research questions. The other quotes were used as contextual knowledge but not coded as this would give results that are based too much in the academic world and do not directly address the research questions. In total three transcripts of four informants were analysed which generated a considerable number of codes. During the coding process, when the coding frameworks did not encompass important dimensions in the data, more were added. The influence of the organisational culture was not attached to any theoretical lens and was added to include the background knowledge of the company motivations and interest in this study. Therefore, the codes for this category were mainly based on open coding. 'Open' coding is a method for

developing a theory or creating a new theory (Strauss & Corbin, 1994) and is suitable when relying on the interviewees as the knowledgeable agents (Gioia et al., 2012).

Relevant quotes were coded with the help of atlas.ti software using three coding frameworks: one framework for the importance of specific entrepreneurial competences with the EntreComp model, one framework for the information system acceptance by the TAM and one through the lens of entrepreneurial culture. The entrepreneurial competences were directly derived from the EntreComp framework (Bacigalupo et al., 2016). This framework is grouped into three aggregate dimensions: Ideas and Opportunities, Resources and Into Action. The TAM has two variables: Perceived ease of use and perceived usefulness. The entrepreneurial competences from EntreComp and the two variables of the TAM were used as the second order codes for the data. Using first and second order coding increases the rigour of the research as the first order uses the informant's terms and the second order code is in the researcher's terms. This enables a clear link between the data and the researcher's interpretation. In the first order, analysis was done by using ''informant-centric terms and codes'' as proposed by (Gioia et al., 2012). In the second order analysis, the three coding frameworks were employed to retain oversight on the results of the analysis. This was done by first summarising the first order quotes into categories which were still closely related to the informants' voice. These categories were then organized under the second order codes through the theoretical lens of the frameworks. This helped formulate the definitions of the second order codes and increases the reliability. Definitions allow for a comparison between quotes with the assigned codes to help determine whether a change in meaning or interpretation of the codes had occurred.

Table 3 Example of the derivation of the first-order code from quotes from KraftHeinz (COR1) during the co-creation workshop on the 28th of June 2018

Quote	First order code	Respondent
so essentially with KraftHeinz, we have a platform that is centrally managed, that offer a lot of foundational and behaviour trainings.	Centrally managed platform for foundational and behaviour tranings	COR1
In that scenario, we will try to; if there's actually a barrier for them to have time to complete it, we will even work with the manager to try to give them more time, in some cases vacations, we will work with sessions where we sit down and go through the training together.	Work with employees to give time for training	COR1

To increase the reliability of the study, an overview with all the codes and a definition of the codes was made. This helped control if the codes were used consistently over time and to determine if there were overlapping codes (Creswell, 2009). The definitions helped when reorganizing the codes as the data analysis drew closer to the conclusions of the study. The full derivation of the codes consists of a first order code, a category, second-order code and an overall concept. An example of this is shown in table 4 where the full code analysis is shown, including to whom the code belongs with U for Unilever, G for Greenfood50, KH for KraftHeinz. For a complete overview of all coded data refer to appendix E.

Table 4 Example of the data analysis. Topic - Entrepreneurial competences | Dimension - Ideas and Opportunities / second order code - Spotting opportunities

	First Order Code	**Definition Category**	**Category**	**Definition of Concept**	**2nd order code**
U	Due to great innovation pressure we didn't take the time to properly understand the demand or the problem	Identifying the needs and challenges of the customer	Understanding Customer Need	Being able to identify and seize opportunities that create value.	Spotting Opportunities
U	from our know-it-all arrogance we started developing products nobody was waiting for.				
G	We exchange needs with the customers and see how we can apply that				
U	We're very risk averse and in you see that in our culture we often speak about 'These are the risks' instead of saying 'these are the opportunities	When opportunities are not identified or seized due to inhibition by fear of risk	Inhibition through risk		
U	People with an engineering background are not risk takers and are not likely to have a start-up				

2.6.2 Non-coded data

The data that did not directly contribute to the research questions or was not recorded was not suitable for the first and second order coding analysis. These pictures, notes, recordings, phone numbers, e-mails, archival data and more were kept for reference during the development of the research. This data was used to support the results from the coding analysis and often directly supported the validation of specific approaches and assumptions in the study. In particular, the non-coded data was used to identify the important aspect of entrepreneurial culture which was subsequently open coded in the transcripts.

3 Theoretical Background

3.1 The definition of Entrepreneurship

Entrepreneurship has many facets that can be applied differently across many disciplines and it has been studied in many different contexts. Entrepreneurship is defined by many as the creation and management of new opportunities in uncertain and complex environments (Gianesini, Cubico, Favretto, & Leitão, 2018). Entrepreneurial activities often lead to innovation in products, services, and markets generates jobs and support competitiveness (Lilleväli & Täks, 2017). Low and MacMillan (2007) state that studies on 'Entrepreneurship' have had many different objectives and adopted different units of analysis, theoretical foundations and methodologies. This diversity is often expressed in the varied definitions of entrepreneurship throughout time: Schumpeter (1934) defined an entrepreneur as an agent of change that carries out a 'new combination of the means of production'. Cole (1968) said that the purposeful activity to initiate, maintain and develop a profit-oriented business is true entrepreneurship. Kirzner's (1973) definition is focused on the ability to correctly anticipate the imperfections and imbalances in the next market will be. Lastly, an important suggestion by Gartner (1988) which is repeated by many is the definition of entrepreneurship as the creation of new organisations. Arriving at one standard definition of entrepreneurship is difficult, and researchers have argued that this is an element that can hamper research in this field (Gartner, 1985; Lilleväli & Täks, 2017). To minimize this impact and confusion in this study, a distinction was made between broad and narrow entrepreneurship.

3.1.1 The difference between broad and narrow entrepreneurship

Lilleväli and Täks (2017) have made a distinction between the 'narrow' and 'broad' approach to entrepreneurship. The fear of organisations is often based on the ''narrow approach'' of entrepreneurship which consists of the process of starting and managing a business with limited resources and changing market conditions (Davidsson, Delmar, & Wiklund, 2008; Lackéus, 2013, 2015; Lilleväli & Täks, 2017). This reflects a person who is seeking to establish their own business outside of the organisational context. Equipping employees with skills to solve social issues and

improve life as a whole through various value creation processes by an enterprising person would be the, in this case, more valuable 'broad approach' to entrepreneurship (Bacigalupo et al., 2016; Draycott & Rae, 2011; Gibb, 2008; Lilleväli & Täks, 2017). These characteristics are appropriate for someone who explores and exploits opportunities and possesses entrepreneurial competences that can be used to create value within the company and in all fields of life.

These two approaches, narrow and broad, both represent a different aim for entrepreneurship education: (1) to support the managing and start of new business and (2) to develop innovative, creative and enterprising individuals (Lilleväli & Täks, 2017). The latter definition was most fitting to the aim of this study and will be used as the primary definition of entrepreneurship in all communications in this study.

3.2 Entrepreneurial Competences

A common misconception in an organisational context is the difference between entrepreneurship and entrepreneurial competences. Knowledge, Skills, Attitudes and Abilities that are required to meet the complex demands of a particular context are generally defined as competences (Baum, Locke, & Smith, 2001). Competences are both changeable and learnable and can be attained through experience, learning and coaching (Volery, Mueller, & von Siemens, 2015). Entrepreneurial competences are a specific set of abilities that are essential to know for a successful entrepreneurship endeavour (Mitchelmore & Rowley, 2010). Entrepreneurial Competences are not limited to the knowledge of technical, financial, organisational and legal know-how often needed for the 'narrow' view of entrepreneurship but also include motives, traits, self-images, social roles and skills (Kuratko, 2005). Considerable time and effort have been devoted to researching which characteristic, traits, values and cognitive styles are associated with entrepreneurial success, but the particular competences that support venture creation are still unclear. Entrepreneurial competences cannot be entirely separated from the personal characteristics, traits and motivations of an entrepreneur (J. Lee, Lee, & Shim, 2016) which makes it difficult to decide on a consensus on what the distinctive elements of entrepreneurial competences are (Gianesini et al., 2018). It is even more difficult to distinguish if the entrepreneurial competences can be learned and how they should be acquired (Lackéus, 2013). To make sure the relevant questions are asked, many competence tools have been developed. A recent tool for entrepreneurial competences has been the EntreComp framework, which was used for this study.

3.2.1 EntreComp Framework

The EntreComp Framework was created with the broad interpretation of entrepreneurship in mind. It is intended as a flexible source of inspiration that can be used or adapted to support different contexts such as a reform of curricula in the training sector (Bacigalupo et al., 2016). EntreComp

recognises the opportunity of entrepreneurial behaviour in any situation from school to innovating in the workplace. By identifying the competences that make someone entrepreneurial, these can be used to support entrepreneurial learning (McCallum, Weicht, McMullan, & Price, 2018). EntreComp is made up of three competence areas: 'Ideas and Opportunities', 'Resources' and 'Into Action'. Within each area, there are five competences which according to the developers are the building blocks of entrepreneurship competences. As described by the creators of the EntreComp model themselves, it is reasonable to expect that more emphasis can be put on certain competences and less on others depending on context. (Bacigalupo et al., 2016).

For validation of the framework in a corporate setting, EntreComp was used as a tool through which to interpret the needs and wishes of the food companies. The EntreComp framework was a suitable tool as it is one of the first that claims to be applicable in a corporate environment. The developers of the framework have also indexed proficiency levels of all competences, which can be considered as a way to determine the learning goals of a curriculum for BoostEdu. An example of the proficiency levels is given in Appendix F.

Gianesini et al. (2018) made a comparative study of three different entrepreneurial competence models and categorised the competences in skills, personality and traits. They state that due to the complexity of the entrepreneur's role, a comprehensive and detailed taxonomy of entrepreneurial competences is needed. In table 5 below, the entire framework is described with the addition of the subcategorisation by Gianesini et al. (2018) and hints of the categories by McCallum et al. (2018) to help the understanding of the different competences.

Table 5 EntreComp Model (Bacigalupo et al., 2016; Gianesini et al., 2018; McCallum et al., 2018)

Competences	Description	Type	Hint
Spotting Opportunities	• Identify and seize opportunities to create value by exploring the social, cultural and economic landscape • Identify needs and challenges that need to be met • Establish new connections and bring together scattered elements of the landscape to create opportunities to create value	Skill	Use your imagination and abilities to identify opportunities for creating value
Creativity	• Develop several ideas and opportunities to create value, including better solutions to existing and new challenges • Explore and experiment with innovative approaches • Combine knowledge and resources to achieve valuable effects	Personality	Develop creative and purposeful ideas
Vision	• Imagine the future • Develop a vision to turn ideas into action • Visualise future scenarios to help guide effort and action	Skill	Work towards your vision of the future
Valuing Ideas	• Judge what value is in social, cultural and economic terms • Recognise the potential an idea has for creating value and identify suitable ways of making the most out of it	Skill	Make the most of ideas and opportunities
Ethical and Sustainable Thinking	• Assess the consequences of ideas that bring value and the effect of entrepreneurial action on the target community, the market, society and the environment • Reflect on how sustainable long-term social, cultural and economic goals are, and the course of action chosen • Act responsibly	Skill	Assess the consequences and impact of ideas, opportunities and actions

Competences	Description	Type	Hint
Self-awareness & self-efficacy	• Reflect on your needs, aspirations and wants in the short, medium and long-term • Identify and assess your individual and group strengths and weaknesses • Believe in your ability to influence the course of events, despite uncertainty, setbacks and temporary failures	Personality	Believe in yourself and keep developing
Motivation & Perseverance	• Be determined to turn ideas into action and satisfy your need to achieve • Be prepared to be patient and keep trying to achieve your long-term individual or group aims • Be resilient under pressure, adversity, and temporary failure	Personality	Stay focused and don't give up
Mobilising Resources	• Get and manage the material, non-material and digital resources needed to turn ideas into action • Make the most of limited resources • Get and manage the competences needed at any stage, including technical, legal, tax and digital competences	Skill	Gather and manage the resources you need
Financial & economic literacy	• Estimate the cost of turning an idea into a value-creating activity • Plan and put in place and evaluate financial decisions over time • Manage financing to make sure your value-creating activity can last over the long-term	Knowledge	Develop financial and economic know-how
Mobilising others	• Inspire and enthuse relevant stakeholders • Get the support needed to achieve valuable outcomes • Demonstrate effective communication, persuasion, negotiation and leadership	Skill	Inspire, enthuse and get others on board

Competences	Description	Type	Hint
Taking the initiative	• Initiate processes that create value • Take up challenges • Act and work independently to achieve goals, stick to intentions and carry out planned tasks	Skill	Go for it
Planning & management	• Set long-, medium- and short-term goals • Define priorities and action plans • Adapt to unforeseen changes	Skill	Prioritise, organise and follow up
Coping with uncertainty, ambiguity & risk	• Make decisions when the result of that decision is uncertain, when the information available is partial or ambiguous, or when there is a risk of unintended outcomes • Within the value-creating process, include structured ways of testing ideas and prototypes from the early stages, to reduce risks of failing • Handle fast-moving situations promptly and flexible	Personality	Make decisions dealing with uncertainty, ambiguity and risk
Working with others	• Work together and co-operate with others to develop ideas and turn them into action • Network • Solve conflicts and face up to competition positively when necessary	Skill	Team up, collaborate and network
Learning through experience	• Use any initiative for value creation as a learning opportunity • Learn with others, including peers and mentors • Reflect and learn from both success and failure (your own and other people's)	Skill	Learn by doing

3.3 Predicting acceptance of MOOCs

3.3.1 Technology Acceptance Model

New technologies, such as MOOCs have been implemented in organisations with the hope that they will increase the productivity of business processes and improve employee participation and satisfaction (Lee, Kozar, & Larsen, 2003; Marler & Dulebohn, 2005). Although there is a precedent of career benefits when using MOOCs for education in a professional capacity, it is still difficult to determine which MOOCs will align closely with the needs of the food professionals and which elements lead to successful completion of the course. During the initial review of the market, it was clear that there are plentiful MOOC providers that provide entrepreneurship and innovation education. A selection of the most important MOOC providers can be found in Appendix G. It is important to consider the process of gaining user acceptance and adoption of the system in an initial stage of the design and implementation of an online learning programme. The study aims to see if identifying particular competences for food companies creates added value in this target group. The entrepreneurial competences need to make an impact on the employees' working methods in a food company to stimulate an entrepreneurial culture. For this, it is necessary to acquire a significant number of active users.

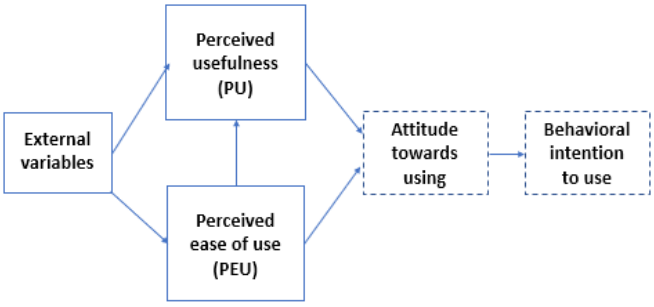

Figure 6 Technology Acceptance Model by Davis et al. (1989)

According to Davis, Bagozzi and Warshaw (1989), the way of using the technology and the acceptance of this delivery method determines whether the adoption of an information system will be successful. Davis et al. (1989) have proposed the Technology Acceptance Model (TAM) depicted in figure 6, adapted from a theory of reasoned action (TRA) (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), which has been used as the theoretical basis for many empirical studies of used technology acceptance (Davis et al., 1989; Khan et al., 2017; Marler & Dulebohn, 2005; Venkatesh & Davis, 2000). The TAM uses the perceived ease of use and perceived usefulness concepts to explain people's acceptance process when the technology emerges and is adopted.

Perceived usefulness

Perceived usefulness (PU) is defined as the subjective 'degree to which a person believes that using a particular system will enhance his or her job performance' (Davis et al., 1989; Davis, 1985). In MOOCs, the PU describes the extent to which the person believes that MOOCs can be a driving force towards achieving their learning goals (Wu & Chen, 2017). The construct of PU has been proven to influence the attitude of people towards MOOCs and is a direct determinant of continued usage

intentions (Yi Hsuan Lee, Hsieh, & Chen, 2013; Wu & Chen, 2017). Alraimi, Zo, and Ciganek (2015) also investigated this in an article that studied the MOOC continuance intention. The results of this study showed that there was a positive relationship between perceived usefulness and the intention to continue with a MOOC.

Perceived ease of use (PEU)

Perceived ease of use (PEU) is defined as: 'the degree to which a person believes that using a particular system will be free of physical and mental effort.' In the case of MOOCs, this is also interpreted as the extent to which a person believes that using MOOCs will be free of effort (Wu & Chen, 2017). In the TAM model, the PEU affects PU and both variables influence the acceptance intention (Joo et al., 2018). Although some have stated that these two constructs alone are not sufficient to explain the acceptance intention (Joo et al., 2018; Venkatesh, Morris, Davis, & Davis, 2003; Wu & Chen, 2017), the original TAM is a versatile and straightforward model to employ when examining people's intention to accept a new type of technology system (Joo et al., 2018). The TAM has been used in some studies focused on the acceptance of technology by students in educational institutions, the use of the TAM as a model to explain the use of e-learning systems by organisations has seldom been applied. There is a precedent that the TAM can be useful in predicting the users' acceptance of this type of system in the organisation. Lee, Hsieh and Chen (2013) have successfully used the TAM to test the relationship between perceived usefulness and perceived ease of use and the dependent variable of behavioural intention to implement. It was found that the model supports the view that TAM and its variables predict the employees' behavioural intention to use e-learning systems and can be useful in predicting the users' acceptance of this type of system in an organisation. In addition to the PU and PEU, Konradt, Christophersen and Schaeffer-Keulz (2006) noted that management support is a positive influence on the acceptance of computer technology programmes and it is suggested to have the organisation support of senior executives in the process of adopting e-learning research.

The TAM was the basis of the first line of questioning in this study to determine which factors contribute to the perceived usefulness and perceived ease of use of online entrepreneurial competence development.

3.4 Employee motivations for online learning

Learning in a workplace environment is radically different from learning at school or in a university. Resnick (1987) observed that one of the main differences between school learning and outside school activity is the level of individuality. The practices in school are often based on individual activities and testing, whereas outside school activities depend on the social context for their application. Work activities often require collaboration with colleagues, and the personal success of

an individual in a company often depends on the performance of other individuals (Tynjälä, 2008). Learning a standard curriculum can be helpful for some (limited) work tasks, but due to the continuous change in the work environment, set curricula may no longer be effective means of professional learning (Littlejohn & Margaryan, 2014). Instead, continuing professional education is an ongoing process.

MOOCs create the possibility of increasing competences anywhere and anytime, at the employees' own pace, mostly without cost and obligations and open up many opportunities for continued learning (Chang, 2015; Karnouskos, 2017). However, the course structure of a MOOC lacks the control and structure that is typically available in brick-and-mortar learning environments. Workplace learners need to decide when, where and how to engage in a course without stimulus from the company infrastructure, which is proven to be a challenge (Fontana et al., 2015). Many learners sign up for a MOOC to satisfy their curiosity and students often make a personal selection of the subset of the course containing the information most relevant to them (Anderson, 2013; Joo et al., 2018). The variations in employee motivations for enrolling in an online curriculum are due to the difference in course topics and the cultural background of students (Hood, Littlejohn, & Milligan, 2015; Macleod, Haywood, Woodgate, & Alkhatnai, 2015; Watted & Barak, 2018; Zhenghao et al., 2015). Recently, Watted and Barak (2018) categorized the primary motivating factors of MOOC completers into three themes: personal benefits, educational benefits, and career benefits. First, for personal benefits, fun and enjoyment are the primary reason for learning. The idea that the learner gains access to valuable educational resources that always were of interest to them but used to be challenging to pursue is their motivation for applying for a MOOC (Hood et al., 2015; Watted & Barak, 2018). Second, the learning is for educational benefits, academic gains and earning a certificate are a primary motivation. In this situation, the MOOC plays a crucial supplementary role to learners' current formal educational opportunities. Lastly, when the motivation is driven mostly by interest in learning knowledge and skills that are relevant to their current job or future employability, this is categorised as career benefits. Watted and Barak (2018) found that professional learners are primarily motivated by their own current needs which are often related to an extension of the career that they are pursuing. Career benefits are therefore an essential factor that needs to be investigated to be able to proclaim the relevance of an online learning curriculum for food professionals.

Career benefits motivation

Zhenghao et al. (2015) collected survey results from more than fifty thousand participants who completed a MOOC on Coursera, before September 2014. The primary motivation of over half of the learners that completed a MOOC were career benefits such as improving their current job or finding a new one. 87% of these MOOC completers reported a benefit of some kind, of which 33% were

categorised as tangible career benefits such as finding a new job, receiving a pay increase or promotion or even starting an own business. 85% of the MOOC completers reported intangible career benefits such as enhanced skills, improved candidacy for a new job or even changing to a new career. These results imply that although the completion rate of MOOC's is low, the participants who do complete their MOOC for career purposes do experience a benefit without completing testing.

Career benefits were also reported by participants in a survey commissioned by Class Central, an online MOOC provider, in 2017. Shah, Chung, Pickard, and de Winter (2017) surveyed over 2500 of Class Central's users. The surveyed users were not required to have registered for, paid for, or completed a MOOC to participate in the survey. The users were highly educated, with over seventy per cent owning at least a college degree. The learning of skills for their current career and new career motivated around fifty per cent of the respondents. Benefits received after following a MOOC mentioned by users included higher performance evaluation at a current job (28%), help with getting a new job in the same field (11%), help with getting a new job in a different field (10%) and promotion at current organization (6%) (Shah et al., 2017). These results show that higher educated employees can still benefit from continued learning for activities in the workplace.

Dillahunt, Ng, Fiesta, and Wang (2016) provide a deeper insight into learners that are motivated to take MOOCs for job-related reasons. They studied over 400 MOOC learners that took MOOCs that were related to their employment and also found that enhancing employability was a key reason for enrolling in a MOOC. Dillahunt et al. (2016) categorised 'desired career advancement' for MOOC learners into four types; Transitioning to a new field, looking to be promoted in current field/job, looking for new positions in current field/job and looking for a refresher course. The result of the survey was that the participants used MOOCs for employment primarily due to their easy to access resources, to improve skills in the current line of work, enhance credibility and to better understand operations of the existing workplace.

Although almost all participants very optimistic about the results, there were still some sceptics. Areas of improvement were mostly related to lack of credentialing with one interviewee quoted as saying 'You are not going to succeed in corporate America without an accredited degree' (Dillahunt et al., 2016). Another concern was the amount of time required to complete the MOOC assignments. Professional learners are incorporating this continued education alongside a busy life schedule, and some MOOCs may be too demanding especially with time management. These concerns will be questioned and validated during this study, and it will be considered if they are contributing factors to the acceptance of online learning in a corporate setting within the technology acceptance model.

3.5 Modelling framework and hypotheses

Based on all the information in the literature review, a conceptual framework was made to answer the research questions of this study. This model is derived from the two frameworks used in this study: Technology Acceptance Model and the EntreComp framework. The integrated conceptual framework for the start of this study is seen in figure 7.

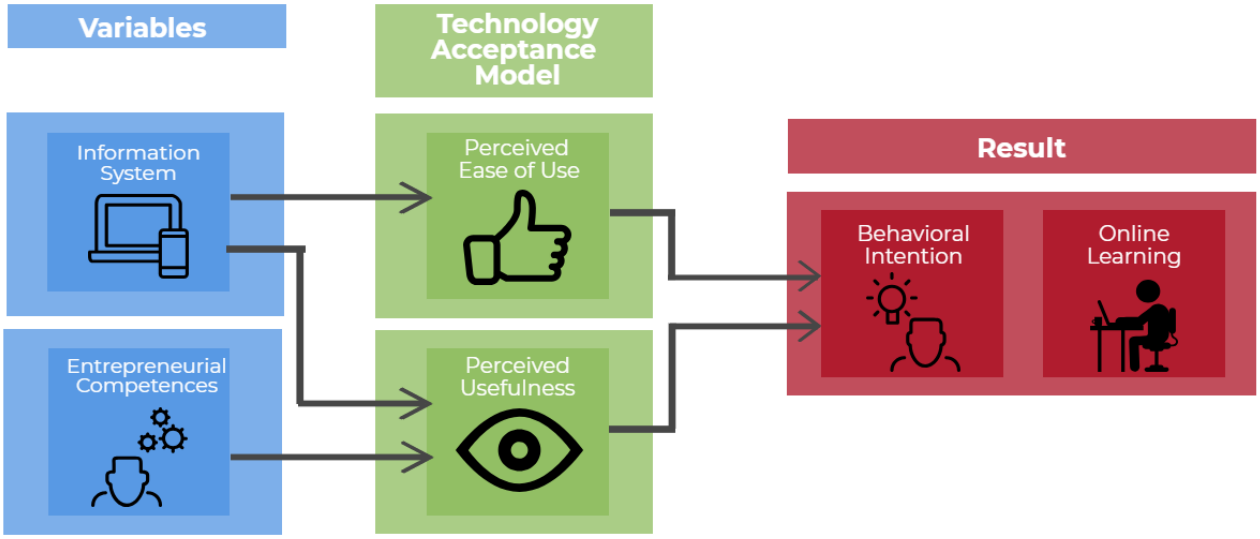

Figure 7 Integrated conceptual framework for the study

4 Results

Based on the methods of data collection and the research question, the results are divided into three domains for clarity. First, the results of the entrepreneurial culture will be presented. Second, the entrepreneurial competences that were discussed are described. Lastly, the results of the technological implications that are involved in developing competences online are presented. The overview of the results in the order that they will be discussed is shown in table 6. The text will use *italics* to highlight the categories of the entrepreneurial culture, and when **bold letters** are used this refers to the second order code, which are the overarching codes from literature and open coding.

Table 6 Overview of the domains of the results and the 2nd order codes used in the discussion of the results.

Domains	**2nd order Codes**
Influence of Entrepreneurial Culture	Definition of Entrepreneurship
	Organizational Support
	Current Innovation Model
Entrepreneurial Competences	Spotting Opportunities
	Creativity
	Vision
	Valuing Ideas
	Ethical and Sustainable thinking
	Self-awareness & Self-efficacy
	Motivation and Perseverance
	Mobilising Resources
	Financial and Economic Literacy
	Mobilising others
	Taking the initiative
	Planning & Management
	Coping with uncertainty, ambiguity and risk
	Working with others
	Learning through experience
Information Technology Structure	Perceived Ease of Use
	Perceived Usefulness

4.1 Influence of the entrepreneurial culture

This section describes the entrepreneurial behaviour that the interviews reported on and uses this to compare cases. Appendix E presents a full overview of all second order codes. The concept of

entrepreneurial culture was fund through open coding and divided into three second order codes: **definition of entrepreneurship and innovation, organisational support and innovation model.**

4.1.1 Definition of entrepreneurship and innovation

All companies have a different view on the importance and definition of entrepreneurship and innovation. It is important to adequately address which definitions are true to the company to categorise the competences correctly. KraftHeinz even addressed the difference between broad and narrow entrepreneurship when discussing the possibilities of developing entrepreneurial competences:

'' Is it about entrepreneurial thinking or really about creating new ideas, process or I don't even know what, because that's where you start making the distinction''[1] – COR2, KraftHeinz

Unilever sees entrepreneurship as a tool that ''*leads to more innovation power of a different way of innovating*'' (Interview, 09-07-2018). GreenFood50 and smaller companies that filled out the BoostEdu survey were interested in the narrow entrepreneurial competences that make up the process of starting and managing a business with limited resources. Whereas larger companies, such as KraftHeinz and Unilever are interested in the broad skills such as the entrepreneurial mindset and enforcing an entrepreneurial culture. KraftHeinz often addresses the *awareness* of this difference between broad and narrow entrepreneurship during the co-creation workshop:

'' if you're targeting an entrepreneur, if I would be the entrepreneur I would want to know how to raise money, I would want to know how to create a BMC for example. But if I were in a big company I want to learn the mindset, I think generally for example, stakeholder management, leadership, strategy, value creation. So, I think it's like completely different things that people would be interested in." – COR1, KraftHeinz

The results of the **definition of entrepreneurship** are directly related to the entrepreneurial competences that are most likely to be addressed in the curriculum. Start-ups and smaller companies commonly have a *narrow view of entrepreneurship* and larger companies such as Unilever and KraftHeinz are interested in the *broad view of entrepreneurship.*

4.1.2 Organizational support

Organizational support was one of the first second order concepts that emerged from the data that did not align with either theoretical framework. It was an essential motivator for the entrepreneurial behaviour of employees according to KraftHeinz and Unilever. Aside from corporate messages about

[1] Is het om learning van entrepreneurial thinking of echt om creeren van nieuwe ideeen processen of weet ik veel wat, want dat is eigenlijk waar je de knip gaat maken.

innovation, little is known about how these large companies invest in the personal development of entrepreneurial competences. They do not often *share curriculum* details or the content of their training programmes due to company secrecy. KraftHeinz also indicated that they were not often asked about the content of their training programmes. This is why it was investigated by questioning how the companies *support entrepreneurship.* During the co-creation workshop and interviews, different forms of support emerged. KraftHeinz mostly sees a programme to promote entrepreneurship as an addition to the internal motivation of the employee:

''*Just from an HR perspective of past 1.5 months what I have observed, if an employee came up to their manager to say I have taken my own time doing this thing and you know, it's not going to impact my regular task but it proves a drive in that they want to innovate and that they want to learn more things and that's something that is very positively perceived.*'' – COR1, KraftHeinz

Unilever is the only company that takes additional measures, by not only acknowledging the need and importance of entrepreneurial behaviour but also actively creating a workplace in which this is pursued. They have currently have working group which is a seed for an intended larger cultural change:

''*We have a working group, or actually more like a movement, that started lean like start-up, so we have developed several types of tools for that. There is an app group for that and a teamsite, in which the tools are shared. So, this is more in the area of tools like, how do you do a Business Model Canvas, how do you write a good hypothesis. So yeah, that's where that is*[2]'' – Unilever, Interview 09-07-2018

Both KraftHeinz and Unilever are actively trying to create a workplace that supports entrepreneurial behaviour. Unilever takes a more active approach in this and KraftHeinz is focused more passively on positive enforcement of entrepreneurial behaviour that already comes from the employee. Both companies acknowledge that much *external motivation* is needed to make employees actively participate in their current learning programmes. Even though pathways can be made mandatory, often it remains challenging to motivate people to complete the training and follow-up by HR is often needed.

'' *similar topics like this, for example, if it is required for a group of employees or managers, it will be assigned on that platform to the employee. And it actually does, is a chunk of work to make sure people complete them'' – COR1, KraftHeinz*

[2] we hebben een werkgroep, of eigenlijk meer een beweging, die lean like start up nu heeft gelanceerd, dus daar hebben we ook vershcillende tools ook voor ontwikkeld, daar is ook gewoon. Daar is een app groep voor, daar is een teamsite, waarin de verschillende tools gedeeld worden, dus dat zit meer op het gebied van tools zoals bijvoorbeeld BMC en hoe ga je, hoe schrijf je een goede hypothese etc. dus daar zit dat in

'' *sometimes trainings are just mandatory. Sometimes it foundational for everyone, we want everyone to do it, and then there's a follow-up by us if it is not done in time*.'' – COR2, KraftHeinz

A reason that might contribute to these difficulties in motivating employees is time. According to the informant, entrepreneurial competence development has to be in your own *time for personal development*:

''It is expected quite a lot that an individual employee finds the time themselves to invest in his or her development[3]*''-Unilever, Interview 09-07-2018*

''If you have some specific trainings that you want for your personal development, most of the time you are also expected to do this at home at your own hours'' –COR2, KraftHeinz

The smaller companies such as GreenFood50 did not give much organisational support for entrepreneurial behaviour. GreenFood50 for example is primarily concerned with innovating on their product knowledge and client base expansion and does not make a distinction between normal workplace behaviour and entrepreneurial behaviour. There is no dedicated department or resources to support learning in this company as the scale is a lot smaller.

4.1.3 Outdated innovation model

The **outdated innovation model** also outlined the motivation for KraftHeinz and Unilever for participating in this study. The companies often mentioned that the current innovation model does not fit the evolving goals and working environment of the companies. Exploring an entrepreneurial competence development programme has become more of a priority because the current innovation model is not future proof. Large food companies are not quick to bring new products to market and want to be able to compete with start-ups that are smaller and faster. Unilever mentions this as a primary reason for interest in entrepreneurship:

'' *The current world changes so much quicker than it did a couple of years ago that our current innovation model actually does not connect to the fast changes*[4]*'' – Unilever, Interview 09-07-2018*

'' *the only thing that I can say is what I see when you look at the big companies, the big multinationals, they tend also within the R&D organization to structure very much. So were very structured in the way we work, we have all kind of checks, all kind of, you have an innovation flow with all kinds of staging gates etcetera and you're so strict and you tend to follow that process that*

[3] het wordt best wel veel verwacht van een individuele medewerker om zelf tijd te vinden om te investeren in zijn of haar ontwikkeling.

[4] de huidige wereld verandert zoveel sneller dan een aantal jaren geleden, dat ons innovatiemodel eigenlijk niet meer voldoende aansluit bij de snelle veranderingen.

you stop looking outside and that's the way that we miss in the bigger companies I think. (…) We don't want to lose that process completely but still want to be open and innovative and entrepreneurial.'' – COR2, KraftHeinz

This strict innovation process is largely connected to the *scale* of the company. Unilever says that they are already extremely skilled at scaling any product, but a focus on scale limits situations in which you can still be experimental:

''Entrepreneurial is one part, and the other part is that we want to give the people the tools to experiment. Just go and experiment, don't do stuff big immediately, but start small and see if it works[5]*''* – Unilever, Interview 09-07-2018

Greenfood50 has a very different innovation model, because of the size and the structure of the company. The small team is mostly specialised in the specific context of their product enhancement. The current product is constantly examined for new potential applications and processes according to the needs of the customer:

''Because [our product] is new, doesn't exist yet, we also have new products. So, we're always (…) looking for new routes, also looking for what are the most interesting applications and then make it. When you're settled at some point, and larger, then it's a different situation, but we are definitely not in that yet[6]*'' – GreenFood50, Interview 05-07-2018*

As the GreenFood50 addresses, innovation is different between a start-up and an established multinational. This is largely contributed to by the *scale* of the company. KraftHeinz and Unilever both mention that there are drawbacks to their *scale*. Company departments are segregated and often only minimally communicate with each other. The internal bias for company segregation was implicitly shown by KraftHeinz during the co-creation workshop. In the workshop an informant asserted that the curriculum was only being discussed for R&D right now and not for sales and marketing even though the majority of the employees work in these areas. Unilever experiences this division between company departments as a direct limitation to entrepreneurial behaviour:

''The other problem is that because of that efficiency our organisation is organized in silo's, so each person only does one small piece of the puzzle. If you really want to work as an entrepreneur, it also

[5] Entrepreneurial is een ding en het andere ding is dat we mensen echt, de handvaten die we geven ook doen experimenteren. Ga nou gewoon experimenteren, ga niet meteen in groots doen, maar begin gewoon klein en kijk of het werkt.

[6] omdat het nieuw is, bestaat nog niet, hebben we ook nieuwe producten. Dus we zijn iedere keer weer, is het, ja is het nieuwe routes zoeken, ook zoeken wat zijn de meest interessante toepassingen en dus dan maakt. Als je helemaal op een gegeven moment gesettled bent en groter, dan kom je in een ander vaarwater, maar geod daar zitten we dus nog zeker niet in.

means that you will need to do something that is outside of your job description sometimes to get things done[7]*''-Unilever Interview*

Unilever was also the only company to address the possible implications of the *success* of innovation. The informant described that their primary goal is to develop entrepreneurial competences for employees. It was not as important that this new knowledge immediately leads to a successful concrete product in the market. There is a stigma around success, and this induces fear in the employees that all ideas must lead to success even though this is not the case:

''We will need a cultural change for this. Within a technical working environment in the Netherlands, it already is difficult to talk about your successes. Cut out that nonsense people say. So, celebrating successes already is an issue, but being open about what has failed is often much more difficult[8]*'' – Unilever Interview*

The informants that discussed the entrepreneurial culture have a significant stake in the learning directives of the company. Based on the case description and the results of interviews, the companies that were interviewed were plotted against their size and current entrepreneurial activities which can be seen in figure 8.

Figure 8 Current entrepreneurial culture of the company versus the size of the company (based on net worth)

[7] Het andere probleem is dat we door of vanwege die efficientie, onze organisatie dusdanig in silos hebben ingericht dat iedereen maar een heel klein stukje van de puzzel doet. En als je echt als een entrepreneur wil gaan werken betekent het ook dat je soms even buiten je eigen functie omschrijving iets zal moeten gaan doen, en iets voor elkaar te krijgen.

[8] Daar hebben we nog wel een cultuurverandering nodig. (…) In Nederland binnen een technische werkomgeving uberhaupt, is het al lastig om te praten over je successen, dat doe je eigenlijk al niet. Doe eens normaal zeg je dan, successen vieren is al een dingetje. Maar heel openlijk zijn over wat gefaald is, is nog vaak veel lastiger.

4.2 Entrepreneurial competences

This section aims to identify what entrepreneurial competences are most valued by companies. The origin of these results is further described in this section based on the data of the interviews, surveys and co-creation workshops. The second order coding is the competences that are listed in the EntreComp model and will be used as the theoretical lens for the data. Each competence is **bold** and the categories that belong to the competence are shown in *italics*. Table 7 shows an overview of the results of this chapter, in which the essential competences for each company are listed.

Table 7 Overview of entrepreneurial competences that are important for employee development. A minimum of 5 competences and a maximum of 10 competences were chosen for each company based on the results of the survey and the interviews and co-creation workshop.

	Kraft	Unilever	Greenfood50	Yara Sluiskil
Spotting Opportunities	√	√		
Creativity				√
Vision	√	√	√	√
Valuing Ideas			√	
Ethical and Sustainable thinking	√			
Self-awareness and self-efficacy		√		
Motivation and Perseverance	√			√
Mobilising Resources			√	
Financial and Economic Literacy	√		√	√
Mobilising others	√	√	√	√
Taking the initiative	√			√
Planning and management	√		√	√
Coping with uncertainty, ambiguity and risk	√	√		
Working with others	√	√		√
Learning through experience	√	√		

4.2.1 Ideas and Opportunities

In the surveys, spotting opportunities was one of the highest rated skills deemed necessary for an entrepreneur. KraftHeinz even rated it the most important competence related to ideas and opportunities. In a start-up the distance to the market is small, and the identification of *customer needs* can be done by direct exchanges with the customers. In an established larger company, the distance between an employee in the market and the number of customers is much greater. R&D

departments of large companies such as KraftHeinz and Unilever therefore often innovate on an assumption of a customer need which leads sometimes leads to incorrectly **spotting opportunities**:

''Due to too much innovation pressure we didn't take enough time to understand the demand or the problem well, so from our passion and our crazy professor idea of 'I have a good idea, and I know all consumers are waiting for this', type of arrogance, we started developing something that nobody is waiting for[9].'' – Unilever, Interview 09-07-2018

Inhibition through risk also plays a significant role in the process of spotting opportunities for large companies. Employees in are trained to assess new ventures by their calculated risks rather than seeking out opportunities:

''for a lot of people with an engineering background (…) I think it's not likely their going to have a start-up and they know that. That would really involve a lot of risk taking, profiling them that's just not who they are.'' – COR1, KraftHeinz

''We're actually very risk averse. You see that in the culture where people talk about 'these are the risks' and what they don't say is: 'these are the opportunities'[10]'' – Unilever, Interview 09-07-2018

Risks are part of an entrepreneurial mindset but are perceived as dangerous by large companies as they can lead to delays and changes in projects. Delays are a problem for companies such as Unilever where delivering *on time and in full* was an integral part of the innovation model. Delivering the product on time and in full often blinds the employee to consider whether the product still answers the demand. Employees that are just starting in a company are often not influenced by the corporate culture yet. They still have the skills to create ideas with inhibited **creativity**. By experimenting and *exploring* new knowledge, they do not limit themselves. More mature employees are often less strong in creative thinking but have more experience and knowledge of the products and are better at *creating value.* KraftHeinz reflects both are important to have to make a product that a customer perceives as valuable:

'' Those personal developments, those skills, people that just come from school they still need to develop it. They're not the strongest in this, but most of the time they have the wildest and the best

[9] vanuit te grote innovatie druk, hebben we onvoldoende lang stil gestaan om de vraag goed te begrijpen of het probleem goed te begrijpen. Dus zijn we gewoon vanuit onze eigen passie en onze verstrooide professor idee van ik heb een goed idee, en ik weet dat elke consument hierop zit te wachten, soort van arrogantie daarin, zijn we iets gaan ontwikkelen waar helemaal niemand op zit te wachten.

[10] wij zijn eigenlijk heel risk averse. Dat zie je ook in die cultuur waar we, waar mensen praten ''dit zijn de risico's'' en wat ze dus niet zeggen is, dit zijn de opportunities.

ideas. And if you're longer in a company or a little older then you tend to look more [mimics tunnel], and then you develop the other skills.'' – COR2, KraftHeinz

In informal conversations, an informant from Yara Sluiskil said they would like a structural way of creative thinking for the continuous problem-solving in their work projects. This was reflected in the answers to the survey, in which they would include this competence in entrepreneurial learning.

Vision is another critical competence. Many companies implicitly refer to vision in combination with other entrepreneurial competences. Unilever mentions that the specific combination of spotting opportunities and creating a compelling vision is valuable to translate ideas into action. The use of vision as an entrepreneurial competence is less needed in the smaller companies where the product portfolio is smaller and the vision is already embedded in the product of the company.

When an idea develops further, it is necessary to be able to **value the idea** and judge what the social, economic and cultural potential of the idea is. The start-ups indicate they would like to develop this competence further and closely link it to economic and financial literacy. GreenFood50 even indicates that it would be nice to have a *qualitative methodology* for the in-house assessment of market needs instead of buying expensive information from marketing companies. Large companies already have these skills in different departments of the company and are focused more on working together to exchange this knowledge among employees.

Assessing the consequences and impacts of an idea or opportunity is a part of **ethical and sustainable thinking**. All companies that have been interviewed already take steps to incorporate *sustainable thinking* in all aspects of their work. GreenFood50 was started from an idea whose aim it was to help the environment and the people with healthy, sustainable food. The large companies do this on a company-wide basis. Unilever uses their Sustainable Living Plan (USLP), and KraftHeinz has their Corporate Social Responsibility (CSR) plan that focuses on hitting specific targets from the UN sustainable development goals by 2020. All new ideas need to be in line with company policy to be further produced. An informant from KraftHeinz noted that this focus is not present worldwide yet:

'' Coming into Europe after work and live in Asia and North America there's not as big as a focus on sustainability. You go to any convention; all business is like ''sustainable'' or have a sustainable focus on sustainability which is such a refreshing thing for me to see'' – COR1, KraftHeinz

For large and small companies, ethical and sustainable thinking is deemed important for a successful entrepreneur, but not all companies agree that it needs to be included in entrepreneurial learning as they already possess this skill.

4.2.2 Resources

In this section, the focus is mainly on the personal resources of an entrepreneur. **Self-awareness and self-efficacy** are *skills* that employees find important to promote entrepreneurial capabilities. Employees need to trust their ability to create value and be able to compensate for weaknesses by further developing their strengths and teaming up with others. In the survey both the informant from Yara and KraftHeinz rates self-awareness and self-efficacy highly important, indicating it is essential for a successful entrepreneur. Only Unilever however, chooses to include this in entrepreneurial learning for their employees. Unilever wants to strengthen these skills to change the mindset of the employees to encourage them to use the entrepreneurial capabilities that they already possess.

Despite setbacks, it is essential to have **motivation and perseverance** to stay focused when turning an idea into action. An entrepreneurial employee needs to be resilient under pressure, adversity and temporary failure. The informant from Unilever recalled an interesting moment during their training for the transformation of the company that illustrates that this does not come naturally to everyone:

> *''During the Wageningen immersion programme, someone was speaking who had had several start-ups. Quite a lot of these start-ups has failed, and then someone asked, they said: Why do you even continue? and the man couldn't understand that question, he thought 'of course I am going to continue, this is my life and failing is part of the innovation'[11]'' – Unilever, Interview 09-07-2018*

These types of situations are commonplace when innovation and entrepreneurship competences are applied. One reason this is so difficult to manage in large companies is the *fear of failure* among the employees. Employees are 'brainwashed into believing innovation must lead to success' (Unilever, 09072018) and then they are afraid to make mistakes. In a start-up, the competences are more present as building a company often is a long-term goal and one needs to be patient and resilient to achieve it.

Mobilising resources is a competence that combined with **financial and economic literacy** divides the established companies and start-ups based on skills. Large companies value the necessity of developing these skills lower than start-ups. This can be attributed to the size of companies. In a large company, the focus is on being able to identify the *right competences* needed to develop an idea. KraftHeinz mentioned that it is important for new employees that do not possess the skills to

[11] tijdens wageningen immersion programma, er kwam iemand aan het woord die had een aantal start ups al gehad. Daar waren er best wel veel van gefaald en toen vroeg iemand ook, die zei waarom ga je er nog uberhaupt meer door? En die man kon die vraag niet plaatsen, die dacht, natuurlijk ga ik er mee door, dit is mijn leven en dat falen is onderdeel van innoveren

turn a good idea into a value-adding process to find someone with the right competences to help make their idea possible. Start-ups are more focused on finding resources outside of the company. As they often operate on *limited resources*, they need to make the most of materials and non-material resources to be successful. GreenFood50, for example, has joined a network that helps them to turn their ideas into action:

''We spend quite a lot of time to try and be on company fairs, but the most interesting fairs are very expensive, so then you look for ways to be on these fairs and you start working with FoodvalleyNL, because they're able to bring five or ten companies together, and then it becomes affordable if every company contributes[12]'' – GreenFood50, Interview 05-07-2018

For large companies, the importance is mobilising in-house resources and for start-ups and smaller companies the focus is on networking to make the most of limited resources. The in-house versus outside knowledge also is important in **financial and economic literacy**. Larger companies do acknowledge the importance of this competence for successful entrepreneurship but have mostly *no interest* in further developing this competence in their employees as they already have it. The informants from start-ups, on the other hand, find this very important to develop as an employee. Especially literacy in the *market research* can contribute to judging the economic viability of new ideas. GreenFood50 mentions that 'market research is expensive' and that all they want to know about the market is 'that is big, and it grows, not the exact number'. Development of this competence will be used to plan for the financial sustainability of their value creation activities.

To sell an idea, it is vital that employees can **mobilise others** and communicate their ideas clearly. This competence sparked enthusiasm in every participant in the interviews. To Unilever, being able to convey an *inspiring vision* was important to help people connect to the idea to make it a success. GreenFood50 was mostly interested in optimising *client communication* to effectively convey the product and inspire and enthuse them for the idea.

''Because these are young companies that do not exist for a long time, people have no idea what you're doing, and you keep noticing that (…) because you can tell them three times and people still won't listen (…) but if you present it in a certain way, it sticks with them. (…) usually they just don't

[12] we besteden er best wel veel tijd aan om dat voor elkaar te krijgen om op beurzen te zijn. Maar dat is, maar de meest interessante beurzen zijn heel kostbaar, dus dan ga je routes zoeken om op zon beurs te kunnen komen want dan ga je schakelen met foodvalleyNL want die kunnen dat weer een soort die kunnen ook als je 5 of 10 van die bedirjven bij elkaar brengen dan kan het op een gegeven moment dat wel uit, en dan als ieder bedrijf bijdraagt.

know the product and that leads to a lot of missed chances, because they say, yeah that would be interesting for us, but if they don't know…[13]'' – GreenFood50, Interview 05-07-2018 05-07-2018

One way to be able to communicate clearly is by learning *pitching* skills. Being able to clearly and concisely communicate the goals or idea is very important for any setting. GreenFood50 said that presentations for clients are important, but rarely well prepared because the person who is going to present if often chosen last-minute. Unilever also says that even when there is time to prepare, often the presentation skills of people are outdated:

''we're still really from the PowerPoint generation and we will need to find other methods to be able to mobilise a group behind your ideas and take the space to do that[14]'' – Unilever, Interview 09-07-2018

In the surveys and all interviews, the ability to mobilise others is one of the most essential competences that they would like to develop within companies.

4.2.3 Into action

Companies such as KraftHeinz want the entrepreneurial spirit of the company to be pursued by the employee themselves. They want employees to **take the initiative** and work independently to achieve goals, stick to intentions and carry out planned tasks. In start-ups, there are fewer employees, and there is less need to further develop this competence as every employee needs to take the initiative to keep the company running. Taking initiative was not a priority for any of the start-ups in the surveys or interviews.

Planning and management were not discussed much by any of the participants in the study. During the co-creation workshop, one of the informants (CON1) indicated that these skills are taught in their leadership training programme, but that it needs to be linked to translating the strategy into action to be useful. KraftHeinz and Yara Sluiskil, only indicated in the follow-up survey that they thought this is a skill that needs to be addressed in entrepreneurial learning for employees. The only company that directly addressed that they had *no interest* in working on these skills was Unilever:

''*Planning, organising… well that can definitely be less at times[15]''* – Unilever, Interview 09-07-2018

[13] omdat het jonge bedirjven zijn en niet zo lang bestaan, dus mensen hebben geen idee wat ze doen en je merkt het iedere keer weer (…) want je kunt het drie keer zeggen en hebben mensen het soms nog niet door. Maar als je het dan zo laat zien (…) dan landt dat. Vaak is het gewoon onebekend, en daardoor een hele hoop gemiste kansen, want zij zeggen jaja, dat zou dan voor ons ook interessant kunnen zijn. Maar goed als ze dat niet weten, dan ja.

[14] wij zijn echt van die powerpoint generaties, en we zullen andere methodes moeten gaan vinden om inderdaad zon groep te mobilseren achter je ideen en daar de ruimte voor pakken

[15] Planning, organizing, nou dat mag zeker wel wat minder soms

Both Unilever and KraftHeinz do see that emphasising planning and management too much also limits an employees' ability to **cope with uncertainty, ambiguity and risk.** The structure of the innovation process *restricts vision* on the big picture as it is in place to minimise the risks:

'' were very structured in the way we work, we have all kind of checks, all kind of, you have an innovation flow with all kinds of staging gates etcetera and you're so strict and you're so tend to follow that process that you stop looking outside and that's the way that we miss in the bigger companies I think. And that's what we're looking for, how can we start doing that again?'' – COR2, KraftHeinz

To let go of the structure that is in place to minimises risk, Unilever says that large companies need to let go of the idea that ambiguity is inadequate and ineffective. Large companies need to be able to make decisions even when there are no clear results, and there is *unknown data.*

''we have the most amazing PowerPoint presentations at the start of the project, but they're actually full of assumptions which we present as facts, and I think that leads to a loss of innovation power. You can be a lot clearer about the areas that are unknown and say: 'we don't actually know this, but we are taking consciously going for it, without completely knowing every detail. We see an opportunity and we're going for it'. '' – Unilever, Interview 09-07-2018

However, this is difficult as not all stakeholders are ready for such uncertainty from a large company. The assumption is that an idea is only good when there is clarity, and every aspect can be described:

''It used to be that if you were in gatekeeping meetings and something was asked and you didn't know the answer, they would say: ''Go back to the lab nd come back in a month', so to speak'' – Unilever, Interview 09-07-2018

This mindset is still embedded in the company culture in many corporate pieces of training. Often project management training mainly consists of *risk management* including risk assessments and risk management plans. To become entrepreneurial employees, need to learn how to let go of all the risks and start managing uncertainties and ambiguities as something that can also be an opportunity.

Many competences need to be developed by **learning through experience.** All companies agreed that the competences need to be applied *on-the-job* and that not everything can be learned in an online module. In a start-up this is part of all activities, as the company is continuously learning how to optimise its processes:

''When you're still in the phase that you're working with a smaller team, literally in one space, then everyone picks it up. (…) these are of course employees that like this type of environment otherwise

they would go to a big company. (…) For us learning is continuous, in real-life, because [the field] is so dynamic[16]'' – GreenFood50, Interview 05-07-2018 05-07-2018

However, learning on the job is not exclusive to start-ups. Unilever makes sure that most learning is done on the job, and only a small per cent is by referring employees to an online learning module. They abide by a 70-20-10 system in which 70% of learning is on-the-job, 20% is by guided mentoring, and only 10% is online on an individual basis. In this system, and in other companies a crucial part of learning is **working with others.** The way that companies want to develop these skills is closely related to the design of online learning, and the results of this will be discussed in the next chapter.

4.3 Online development of entrepreneurial activities

The previous sections established that the entrepreneurial culture and the interest in certain elements of entrepreneurial behaviour are closely related. From this research's perspective, the implementation of this data in an online curriculum is important to answer the 'how' question of entrepreneurial competences. This section addresses the third research question which brings together the 'what' for the entrepreneurial competences with the 'how' of online education. The two variables, perceived ease of use and perceived usefulness from the TAM, model were used as second-order coding. All the categories that will be discussed are highlighted in *italics.*

4.3.1 Perceived ease of use

Current online training is a part of the perceived ease of use as it can help identify how the current training works and how a new online competence development programme should be implemented. Large companies already incorporate online learning in their day-to-day activities. Unilever has an app in which you can select what you are interested in and then study it on the go:

''We have a, HR did a good job with this, a really nice programme for this, it's called mylearning via the app (…) which is really cool. [In the app] you can just put in that you're looking for entrepreneurship (…) and then you get a weekly pathway (…) and we've already applied this quite a lot, so real classroom learning doesn't happen much anymore[17]'' -Unilever, Interview 09-07-2018

KraftHeinz also has their own centrally managed platform for foundational and behaviour training. Only the start-ups did not have their own online training programmes but does make use of training

[16] Zolang je nog in die fase zit dat je nog met een kleiner team, letterlijk in een ruimte zit ja krijgt iedereen het mee (…)per definitie zijn het dan mensen die zon omgeving aanspreekt anders zouden ze wel nar een groot bedrijf gaan. Voor ons is leren eigenlijk continue in real life, omdat het ook dynamisch is.

[17] daar hebben we ook… dat heeft HR goed gedaan, een heel mooi programma voor, dat heet mylearning, via de app (…) dat is echt wel gaaf, daar kan je gewoon, daar kan je ook aanmerken al van ik ben op zoek naar entrepreneurship (…) en dan kan je gewoon zeggen ik wil hier [van leren] en dan krijg je wekelijks een soort pathway. Dat hebben we al redelijk ver doorgevoerd, dus het echte classroom learning is er eigenlijk niet meer bij.

videos supplied by manufacturers of companies in the cloud. Start-ups still rely more on *offline training* such as on-the-job learning and manuals that describe the processes:

''We also developed a quality manual, where [employees] can read how to do certain things step-by-step, for example: send a sample to a client; what is involved with this and how do you do it (…) but those are also the quality procedures[18]'' – GreenFood50, Interview 05-07-2018 05-07-2018

GreenFood50 said that an ICT structure is needed when the company starts to grow, but that it is not the case yet. For the development of entrepreneurial competences in employees, it is important that the learning programmes can easily be *integrated with their current learning* programmes. As the ICT structure does not yet exist in many start-ups, GreenFood50 specifies that it needs to be easily available and the topics should be presented in a short, modular fashion which is easily accessible. The companies with an established ICT structure are mainly interested in integration with their current ICT structure but see no problem in collaborating to find an optimal way to provide this to their employees:

''We already know how to collaborate with our existing platform (…) if it is not something we can incorporate into our core learning platform, is it something that the company can promote on your behalf or something that we can collaborate on outside of our platform? (…) If it is like exactly the same it is something we can absorb, if it is similar it is something we probably want to do ourselves'' – COR2, KraftHeinz

Time for online training is crucial for the ease of use. Most general training is done during working hours, and it is hard for an employee to free up working times to complete these training. The informant from GreenFood50 has worked in a large pharmaceutical company for many years before starting in a startup and commented that ''if you need to sit down for 1 – 1.5 hour within a certain time span it becomes a compulsory training'' and this is counterproductive to the personal development of the employee. The companies are interested in shorter modules, with blended learning elements and gamification to motivate their employees to learn these competences. The platform should present a *structured overview,* so it can easily be used as reference work. In large companies, an online curriculum is intended to help employees take the first step into entrepreneurship and not be overwhelmed by the amount of knowledge.

[18] we hebben ook een quality manual ontwikkeld, daar kunnen ze ook lezen van hoe doe je de verschillende dingen, ook stapsgewijs bijvoorbeeld verstuur een sample naar een klant, wat komt er allemaal bij kijken van hoe pak je dat aan en zo heb je verschillende onderwerpen, dat zijn dan ook meteen de kwaliteitsprocedures

4.3.2 Perceived usefulness

This section focusses on specific elements of the technology of online learning that should be implemented to increase the perceived usefulness for companies.

Companies all agree that there is already a lot of *existing information* on entrepreneurship and innovation. Start-ups receive information from startlife and starthub and use online sources to inform themselves. The strength of the usefulness is the specificity for the food companies, and that the information is from a reputable source that provides good quality. Their *vision for the use* of online learning for entrepreneurial competence development is that it is a toolbox, or guidebook to help employees pursue an idea:

''It would be very nice if in this way with a couple of modules they have some means, like how can they approach things differently, how can they let go what they've learned all these years and make room to learn something new, so I think that is the use of something like this[19]'' – Unilever, Interview 09-07-2018

One of the primary interests which were mentioned many times by both Unilever and KraftHeinz was the use of a *team for motivation*. The use of a network or team of peers is necessary according to the informants to be able to develop entrepreneurial competences. Unilever felt like entrepreneurship is difficult to learn individually and online and sees the online learning as a tool to work together in teams. Tools that *extend the online environment* are desired. Examples can be; endorsing peers on LinkedIn, extending the online curriculum to inhouse training, extending knowledge on the topics and even going outside food-based companies. It is key that you can work with others to develop the entrepreneurial mindset on a personal level and an entrepreneurial culture in the company:

'' The real mindset change is difficult to do one-on-one (…) you could use certain tools and then work with them in a team because that's how you can create that empowerment[20]'' – Unilever, Interview 09-07-2018

Another important factor that was mentioned that there should be no *standardised testing* for the participants of online learning. Instead of working to earn a certificate on the achieved knowledge, the results should be more practical. KraftHeinz notes that short online learning modules for personal development make employees very flexible with their timing. They assert there needs to be some form of pressure for example with implicit accountability from a network that drives the

[19] heel fijn is als zij op deze manier toch met een aantal modules gewoon wat handvatten krijgen, van hoe zouden ze dingen nu op een andere manier kunnen aanpakken, hoe kunnen ze nou eigenlijk loslaten wat ze al die jaren hebben geleerd en juist ruimte maken om iets anders te gaan leren dus daar denk ik dat het goed voor is.

[20] echt mindset verandering is ook lastig om één op één te doen, dus daar zou ik dan toch nog. Daar zou je met bepaalde tools misschien toch in teams mee aan de slag willen gaan omdat je dan ook die empowerment, voor elkaar kan krijgen.

employee to finish certain modules. Unilever agrees that there should be no diploma at the end to prove that the module was successful, but instead the community should provide feedback for the entrepreneurial capabilities:

'' What I like about this (…) is that it is a type of practical guidebook. You can start with pitching your idea, go and do that and learn from that and connect with each other, so I think it is good to build that community around it which functions as a test on what works and what doesn't[21].'' - Unilever, Interview 09-07-2018

Unilever also brings up that although ideally, everyone would participate in developing his or her entrepreneurial skills, it will *not be useful for everyone*. People who are interested in entrepreneurial competences pursue the further development themselves. GreenFood50 even mentions that entrepreneurial learning only becomes more relevant when the company grows and segregates in sales and R&D, so the distance between the customer and the employee becomes bigger.

''When I look at the entire Unilever R&D population, there's also people that say: 'I just want to come in in the morning, do my experiments at the lab and then go home at five. I am not waiting for something like this.' I think this is fine too because we also need people like this. So, it does not need to be for everyone, and I also wouldn't want to test it[22].'' – Unilever, Interview 09-07-2018s

Each company has different *individual demands* depending on the type of employees that works there. A start-up such as GreenFood50 does not think that it is possible to address the needs of a small company by creating a tool that is meant for broader use. Larger companies such as Greenfood50 and Unilever, see an online tool as a useful addition to the personal development of entrepreneurial competences of employees.

4.4 Model of the relation between entrepreneurial competences and perceived usefulness and ease of use

Based on the results, the theoretical framework was adjusted. The entrepreneurial competences of the EntreComp model were included and it was identified which competences are relevant for which stakeholder (large or small companies). Categories were defined to answer the research question on how the competences can be optimally developed in an online curriculum. This was included under

[21] wat ik leuk vind (…) is dat het toch een beetje een praktische handleiding is. Dat je begint met pitching your idea, ga dat dan maar doen en ga daar maar van leren en kom met elkaar in contact, dus het is denk ik goed om die community eromheen te bouwen waar mensen elkaar, een toets van dit werkte wel en dit werkte niet

[22] Als ik kijk naar de hele Unilever R&D populatie, daar zitten ook mensen bij die zeggen ik wil s ochtends gewoon binnenkomen, ik wil gewoon mijn experimenten doen op het lab en ik wil om 5 uur naar huis. Ik zit hier niet op te wachten om dit. Dat vind ik ook prima, die mensen hebben we ook nodig. Dus het is, dus het hoeft niet voor iedereen te zijn en ik zou het ook niet willen toetsen.''

technological implications of entrepreneurial competence development. Lastly, the additional category of entrepreneurial culture that was identified by open coding was added to the model. The complete model with all the second order codes for entrepreneurial competences and categories identified in technological implications and entrepreneurial culture can be found in figure 9.

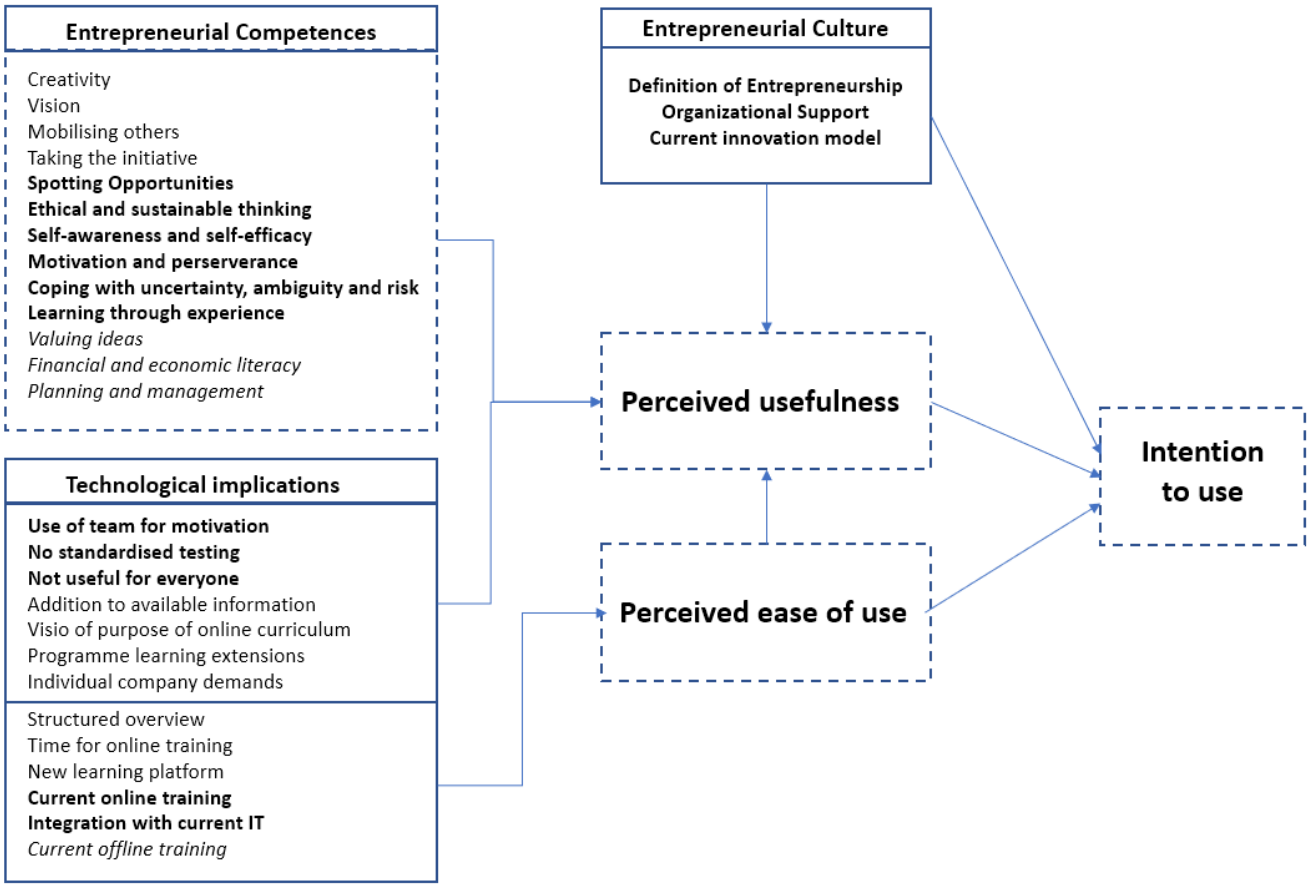

Figure 9 Integrated theoretical framework with the entrepreneurial competences (second order codes) from EntreComp. All other lists are the categories identified by data analysis. Standard text implies the relation is for both large companies and start-ups. ***Bold*** *text is related only to large companies/multinationals. Italic text is related only to start-ups/small companies. Dashed lines indicate original framework, solid lines are the added concepts.*

5 Discussion

Little is known about online learning and entrepreneurial competence development for employees of food companies. The EntreComp framework is a new entrepreneurial competences framework that is one of the few that claims to be relevant in a work environment. However, the validation for this framework in a corporate setting is still lacking. The first aim of this study is to examine food companies and validate the relevance of the described competences for food companies. The second aim is to identify the factors that will contribute to a positive intent to use an online entrepreneurial learning curriculum. This is summarised in the following research questions: (1) To which extent does the EntreComp framework address the competences needed for the development of an entrepreneurial culture in food companies? And (2) how can these competences optimally be developed by using an online curriculum for food companies? The results showed that EntreComp can be used as a suitable starting point to take stock of which entrepreneurial development needs food companies possess. It is easy to use, and the definitions of competences ensure that the researcher and informant are discussing the same competences. However, the results indicate that competences such as planning and organising, and financial and economic literacy are redundant for multinationals who focus primarily on development of the entrepreneurial mind. Start-ups are more concerned with these hard skills and do are not interested in broader entrepreneurial skills such as spotting opportunities and coping with risk. The most important technological factor for the optimal development of entrepreneurial competences are integration of team motivation, no standardized testing and the adjustment of competence subjects for start-ups and multinationals. The influence of the entrepreneurial culture was added to the results which helps contextualise the result of the interviews and co-creation workshop.

5.1 The influence of the entrepreneurial culture

The identification of entrepreneurial culture as an important influence of the usefulness of entrepreneurial education was a valuable addition to the research that was found through open coding. Upon further investigation of the original TAM by Davis (1985) it was determined that this is in line with the literature. The identified entrepreneurial culture was the subjective social norm for these employees. The subjective social norm was added in an extension of the original TAM, also called TAM2, by Venkatesh & Davis (2000). This addition was derived from the theory of reasoned action by Fishbein and Ajzen (1975) which defined *subjective norm* as a ‘’persons perception that most people who are important to him think he should or should not perform the behaviour in question’’. It was found that subjective norm significant influences perceived usefulness via internalisation, in which people incorporate social influence into their own perception of usefulness and identification, in which people use a system to gain status and influence and thereby improve

their job performance. The identification of entrepreneurial culture is therefore supported by literature as a valid addition to the theoretical model. This was further investigated within entrepreneurial culture and the main emerging category was organizational support

A main finding in the entrepreneurial culture is the importance of organizational support for entrepreneurial development of the employees. Organizational support is one of the first variables found that did not fit within the EntreComp and Technology Acceptance Model and is a result of open coding. Due to the essential motivating factor of organizational support, the relation to TAM2 and the subjective norm was identified. The importance of organizational support was supported by past literature. Lee and Peterson (2000) are even so bold to acclaim that if managers of many firms were to adopt entrepreneurial behaviour when developing their strategies, companies could be facing a much brighter future than perceptions suggest. This is in agreement with Guimaraes & Igbaria (1997) who reported that one of the main barriers to effective information systems usage is the lack of support of management. Organizational behaviour research has consistently shown that perceived organization support is linked to positive employee behaviours and feelings (Eisenberger, Huntington, Hutchison, & Sowa, 1986). When individuals are encouraged by top management to receive training and resources for working, they are motivated to explore the system without worrying about the negative consequences of failure. Organizational support of Unilever and KraftHeinz seems mostly limited to positive reinforcement when employees show interest in entrepreneurial competence development. Unilever is the only company that actively pursues experimenting with entrepreneurial units within the company with for example the 'lean like start-up' approach. These findings are in line with the recent research of Castaño-Muñoz, Kreijns, Kalz, and Punie (2017) in which over 80 percent of the participants in the study revealed the support they received was encouragement, rather than tangible support.

Start-ups and large companies have fundamentally different business processes, which translates to a different opinion on the important and definitions of entrepreneurial competences. Start-ups are flexible and entrepreneurial by nature and established companies are large and often slow to innovate because of their scale. Therefore, large companies want to learn how to experiment more and innovate differently, so they can address the market needs quicker. Start-ups and smaller companies, however, see entrepreneurship education primarily as a toolbox that provides a type of manual for best practices. The results indicate that large companies are primarily interested in developing the entrepreneurial mindset of their employees. Start-ups, on the other hand are, looking to learn more skills related to the process of managing a business with limited resources. According to Lilleväli & Täks (2017), this means that start-ups are primarily interested in the narrow approach of entrepreneurship and large companies in the broad approach. A potential reason that start-ups are

looking for competences that are from the narrow approach can be because they are primarily concerned with innovating and product and client base expansion. These are entrepreneurial activities, and the companies do not make a distinction between entrepreneurial behaviour and their normal workplace behaviour. Smaller companies are not nested in a larger organisational construct and therefore do not dedicate special resources to supporting entrepreneurial behaviour of their employees.

5.2 Entrepreneurial competences

The entrepreneurial competences that are important to companies differ greatly between start-ups and established companies. All companies agree that creating a compelling vision and mobilising others are important entrepreneurial competences that employees should develop. An interesting finding to highlight is the fact that mobilising others is rated highly by GreenFood50, which can be attributed to the important role of stakeholder support. However, in practice GreenFood50 acknowledges that the least amount of attention is often paid to this entrepreneurial competence. Last-minute decisions dictate who will go to the client and present, instead of taking the time to prepare this. The development of skills that allow more creative and flexible thinking for last-minute presentations can therefore be an interesting area to consider.

On an individual company level, there are differences on how much emphasis should be put on certain competences. Start-ups are interested in business skills such as financial and economic literacy, planning and management, valuing ideas and mobilising resources. This is expected a s a start-up is much more likely to be in situations where resources are scarce and need business skills that cannot be outsourced. These types of competences are less important in larger established companies, as they are not likely to have scarce resources and often have dedicated departments for finance and management that can assist when needed. The skills that are related to the narrow approach in EntreComp are limited. A different competence model could be used to better address the needs of the start-ups. For example, an American competence model that is more behavioural rather than holistic are the National Content Standards for Entrepreneurship Education (Consortium for Entrepreneurship Education, 2004; Le Deist & Winterton, 2005; Lilleväli & Täks, 2017). This model has a more business focused approach and was not chosen for this study as it was deemed too detailed and technical to be matched with most European competence models in a review by Lilleväli and Täks (2017). These specific competences that didn't match with other models, such as the abilities to "implement workplace regulations," "plan follow-up strategies in selling," and "explain the nature of the Consumer Price Index" were more likely to answer the need of the start-ups in this study. Employees in start-ups are generally more entrepreneurial, as it is the type of environment that requires these types of skills, so the broad entrepreneurial competences mentioned in

EntreComp are already developed quite well. In the words of GreenFood50 themselves: ''*Learning is in front of you in real-life, this is what is going on (…) then by definition you have people who are attracted to this type of environment, otherwise they would go to a large company*[23]''. The large companies are indeed interested in the more personal and broad entrepreneurial skills such as spotting opportunities, coping with risk and working with others. The findings confirmed the assumption that these companies are very structured and focused on managing risks, so employees are used to only pursuing opportunities when they are most likely to become a success. A surprising outcome however, was that Unilever specifically mentions that success is not a prerequisite or expectation of the ideas that follow from the entrepreneurial development. Instead, the focus is on changing the mindset of an employee and encouraging them to take risks and deal with uncertainty. In conclusion, it is important to consider the potential target groups prior to the selection of a competence model. EntreComp has only been scientifically tested in real setting to a limited extent (Bacigalupo et al., 2016; Lilleväli & Täks, 2017) and this feedback shows that the core competences are not always efficient for most effectively enhancing entrepreneurial competences. In this case study the start-ups already possess many of the competences listed in the EntreComp model and are interested in more specific business skills.

Large companies' needs are more related to the broad approach of entrepreneurship and EntreComp is a good fit for the identification of entrepreneurial competences for these food companies. Although both KraftHeinz and Unilever indicate that ethical and sustainable thinking is one very important aspect for entrepreneurial endeavours, it is not necessary to further develop this in their employees. The use of their own sustainable agenda has a higher priority. However, a practical limitation to keeping this out of an entrepreneurial competence development programme is the global reach. If the online learning is open to the public, it is possible that there will be participants from over the world, who, as KraftHeinz indicated do not prioritise sustainability. It should therefore be considered if this should remain in an online learning programme, depending on what the application process will be. The statement by Bacigalupo et al. (2016), the developers of EntreComp, that all the competences listed in EntreComp are needed for successful entrepreneurship but not all competences need to be addressed with entrepreneurship education is valid. EntreComp is the competence model with the broadest reach of competences (Gianesini et al., 2018) and can be used as a tool to structure the findings of entrepreneurial competences in companies.

[23] Leren is dan gewoon real life voor je, van dit speelt er (…) en per definitie zijn het dan mensen die zon omgeving aanspreekt anders zouden ze wel naar een groot bedrijf gaan

5.3 Technological implications for practice

The aim of these results was to find out how food companies think entrepreneurial competences can optimally be developed with an online curriculum. To benefit the perceived ease of use, the MOOC concept was not further developed. Instead, a course should be short and modular, with elements of gamification. Companies want a structure overview in which the learner can chose what topics are most interesting for them, and do not need to learn in order of appearance. One of the new possibilities that addresses all these needs is micro-learning. Microlearning uses relatively small learning units and short-term learning activities. This type of learning is still part of an emerging trend so there are no exact definitions or coherent uses of the term in literature yet. However, it is becoming a new hype in corporate education, and many blogs have devoted attention to it (Glahn, 2017; Pandey, 2016; Rubens, 2017; van den Berg, 2017). Microlearning itself is not a new concept, but it has now become a hot topic as the next approach to train workforce. The goal of microlearning seems to be more focused on advancement of skills and on-the-job performance support, rather than a fully developed training on a subject (Glahn, 2017; Pandey, 2016; van den Berg, 2017). Instead of sitting behind a computer for an extended time, microlearning is designed to be only a few minutes long and can be done on the go as well. According to the informants, this type of learning seems suitable for their employees, who experience a barrier if the time for education is long. It is important for the developers of the learning activities that they are critical on the design of the course content. To address the needs of the food companies, microlearning should not simply be a shortened version of a MOOC, but be designed from scratch to be modular, short and easy to use (Glahn, 2017). One concern of the large companies however, is that there should be a possibility for integration with the current online ICT system. Smaller companies do not have their own ICT structure yet and for them an external course needs to easily available. This was already established by research on SPOCs in which it becomes clear that companies prefer to keep their training systems in-house and have a hand in the development of the content (Fox, 2013; Goral, 2013; Kaplan & Haenlein, 2016).

A lot of information is readily available about entrepreneurship and innovation competence development. To be able to compete with existing courses and provide an additional value to food companies, the perceived usefulness of certain elements was determined. The most important factors that increase the perceived usefulness are use of a team for motivation and the rejection of standardised testing. Training programmes often deliver information but do not engage learners in the organisation's most valuable learning resource, that is, practice itself (Tynjälä, 2008). This is recognised by the informants in this study and they are very interested in how to apply the learned competences to practice. Collaboration between work and education is fundamentally important in

this case. Tynjälä (2008) and Helle (2007) state that this collaboration between formal learning and on-the-job learning can take various forms, ranging from programmes providing students with on-the-job training to programmes providing working adults with off-the-job training. LinkedIn integration and group chats are practical collaborative aspects that are suggested by our informants and increase the perceived usefulness of the online learning. It is important that employees are self-motivated to work on the development of entrepreneurial competences, as companies state that it can be quite difficult to motivate employees from a company perspective. Working with projects is a viable and important addition to the curriculum that should be considered. The additional benefit of project work was also confirmed by Helle, Tynjälä, Olkinuora and Lonka (2007) who found that the study motivation increased and the students that initially scored lowest on self-regulation of study benefitted most of intrinsic study motivation. Another research that focuses on using company context for employee motivation is the study of SRL@Work by Siadaty, Gašević, & Hatala (2016). SRL@Work is a learning and development planning tool that is specifically aimed at supporting professionals to attain knowledge from different domains. The goal of SRL@Work is to connect knowledge across domain boundaries by aligning learning goals of employees with the learning goals and activities of their colleagues and organization (Siadaty et al., 2016). Just like the answers of respondents in this study, the main finding of Siadaty et al. (2016) was that when employees are directly asked for their motivation for entrepreneurial development, the often primarily rely on the organisational context. Social context of the workplace is not the most influential factor, but it is essential. Having a peripheral awareness of the activities of colleagues in the workplace is a critical part of the planning and engagement with self-regulated learning and offers an incentive for the professional learner to evaluate and reflect on their learning progression (Siadaty et al., 2016). The informants in this study suggested this can be done with an integration with LinkedIn or by a chart function that allows you to directly communicate with peers while working. It is important that the social aspect is seamlessly integrated in the program to increase perceived usefulness. This is because many participants, especially those from highly competitive organizational settings, are not comfortable enough working with (research) prototypes (Siadaty et al., 2016).

Another aspect that was important to the informants in this study is the use of the organizational context as a form of testing instead of standardised testing. This was unexpected as in the literature it was described that one of the main concerns of sceptics was the lack of credentialing (Dillahunt et al., 2016). However, Tynjälä(2008) sheds light on this result when explaining that students need the opportunity to participate in authentic communities of practice in work places to enhance learning. There is no comprehensive way that a computer test can cover the theoretical, practical and self-regulative knowledge that has been acquired. The informants suggest that a way to integrate

learning and testing by social control. This was strengthened by their opinions in the possible additions to the curriculums. They want employees to work with others to test and strengthen their skills. Examples of practical implications mentioned by informants are using Academic Consultancy Training (ACTs), tools, inhouse trainings and even the suggestion to go outside food-based companies. These are examples of knotworking, a termed coined by Engeström (2004)as a significant new form of organising and performing expert work activity. Knotworking brings people together who work in separate departments or organisations for certain purposes such as negotiating meanings and solving problems. Then they continue again with other partners for other purposes, maybe to reform again at a later date. Engeström argues that this is a key process in producing radical transformations in and between organisations. Networking between organisations and employees is an important element of organisational success strategy, because it provides potential for innovative learning (Engeström, 2004; Hakkarainen, Palonen, Paavola, Lehtinen, & West, 2004; Miles, Miles, & Snow, 2005). In the food industry, the companies seem very willing to participate in these types of learning activities to help the entrepreneurial development of their employees.

5.4 Limitations of the study

It is not easy to comprehensively and linearly present a thesis that resulted from an iterative process of combining and matching theory and observations from the empirical working landscape (Dubois & Gadde, 2002). The framework and conclusions of this thesis have not been derived from pure induction, nor pure deduction which poses a challenge when describing it in enough detail to make it repeatable and reproducible (Lackéus, 2013). This work is the result of a robust research methodology, where informants were consulted at different stages and in different settings. However, there are some methodological limitations that need to be considered.

Although effort was made to gather as many informants for the in-depth interview and co-creation workshop there was a lack in responses which resulted in a small sample size of the case study. The lack of in-depth interviews was mitigated by sourcing as much information as possible from observations, informal conversations and the surveys. Also, KraftHeinz and Unilever are renowned multinationals that are reliable indicators for the opinions of large companies. This study is intended as an initial investigative angle of using a competence framework in a corporate setting. This study produced data that can be used to anticipate the opinions and needs of large food companies. The results and method can be used as a reference for future creation of online learning for entrepreneurial competence development in various target groups.

Since this study relies on self-reported data it is important to be aware of the potential bias of the informants and the research. These can be; selective memory, attribution and exaggeration. These types of bias were managed by checking if the outcomes aligned with the literature. The last

methodological limitation are the measures to collect data. A recommendation for future research is to revise the surveys so there only needs to be one. Due to the obligations with the BoostEdu project the European surveys were split into a company and an individual perspective. These were filled in fifty-two and six times respectively. Respondents do not want to click on two links to fill in surveys, which led to less reliable results for the company perspective.

The role of the researcher in this study was significant. Access to the right people was important and this was heavily limited when there are no personal contacts in the food industry. By immersing myself in the food company culture as a participant, researcher, observer, interviewer and any other role, finally the right contacts were made to be able to involve Unilever and Greenfood50.

During this study it was not possible to create a curriculum containing the identified competences to test if the findings were appropriate. A resulting limitation of the study is that the data that was collected is cross-sectional and not longitudinal. The longitudinal data from literature has established that TAM variables are reliable predictors of system usage (Venkatesh & Davis, 2000), but for correlation between factors and usage could not be tested. The study therefore remains theoretical in nature.

Beyond replicating and further testing the proposed integrated model of TAM and an entrepreneurial competence framework, the results suggest several avenues for future research. There is a lack of narrow entrepreneurial activities in the EntreComp framework and a different competence framework could be more fitting to the needs of a start-up. Furthermore, the introduction of microlearning was a development that took place during the research and couldn't be further pursued. The field of microlearning for workplace competence development has many opportunities for research. This study can be used a start to further investigate the technical possibilities of designing a microlearning curriculum for the food industry. Lastly, the study can be repeated in more food companies using the same categories and second order codes that were elucidated in this study. This can add to the relevance and validity of the outcomes of this study clarify if the identification of the corporate culture as a subjective social norm is relevant in all contexts.

6 Conclusion

By using a cross-sectional mixed methods approach, this study has investigated to which extent the EntreComp framework addresses the entrepreneurial competences needed for the promotion of an entrepreneurial culture in food companies and which aspects are most important for the development of these competences on an online learning platform. This was done by creating an integrated framework with the elements of Technology Acceptance Model and EntreComp. It was uncovered that start-ups are mostly interested in narrow entrepreneurial competences and larger established companies in the development of broad entrepreneurial competences. EntreComp does not have a lot of narrow entrepreneurial competences and a different competence framework such as the National Content Standards for Entrepreneurship Education can be tested to see if it will be a better fit for start-ups. EntreComp does address the most important needs of the larger companies. Larger companies are not interested in the limited narrow competences, such as financial and economic literacy, planning and management and valuing ideas that are described in EntreComp. The study also found that the educational design of the program should include no standardised testing. Instead it should rely on the social component to test in real life if entrepreneurial competences have been developed successfully.

These findings represent a novel application of EntreComp to assess the entrepreneurial competences needed in the food industry. A first step has been taken in this study using EntreComp for the development and an inventory of learning goals and competences for food professionals. EntreComp is easy to use alongside existing knowledge serves as a structuring element with clear definitions of competences. It is a means to provide a bigger picture and illustrate competences that are missed in a company or that can be developed to a higher level.

This study also attempts to elucidate some of the inner working of the ''black'' box of corporate training, and it has succeeded in uncovering some of the mechanisms. Educators designing a curriculum for the development of entrepreneurial competences should use a competence model as a structured approach to derive what competences are necessary for their target group and specific company. The use of the TAM was necessary to answer how the entrepreneurial competences are best taught in a corporate environment. Furthermore, the TAM explained which variables contributed to a positive behavioural intention to use a curriculum and helped identify the subjective social norm that is the entrepreneurial competence in a company.

Limitations of this study include a limited number of interviewees, risk for individual bias in the data coding procedures and a lack of theoretical framework for entrepreneurial culture within the domain of entrepreneurship education.

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Appendix

A. Contact Log

Naam organisatie	Functie	Contact method	Interview	How it was found
Zeelandia H.J. Doeleman b.v.	HR Advisor	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Wageningen Academy
Koppert Biological Systems	Manager HR	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Wageningen Academy
Beekenkamp Plants B.V.	HR-functionaris	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Wageningen Academy
Enza Zaden BV	Sr. HR	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. Automatic response: out of office	-	Wageningen Academy
Florensis BV	HRM	First email on 22-05-2018. Second reminder 13-06-2018. No response	-	Wageningen Academy
Koppert Cress BV	HRM (2)	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Wageningen Academy
Monsanto Vegetable Seeds Division	HR	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Wageningen Academy
Bayer	Global HR Business Partner (3)	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Wageningen Academy
Kapiteyn Breeding B.V.	HRM	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Wageningen Academy

Interfood BV	HR Adviseur	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Wageningen Academy
Nutreco NV	HR Director	Contact from F&A Next, e-mail 6-6-2018, no response	-	F&A Next
Nutreco NV	HR Director Skretting	Contact from F&A Next. E-mail 9-6-2018.no response	-	F&A Next
Nutreco	Chief innovation officer	Contact from F&A Next. E-mail 9-6-2018. Response on 2-7-2018, on vacation. Not able to make it but interested in the project.	-	F&A Next
DIBcoop	-	Contact from F&A Next. E-mail 9-6-2018. no response	-	F&A Next
Schothorst Feed research	-	Contact from F&A Next. E-mail 15-6-2018.no response	-	F&A Next
OSP	Floor manager	Contacted 31-05-2018 by personal contact. Interested in project but no time	-	F&A Next
CSKfood	-	Contact from F&A Next. E-mail 9-6-2018.no response	-	F&A Next
BVOR	-	Contact from F&A Next. E-mail 9-6-2018.no response	-	F&A Next
Green Protein alliance	-	Contact from F&A Next. E-mail 9-6-2018.no response	-	F&A Next
Carezzo	-	Contact from F&A Next. E-mail 9-6-2018.no response, out of office	-	F&A Next
De pindakaas winkel	founder	First email on 22-05-2018. reminder 13-06-2018. No response.	-	Google food start ups; website startlife
Burgs foods	founder	First email on 22-05-2018. reminder 13-06-2018. No response.	-	Google food start ups; website startlife
Agrifirm Group	HR (3)	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Wageningen Academy
Agrifirm Group	HR	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Automatic response that they're out of office.	-	Referral by colleague through the general HR e-mail.
Nuscience Group	HR Director	Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Personal contacts/LinkedIn
Bejo Zaden	Personeelsadviseur	Contacted 1-05-2018, reminder on 13-06-2018. No response.	-	Wageningen Academy

Syngenta Seeds BV	Head Human Resourses Benelux (2)	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Automatic response that they're out of office.	-	Wageningen Academy
Rijk Zwaan BV	Advisor Learning & Development - Human R	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Automatic response that they're out of office.	-	Wageningen Academy
Bayer	R&D scientist	First e-mail on 22-05-2018, no response.	-	Wageningen Academy
Nunhems Netherlands (3)	Human Resources Local	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. No response.	-	One from Wageningen Academy, two more through personal contacts and the internet
Hendrix Genetics BV	Human Resources officer	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Automatic response out of office. Reminder on 22-05-2018 ad 13-06-2018. No response.	-	Wageningen Academy
Farmdairy (2)	HR medewerker	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Wageningen Academy
Farmdairy	Algemeen Directeur	First e-mail on 05-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Online contacts found on LinkedIn, e-mail extrapolated from colleagues
Danone Early life	Food Technologist	First e-mail on 05-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Personal contacts from food technology
Danone	HR director	First e-mail on 05-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	Online search on LinkedIn
Danone	HR Director	First e-mail on 05-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Second reminder 13-06-2018. No response.	-	

Startlife Wageningen	Communications officer	Invitation to circulate co-creation workshop amongst interested parties on 22-6-2018, no response	-	Wageningen Academy
Starthub wageningen	Communications officer	Invitation to circulate co-creation workshop amongst interested parties on 22-6-2018, no response	-	
Corbion	Meat Application Scientist	First e-mail on 05-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Automatic e-mail out of office.	-	Personal contacts after the e-mails of Wageningen Academy were not up to date.
Cargill	Global Manufacturing Technical Director and HR personnel	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Delivery failed to all recipients (3).	-	Wageningen Academy
Unilever	Ecosystems manager	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Indicated there was no time for the project anymore. Additional contact on 2-7-2018, out of office until August	-	Supervisor contacts
Unilever		First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Indicated no time for project anymore.	-	Supervisor contacts
Unilever	Change manager	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Initially indicated no time for project. After personal contact, secondary e-mail on 7-2-2018, to make a time for an interview.	09-07-2018 Interview, Orion	Personal contacts during selection process for Unilever
Cosun	Senior Scientist Food Physics and HR officer	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Automatic response that they're out of office and one e-mail was out of date.	-	Personal contacts for company e-mail format, function on LinkedIn
KraftHeinz	HR business partner	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Sign in seen for co-creation workshop. Follow up response issued, and survey was filled in.	Co-creation workshop 26-06-2018	Personal contacts for company e-mail format, function on LinkedIn
KraftHeinz	R&D HR director	No e-mail contact at first. Sign-in for co-creation workshop. Correspondence after co-creation workshop by e-mail.	Co-creation workshop 26-06-2018	Personal contacts for company e-mail format, function on LinkedIn

KraftHeinz	HR Business Partner (3)	First e-mail on 22-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. No response	-	Personal contacts for company e-mail format, function on LinkedIn
Dawn foods (3)	R&D Innovation Manager HR manager EU, VP HR EU	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. No response.	-	Personal contacts for company e-mail format, function on LinkedIn
Duyvis	HRM Manager	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. No response.	-	Personal contacts for company e-mail format, function on LinkedIn
Duyvis	HR manager	First e-mail on 01-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 22-05-2018. Automatic reply out of office.	-	Personal contacts for company e-mail format, function on LinkedIn
Coca Cola	HR coordinator NL	First e-mail on 23--05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 13-06-2018. No response	-	Personal contacts for company e-mail format, function on LinkedIn
Puratos	R&D manager baking mixes HR officer	First e-mail on 23--05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 13-06-2018. No response	-	Personal contacts for company e-mail format, function on LinkedIn
Danone	HR business partner HR Manager	First e-mail on 23--05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 13-06-2018. No response	-	Personal contacts for company e-mail format, function on LinkedIn
Cloetta	HR director	Contacted on 1-5-2018, not able to come to co-creation workshop. Interested in results. Not in office until August.	-	Personal contacts for company e-mail format, function on LinkedIn
Cloetta	HR medewerker	First e-mail on 23--05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 13-06-2018. No response	-	Personal contacts for company e-mail format, function on LinkedIn
Mission Foods Roermond (2)	HR manager HR administrator	First e-mail on 23--05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 13-06-2018. No response	-	Personal contacts for company e-mail format, function on LinkedIn

Ahold (2)	Director HR HR business partner	First e-mail on 23-05-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Reminder on 13-06-2018. Out of office.	-	Personal contacts for company e-mail format, function on LinkedIn
GreenFood50	Founder	First e-mail on 25-06-2018 with invitation to Dutch co-creation workshop and BoostEdu survey. Not able to join the co-creation workshop. Additional e-mail exchange for interview.	Interview, 05-07-2018 Plus Ultra	Online search for food start-ups in Wageningen
Yara Sluiskil	Project manager algae wastewater treatment	First call on 20-06-2018 with invitation to Dutch co-creation workshop and BoostEdu survey.	Co-creation workshop 26-06-2018	Personal contacts

B. Survey Questions + Results

a. BoostEdu survey – Company perspective

Table 8 BoostEdu survey from the companies' perspective. Published and edited by BoostEdu partner from UNIBO. Six respondents filled in this survey

To what of the following categories does your company belong?	Food processor
	Technology suppliers (e.g. Packaging)
	Ingredient Suppliers
	Logistics (e.g. transportation)
	Other (please specify)
In what country is your company located?	-
What is your company's geographical market?	Local/Regional
	National
	European
	Worldwide
What is your company's age?	0-1 year (start-up)
	1-5 years
	5-10 years
	10-20 years
	20+ years
What is the current number of employees in the company?	0-1
	2-5
	6-10
	11-50
	50+
Compared to three years ago, the number of employees in your firm has	Decreased
	Remained stable
	Increased
In which branch of your company are you currently working?	-
What is your position in the company?	-
What are the competencies and skills most needed to succeed as an entrepreneur in the food industry?	Communication skills
	Leadership
	Time management

	Team working capability
	Cutting-edge knowledge
	Long-life learning
	Other (please specify):
Do you think that continued education in entrepreneurship and innovation is important for an employee in the food industry?	Yes
	No
	Maybe; please elaborate
From the following potential topics in entrepreneurship and innovation courses, which do you think are most relevant for continued education (please rank 1= most important)	New technologies
	Sustainable intra/entrepreneurship
	Circular business modelling
	Entrepreneurship and innovation competencies
	Networking
	Policy for innovation in food sector
	Cross fertilisation across industry
	Internationalisation
	Intellectual property rights
	Cooperation with research infrastructure
	Economics/business plan
Is there any topic missing in the previous question that you would like to see in a continued education course on entrepreneurship and innovation for food professionals?	-
Which specific area of food industry do you see as a priority for future innovation (please rank, 1=most important)	Searching for new raw materials
	Reducing the energetic consumption
	Reducing waste
	Improving the quality of the final product
	Improve the nutritional value (functionality) of the final food
	Increasing the shelf life
	Employing soft-technologies in food processing
Is there any other major area of future innovation missing in the list above?	-

What type of approach do you think is the most suitable for innovation and entrepreneurship continued education in the food sector? (please rank, 1=most suitable)	MOOC (massive open online courses, a course that you can follow in your own time)
	e-learning
	Face-to-face courses
Is there any other approach that you think is particularly suitable for continued education in innovation and entrepreneurship in the food sector?	-
Can you mention any examples of concrete initiatives in continued education for Innovation and Entrepreneurship in food industry that you would regard as best practices (e.g. a course you have attended)?	
Can you mention any examples of concrete initiatives in continued education for Innovation and Entrepreneurship in food industry that you would regard as best practices (e.g. a course you have attended)?	
Please add any comment, insight or suggestion about your company needs for continued education in innovation and entrepreneurship	

b. BoostEdu survey – Individual perspective

Table 9 BoostEdu survey about the individual perspective on entrepreneurship education. Published and edited by BoostEdu partner from UNIBO. Fifty-two respondents filled in this survey

To what of the following categories does your company belong?	Food processor
	Technology suppliers (e.g. Packaging)
	Ingredient Suppliers
	Logistics (e.g. transportation)
	Other (please specify)
In what country is your company located?	-
Do you think that continued education in entrepreneurship and innovation is important for an employee in the food industry	Yes
	No
	Maybe, please elaborate
Approximately how many days have you spent in LEARNING ACTIVITIES that were NOT advised or initiated by your employer in the last two years? (By learning activities, we mean: taking lessons or courses that are not a part of your degree, attending seminars or workshops, reading books or articles, or visiting other companies, historical sites and libraries) (One day is 8 hours)	None
	0-1 days
	2-5 days
	6-10 days
	10+ days
Approximately how many days have you spent in LEARNING ACTIVITIES that WERE advised or initiated by your EMPLOYER in the last two years? (By learning activities, we mean: taking lessons or courses that are not a part of your degree, attending seminars or workshops, reading books or articles, or visiting museums, historical sites and libraries) (One day is 8 hours)	None
	0-1 days
	2-5 days
	6-10 days
	10+ days
The next questions are about your personal experiences with working as an employee in your organization. Please indicate to what extend you disagree, agree with the following statements: I am able to break out of traditional mind-sets to see things in new and different ways	I fully agree
	I agree but only slightly
	Neither disagree, nor disagree
	I disagree but only slightly
	I fully disagree
I have input into the organizations' strategy	I fully agree
	I agree but only slightly
	Neither disagree, nor disagree
	I disagree but only slightly
	I fully disagree

Training is readily available for me when I need to improve my knowledge and skills	I fully agree
	I agree but only slightly
	Neither disagree, nor disagree
	I disagree but only slightly
	I fully disagree
Teams or groups that I am working in propose innovative solutions to organization wide issues	I fully agree
	I agree but only slightly
	Neither disagree, nor disagree
	I disagree but only slightly
	I fully disagree
Results of teams or groups that I am working in are used to improve products, services and processes	I fully agree
	I agree but only slightly
	Neither disagree, nor disagree
	I disagree but only slightly
	I fully disagree
I like learning new things	I fully agree
	I agree but only slightly
	Neither disagree, nor disagree
	I disagree but only slightly
	I fully disagree
How often does your job involve keeping up to date with new products or services?	Never
	Less than once a month
	Less than once a week but at least once a month
	At least once a week but not every day
	Every day
Instructing, training or teaching people, individually or in groups	Never
	Less than once a month
	Less than once a week but at least once a month
	At least once a week but not every day

From the learning activities that you have completed, was there any focus on entrepreneurship	I did not complete training
	Yes
	No
From the learning activities that you have done was there any focus on innovation?	I did not complete training
	Yes
	No
How many YEARS OF WORK EXPERIENCE do you have in total? (not including education, internships, sick leave, unemployment, maternity leave, etc.)	-
What is your current OCCUPATION/PROFESSION? (if you have more than one occupation, please let us know your main occupation)	-
In your main job do you have a permanent employment contract?	-
By how much do you expect your wage to increase within the next 2 years?	I don't expect to stay at this firm for so long
	Not at all
	1-5%
	6-10%
	10-15%
	More than 15%
	Don't know
	NA
Do you think that you can personally influence your current wage, for instance by working harder?	No
	Yes
	Don't know
Do you think entrepreneurship and innovation education could positively contribute to your work?	No
	Yes
	Don't know
Do you think applying entrepreneurship and innovation knowledge would translate into a higher wage?	No
	Yes
	Don't know
If the E&I training was provided in a MOOC; how likely are you to pursue this?	Very unlikely
	Unlikely

	Neutral
	Likely
	Very likely
How likely are you to tell your superior about your added capabilities?	Very unlikely
	Unlikely
	Neutral
	Likely
	Very likely
How likely are you to be rewarded for this (financially, more responsibility, opportunity to use gained knowledge)?	Very unlikely
	Unlikely
	Neutral
	Likely
	Very likely
Please add any comment, insight or suggestion about your company needs for continued education in innovation and entrepreneurship	-
What is the highest level of education or training that you have ever successfully completed?	Primary education
	High school
	College
	Bachelor
	Master
	PhD
Age	
Gender	Female
	Male
	Other
How satisfied are you with your current job? Would you say you are…?	Extremely satisfied
	Satisfied
	Neither satisfied or dissatisfied
	Dissatisfied
	Extremely dissatisfied

c. Follow-up survey co-creation workshop

Table 10 Survey created by the researcher for certain participants of the co-creation workshop. Filled in by Yara Sluiskil representative and KraftHeinz

Thank you for your earlier participation in the research to create an online learning curriculum for Agri-Food professionals in Entrepreneurship and Innovation. Based on the information that has been collected to date, we would like to invite you to give input on certain concepts that have come forward through the current research. In the following 5-minute survey we will follow up on the discussion that has been had with you in either our co-creation workshops or interviews. First, certain entrepreneurial competences are proposed, and it is up to you to decide whether you consider these important for entrepreneurial success. Second, the competences that you were asked to judge are listed and it is asked whether you believe these competences should be included in the curriculum for e-learning. It is important to note that although you may think one competence is very important to have, the current situation at your company through training or individuals does not call for it to be included in the curriculum. You are allowed to make this distinction. There are three sections of 5 competences that will be judged. At the end we will ask you to prioritize the top 6 from all of the listed competences. All results will be confidential and treated in the same way as the previous encounter, this survey is purely to elucidate certain concepts and answers to further solidify the curriculum.	
What company are you representing?	
What is your function in this company?	
Any other questions/information you would like to share before beginning?	
Into action – New Page All questions are asked on a 5-point Likert Scale where 1 is strongly disagree and 5 is strongly agree	
Knowing how to take the initiative is important for entrepreneurial success.	
Knowing how to plan and manage goals by prioritising, organising and following up is important for entrepreneurial success.	
Knowing how to make decisions while dealing with uncertainty, ambiguity and risk is important for entrepreneurial success.	
Knowing how to work with others, to team up, collaborate and network is important for entrepreneurial success.	
Knowing how to work with others, to team up, collaborate and network is important for entrepreneurial success.	
Please rank the following competencies from most important (5) to least important (1).	Taking Initiative
	Planning & Management
	Coping with uncertainty, ambiguity and risk
	Working with others

	Learning through experience
Is there anything that was unclear, or that you would like to share? If no, simply continue to the next page.	-
Resources – New Page All questions are asked on a 5-point Likert Scale where 1 is strongly disagree and 5 is strongly agree	
Knowing how to believe in yourself and keep developing crucial for entrepreneurial success.	
Knowing how to stay focused and do not give up under pressure, adversity and temporary failure is crucial for entrepreneurial success.	
Knowing how to gather and manage the resources you need to turn an idea into action is crucial for entrepreneurial success.	
Knowing how to develop the financial and economic know-how to make sure your idea can be turned into a value-creating activity over the long term is crucial for entrepreneurial success.	
Knowing how to inspire, enthuse and get relevant stakeholders on board is crucial for entrepreneurial success.	
Please rank the following competencies from most important (5) to least important (1).	Belief in self: self-awareness & self-efficacy
	Motivation & Perseverance: stay focused, don't give up
	Mobilising resources: gather & manage needed resources
	Financial & Economic literacy
	Mobilising others: inspire, enthuse and get others on board
Is there anything that was unclear, or that you would like to share? If no, simply continue to the next page.	-
Ideas and Opportunities – New Page All questions are asked on a 5-point Likert Scale where 1 is strongly disagree and 5 is strongly agree	
Knowing how to use your imagination and abilities to identify opportunities for value creation is crucial for entrepreneurial success.	
Knowing how to develop creative and purposeful ideas is crucial for entrepreneurial success.	
Knowing how to imagine the future and work towards your vision of the future is crucial for entrepreneurial success.	
Knowing how to judge what the value and potential of an idea is in social, cultural and economic terms is crucial for entrepreneurial success.	
Knowing how to assess the consequences and impact of ideas on the target community, market, society and environment and act responsibly is crucial for entrepreneurial success.	
	Spotting Opportunities

Please rank the following competencies from most important (5) to least important (1).	Creativity
	Valuing Ideas
	Vision
	Ethical and Sustainable Thinking
Is there anything that was unclear, or that you would like to share? If no, simply continue to the next page.	-
Next page – Curriculum	
Which of the following 15 competences that have been listed in the previous questions should be in the curriculum according to you (please select a minimum of 5 maximum of 10 competences).	Ethical and Sustainable Thinking
	Valuing ideas
	Vision
	Creativity
	Spotting Opportunities
	Motivation & perseverance
	Self-awareness and self-efficacy
	Mobilising resources
	Financial and economic literacy
	Mobilising others
	Coping with uncertainty, ambiguity and risk
	Working with others
	Planning and management
	Taking the initiative
	Learning through experience
	Other…

C. Interview Blueprints

a. Co-creation workshop - Theoretical Questions

Theory	Sub-process	Question	Source
Technology Acceptance Model ((Davis, 1985; Davis et al., 1989)	Usefulness	Would you sign up for this MOOC?	
		Do you expect to integrate what you will learn in the professional practice?	
		Will a MOOC enable you to accomplish the tasks more effectively?	(Davis et al., 1989; Joo et al., 2018)
		Does using a MOOC enhance learning effectiveness	Wu & Zhang
		Will it improve effectiveness in learning?	
		Is it easier than learning in offline classes?	
		Would it be useful for you?	
	Ease of Use	Is it easy to use participation features? (such as learning activities, discussions & quizzes)	
		Is this designed to be clear and understandable?	
		Is it easy to interact with other students and professors?	
		Is it easy to become proficient in using MOOCs?	
		Is the interaction with MOOCs clear and understandable?	

b. Greenfood50 – Interview

	Interview founder Greenfood50
Date	05-07-2018
Company	Greenfood50
Place	Plus Ultra – Conference Room
People Involved	Interviewer, Interviewee
What am I learning?	Familiarization with the organizational context of a mature start-up. Discovering whether a start-up has different priorities from an established large food company. Integrating observations from previous data collection moments with accounts of the informants, to improve our understanding of their motivations and their current learning curriculum. Improving my understanding of which competences are most appreciated to develop in the food R&D context and whether there is space and motivation to do this within the company.
How does this case/interview differ from the last one?	
General Observations?	It was not clear to the interviewee exactly what the purpose of this meeting was and how much time it would take. After explanation it was clear that it seemed to have no use for their company in their opinion as it was more useful for larger companies with a dedicated R&D department. The interviewee was willing and able to provide information but needed much probing to get to the point where he was more talkative than I was as interviewer and we could dig in to the reasons for the initial opinion and the needs of a start-up vs. a large company.
Introduction	- Introduce oneself: student at Wageningen university, part of EU wide project, MSc study - Make sure that sound for recording/seating arrangement is acceptable for the interview/co-creation. - Ask if there's time constraints - Duration of interview

	- Explain why the interviewee was selected: ○ Discuss if interviewee wants to be identified by name - Recording: ask for permission for MSc study only
Opening Questions	- Name - Function - Why did you join? - Explanation of BoostEdu project, MOOCS/online learning and the reason for this interview. Summary of co-creation workshop (not results yet) and participants and context. - Ask about the company & current situation (start-up, team).
Questions	- *What is the difference between the needs of you and that of a larger food company?* ***Probe:*** *Why are there differences? Entrepreneurship education needed?* - *What does your 'R&D' process look like?* ***Probe:*** *do you create new products? Is it mainly on current business processes? What is the priority?* - *Do you think we can teach you more via an online MOOC?* ***Probe:*** *Is MOOC/e-learning a good way to do this? Will people think it is helpful or an extra hassle?* - *As a start-up, if you were able to inventorise the situation, is there information that you feel is lacking when going on this entrepreneurial venture?* ***Probe****: what would you like in the curriculum?* - *'Co-creation'' angle → according to Edu Comp model, several competences are laid out bit by bit and we discuss them and rank them by importance.* - ***Probe:*** *you can make it as specific as you want for your company* - *Do you feel like these competences are missing practical tools you need in the company?*

	Probe: *Which are most important? Are there ones missing? Why are those important?* - *Why would your employees go to this programme? What is their motivation? (self-determination or...)* - ***Probe:*** *Would they use it? What is their motivation? Personal development/self-determination/anything else?* - *Is a MOOC a viable option within your company, how is the corporate training organized now?* - ***Probe:*** *Current corporate learning, ICT system, is Online better than in classroom? Modular offering* - *Should we test the knowledge of the participant to ensure a high standard?* *Care about accreditation? Is high standard necessary? What is necessary?*
End	Last Question of interview *Anything important that wasn't discussed, or that you would like to add?* *Any questions from your side?* *Am I allowed to contact you for clarification of some data, if needed?* Offer to e-mail coding analysis for review. Thank you and goodbye

c. Unilever – Interview 09-07-18

	Interview Change Manager Unilever
Date	09-07-2018
Company	Unilever
Place	Orion, Campus Wageningen
People Involved	Interviewer, Change Manager
What am I learning?	Familiarization with the organizational context. Insights into organizational change and the development of the entrepreneurial mind within this large food company. Integrating observations from previous data collection moments with accounts of the informants, to improve our understanding of their motivations and their current learning curriculum. Improving my understanding of which competences are most appreciated to develop in the food R&D context and whether there is space and motivation to do this within the company.
How does this case/interview differ from the last one?	
General Observations?	Invitation was in an interview/co-creation type of setting. Less structured interview questions and more focused on the willingness to divulge information about the company from the informant than adhere to a strict interview protocol.
Introduction	- Introduce oneself: student at Wageningen university, part of EU wide project, MSc study - Make sure that sound for recording/seating arrangement is acceptable for the purpose of the co-creation. - Ask if there's time constraints - Duration of interview - Explain why the interviewee was selected: o Discuss if interviewee wants to be identified by name - Recording: ask for permission for MSc study only - Explain global structure of co0creation process

Opening Questions	- Name - Function - Why did you join? - Refer to survey - Explanation of project and curriculum - Summary of co-creation workshop (not results yet) and participants and context.
Questions	- *What is the problem you are currently encountering that spikes the interest in entrepreneurial education for your employees?* **Probe:** Relationship between interest and organizational context. Current development of business landscape. - *Do you understand entrepreneurship and innovation, and do you make a distinction or preference between the two?* **Probe:** Results of survey & previous workshops, emphasis on entrepreneurship, do you think they should be separated? - *Do you already test how much entrepreneurial/innovative ideas are made within the company?* ***Probe:** How many are a success; how many get through the manager?* - *Is a MOOC a viable option within your company, how is the corporate training organized now?* - ***Probe:** Current corporate learning, ICT system, is Online better than in classroom? Modular offering* - *In your opinion, is entrepreneurial education categorized as personal development or corporate training?* **Probe:** Time management, assistance from company, corporate training programme currently involved. - *''Co-creation'' angle → according to Edu Comp model, several competences are laid out bit by bit and we discuss them and rank them by importance.* **Probe:** for each competence, probe for further information/opinion and to judge whether the understanding of the term is correct. Question further on the competences that were initially most valued.

	- *Can you teach entrepreneurship by the online module, or do you think more is necessary?* **Probe:** Tools necessary to bring knowledge in action, importance of company culture, importance of fellow employee enthusiasm/motivation - *Can you rank the competences, now that we've discussed your organizational competences to the 5-10 most important ones you would like your employees to learn?* ***Probe:*** *Why are these most important? Which are least important? Why are they not as important? Do you feel something is missing?* - *Explanation of MOOC. What do you think is the best way to set up an online curriculum to create enthusiasm within the company for learning entrepreneurial skills?* ***Probe:*** *if you could ask anything you want from us, what is your ideal situation? What is the learning goal you would want from this curriculum?* - *Sketching the MOOC: we were thinking of really giving people tools to try out within the organizational context, example: pitching in the coffee corner and team work within a chat function in the app, maybe even with other companies. Does that interest you?* ***Probe:*** *Chat function within app, communication with other companies. Fear of sensitive information? Intern/extern?* - *Should you test the knowledge gained by the MOOC at the end of the modules or curriculum?* ***Probe:*** *Why not, why yes? What should you do instead to check if it has been done?*
End	Last Question of interview *Anything important that wasn't discussed, or that you would like to add?* *Any questions from your side?* *Am I allowed to contact you for clarification of some data, if needed?* Offer to e-mail coding analysis for review. Thank you and goodbye

D. Data Analysis

a. First & Second order coding + definitions

Entrepreneurial Culture

Second order code	Definition of Concept	Category	Definition category	First order code	
Definition of Entrepreneurship	Company views on what entrepreneurial competences are and what the definition is of entrepreneurship	Narrow view on entrepreneurship	entrepreneurship consists of the process of starting and managing a business with limited resources and changing market conditions (Lilleväli & Täks, 2017)	Entrepreneurs want to know how to raise money and create a BMC	
		Broad view on entrepreneurship	An entrepreneurial mindset is the core of entrepreneurial competences and teaches how to exploit opportunities and possess entrepreneurial competences that can be used to create value within the company and in all fields of life.	Entrepreneurship leads to more innovation power or a different way of innovating	U
				A big company wants to learn the mindset, stakeholder management, leadership, strategy, value creation	K
				Different process of decision making	K
		Awareness	Additional observations about the definition of an entrepreneur by the interviewees, that highlights the awareness of the categorization of entrepreneurial tendencies….	If you want to work as an entrepreneur you need to do something that is outside of your own job description sometimes,	U
				You make a distinction between learning entrepreneurial thinking or creating new ideas	K
				It depends on your target audience, entrepreneurs or people who want an innovative mindset	K
				There's a difference between people who want to be an entrepreneur or an innovative entrepreneurial mindset	K
Organizational Support	Organizational support for entrepreneurial behaviour or learning.	Supporting Entrepreneurial Employees	Organizational support for entrepreneurial activities within the company	There is a working group, or movement, in the company that has launched 'lean like start up' for which we have an app group, a team site and different tools already.	U
				The organization needs to make room for inspiration, team and mobilising others for it to work.	
				Create a positive environment to encourage you to do more	K
				A mind shift we must make is to see mistakes as on the job training	U
				Proving an own drive to innovate is very positively perceived	K
				The organization needs to make room for inspiration, team and mobilising others for it to work.	U
				Giving people 20 projects loses a lot of time with context switching, so for this to work you need to create a focus.	U

		Organizational support for Entrepreneurial Curriculum (3)	Organizational support for focus on entrepreneurial learning	Our biggest challenge also lies with getting senior stakeholders on board with this transformation, with the cultural change that is happening.	U
				For R&D everyone should feel encouraged and self-motivated to learn	K
				to take these jumps in the unknown, you need to start internally by saying 'This is what we want to do'	U
				Entrepreneurship is being promoted by companies	K
				Entrepreneurship is part of leadership trainings but not a specific topic	
				Promoting entrepreneurial spirit	K
		External Motivation (3)	Mention of motivating persons to use the current corporate training	We can make certain pathways in our training mandatory, or strongly recommend it for a certain target group.	U
				There's a follow-up if mandatory trainings are not done in time	K
				Difficult to make people complete training	K
		Time for Personal Development (3)	Time division for entrepreneurial learning, categorized by the interviewees as personal developments	An individual worker is expected to find the time to invest in his or her development themselves.	U
				Personal development would be done outside of training by my own motivation.	K
				Specific trainings for personal development are done at home in your own time	K
		Sharing Curriculum (3)	Sharing knowledge of the current company learning or training curriculum	We've never been asked what the content of our training programmes is.	K
				You get troubles with NDA's, dedicating a group and the idea to the company when working with students	K
				don't normally share the content of our training programme	K
				No risk in sharing participation	K
Outdated Current Innovation Model	Instances where the current innovation model is not fitting for the current working environment and goals of the company	Reason for change	Reasons for wanting to change the outdated current innovation model	a lot of ideas, patents and stacks of detailed concepts are on the shelf because they do not have a priority because they're not linked to a business idea.	U
				Don't want to lose that (strict) process, but want to be open, innovative and entrepreneurial	K
				The current business market changes so fast that our current innovation model cannot keep up anymore.	U

		Focus on success	Success in market as measure for innovation practices or entrepreneurial activities in the current innovation model	When going public with an idea there is a fear that it needs to necessarily lead to a success even though internally it doesn't lead to success.	U
				It is not important whether it leads to a concrete successful product in the market.	U
				We don't start measuring success in the pre-phase of the ideas, but we do have some numbers from a couple of started projects that led to a successful launch.	U
				Especially within the Netherlands in a technical working environment it is difficult to celebrate successes, we will need a cultural change for this.	U
		Scale	Scale of company contributing to a less successful innovation model	We want to give people the tools to experiment, don't do something to scale immediately, but start small and see if it works.	U
				…very good at doing things big, globally with a large impact.	U
				When you're settled, and larger innovation is a different story	G
				Due to efficiency we have organized our organization in silo's, so everyone only does a very small piece of the puzzle which is a problem.	U
				The majority of employees work in sales or marketing, not in R&D and they have less need for this programme	K

Entrepreneurial Competences

Concept	Definition of Concept	Category	Definition Category	First Order Code	
Entrepreneurial Competences	Company views on what entrepreneurial competences are	Narrow view on entrepreneurship	entrepreneurship consists of the process of starting and managing a business with limited resources and changing market conditions (Lilleväli & Täks, 2017)	Entrepreneurs want to know how to raise money and create a BMC	G
		Broad view on entrepreneurship	An entrepreneurial mindset is the core of entrepreneurial competences and teaches how to exploit opportunities and possess entrepreneurial competences that can be used to create value within the company and in all fields of life.	Entrepreneurship leads to more innovation power or a different way of innovating	U
				A big company wants to learn the mindset, stakeholder management, leadership, strategy, value creation	K
				Different process of decision making	K
		Awareness	**Additional observations about the definition of an entrepreneur by the interviewees, that highlights the awareness of the categorization of entrepreneurial tendencies….**	If you want to work as an an entrepreneur you need to do something that is outside of your own job description sometimes,	U
				You make a distinction between learning entrepreneurial thinking or creating new ideas	K
				It depends on your target audience, entrepreneurs or people who want an innovative mindset	K
				There's a difference between people who want to be an entrepreneur or an innovative entrepreneurial mindset	K
Spotting Opportunities	Being able to identify and seize opportunities that create value.	Understanding Customer Need	Identifying needs and challenges of the customer	Due to great innovation pressure we didn't take the time to properly understand the demand or the problem	U
				from our know-it-all arrogance we started developing products nobody was waiting for.	U
				We exchange needs with the customers and see how we can apply that	G
		Inhibition through risk	When opportunities are not identified or seized due to inhibition by fear of risk	We're very risk averse and in you see that in our culture we often speak about 'These are the risks' instead of saying 'these are the opportunities	
				People with an engineering background are not risk takers and are not likely to have a start-up	K

		On time in full (2)	Delivering the promised result on time and in full	Focusing on on time in full, blinds you to knowing whether the product still answers the demand.	U
				With a strong focus on delivering on time and in full, you do not consider whether the question is still relevant.	U
Taking the Initiative	Act and work independently to achieve goals, stick to intentions and carry out planned task	Initiate value creating processes	Employee driven entrepreneurial activity	Entrepreneurship is how you approach things and take initiative	
				want the innovative company to come from the employees themselves	K
Coping with uncertainty, ambiguity & risk	Coping with decision making when the road is uncertain, ambiguous and risky	Restricting Vision	Restricted vision on the whole picture when including structured ways of testing ideas and prototypes from the early stages, to reduce risks of failing	The Unilever innovation model was negatively phrased, locked concept, locked design and no scope.	U
				Big companies structure very much, you're so strict that you stop looking outside	K
		Unknown data (2)	Being able to make decisions when the result of the decision is uncertain, when information is partial or ambiguous (Bacigalupo et al., 2016)	Innovation power is missing because we fill presentations with assumptions presented as facts instead of being clearer about what is unknown and taking the opportunity anyway	U
				It used to be that if you didn't know the answer to a question at a gatekeeping meeting you were sent away to come back when you do know.	U
		Risk Management (2)	Learning activities related to risk management	Our project management trainings were mostly risk management trainings, so we have difficulties with coping with risks.	U
				We are trained to see risk as something negative and do everything to cover the risks.	U
Motivation & Perseverance	Be determined to turn ideas into action and satisfy your need to achieve.	Fear of Failure (2)	Be resilient under pressure, adversity, and temporary failure.	People are afraid that failure is a reason to be laid off	U
				It is difficult to be open about what has failed, especially in times of organizational change	U
				Fear of failure is commonplace, when hearing an entrepreneur during a corporate training about their	U

	Be prepared to be patient and keep trying to achieve your long-term individual or group aims			failed start-ups, the question is: why do you even still try?	
				The difference between start-ups and corporations is large. We're brainwashed into believing innovation must lead to success and then we're too afraid to make mistake	U
Creativity	Developing ideas and opportunities to create value or better solutions to existing and new challenge	Exploring	Exploring and experimenting with new knowledge and innovating approaches	People that come from school need to develop those personal development skills but have the best ideas	K
		Creating value	Linking the ideas to a value creating idea for the customer or company	If you're in a company, you tend to have more tunnel vision and then you develop the other skill	K
				If you have more knowledge of a product you can create more value for the customer	G
Vision	Imagine the future and develop a vision to turn ideas into action	Translating Ideas	Combine knowledge and resources to translate the vision into action and guide effort into something that achieves a valuable effect.	We're already paying attention to spotting opportunity and creating a compelling vision together.	U
				If you're discussing the total picture of entrepreneurship then all competences are equally important, the problem is that we need to translate those ideas into action	U
Valuing Ideas	Judge what value is in social, cultural and economic terms Recognise the potential an idea has for creating value and identify suitable ways of making the most out of it	Non-workable competence	They would like to have this competence but do not yet	Would be nice to have a qualitative methodology on how to assess the market needs and valuing ideas with good source	G
Ethical & Sustainable Thinking	Assessing the consequences and impact of ideas, opportunities and actions	Sustainable Thinking	Reflect on how sustainable long-term social, cultural and economic goals are, and the course of action chosen	We're already very good at sustainable thinking, innovating and valuing ideas.	U
				In Asia and north America there's not as big a focus on sustainability in entrepreneurship	K
	Estimate the cost of turning an idea into a value-creating activity	No interest	No interest in learning this or teaching it to employees for which this entrepreneurship curriculum is meant	Planning, finances and organizing are not really relevant.	U
				I think we already have enough of finances.	U

Financial and economic literacy	Plan put in place and evaluate financial decisions over time	Market Research	Knowing the market for your product and managing the finance to make sure the value creating activity lasts over the long term	The only thing important for us about the market is that it is big, and it grows, not the exact number	G
				Methodology to identify the most important players in this type of market	G
				Market research is expensive There is a lot of unstructured information on internet to find market leaders	G
Self-awareness & self-efficacy	Reflect on your needs, aspirations and wants in the short, medium and long term Believe in your ability to influence the course of events, despite uncertainty, setbacks and temporary failure	Skills	Identify and assess your individual and group strengths and weaknesses	Based on what I see, we have the skills, we need a mindset change.	U
				People have a desire for learning something unfamiliar that completes their skillsets	K
Mobilising Resources	Get and manage the material, non-material and digital resources needed to turn ideas into action Make the most of limited resources	Right competences	Get and manage the competences needed at any stage	Find someone with those skills your missing and let him/her sell	K
		Limited resources	Make the most of limited resources	Foodvalley can bring together companies which makes it economically feasible to be on fairs	G
				We spend a lot of time to try to be on expensive fairs through networks	G
Mobilising others	Inspire and enthuse relevant stakeholders Get the support needed to achieve valuable outcomes Demonstrate effective communication, persuasion, negotiation and leadership	Inspiring vision	Inspiring other through your vision so they will support the idea that you believe in	If you have the vision you need to be able to translate it and mobilise people to connect to your idea and make sure it becomes a success, which is what we're trying to do with our transformation.	U
				It's important to couple your vision to mobilising others and having belief in yourself.	U
		Informing customer	Effectively communicating with potential customers to inspire and enthuse them for your idea	People do not know the products of young companies, sometimes you can say it three times and they still don't realize	G
				Potential clients say, this could be interesting for us, but often they don't know the product and there's a lot of missed chances.	U

		Pitching	Being able to effectively communicate, persuade, negotiate and show leadership to inspire and get the support needed for your outcome from relevant stakeholders	the PowerPoint generation, and with the transformation we need to find other methods of mobilising a group behind your idea by pitching and storytelling and taking the space for that.	U
				I think this curriculum, with for example pitching your idea, internally or externally, would be a good fit. I am thinking also of my presentation of how we can make more internal start-ups.	U
				Someone can learn from a movie what the pitfalls of presentations are when time is short before meeting with a client	K
Planning & Management	Set goals and define priorities and action plans	No interest	If there is no interest in further developing this competence	Planning, organizing should be less at times **See also finance**	U
Working with others	Working together and cooperating with other people to turn ideas into action	**Client Communication**	**Working together with clients and**	I would like a best practice for approaching potential clients by phone or on fairs.	G
				I would like do's and don'ts for client contact/communication	G
				How to pick up signals of a client is an aspect for new people	
				We experience what is happening on the floor with the clients directly	
Learning through experience	Use any initiative for value creation as a learning opportunity	On-the-job	Activities that promote learning while on the job	When you're with a smaller team, everyone picks it up	G
				For us learning is continuous in real-life because it is dynamic	G
				People already pick up everything, we are continuously learning	G
				You learn on the job by talking to client	G
				Best practices come from conversations you have with companies	G

Entrepreneurial Training

Concept	Definition of Concept	Category	Definition of Category	First Order Code	
Perceived Ease of Use		Current Online Training	Mentions current IT structure for current learning processes	We have a really nice programme for this which is called mylearning via the app.	U
				In our programme, I use it most often on my iPad, you can already indicate you're looking for entrepreneurship and then you can get videos, ted talks.	U
				We use the app for learning, so we don't have classroom learning anymore really.	U
				We have a lot of longer e-learning	K
				We already know how to collaborate with our existing learning platform.	K
				centrally managed platform for foundational and behaviour trainings	K
				We have a company that gives help via the cloud environment	
		Current Offline Training	Offline manuals with the purpose of teaching the same principles as in online training	We have a step-by-step manual which doubles as a quality as	GF
				The large manuals of big companies are too much for an SME	GF
		New Learning Platform	Demands for the ease of use of a new online learning platform	It needs to be easily available	G
				It should be modular, short and easily accessible for a start-up	G
		Structured overview	Ease of use is influenced by the structure of the online learning programme and the mentions of the structured overview are here.	A curriculum that helps people to not be overwhelmed so you can help people take the first step into entrepreneurship.	U
				Keep it easily accessible so people use it as a reference work	G
				If you have too much information and you can't find what you're looking for it will not be used	K
				You should present it in different blocks, one for client side and one for product development	
		Integration with current IT	What is the current learning IT platform situation and is it possible to integrate a new programme in the system (and how willing are they)	You can choose models in our training, so something similar, like the e-learning curriculum should be housed within the platform that already exists.	U

				An option is extending our program with an address and tell assigned people to do it	K
				The question is compatibility when you want to create a community of sharing	K
				If the programme platform is similar we want to do it ourselves.	K
				There is no problem with integrating this new type of learning environment	K
		Time difficulties with Online training	Difficulties with time management to complete online training in a company in the current environment.	Most general training is done during working hours	K
				hard to free up working time to do a training	K
				Work with employees to give time for training	K
				If you need to sit down for 1-1.5 hour within a certain time span it becomes a compulsory training	G
				The time of video clips should be between 5-7 minutes	G
				Logging in in a busy moment takes too much time and is not going to work.	U
Perceived Usefulness	Definition	Use of Network or Team for Motivation/**Working with others**	Everything the use of a network or team element is mentioned as a way of motivation to start using the e-learning curriculum and create a sustained interest.	Instinctively I think it is difficult to teach entrepreneurship in our company individually, online, so I see this in the form of teams.	U
				What I want most for myself is a way to not be overwhelmed by it, to know what the best tools are to use for entrepreneurship in teams.	U
				It is difficult to create a mindset change with a one-on-one vision, so you should use tools or methods within a team to create empowerment.	U
				If you can do LinkedIn link you can create a community	K
				relying on regularly giving each other feedback in a group to hold each other accountable for progressing.	K
				Creating long time sustainable interest	
		No standardized testing		Implicit accountability, incentives like your network is driving you	K
				I am waiting for your answer to finish myself	K
				I think it is good to test it by building a community around it where people can learn that 'this worked well, and this didn't'	U

				The best test is whether your project comes off the ground and if you can mobilise people behind your ideas and learn something out of it.	U
				This approach makes you very flexible with your timing, there needs to be some kind of pressure that you finish it	K
				I don't think you should test it	U
		Addition to available information		It's difficult to say what is missing, because I don't really know what there already is exactly.	U
				It is difficult to say what we want because I think there already is a lot out there.	U
				A lot is available via start life and Starthub and online	G
				It needs to be on a higher level than YouTube, with best practices	G
		Vision of purpose of online curriculum		A start-up has little time, so it should be an easy tool for help	G
				I like that is kind of a practical guidebook, that you can tell people to start pitching their idea and learn from it and come into contact with each other.	U
				A toolbox of general things such as starting a conversation with a client	G
				It matters how it translates to application	K
				I imagine a toolbox of short intro's on how to do something	G
				I think the modules are a good start for an employee to get a few handles on how to let go what they've learned all those years to and make space to learn something different.	U
				You can take people by the hand through different modules to go not only from an idea, but a wish of wanting to do something to a something concrete.	U
		Programme Learning Extension		I would love the possibility to endorse certain skills on linked in	K
				it should be able to learn further, at a different time or repeatable	G
				You could use ACTs, tools or extra inhouse training	K
				Go outside the food-based companies	K
				After learning one topic there could be videos to extend the topics	G

				Short videos on how to best capture what has been discussed in a fast-paced environment such as a fair	
		Individual Company Demands		You need to choose whether you become a start-up that supports a company, or a standalone tool that can be promoted within the company.	K
				It is not possible to put what we need for a company in an online tool that is meant for broader use	G
		Not useful for everyone		there're also people that just want to do their 9-5 job and aren't looking for this, which is fine because we need them.	U
				If the company grows it becomes more segregated in sales and R&D, then it becomes more relevant	G
				The curriculum should not need to be for everyone an I wouldn't want to test it either.	u
				You keep people that like the environment that has customers in front of you in real life	G

E. EntreComp Proficiency

Table 11 EntreComp progression model with example for Ideas & Opportunities adapted from McCallum et al. (2018)

EntreComp Progression model							
Foundation Relying on support from others		**Intermediate** Building independence		**Advanced** Taking responsibility		**Expert** Driving transformation, innovation and growth	
Under direct supervision (includes support by teachers, mentors, peers or advisors)	With reduced support from others, some autonomy and together with peers.	On my own and together with my peers	Taking and sharing some responsibilities	With some guidance and together with others	Taking responsibility for making decisions and working with others	Taking responsibility for contributing to complex developments in a specific field.	Contributing substantially to the development of a specific field.
1**. Discover** Focuses on discovering your qualities, potential, interests and wished. Also focuses on recognising different types of problems and needs that can be solved creatively and on developing individual skills and attitudes	**2. Explore** Focuses on exploring different approaches to problems, concentrating on diversity and developing social skills and attitudes	**3. Experiment** Focuses on critical thinking and on experimenting with creating value, for instance through practical entrepreneurial competences	**4. Dare** Focuses on turning ideas into action in 'real life' and on taking responsibility for this	**5. Improve** Focuses on improving your skills for turning ideas into action, taking responsibility for creating value and developing knowledge about entrepreneurship	**6. Reinforce** Focuses on working with others, using the knowledge you have to generate value and deal with increasingly complex challenges.	**7. Expand** Focuses on the competences needed to deal with complex challenges, handling a constantly changing environment where the degree of uncertainty is high	**8. Transform** Focuses on merging challenges by developing new knowledge, through research and development and innovation capabilities to achieve excellence and transform the way things are done
Example: learning outcomes / Area: Ideas & Opportunities / Competence: Creativity / Thread: Develop Ideas							
I can develop ideas that solve problems that are relevant to me and my surroundings	Alone and as part of a team, I can develop ideas that create value for others	I can experiment with different techniques to generate alternative solutions to problems, using available resources in an effective way	I can test the value of my solutions with end users.	I can describe different techniques to test innovative ideas with end users.	I can set up processes to involve stakeholders in finding, developing and testing ideas.	I can tailor a variety of ways of involving stakeholders to suit the needs of my value-creating activity.	I can design new processes to involve stakeholder in generating, developing and testing ideas that create value

F. Current MOOCs types and providers

a. Different types of MOOCs and learning programmes

There are many types of MOOC definitions used in literature. The most common are the cMOOC, in which c stands for connectivity, and the xMOOC, in which x stands for extension. These are the first coined phrases for types of MOOC and made a distinction between primary intentions of the learning process.

cMOOC

A cMOOC is part of a lifelong learning experience, focusing on knowledge creation and generation and taking strength from learner's creativity, autonomy and learning by connecting (Gaebel, 2013; Kesim & Altınpulluk, 2015; Welsh & Dragusin, 2013; Yousef, Chatti, Wosnitza, & Schroeder, 2015). To better understand how the connectivism MOOC is grounded in theory, it will be further elaborated. Distance education pedagogy was divided in three categories by Anderson and Dron (2011); cognitive behaviourism, social constructivism and connectivism. Cognitive behaviourism was related to the pre-web period of learning with printed materials, television and radio; social constructivism refers to the period with teleconferences and the web 1.0 and connectivism is the approach of the new age with the web 2.0 and the communication, interaction processes and social networks derived from this constant connectivity. It has been debated whether this theory is still relevant enough behaviourism and constructivism are concepts that do not consider that technology has developed and has an influence on education. Connectivists are firm believers that the focus of education is not simply the transfer of knowledge from teacher to the learning within a traditional environment, but that knowledge is transferred and transformed by interactions between people, especially in a web environment (Kesim & Altınpulluk, 2015; Kop, 2011)(Kesim & Altınpulluk, 2015; Kop, 2011). The nature of this MOOC is that the learner is free throughout the learning process and can determine their own learning goals. This, however, does result in difficulties in evaluating and assessing the learning of the student. In return it is difficult to create a straight forward certification process and gain monetary value from this types of system (Kesim & Altınpulluk, 2015).

xMOOC

The xMOOC is a formal learning type, often described as the 'Coursera' MOOC, that is focused more on knowledge duplication rather than creation. Based on a more traditional classroom format, the xMOOC content is fixed and often accompanied by video presentations, short quizzes, and testing and the possibility for certification (Gaebel, 2013; Kesim & Altınpulluk, 2015; Welsh & Dragusin, 2013). In the recent years, when literature refers to MOOCs, they mostly mean the xMOOC. Main MOOC providers such as Coursera, Udemy, Udacity and EdX are focused on xMOOCs. The students can take any course they wish and need to finish their quizzes and assignments within a fixed time

frame of a few weeks. The main purpose of learners working on xMOOCs is a further introduction to the subject rather than attaining credit or proficiency (Kesim & Altınpulluk, 2015).

Although the offerings and exact logistic details of each xMOOC provider differ slightly, they all have the same characteristics of a traditional behaviourist approach in which the information is directly transmitted and the learner receives this passively, rather than stimulating critical, creative and cognitive skills (Kesim & Altınpulluk, 2015).

Overview of all types of MOOCs

Over the years more variants of MOOCs have evolved from the xMOOC and cMOOC, ranging from SM-MOOC, which is a definition of a smaller type of MOOC with up to 150 participants, to Blended MOOCs, which allow for more flexibility with the course format. Often, the different classifications of MOOCs do not need to be mutually exclusive. The most relevant MOOC descriptions for the new MOOC development are reviewed in the table below.

Table 12 Overview of most common MOOC types from the literature and their descriptions

Type of MOOC	Year Started	Description	Authors
cMOOC	2008	Connectivity MOOC – knowledge creation and generation, learners are expected to enrich course content, autonomy and networking is encouraged	(Gaebel, 2013; Kesim & Altınpulluk, 2015; Welsh & Dragusin, 2013; Yousef et al., 2015)
xMOOC	2012	Extension MOOC – traditional format, fixed structured content, centralized discussion forum support, automated or peer-graded evaluation. Students are required to master what they are taught.	(Gaebel, 2013; Kesim & Altınpulluk, 2015; Welsh & Dragusin, 2013; Yousef et al., 2015)
smMOOC	-	Small or Social Open Online Course – A MOOC that has less than 150 participants	(Bravo, 2013; Yousef et al., 2015)
bMOOC	-	Blended MOOC – combination of traditional MOOC with face-to-face seminars at universities and open groups of participants.	(Bravo, 2013; Yousef et al., 2015)
SPOC	2013	Small Private Open/Online Course – Offering a tailor-made course to a small group of people. Currculum is designed with corporate training directors to meet goals of training	(Fox, 2013; Goral, 2013)

b. Common MOOC providers that have entrepreneurship and innovation curriculums

Overview of MOOC providers, with country and year of foundation that currently host at least one or more Entrepreneurship and Innovation courses of professional level in English. Compiled from systematic searches and several MOOC lists compiled by users and providers (Dhiman, 2015; Haider, 2013; Shah, 2017)

	Name	Type	Website	Country	Year	Accreditation?	Professional Learning
1	***EDX***	Non-profit	https://www.edx.org/	USA	2012	All rights reserved	
2	***COURSERA***	Commercial	https://www.coursera.org/	USA	2012	Free for registered users	Free for
3	***NOVOED***	Commercial	https://novoed.com/	USA	2013		Yes
4	***FUTURELEARN***	Commercial	https://www.futurelearn.com	UK	2012	ARR	Yes
5	***OPENUPED***	Non-profit	http://www.openuped.eu/				yes
6	***IVERSITY***	Commercial	https://iversity.org	EU	2013		
7	***OPEN2STUDY***	Commercial	https://www.open2study.com	Australia	2013	No – only on open university australia	Yes
8	***OPENLEARNING***		https://www.openlearning.com	Australia	2012		
9	***UDEMY***	Commercial	www.udemy.com	USA	2010	Yes	Yes
13	***OPEN CLASSROOMS***	Commercial	https://openclassrooms.com/	France	2007	CC license	yes