SYSTEMS-THINKING FOR SUSTAINABILITY IN
TOURISM HIGHER EDUCATION

by

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Abstract

This thesis explores systems-thinking in fifty tourism higher education programs across the world by establishing several indicators: critical thinking, networks, interdisciplinarity, wicked problems and feedback loops. Critical thinking is seen as one of the fundaments of systems-thinking. Networks and interdisciplinarity are characteristics of any system. Lastly, wicked problems and feedback loops relate to the complexity of systems. In addition, barriers and facilitators of incorporating systems-thinking in tourism education are explored through sending out a survey in a mailing list of scholars and by sending emails directly to the schools of the sample. A content analysis of program descriptions on two study portal websites and university websites provides an in-depth evaluation of the abovementioned indicators. A matrix which has been established, plotting systems-thinking against critical thinking shows that these two concepts are usually either both implemented or both kept out of a program. This confirms the interrelationship between the two concepts. Finally, it can be said that most of the indicators are found in tourism programs to some extent. Master programs generally contain more systems-thinking indicators than Bachelor level education. In general, however, there are great differences between programs and what they aim to teach.

Key words: systems-thinking, critical thinking, tourism education, university, interdisciplinarity, feedback loops, exploratory, dynamics, impacts, tourism, sustainability.

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1   Introduction

'Tourism has diverse impacts and operates in a complex, changeable world calling for sustainable development.' (Ring, Dickinger & Wöber, 2009, p. 106-107)

Tourism is a complex system in which different scales from local to global come together, and different actors interact and depend on each other (Russell & Faulkner, 1999). The above quote also illustrates that tourism is dynamic and interconnected. The different scales in tourism all get to be connected and interact with each other. There are so many different elements in this system, that it can be difficult to see where tourism starts and where it ends. More concretely, tourism does not only comprise tourism managers, hotels and the aviation industry. Other stakeholders that are just as important are for example local communities in the destinations, as well as governments and ecosystems.

Politics, economics, sociology, environmental sciences, and even technology all come together in the tourism system, as tourism is inherently multi-disciplinary (Faulkner & Russell, 1997). Therefore, it is important to approach tourism from a holistic perspective (Jakulin, 2015). A set of skills that can assist in this is systems-thinking. This is a way of thinking which facilitates a broad understanding of the tourism system. The study of tourism as a system is crucial to gain understanding of everything that is part of tourism, as well as exploring the relationships between different parts of that system. Systems-thinking is already used in tourism research (Amelung et al., 2016) and often seen in a complex context (Farrell & Twining-Ward, 2003; Lacitignola, Petrosillo, Cataldi & Zurlini, 2007). This research shows us how a holistic perspective helps to comprehend what exactly is going on.

The emergence of the tourism industry and its importance on economic and social levels have long been established (Paul, 2012). Employment, cultural exchange and personal development are all advantages that have been ascribed to tourism (Paul, 2012). However, there are also major downsides. Pollution, water stress and inequalities are not foreign to the tourism industry (Paul, 2012). Because of the increasing pressures on local cultures and the environmental assets of destinations, sustainability is also more and more needed in the growing industry.

The potential of ensuring sustainability and creating a path that makes tourism more environmentally friendly is also increased when the whole system is considered. The sustainability issue nowadays is gaining more and more attention. Also in the tourism domain, environmental sustainability is becoming increasingly important (Shephard, 2007; Inui, Wheeler & Lankford, 2006; Pan, Chou, Morrison, Huang & Lin, 2018). Research and education are important tools in learning how to tackle environmental and other complex issues. A well-cited article from Farrell and Twining-Ward (2003) already calls for exploring how systems-thinking can be implemented in the way of thinking, while connecting this to changing current education systems. Inui et al. (2006) add that even though it is desirable to learn about the business and practical part of tourism, it is important to educate future tourism professionals to become critical thinkers and to learn about the morality that comes with developing tourism. In order to make changes in the tourism domain and to be able to communicate new findings about how the tourism system works and how it should be approached, tourism education is a crucial starting point. This is where young students are taught about how the system works and often also how to manage it. These students are the future leaders of the industry, and it is thus the place where seeds are sown for the future. Systems-thinking can be an important tool and skill to learn in tourism education. It provides a more holistic view and enables one to make more effective changes in terms of sustainability or other complex issues.

One of the characteristics of gaining understanding of the system is interdisciplinarity (Faulkner & Russell, 1997). The combination of different disciplines and relationships between them is essentially what systems-thinking promotes (Haines, 1998). Different perspectives give insights into other ways of thinking and this enables students to challenge the dominant paradigm that exists. Furthermore, critical thinking is crucial. To challenge conventional ideas and to critically reflect upon the dominant discourse is a skill that is often taught in academic programs. It provides the opportunity to improve and alter the way that tourism is often taught today. Systems-thinking can be a tool in accomplishing that. The importance of exploring systems-thinking in tourism education becomes evident when one considers the occurrence of so-called wicked problems. In a world in which digitalization takes place on every scale, where globalization is no longer a new phenomenon, making everything more complex (Arnold & Wade, 2015), and everything seems to be shared with everyone, it is only logical that large problems can also occur. Within these problems, a great number of different stakeholders is involved. Roberts (2000) explores the occurrence of these wicked problems. Such problems are so complex, that the many stakeholders and actors that are involved in them, do not agree on neither the solution nor on what exactly the problem is. As previously mentioned, the

tourism sector accounts for many different stakeholders on different levels and scales. Thus, wicked problems also occur in the tourism domain. By involving systems-thinking, innovative ideas may be developed in the process of defining the problems and searching for solutions.

As societal and environmental issues are not only growing in size, but in severity, it is crucial to learn how different nodes in the system are connected and how they influence each other. Especially when sustainability is to be implemented and to function effectively in the system. To sustain the world industries, or the tourism industry more specifically, a systems-approach can assist in facilitating the implementation of sustainability. This sustainable development is eventually the goal (Nguyen, Bosch & Maani, 2011a), because most can agree that the world should not be depleted of natural resources to the extent that the livability of people and next generations to come is threatened.

Scholarly relevance

Tourism development is a widespread phenomenon and the growth of the sector is tremendous (Mowforth & Munt, 2015). Therefore, research in this field is important to assess impacts and develop improvements of the current system. Education is a way to get the knowledge to (new) professionals in tourism and to make sure that what is known can be implemented. Consequently, this also means that students of higher education in tourism should not only learn how a tourism experience can be delivered in an appropriate way or how one can profit economically by selling tourism products. In learning about tourism, it is also important to explore different, less obvious, components of the system, and especially the interactions that take place between these different elements. Back in 1994, Forrester (1994a) recognized that education was rather rigid, teaching facts rather than dynamics. The change that is inherent to social and ecological systems can be better understood when using systems dynamics for education (Forrester, 1994a). Complexity is also mentioned as one of the major challenges that need to be addressed in education. The material that is taught is not in line with what is needed in the complexity of the working place and of the real world according to Forrester (1994a).

A review of tourism education in relation to sustainability in curricula has already been conducted by Wilson and Von der Heidt (2013), as has a content analysis on 64 Bachelor tourism programs in English (Ring et al., 2009). However, a review of systems-thinking as part of curricula in tourism education is still lacking. To design a curriculum means to choose what to include and exclude and to provide context for students to be able to learn and understand the material (Ring et al., 2009). Therefore, it is interesting to look further into what programs currently teach. This thesis can

contribute to give an overview of how tourism professionals develop and learn about the tourism system during their study programs.

There are multiple concepts that are involved in the topic of the thesis. First of all, systems-thinking is crucial, as well as tourism development and education. Aside from dealing with issues in the political, economic, environmental and social dimension, the integration of disciplines and looking at how the elements affect each other through networks is a main topic. The complexity of the system is looked at through feedback loops and wicked problems, while the characteristics of the system itself are looked at through networks and interdisciplinarity. A crucial fundament of systems-thinking is critical thinking. Eventually these indicators will facilitate the analysis of tourism programs to see if systems-thinking is implemented in the curriculum.

There are many different approaches to tourism education. The scope of this thesis is tourism programs on both the Bachelor and Master's level at academic universities. The focus of different programs can vary, such as the economics of tourism, a holistic approach to the tourism system or a management perspective. With this analysis on how tourism programs integrate systems-thinking, it will be explored whether wicked issues are currently taught, whether a critical approach is taken and whether interconnectedness through networks, feedback loops and interdisciplinarity are acknowledged and paid attention to.

With the answers to the research questions, a concise overview can be provided to everyone who is interested in how tourism programs are set up at academic universities and for those who seek to increase systems-thinking to establish an understanding of the tourism system as a whole. It can also be assessed if tourism education programs need to integrate systems-thinking more in their curricula to make tourism professionals more sensitive to approaching the tourism industry with a holistic perspective on the issues that tourism faces today. The option to expand the use of systems-analysis tools in tourism education can then be further researched and explored. On a societal level, the answers to these research questions may influence how tourism programs are set up. Sustainability is a relevant topic in tourism development, that most tourism programs are likely to address. Assessing to what extent these programs are able to teach their students a systemic approach to global issues and educate their students on this pressing matter is essential in changing the current destructive manner in which we interact with the planet, also in terms of tourism.

In this thesis, the goal is to find out which programs already apply systems-thinking and which are still lacking. The programs will be from different countries around the world. The aforementioned indicators of systems-thinking are going to be introduced to establish a deeper understanding of these

concepts and to evaluate systems-thinking in tourism education. The main research question that is formulated for this thesis is: To what extent do tourism programs already involve systems-thinking in their program descriptions? The following sub-questions are formulated to assist in answering the research question:

1. To what extent is systems-thinking used as a specific concept in tourism curricula?
2. How do critical thinking and systems-thinking relate to each other?
3. To what extent is interdisciplinarity implemented in the program?
4. How are wicked problems discussed and analyzed in their context, keeping in mind relationships and connectedness from systems-theory?
5. Are relations between elements in the system highlighted through feedback loops?
6. What are the barriers and facilitators of systems-thinking in tourism education?

In order to answer these research questions, the literature review will go into more depth with the concepts that are required for this study. Afterwards, the methodology will elaborate on how the sample is chosen and what type of research design is appropriate. The results of the analysis will be discussed thereafter. The discussion synthesizes the findings and shows what limitations are applicable to the research. Finally, the conclusion will shortly summarize the findings and show what the most important points are to take into account in the future.

2   Literature Review

The emergence of complex and far-reaching problems is nothing new anymore nowadays (Nguyen, Graham, Ross, Maani & Bosch, 2011b). Organizations cannot deal with issues all on their own and are required to work together (Nguyen et al., 2011b; Pavlovich, 2003). Decisions that are made are likely to have far-reaching effects that cannot always be predicted. Therefore, it is crucial that decision-makers have a sense of systems-thinking (Jakulin, 2015). There is a growing number of researchers in the tourism domain who are trying to predict future behaviors of the system by learning about the dynamics of it (Jakulin and Clarke, 2017; Baggio, 2008). Right away, it becomes evident that this is not an easy task. Structures of tourism vary in different countries and there is no clear production and consumption line to be recognized universally (Baggio, 2008). Interdependency and nonlinearity are two key characteristics of the tourism system. An in-depth overview of the concepts

that are used in this thesis needs to be given to comprehend what different concepts mean and how they relate to each other. The following sub-chapters will discuss the different elements of this thesis that are needed to set up a methodology and analyze the data that is gathered.

2.1   Tourism education

The way in which programs should be structured and which content is most important for students to learn is a point of debate. There are great differences between tourism programs in terms of their focus and on what they find important for their students to take with them. Sheldon, Fesenmaier, Woeber, Cooper and Antonioli (2008) examine in what ways tourism education should develop up to 2030. Future initiatives have been discussed by tourism educators, and outcomes are discussed in their paper. Among some of the outcomes are skills that are considered important to be taught to future tourism professionals. These skills relate to stewardship, politics, ethics, human resources and business skills (Sheldon et al., 2008). With the vulnerability and uncertainty of the tourism sector, it is crucial for students to learn how to handle future challenges. It is argued that a restructuring is needed (Sheldon et al., 2008). As universities have always been a great source of innovation and change (Sheldon, Fesenmaier & Tribe, 2013), it is an essential point of departure where one requires skills such as systems-thinking to solve issues related to complex dynamics of tourism today. Baggio (2008) also emphasizes that a change in how tourism studies are approached is required. Already in 1995, a 'chaos and complexity framework' is suggested by Faulkner and Valerio (1995). In this framework, the tourism sector is seen as a complex one, comprised of internal and external influences that make up the relationships between the elements and the behavior of the system. Instead of the reductionist approach, with models trying to predict and forecast the future, this framework incorporates the different elements and relationships between them.

Apart from these specific skills, Nguyen et al. (2011b) emphasize that systems-thinking skills should be in the routine of social sciences in general. It has been suggested that young students are able to pick up skills to discern the structure of systems quicker, and it is even important for them to develop such an understanding, because it helps to see complex relationships in both the natural and the social world (Nguyen et al., 2011b).

Baggio (2008) found that tourism can be seen as a complex adaptive system, with nonlinear, dynamic and interdependent elements that should be seen holistically. The behavior of the system can be understood much better if tourism is not seen simplistically from a reductionist approach (Baggio, 2008). Therefore, systems-thinking will prove to become more important in the tourism domain and

the education system. Ring et al. (2009) incorporate one criterium for their analysis which states that impacts of tourism and an interdisciplinary approach to understand the entire tourism system is an important characteristic of tourism education to be assessed. The assessment of tourism education in terms of systems-thinking can only be conducted when it becomes clearer what systems-thinking exactly entails.

2.2   Systems-thinking

Systems-thinking originated in the beginning of the twentieth century, when the biological discipline stated that organisms need to be seen as whole entities (Capra & Luisi, 2014). From this, systems-thinking has made its way in a lot of other disciplines, such as ecology, quantum physics, business (Forrester, 1994b) and now also tourism (Capra & Luisi, 2014; Mai & Smith, 2015). The social sciences were introduced to systems-thinking in 1990 by Senge (as cited in Jakulin & Clarke, 2017). As Capra and Luisi (2014) illustrate, systems-thinking is a 'new way of thinking' (Nguyen et al., 2011b p. 4) … 'in terms of connectedness, relationships, patterns and context' (p. 65). This new perspective highlights interactions between different parts of a larger system. The biological discipline illustrates the importance of systems-thinking: the whole organism is more than a sum of its parts (Zahra & Ryan, 2006), because there are the interactions between different parts that shape what becomes life (Capra & Luisi, 2014). The following quote again illustrates that: 'although we can discern individual parts in any system, these parts are not isolated, and the nature of the whole is always different from the mere sum of its parts' (Capra & Luisi, 2014, p. 65; Zahra & Ryan, 2006). In this sense, it can be understood why systems-thinking is so important in a complex discipline as tourism: it is not the parts of the system that need to be understood, but the interactions that contribute to what becomes a whole. What is important to mention is that systems-thinking is based on context, whereas analytical thinking tends to take everything apart and look into each component separately (Capra & Luisi, 2014). Thus, systems-thinking goes beyond that.

The importance of systems-thinking is again emphasized by Arnold and Wade (2015) as playing a crucial role in the complexity of the world today. Systems-thinking is implemented and understood in a variety of ways by different scholars (Arnold & Wade, 2015). A complete definition is required to bring more attention to systems-thinking in educational settings. Systems-thinking is seen as a set of skills which assists in understanding deeper structures of complex behaviors, which eventually facilitates the prediction of future behavior (Arnold & Wade, 2015). So-called ripple effects are also described, which are evident in the global system. They even go as far as stating that each

decision-maker should in fact have some idea of systems-thinking (Arnold & Wade, 2015; Jakulin, 2015). Different indicators that have been identified by Arnold and Wade (2015) are: wholes rather than parts, dynamic behavior, system as the cause of its behavior, interconnectedness/interrelationships, stock and flow relationships, acknowledging that systems are important, delays, non-linear relationships, feedback loops, and system structure generates behavior (p. 674). All these elements are found in different definitions of scholars. The final objective definition they come up with is as follows: 'systems thinking is a set of synergistic analytic skills used to improve the capability of identifying and understanding systems, predicting their behaviors, and devising modifications to them in order to produce desired effects. These skills work together as a system.' (Arnold & Wade, 2015 p. 675). Thus, it facilitates a deeper understanding of underlying structures, enabling predictions about future behaviour of a system.

Mai and Smith (2015) also recognize the importance of systems-thinking by stating that it is a crucial aspect to understand complex systems, and to comprehend how current structures potentially influence the future. As tourism is a highly complex system that integrates many different businesses, communities and governmental institutions, it seems only logical to approach it from a systems-thinking perspective (Mai & Smith, 2015; Ring et al., 2009). It is not only crucial to look at these different actors that operate in tourism, but specifically the relationships between them are what makes tourism so complex. In addition, tourism is very dependent on safety and security, from both a political and a natural point of view. Influences from the outside world are often dynamic and nonlinear (Baggio, 2008). By combining systems-thinking with tourism development, this paper shows that these two concepts are inherent to each other, and therefore relevant to explore.

The connection between systems-thinking and sustainable development has been made before (Nguyen, et al. 2011a). Maintaining the standard of life as we know it, while also acknowledging and staying within ecosystem boundaries, is a challenge of today's society (Nguyen et al., 2011a). Complexity, multi-stakeholders and dynamics of nature are all concepts that need to be understood and acknowledged in the issues today (Nguyen et al., 2011a). Nguyen et al. (2011a) discuss the framework of Maani and Cavana (2007) in which there are four levels of thinking identified. The first three range from day to day decisions, to thinking in patterns and systemic structures. Finally, the fourth level is one that goes even further into depth and comprises the deeper lying assumptions of organizations and individuals which make them act and behave in a certain way. This is the level that is often overlooked or not thought through properly. It is also mentioned that in decision-making processes, it is often difficult for the people involved to see the interdependencies and relationships

between the different stakeholders (Nguyen et al. 2011a). Identifying the dynamics that take place at such negotiation tables can be overlooked easily.

Forrester (1994a) discusses how educating about systems-thinking alone will not enable students to really understand what it comprehends. He suggests that rather than theoretical learning, it is of great importance to gain experience by participating in activities that build this understanding. However, he also recognizes that systems-thinking education is a theoretical lesson that needs to be taught (Forrester, 1994a). To be able to really learn about what systems-thinking is and how the skill can be developed, it is important to learn by doing and continuously apply the method. It is also helpful to take examples from one's personal life and experience to be able to identify the relevant structures. Creating one's own models will enable students to dive into the material provided.

2.3   Critical thinking and interdisciplinarity

As previously mentioned, the importance of critical thinking is emphasized by Inui et al. (2006), as they state that it is crucial for tourism professionals to be critical thinkers. On the one hand, systems-thinking provides a set of skills that enables students and researchers to approach a system from multiple angles and consider how elements interact and how these interrelationships shape what becomes the system. On the other hand, questioning the way of thinking and the approach towards the tourism system is also a skill that facilitates a better understanding of what is going on in a system and why. To think critically causes certain problems to surface that were not apparent before (Inui et al., 2006). It even generates innovation and new ideas. The importance of critical thinking at the core of an academic program is mentioned by multiple scholars (Tribe, 2002; Inui et al., 2006). Even while approaching the system from a broader and more open mindset, critical thinking is a crucial skill in learning how to go about problems in the world. Richmond (1993) even turns it around and states that systems-thinking is a part of critical thinking in a broader context. This adds to the argumentation that systems-thinking and critical thinking are inherent to each other (see Figure 2). Furthermore, Sheldon et al. (2008) identify that critical thinking is among the dynamic business skills that tourism students should learn about.

As an indication for systems-thinking, one can also think of multi- or interdisciplinarity (Faulkner & Russell, 1997). As mentioned before, systems-thinking is connected to relationships and context. Combining different disciplines for understanding the system can be seen as an indication that one is aware of the larger system and the interactions between different approaches. Steiner and Posch (2006) relate interdisciplinarity to complexity and sustainable development. As wicked problems

are related to increased complexity, it is even more difficult to describe how the current system operates, where it should be directed to and to everything between getting from the current state to a desired state (Steiner & Posch, 2006). A dynamic understanding, based on a mutual learning approach (Steiner & Posch, 2006; Forrester, 1994a) rather than an analytical approach will provide an opportunity to deal with this complexity better. For mutual learning to take place, a critical stance is needed towards the traditional roles of students and professors. A professor may not be seen only as a provider of information and a student as a receiver of this information (Steiner & Posch, 2006). Rather, a more dynamic exchange of information is required, applied to real life cases to address the complexity appropriately.

According to Ring et al. (2009) and Inui et al. (2006) the majority of tourism programs already incorporates interdisciplinarity in their curricula, as well as impacts of tourism. Students of tourism programs are thus provided with an holistic approach to tourism to some extent (Ring et al., 2009). The complexity of today's world cannot be addressed through vocational education properly (Ring et al., 2009). As many more have argued before, a vocational approach simply applies knowledge to society as it is now and teaches students to operate in the current state of the society (Ring et al., 2009; Inui et al., 2006). Therefore, a rather static and especially narrow approach to the reality of the tourism system is used in vocational study programs. Ring et al. (2009) argues that a systemic approach is needed which acknowledges the changing nature of the system and the unpredictability of the future. A systemic approach which facilitates critical thinking helps in understanding the reality of the system. This also involves combining different disciplines to grasp the interrelationships that exist.

2.4 Wicked problems

A consequence of complex systems and globalization is the emergence of far more complex issues. It may even become so complex, that a new term has been introduced: wicked problems. A distinction is made by Roberts (2000) between wicked and complex problems, in which complex problems are defined as issues in which stakeholders only disagree on what the solution to a common problem is. As previously described, wicked problems, on the other hand, are issues in which the involved stakeholders do not agree on neither the solution nor on the problem. Head (2008) describes wicked problems as a combination of complexity, uncertainty and value divergence. Problems that occur on each of the three levels are considered wicked. Thus, complexity on its own does not mean a problem is wicked, neither does uncertainty or disagreement on its own cause a wicked problem to

occur. It is the combination of these three elements that make a problem so difficult that it can be considered wicked (Head, 2008). Roberts (2000) also mentions, that to solve these wicked issues, some call for a restructured education system. While the article does not specifically talk about tourism education, it does indicate that wicked problems require every stakeholder to get involved and take responsibility to tackle it in some way or another (Roberts, 2000). Head (2008) also indicates that to tackle wicked issues, 'management education would need to be adjusted accordingly' (p. 109). They conclude that it will be a challenge to open up a new way of thinking about problems in a complex world, yet doing so is necessary. Acceptance of multiple stakeholder involvement as well as looking at problems from multiple directions is a fundament for finding ways to deal with wicked problems. The governance of a dialogue between stakeholders becomes very complex and is a whole other topic on its own. However, understanding the underlying structures of such a negotiation is key in many different disciplines, including tourism. Ropret, Jakulin and Likar (2014) also discuss the global and local dimension of tourism and how a systemic approach is appropriate to tackle issues. Especially when sustainability on a social, environmental and economic level is to be achieved, systems-thinking is a facilitator. Wilson and Von der Heidt (2013) also note that little research has been done on how tourism education incorporates sustainable development. More importantly, there is a lack of connecting systems-thinking to tourism education in order to reach the goal of sustainability.

2.5   Feedback loops

Uncertainty and change are part of the tourism system (Strickland-Munro, Allison, & Moore, 2010) and feedback loops or cycles are inherent to complex adaptive systems (Baggio, 2008; Jakulin, 2015). Strongly connected to this concept is the ability of a system to reorganize itself. This also relates to Holling's resilience theory (1973). Feedback loops are essential in systems to be able to maintain a certain equilibrium or a specific state in which certain rules apply. Through feedback loops, consequences of a certain action or effects can be mitigated (negative feedback) or reinforced (positive feedback) (Holling, 1973). The ability to deal with consequences is also part of the tourism domain, as it is an important feature in the industry to be able to live with constant change. A resilient approach would enable tourism managers to accept change as part of the rules of the game, and help in keeping heterogeneity, meaning that one will not rigidly try to predict the future, but recognize that the system is complex and can absorb changes or disruptions (Holling, 1973). Furthermore, as one could also phrase it: 'understanding the underlying causal relationships affecting changes in tourism demand is fundamental to the development of better forecasting systems' (Faulkner & Valerio, 1995). The skill

to recognize this is to understand what systems do and how they behave, but not forgetting the ignorance that persists. In systems, reorganization takes place through feedback loops and disturbances are absorbed, when resilience is high, and a current state is thus maintained (Baggio, 2008). Therefore, feedback loops are essential in trying to understand the system as a whole. These are underlying mechanisms that may not be so obvious but keep a certain system in a certain state. Jakulin and Clarke (2017) talk about systems-thinking in terms of feedbacks and an ontology of action. One of the goals, according to them, is to be able to predict future behaviors of a system, as a consequence of decisions that were made (Jakulin & Clarke, 2017; Faulkner & Valerio, 1995). The approach is suitable for complex phenomena, with overlapping scientific fields (Jakulin & Clarke, 2017). Zahra and Ryan (2006) also recognize the chaos and complexity that is present in tourism. Russell and Faulkner (1999) indicate the complexity of tourism by referring to the chaotic and non-linear nature of tourism as well. The complexity is easily overlooked when one assumes that tourism has order and linearity. The underlying structures of tourism can be better addressed with the chaos and complexity theory they propose (Russell & Faulkner, 1999). Consequently, Ladyman, Lambert and Wiesner (2013) describe a complex system as one containing feedback.

Finally, Nguyen et al. (2011b) make use of causal loop diagrams in their case study of educating systems-thinking. This is done to show interrelationships between the different elements. Effects of tourism are shown and how they are interconnected to one another. The causal loop diagram is a model to show that one needs to look at the whole system as opposed to working on only parts of the entire system (Maani & Cavana, 2007). Similarly, Jakulin (2015) also presents a feedback system in tourism with the following figure (see Figure 1), containing inputs and outputs, which are mitigated by feedback in between. Jakulin (2015) talks about how tourism is comprised of parts, co-dependency, dynamics, and the environment. The cycle starts at A, where one looks at what one wants to achieve in the tourism system in relation to E, as the context. Then B is used to see how the system responds when one implements a certain decision, again in relation to E. The current situation is evaluated in C and how elements can help in achieving A through D, in which dynamics take place.
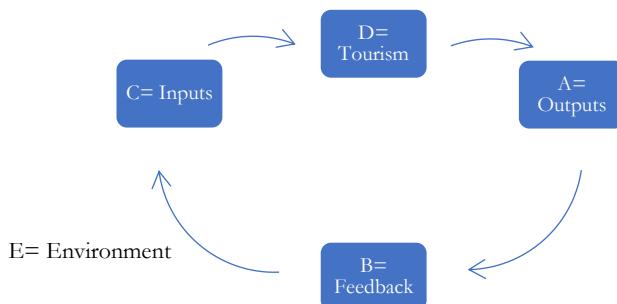

Figure 1. Feedback loops in tourism. Based on Jakulin (2015): p. 70.

2.6   Barriers to incorporation of systems-thinking

Although systems-thinking is considered an important set of skills in dealing with the tourism system, there are reasons why systems-thinking may not be prioritized to be implemented in curricula in tourism programs. An example is a study of the curriculum of an Australian university in relation to implementing sustainability. Wilson and Von der Heidt (2013) showed three themes as to why sustainability is not incorporated in university tourism education. The first one is a crowded curriculum, which means that the curricula that universities currently use are often already full. Incorporating sustainability concepts or even extra course content is in this sense not feasible. Secondly, there is a staff and student resistance to learning about sustainability, as it involves challenging the collective consensus that exists already (Wilson & Von der Heidt, 2013). Finally, there is the reality of a complex, multi-campus institution which does not always allow interaction between students and professors. It is even said that teachers do not have enough time to really go into depth with the complexities and the holistic approach to sustainability in tourism education. Other barriers to implementing systems-thinking are claims for not having enough resources to teach about systems-thinking (Nguyen et al., 2011b). It may even be too difficult for young students to learn about such complex structures. University students are also argued to use simplistic ways of dealing with complex issues. However, on the other hand, it is stated how important it is for students to be able to apply systems-thinking to real life cases. To facilitate systems-thinking in education, Nguyen et al. (2011b) suggest that it depends on system educators who must have the ability to relate the topic to more concrete disciplines and issues. In the training that they provided to a group of adults, Nguyen et al. (2011b) identify that it has been important to tailor the material to the needs of the audience, and to make it as concrete as possible. Furthermore, cooperation of different levels of stakeholders facilitates a better implementation of systems-thinking (Nguyen et al., 2011b). Evaluation is also added at the end to identify whether it has been a success.

2.7   Conceptual framework

In this thesis, the occurrence of systems-thinking in tourism education is explored. The tourism programs that are selected and compared function as the context. Systems-thinking is a complex term which has been explored in the literature review.

At the fundament of systems-thinking is critical thinking (See Figure 2). Without critical thinking, systems-thinking would not have been able to develop in the first place. As previously

described, systems-thinking became relevant in the twentieth century when one considered to look at biological systems in a different way than before (Capra & Luisi, 2014; Nguyen et al., 2011b). Thus, without critical thinking, this leap would not have been made. Furthermore, academic programs typically teach students to not assume every practice in the way it currently is, but to question the conventional way of perceiving reality and thinking outside the box. To think critically relates to systems-thinking in the sense that it is key to understanding any system. Most systems have been in the past or still are perceived in a simplistic way. A critical reflection facilitates systems-thinking, while systems-thinking the other way around also requires a critical outlook on conventional ways of looking at reality. The critical evaluation of how systems had been perceived until the twentieth century, has given rise to the idea of systems-thinking in more than one discipline over time.
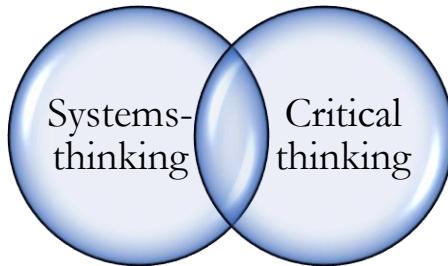

Figure 2. Inherent relation of systems-thinking with critical thinking.

Apart from critical thinking at the fundament of systems-thinking, other indicators also apply to systems-thinking in different ways. Feedback loops relate to the complexity of the system. As previously described, these loops are found in complex system in which chaos and disturbances can be mitigated by reorganization and resilience of the system. The acknowledgement of these loops is an important characteristic for systems-thinking. Consequences, influences and impacts of and on tourism are reflected on in the feedback loops. In addition, wicked problems as multi-actor issues also indicate complexity of a system and relates to the many actors that are involved in the tourism industry. Acknowledgement of this characteristic shows that a greater system is recognized. Systems-thinking may assist in gaining understanding of relationships between actors and the dynamics of the problem-defining process and the solution-finding issues. The recognition of these wicked problems may indicate that systems-thinking is implemented on a higher level to tackle the issues that arise in multi-actor settings.

In addition to these two indicators, the tourism system itself is also characterized by multi-disciplinarity. The connection of different disciplines, in interdisciplinarity, focuses on the

interrelations between elements of the system and are key to systems-thinking. This concept is embedded in systems-thinking as it combines different perspectives and disciplines that can all contribute to understanding the tourism system. Finally, a characteristic of the system is the occurrence of networks across different elements. This is at the core of any system as well and cannot be overlooked when one aims to gain an understanding of an entire system. There are, however, other indications, that are beyond the scope of this research. Figure 3 gives the overview of indicators.
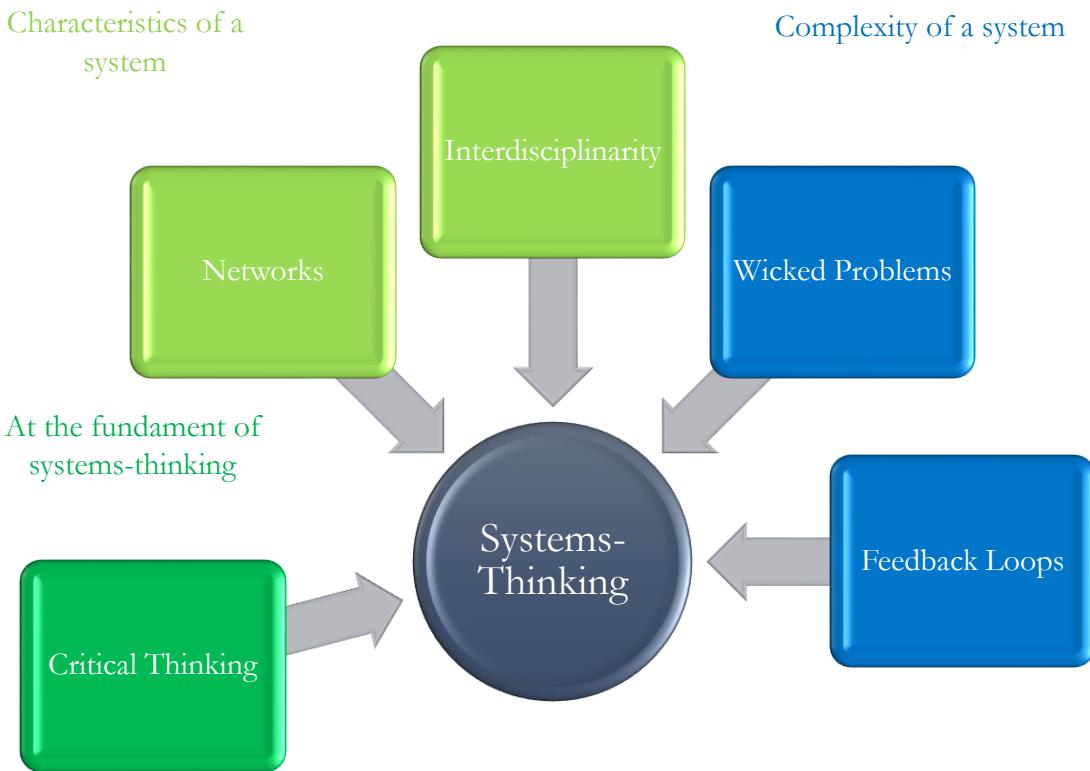
Figure 3. The conceptual framework for indicators of systems-thinking.

Finally, barriers and facilitators to systems-thinking implementation can be helpful in determining how systems-thinking is implemented and what reasons there are when the choice is made not to implement it. The answer to the last sub-question, which relates to barriers and facilitators facilitates a more thorough understanding of the complexities in designing a study program. Even though tourism has been linked to systems-thinking in multiple researches (Mai & Smith 2015; Mayaka & Akama, 2007), it is not so evident how tourism education institutions incorporate this type of thinking in educating their students, and thus future professionals in the field. One could say that education content is crucial if effective changes are to be made and implemented

in the tourism industry. Evaluating how and what is taught about the tourism industry at selected universities is the objective of this thesis.

3   Methodology

To be able to identify whether systems-thinking is incorporated in a program, several main indicators were chosen: critical thinking, wicked problems, networks, feedback loops and interdisciplinarity (see Figure 3), these five indicators form the foundation of the analysis in this thesis. By identifying whether tourism programs discuss critical thinking, networks, interdisciplinarity, wicked problems and feedback loops, it is possible to evaluate whether or not systems-thinking is incorporated. The results will be discussed separately per research question.

3.1   Research design

Tourism education is offered on different levels: applied sciences, Bachelor, Master and PhD. The programs offered at universities of applied sciences are often more focused on vocational education (Inui et al., 2006; Ring et al., 2009). This means that management and the implementation of economic sides of tourism are emphasized. Systems-thinking might not be a first priority in these programs. PhD level tourism education is often tailored to the researcher and there is no general tourism curriculum that applies. Therefore, this thesis goes into depth on the academic university level on both Bachelor and Master programs. These programs have a set structure and are usually more focused on critical reflections of tourism, as Ring et al. (2009) indicate that generic skills, which can be applied in multiple domains, are important for academics. In this way, tourism professionals are educated towards a research approach.

This research has an exploratory design. It explores whether and how systems-thinking is implemented in a sample of tourism study programs around the world. There is limited research available on this subject, and therefore an exploratory design seems most fit. The focus lies on attaining an insight into the subject (University of Southern California, 2018). Starting from there, new research objectives can be formulated. Exploratory studies typically have small sample sizes (University of Southern California, 2018) and provide background information for future research. Thus, this thesis

indicates to what extent systems-thinking is already being implemented in tourism higher education and will introduce further research suggestions.

To establish the sample, this thesis focusses on English taught tourism programs. Furthermore, 'tourism' is to be named in the title of the program. Academic tourism programs from universities are considered, as this level of education is focused on reflection and critical thinking, in which systems-thinking is a skill and method for tackling wicked issues. Both 'university of applied sciences' and 'polytechnic universities' are considered of vocational value and are not included in the data collection of this thesis. However, sometimes a clear distinction between academic and vocational education is lacking. For example, in the USA, no formal distinction is made between the university level and the applied sciences level. Although there are distinctions between colleges and universities, this often relates more to the size of a school than to the actual level of programs given (Wellman, 2017). Therefore, any universities or colleges from the USA are used in this analysis. In other countries, the universities are considered which are understood to be academic universities. A selection is based on two portals providing information on tourism programs: bachelorstudies.com and masterstudies.com. Different universities from all over the world are included in this analysis. Based on the two program portals, a sample of 50 programs is established. It gives a diversified idea of how tourism professionals are educated in different parts of the world.

The programs are divided in 13 Bachelor and 37 Master programs in the sample of this study. The universities are from the following 19 countries: the Netherlands (1), Jamaica (1), the USA (6), France (3), Hungary (1), Spain (1), China (2), Sweden (2), Germany (1), Greece (4), the Philippines (1), Sri Lanka (1), Malaysia (1), the UK (20), Finland (1), Bulgaria (1), Cyprus (1), Norway (1) and Switzerland (1). The sample consists of 44 schools in total, as some programs are offered at the same school. The methodology of this research is in-depth content analysis of data gathered from the portals bachelorstudies.com and masterstudies.com. Firstly, the information on the portals is gathered as well as texts from the websites of these programs which are consulted, and brochures are collected. The university websites contain information that is directed towards prospective students, and include information such as general descriptions, course content and learning outcomes of the program. For eight out of the 13 bachelor programs brochures are available on their websites, which have also been looked at for the analysis. Eighteen of 37 Master programs also provide a brochure on their website.

Secondly, to acquire more information than websites provide, an email is sent to the Trinet mailing list that covers thousands of tourism scholars across the world, with a survey about barriers

and facilitators in implementing systems-thinking in tourism education. Reasons that may exist for not integrating systems-thinking, which is one of the sub-questions, are addressed through the survey. The survey addresses first whether systems-thinking is part of the program and then continues to ask what kind of barriers there are to involve systems-thinking in the curriculum. Then, facilitators of incorporating systems-thinking are asked to be elaborated on. A full overview of the survey can be found in Appendix C. In total, nine responses are recorded for this survey.

In addition to this, if contact information is available, either through email addresses or a contact form, study advisers or coordinators of given programs are contacted to acquire more information, specifically information that may not be directly available. A contact email address is available for 39 out of 44 schools. For four other schools, there are contact forms available. Only one school did not provide any contact information, which is the program in Spain. The survey about barriers and facilitators is also sent in this email to the specific programs. The nine responses which are recorded for the survey have been gathered through response from the Trinet email list, as well as the emails that are sent out to the different schools. The response gives an indication on how systems-thinking is facilitated or why systems-thinking is not implemented.

To be able to analyze the qualitative data, a content analysis is conducted. There are multiple indicators that have been identified in the Literature Review. These indicators are partly subdivided in so-called categories. A category functions as an overall theme. For example, one of the categories is 'networks'. To the different categories several codes are ascribed to be able to identify a certain category in a text. So, the category 'networks' is identified when codes such as 'system', 'global context', or 'broad understanding' are found in the text. A complete overview of the categories and ascribed codes can be found in Appendix D. The ascribed codes are based on previous research, a theoretical framework or one's own experience, through deductive coding. While analyzing the collected information, certain codes are added when they are deemed relevant. This is inductive coding. As a result, a combination of the two leads to the codes, which are ascribed to their relevant categories. The categories are:

1. Networks/systems (global transformations)
2. Connectedness/interdependency
3. Dynamics
4. Critical thinking
5. Interdisciplinarity
6. Wicked problems

7. Feedback loops

8. Consequences (effects of tourism)

Apart from the obvious categories, which are based on the literature review and research questions of this thesis (critical thinking, interdisciplinarity, networks, wicked problems, feedback loops), a few other categories have been added as part of these research questions. The first three categories relate to the first research question, about systems-thinking as a concept. Networks/systems relate to the overall acknowledgement of systems in tourism curricula, and the global transformations that may be connected to these systems. Furthermore, connectedness and interdependency relate to systems-thinking in various ways. The interrelationships of the system are crucial when adopting a systemic way of thinking and providing a holistic approach to various problems occurring in tourism and other domains. Lastly, dynamics are a part of the system, as the tourism system is not static, but constantly in motion. The final category 'consequences' has been added as part of the feedback loops sub-question. Consequences and impacts of tourism and its effects are a separate topic to be able to identify it in more depth.

After the coding and categorizing of the content, an analysis is conducted to see which programs indicate the presence of which categories. Afterwards, the programs are clustered in groups, based on the occurrence and relative importance of the categories in the description of a program and how the programs are generally set up. Some have more indicators that systems-thinking is part of the curriculum than others.

After the overall identification of codes and categories, a matrix is created to show the degree to which systems-thinking is found in the programs against the degree to which critical thinking (as an important part of systems-thinking and academic level studies in general) is implemented in programs. This is done to reflect and cluster the different programs in groups. It shows an interesting contrast, to see if several programs do implement systems-thinking, but do not really address the development of a critical mindset or the other way around. The comparison is important to make a distinction between the groups of programs that do mention critical thinking and indicate systems-thinking and those who only focus on either one or even on neither one of them. The next chapter will provide the overview of results that were gathered from the content analysis.

4   Results and Analysis

This chapter provides an overview of the most important findings from the content analysis. The findings are ordered by research question. Later in the chapter, clusters of programs are made to discuss commonalities and differences between clusters of programs. A visualization will facilitate the understanding of the results. In this chapter, abbreviations are used of the tourism programs to facilitate a reading-flow. The abbreviations are created based on degree-level, starting with a B for Bachelor or M for Master, usually followed by the country where the tourism program is given, such as NL for the Netherlands and FI for Finland. If multiple programs from the same country exist in the sample, another indication is given from either the name of the university (MUSRI for Master in USA at RIT) or the place in the country (MUKLE for Master in UK in Leeds). Sometimes even the first letters of a specific program are given to indicate which program is meant at a given university, when multiple exist (MUKOXITM for Master in UK, Oxford in International Tourism Management). The abbreviations for each of the corresponding programs can be found in Appendix A and B.

4.1   Systems-thinking as a concept

The occurrence of systems-thinking as a concept in tourism programs is divided in three separate themes, which are the first three categories as described in the methodology: networks/systems, interdependency/connectedness, and dynamics. These three categories used in the analysis of the programs are part of the first research question. Per category, codes have been ascribed to identify if a category is found in the texts used in the content analysis.

4.1.1 Networks/systems

The category 'networks' was found in 58% of all the programs, which is the number one category in the sample. Systems, networks or structures in tourism are mentioned in both Bachelor and Master programs. In BNL, a specific course is incorporated called 'tourism systems analysis'. MUKLE talks about 'global forces which might impact on the sustainability of tourism systems', and MUKBOM indicates that a 'systematic understanding' is developed during the program. BSWE furthermore specifies by stating that it will aim to 'provide insights into the role tourism plays in society and into processes of globalisation and development, including issues such as sustainability and climate change', as well as stating that it aims to 'critically understand tourism as both an industry and a phenomenon'.

The use of this category in the texts of university programs is not the only indication for systems-thinking in a program. For example, the following quote indicates a connection to systems-thinking as well: 'You will be provided with a broad inter-disciplinary focus and the opportunity to study most aspects of tourism in depth. The program content reflects the dynamic nature of the tourist industry and develops the core skills that are most valued by employers.' (BHU). Interdisciplinarity, in-depth studies and dynamics are highlighted as part of underlining a broader structure at play in tourism and the education about it.

4.1.2 Connectedness/interdependency

Only 30% of the programs indicated a connection to connectedness. Some programs directly mention the relationships and interdependency, and show an integrated approach to certain areas of the system. For example, BNL: 'The program deals with developments in tourism and the interrelationships between tourism, the economy, society and the environment'. BSWE aims to 'understand the relationships between tourism as an activity and tourism as a business'. For Bachelor programs, there is fewer indication of integrated approaches or an interdependency focus (23%), in comparison to the Master programs in the sample (32%). Multiple Master programs indicate the interconnections. An example is MUKLER, which shows connections regarding the environment and social side of tourism: 'explore the relationships between host communities, their unique cultures and heritage, and the tourists who visit these destinations (…) relationship between tourism and natural resources'. MUKBOM provides a module addressing 'linkages, interrelations, and collaboration requirements'. MUKGREHE also addresses the 'application of integrated solutions' and MUKOXE focuses on 'crucial links between financial, human resource, marketing and operations management'.

4.1.3 Dynamics

Dynamics as a category occurred in 32% of the programs. Relating to this category, codes have been ascribed such as 'non-linearity', 'changing or evolving circumstances', 'trends' and 'transformations' (see Appendix D). For example, MFI discusses that 'travel and tourism is an ever-growing, global and international business' (MFI). MUKBOH addresses 'the current issues and innovations' (MUKBOH), and MUKGCU states: 'we understand how the international tourism sector is constantly evolving, from advances in destination management and sustainability to the dynamic influence of global events'.

4.2   Critical thinking

Critical thinking is not only related to systems-thinking, but to academic university programs in general. This category was the second most frequently found. Almost half, 48% of all the programs indicated to address critical thinking. Some of the codes that belong to this category are 'analyze', 'synthesize', 'moral and ethical' and 'challenging the conventional understanding' (see Appendix D). Some programs may indicate to focus on developing a critical mindset in their students, while also acknowledging the system. And others may not explicitly focus on systems-thinking yet do understand the importance of critical thinking. This is revisited later in the chapter.

Some quotes may illustrate how critical thinking is a part of the programs in the sample: 'the research component develops critical thinking and analytical skills required for decision making and problem solutions in the industry' (BJA). 'Understand, analyze and synthesize data; ethical and socially responsible practices' (BUS). Yet it is also used in a more practical sense to 'demonstrate critical thinking, writing, analytical and decision-making skills, exhibit awareness and knowledge of industry trends and best practices' (BSPA). BSWE also indicates to 'analyse issues that are specific to the tourism industry', to 'engage critically with tourism phenomena and issues' and to 'critically work with social, cultural and management-related issues within tourism and destination development'. In Bachelor programs, the category was less present (38%), than in Master level programs (51%).

Master programs also explicitly indicate the importance of critical thinking in their programs: 'Critically challenge your understanding of the industries in practical contexts' (MUKS). An emphasis may be placed on 'the cross-cultural, moral, ethical, institutional and environmental issues in the management of tourism organizations' (MGREA). 'You'll develop a critical understanding of contemporary issues in marketing and the ability to question current marketing patterns and trends' (MUKBOM) and 'you'll critically reflect upon the significance and impact of tourism on a variety of ecosystems' (MUKBOM). A special awareness is also appreciated: 'awareness of the ethical, cultural, environmental and social settings' (MUKLSB). And most importantly: 'questioning approach to the industry, examining growth and development through the prism of social responsibility and sustainability' (MUKLSB).

4.3   Interdisciplinarity

Interdisciplinarity occurred in 42% of all programs. It occurred in 3 out of 13 Bachelor degrees and in 18 out of 37 Master programs. The Bachelor degree BNL for example mentions it looks 'from different scientific perspectives' and is an interdisciplinary bachelor, as it 'explore(s) tourism as a

multifaceted phenomenon. You will be introduced to the disciplines of sociology, economics and environmental sciences and their contribution to tourism' (BNL). BSWE aims to 'demonstrate knowledge and understanding of tourism and destination development from different disciplinary perspectives'. Generally, Bachelor programs only incorporated interdisciplinarity in 23% of the sample. More specifically, Master programs are more inclined to add an interdisciplinary dimension to their programs (49%). MUKS adds a specific course to their curriculum called 'approaches to tourism and hospitality business management'. Others have an exploratory idea: 'the unit explores the principles, concepts and practices of tourism from the perspective of social science and cultural studies theories. More specifically, the unit discusses the contributions of social science disciplines in understanding the multiple dimensions' (MUKBOM). Furthermore, connections are even made with other categories (interdependency/connectedness) by adding a 'multi-disciplinary framework to explore the wider inter-relationships between operations, marketing, and accounting' (MUKBOH). Interdisciplinarity also seems to be used to establish the context in which tourism operates: 'how tourism businesses operate within their political, economic and socio-cultural environments' (MCY).

4.4   Wicked problems

Even though there are several codes of the wicked problem category, which have been found in the texts, 'wicked problems' as a concept is not mentioned directly by any of the programs. However, the codes that are ascribed to wicked problems did occur, albeit in only 26% of the programs in the sample. This makes it the least occurred category. The category of wicked problems was noted and evaluated as part of the program in 2 of 13 Bachelor programs and in 11 out of 37 Master programs. The category contains several codes, among which are 'complexity', 'multi-stakeholder', 'problem/conflict solving', and 'making tourism better' (see Appendix D). For example, BNL says: 'It (tourism) is a complex phenomenon' (BNL). BSWE only points to 'provide solutions and recognise opportunities for tourism stakeholders'. Master programs also talk about complex issues in the world: 'Complex global phenomena (…) tackle core, contemporary and emerging issues' (MCHI). Others indicate that solutions must be sought: 'tackle the major evolutions in the tourism industry' (MFRARO). MFI even goes as far as to state: 'we aim to make tourism better. Better for businesses, better for tourists, better for the environment and better for local communities', and they claim that their 'students are problems solvers who enjoy challenges, identify and tackle complex problems in the field of tourism' (MFI). MUKLER also indicates such an aim: 'making better places for people to visit and to live'.

4.5   Feedback loops

Feedback loops are identified in the content analysis through codes such as 'cycles', 'developments', 'comprehensive' and 'reflect/review/evaluation', which indicate a sense of acknowledgement of feedback loops in the system (see Appendix D). These are addressed in 16 of the 37 Master tourism programs. For the Bachelor programs, 4 out of 13 indicated the presence of feedback loops.

4.5.1 Feedback loops

Indications for feedback loops were found in 40% of the sample. The term 'feedback loops' does not come back in-text in the sample. In Bachelor programs, the feedback loop indications are often rather weak, for example BSWE only talks about 'focusing on destination development' or the incorporation of courses with 'development' in the title. BCHI has the same style, incorporating courses such as 'sustainable development' and 'tourism policy and development'. A little more specific is BNL talking about how 'tourist activities affect the environment of travel destinations and influence cultures all over the world'. BSRI mentions: 'you will also gain an understanding of the impacts of current international initiatives', hinting to the effects of tourism and how they are interconnected to one another, which are inherent to feedback mechanisms of systems.

The identification of feedback loops as part of the program is illustrated in the following quote: 'comprehensive understanding, implications for local sustainability, policy-making, and decision-making processes related to tourism as well as tourism destination development, planning and airline management' (MCHI). A connection between these concepts is shown through how they affect each other. Others also talk about this connection: 'major influences affecting international hospitality business environment, as well as deep-rooted understanding of the issues currently shaping the management of international hospitality corporations' (MUKM). The feedback that is currently experienced by the environment in the form of its limited resources is also addressed in a module by MUKBOM: 'it will evaluate the potential barriers to continued growth and explore the conflicts and challenges of meeting economic and environmental targets; changing demands; supply structures and impacts on and responses from sport and tourism providers.'(MUKBOM). This also requires a critical perspective: 'critically analyze different multilateral institutions and transnational organization including an evaluation of their impacts involved in international tourism and heritage tourism management' (MSWI).

4.5.2 Consequences/effects of tourism

Impacts on the system as a whole, consequences, effects, and adapting to these changes are all part of the category of consequences. These codes were found in both Bachelor and Master programs, although significantly more in the Master programs (43%), where 16 out of 37 programs indicated some sort of acknowledgement of consequences in the system or how to deal with them. On the other hand, Bachelor programs only discussed consequences in 15% of the sample. In total, 36% of all the programs indicated a relation to consequences. A distinction can be seen between the two levels. For example, the Bachelor program BSWE only indicates awareness of the consequences of different strategies: 'You will learn how to critically analyze the prerequisites for destination development and the consequences of different strategies, as well as marketing, communications and product development' (BSWE). Whereas Master programs tend to look more broadly at consequences, in the sense that it looks on a societal level for example: 'Adapt and respond effectively to ensure sustainability at organizational and societal level' (MGREA). It seems to go a little deeper: 'Analysing the major influences affecting the international tourism and hospitality business environments (…) deep-rooted understanding of the issues, explore the issues that make an impact on the management of human resources in the tourism and hospitality industries' (MUKLE). There is also a certain goal in learning about certain impacts and how to respond to that: 'an increasing focus on the need to adopt responsible business practices that improve the quality of life for communities and conserve the environment and local cultures, minimising the environmental impact' (MUKLER). More specifically, MUKBOM emphasizes to aim 'at addressing the need to integrate tourism and events within risk reduction, response and recovery strategies' (MUKBOM). It is recognized that the awareness of the 'various ways in which tourism planning affects destinations, the tourism industry and tourists is an essential component of understanding of tourism' (MUKBO). Yet another program mentions that it aims for students 'to learn about tourism developments and impacts in the world' (MCY). All these quotes show an awareness of consequences that originate in tourism activities and that should be understood and explored to some extent.

4.6   Barriers and facilitators

The barriers and facilitators are addressed in the survey that has been sent out in the Trinet mailing list among scholars. Only nine responses were recorded, but the information provided can give an indication on what barriers and facilitators there exist among tourism programs. First of all,

there are three out of the nine respondents who state that systems-thinking is part of the program that they are representing. Three others indicate that systems-thinking is used on a basic level and partly integrated. The final three say that systems-thinking is not part of the curricula.

Two major reasons (50% of respondents) for not implementing systems-thinking are: 'the curriculum is already full – there is no room to add systems-thinking as such (Wilson & Von der Heidt, 2013)' and 'There is little time to go into depth and explore complexities and a holistic approach through direct interaction with the students (Wilson & Von der Heidt, 2013)'. Apart from these reasons, 37.5% indicates that 'the focus lies on other skills (specific vocational training, etc.)' and 'there is resistance of students or staff to learn these skills, because the necessity it not recognized (rather 'a traditional business-focused teaching paradigm') (Wilson & Von der Heidt, 2013, para. 7)'. There are some other barriers such as alterations which are not allowed by the organization of the university, lack of staff which is specialized in systems-thinking or the program curriculum is currently being changed (25%). Approximately 12.5% says systems-thinking simply does not fit into the program and there is no interest in implementing it either. None of the respondents indicated that wicked problems are not considered an issue.

When systems-thinking is found significantly important enough to be implemented in the program, there are several facilitators being mentioned. First of all, enough money is stated as a significant facilitator. Secondly, teacher's expertise is vital. Professors who are well-prepared to teach about such issues as wicked problems are mentioned twice in the survey. Another facilitator is the use of a simulation game which provides an experiential application of the way in which systems-thinking can be used. Such a learning tool seems to be quite effective and its effect and evaluation by staff and students is currently still being researched.

Bachelor programs

Now that there are general comments made on what the different programs indicate based on the categories and codes used for the analysis, it may be interesting to cluster the programs to see how they relate to each other and to be able to generalize the findings later in the discussion. For this, systems-thinking in contrast to critical thinking is taken to see in what ways these two concepts relate to each other. To make a division, an evaluation of how many categories were found in each of the programs helped in finding out to what extent the categories are addressed and how strongly they form a focus of a program. Firstly, there are two Bachelor programs that show strong links with almost each of the categories, and thus, with systems-thinking. These are BNL and BSWE. They form Group

A and indicate a high level of systems-thinking. For examples BSWE provides a very thorough explanation of its learning outcomes and it seems that systems-thinking is implemented to a high degree. The same can be said for BNL, which also has a major focus on the interrelationships between different disciplines.

Apart from systems-thinking, another indicator which is crucial for university level programs is put upfront: critical thinking. This category is chosen as a second criterium for the matrix provided below. Plotting these two major criteria over each other gives an interesting new dimension to clustering the findings and finding out more about what programs do and do not contain.

Most of the programs do show indication of systems-thinking to some degree in their programs: BCHI, BGRE, BHU and BSRI. These programs indicate a certain sense of the systems at play but do not incorporate critical thinking in their program descriptions. They are placed in Group B. 'Exposed to a wide variety of tourism and hospitality theories and concepts' (BGRE), 'You will also gain an understanding of the impacts of current international initiatives around tourism leadership and innovation' (BSRI). On the other hand, BJA, BUS, BSPA incorporate critical thinking as an important focus in their studies, but do not indicate any relation to the system in general. These are part of Group C. 'While the research component develops critical thinking and analytical skills required for decision making and problem solutions in the industry' (BJA). Finally, there are only four programs that do not significantly indicate any involvement of systems-thinking nor critical thinking in their course descriptions: BFRA, BWEUS, BGER, BPHI. These programs are part of Group D as little to no indication is found that systems-thinking is a significant part of the programs.

Master programs

There are 14 degrees that incorporate systems-thinking in general on a high level, as indicated in Table 1, which are added to Group A. There are six Master programs which show a moderate level of systems-thinking, but do not incorporate critical thinking, which are placed in Group B. In addition, four programs which show critical thinking as a focus, but not systems-thinking, are added as part of Group C. Thirteen programs show little to no indication for systems-thinking in their curriculum, which are referred to in Group D as well. An overview can be found in Table 1. Also, Figure 4 shows a representation of the Groups and their place in the matrix.

High level of Systems-Thinking

	Group B		Group A	

Low degree of Critical Thinking

High degree of Critical Thinking

	Group D		Group C	

Low level of Systems-Thinking
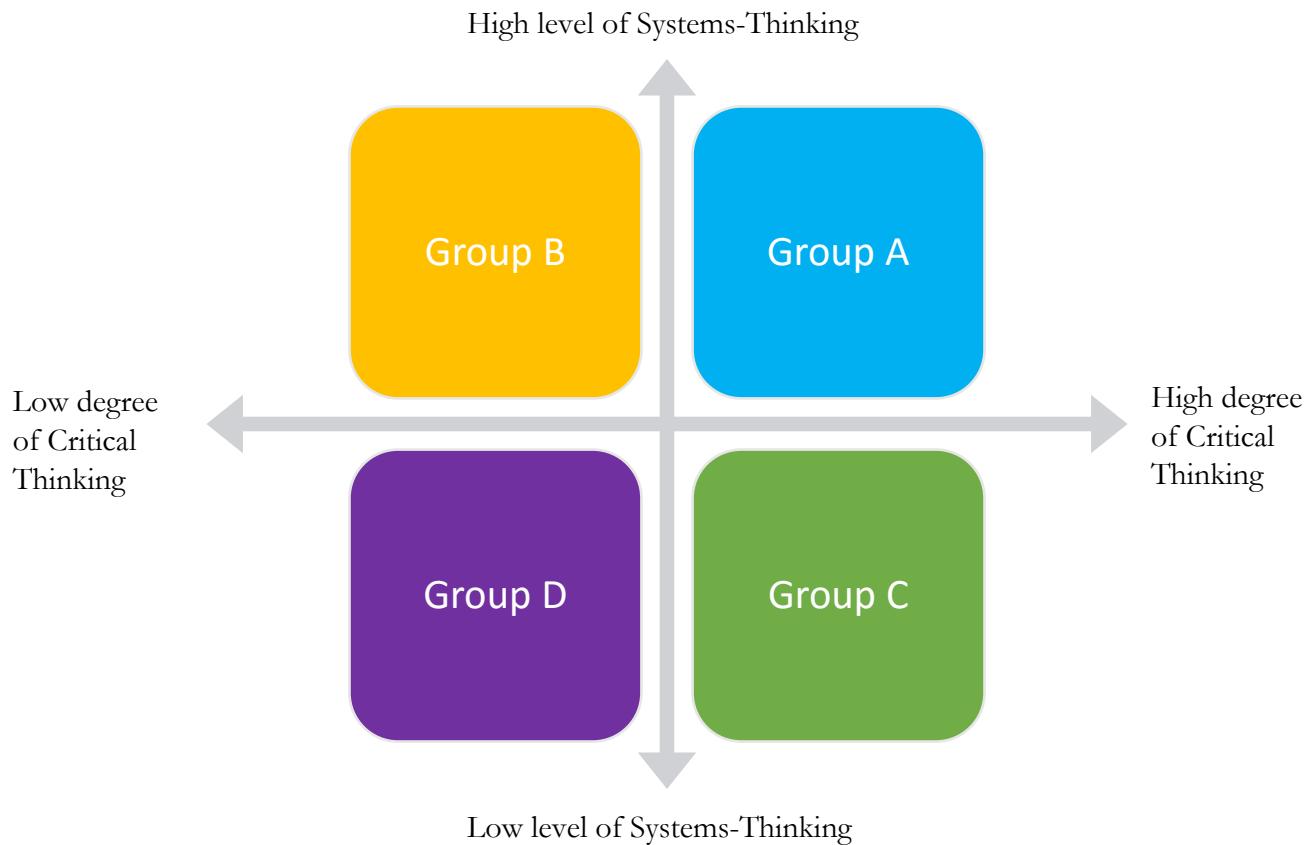
Figure 4. Matrix showing Systems-Thinking in relation to Critical Thinking.

Group A (ST&CT)	Group B (ST, no CT)	Group C (CT, no ST)	Group D (no ST, no CT)
BNL	BCHI	BJA	BFRA
BSWE	BGRE	BUS	BWEUS
MUSRI	BSRI	BSPA	BGER
MFI	BHU	MMA	BPHI
MUKLE	MCHI	MFRARE	MUSC
MUKLER	MGREA	MUKS	MUKGL
MUKBOM	MUKUL	MUKLSB	MUKL
MUKBO	MUKOX		MGRETH
MUKBOH	MBU		MFRARO
MUKGCU	MCY		MUKIPA
MNO			MUKNEW
MSWI			MUSEU
MGREHE			MUKEDI
MUKOXE			MUKLMCA
MUKOXITM			MUKLO
MUKM			MSWE
			MUSNEW
32% (of total sample)	20%	14%	34%

Table 1. Division of the four groups and the study programs that belong to each of the groups.

Commonalities

Generally seen, the division shows that the majority of programs make a clear choice to either incorporate both systems-thinking and critical thinking simultaneously (Group A), or they do not incorporate either (Group D). Group C, in which programs are clustered that only incorporate critical thinking and not systems-thinking is the smallest. Finally, Group B in which systems-thinking is implemented but not critical thinking is also quite small in comparison to Group A and D.

The programs that are placed in Group A incorporate both systems-thinking and critical thinking to an extent that it is evaluated as significant. These programs focus on providing students with a systemic approach to issues that come up in the tourism domain, as well as connecting the elements to evaluate processes in the tourism system. Each of the 16 programs includes critical thinking, secondly feedback loops are found in 15 of 16 programs. Interdisciplinarity comes after with 14 out of 16 programs that talk about this feature in their program descriptions. Networks/systems are discussed in 13 of them, as well as consequences or impacts, which are mentioned by 12. Wicked problems have been mentioned by 10 and finally dynamics were only addressed by 6 out of 16.

Group B also has some commonalities. Critical thinking is not part of any of these programs, but the other categories are sporadically distributed among the programs in this group. Networks are mentioned in almost all (9 out of 10). Dynamics are also important topics in 7 out of the 10 programs.

Group C are programs in which critical thinking is addressed by each of the 7 programs. Few other categories were mentioned by these program descriptions. Two of 7 mentioned interdisciplinarity. Dynamics, feedback loops and consequences were all found once and connections, wicked problems and networks were not discussed at all.

Group D contains some commonalities as well. Connections, consequences and feedback loops are not discussed by any of these programs. Furthermore, wicked problems, interdisciplinarity, critical thinking and dynamics are mentioned by some (1 or 2 programs). Networks were mentioned by 7 out of 17 programs, however, these elements were all evaluated as relatively weak and thus considered not to contain any real connections to systems-thinking in the programs.

In the next chapter, the findings from the previous chapter will be reflected upon. Research questions will be answered, limitations of the study are addressed and suggestions for future research are indicated.

5   Discussion

5.1   Interpretations of main results

To answer the research questions, let us first revisit the main research question which is: To what extent do tourism programs already involve systems-thinking in their program descriptions? To answer this question, the following sub-questions have guided the process of this thesis and should be answered in order to be able to say anything relevant about the main research question.

Is systems-thinking used as a specific concept in tourism curricula?

In both the Bachelor as well as the Master programs of the sample, the word 'systems-thinking' has not been found as such a specific concept. It seems that the concept is not really used in the descriptions of tourism programs, although there are multiple indications that systems-thinking is present under the surface. It may be that the term is too specific for a usually short description of a program directed towards prospective students, or it is not so well-known that it is used as such a term. Nonetheless, the occurrence of the ascribed codes as well as other categories points to the recognition of the existence of the system as such, even though it is not always named in the program necessarily. For example, there are some courses that do show the acknowledgement of the system such as tourism systems analysis (BNL) as well as how MUKLE talks about global forces impacting sustainability in tourism systems. The category 'networks' was found in as many as 58% of the programs. Thus, codes such as 'systems', 'structures', 'a broad understanding' and 'a holistic approach' come up most in tourism program descriptions. The connections and interdependency of elements of the system have also been coded and found in several programs. BNL, MUKLER and MUKBOM for example point towards these interrelationships of the system. Dynamics show the reflexivity and non-linear characteristic of any greater system, and recognition of this allows a broader understanding. The dynamics are mentioned in 32% of the programs. Ring et al. (2009) previously identified that only 2 out of 64 programs in their sample indicated all of their requirements, among which was an understanding of the tourism industry in its entirety as well as the future of tourism, sustainability and management skills. Almost 14% of the programs they assessed aimed to provide students with an understanding of tourism's complexity and multi-disciplinarity as a core focus (Ring et al., 2009). In the sample of this thesis, 32% have been evaluated to aim to provide students with the holistic understanding of tourism to some extent as well as teaching student to think critically (Group A, figure 4). The programs of this sample that show most indication for a high degree of systems-thinking are

provided in Table 1. For these programs, it was very clear from their descriptions that attention is paid to the understanding of a wider system of tourism.

How do critical thinking and systems-thinking relate to each other?

As described in the literature review, critical thinking can be seen as one of the fundaments of systems-thinking (Richmond, 1993). The matrix of the Results chapter has shown that systems-thinking and critical thinking are indeed generally kept together, in the sense that either both can be found in a program or neither. However, a minority of programs do seem to focus on either systems-thinking without critical thinking or critical thinking without systems-thinking. In general, critical thinking has been found to be one of the fundaments of the development of systems-thinking and is part of academic programs so that students learn how to innovate and get away from conventional ways of developing tourism. This is an advantage for both the student as well as the tourism industry.

Critical thinking was indicated in 48% of the cases. In combination with systems-thinking critical thinking has been indicated in slightly fewer programs, in 32% of the sample (Group A, see Figure 4). As the combination of both systems-thinking and critical thinking is deemed as complementary, it does not surprise that just as many (34%) of programs incorporate neither (Group D, see Figure 4). In most programs, the two concepts are kept together as belonging to each other.

The aim of gaining a critical understanding of tourism was found in 9,38% of the programs in Ring et al. (2009), while in this study 48% of the total sample indicated critical thinking in their curricula to some extent. This is a large difference, however, in this thesis critical thinking has been assessed as part of programs in each form, whereas Ring et al. (2009) focused on the main aims of tourism programs. The main aim of a program has not been reflected upon or focused on in this thesis, and therefore, the deviations between the results of these two papers is not a surprise. However, it may indicate that great differences exist between programs.

To what extent is interdisciplinarity implemented in the program?

The interdisciplinarity of a program permits an in-depth understanding of reality and allows multiple approaches to co-exist. Interdisciplinarity seems to be a major topic, especially in Master programs. In a little less than half of the programs (42%) it has been found as a significant indicator for systems-thinking, while in Master programs it was 49%. Inter-relationships are discussed, and the tourism system is supposedly approached from multiple domains. For example, the programs of MUKBOM, MUKBO and MUKBOH all relate to this. These three programs are from the same

university which offers a few different tourism programs and have all been included in the sample. They are very similar in the sense that systems-thinking can be recognized in all three programs, through interdisciplinarity. Also the other categories are found in these programs. Several disciplines may come together, such as social sciences, cultural studies, operations accounting, marketing, political, economic and socio-cultural environments, etc. As Ring et al. (2009) found in their research, interdisciplinary aspects and impacts of tourism are indeed often part of tourism programs, estimated at 86% of their sample. In the sample of this study, 42% was evaluated to contain interdisciplinarity. The difference can be explained in the way Ring et al. (2009) categorize the indicators. Interdisciplinarity on its own is estimated to be found in 41% of their sample. In combination with impacts, 86% of their programs show interdisciplinarity. In this study too, impacts and interdisciplinarity are separated. A deep-rooted understanding is achieved by the connections that are recognized to understand the system as a whole. Thus, interdisciplinarity is incorporated by half of the Master programs and generally by 42% of the sample.

To what extent are wicked problems discussed and analyzed in their context, keeping in mind relationships and connectedness from systems-theory?

Generally, the programs do not indicate the importance of wicked problems as much as the other indicators can be identified. 'Wicked problems' was the category which was least found in the sample. Only 26% of the programs indicated any relation to wicked problems in their curricula. Even though challenges are recognized, many programs discuss how the proper management and skills that are taught in the program is the solution to facing these challenges. This indicates a rather simplistic idea of the increased complexity of wicked problems. However, some programs do to a certain extent implement the concept indirectly by mentioning complexities, multi-stakeholders and problem solving. The complexity of tourism is generally acknowledged (BNL; MCHI; MFI; MUKLER; MFRARO). As previously described, connectedness and relationships between nodes in the system that add to the complexity of the problem are sometimes mentioned after all. However, there is no clear line to see among tourism programs in general, as this is very program-specific. Most programs that do indicate wicked problems to some extent, are part of Group A and thus relate to systems-thinking and critical thinking.

Are relations between elements in the system highlighted through feedback loops?

Feedback loops were analyzed based on two categories: feedback loops and consequences. First of all, feedback loops have been identified in 40% of the programs. The connections between different nodes of the system and how they affect each other when changes occur are an important indication for feedback loops in a program. In some programs, there is some sort of indication of these cycles. Systems communicate by providing feedback, as Faulkner and Russell (1997) have shown, which relates to chaos and complexity theory. Underlying dynamics of the tourism system are brought up through the recognition of these loops. Resilience in a system can be recognized by seeing how a system responds to sudden changes, how it reorganizes itself after chaos and its ability to absorb disturbances to a certain extent (Holling, 1973). Consequences of tourism and the occurrence of this theme in tourism programs has also been evaluated by Ring et al. (2009). In connection with interdisciplinarity it seemed to be a central focus of many programs (86%). In this thesis, consequences have been addressed by 36% of the sample, and feedback loops by 40%. In conclusion, 'feedback loops' as a concept were mentioned in none of the programs, however, codes of the category could be identified in 40% of the sample and thus, some acknowledgement of feedback can be shown.

What are the barriers and facilitators of systems-thinking in tourism education?

The barriers and facilitators can be summarized shortly. The responses to the questionnaire were very limited as only nine responses were gathered. Therefore, the answer to this research question is only indicative. There are quite some barriers that stand in the way of implementing systems-thinking in the programs. Most significantly, it seems that it is related to a full curriculum. Either there is no time or no room in the curricula to add systems-thinking now. This is in accordance with the findings from Wilson and Von der Heidt (2013). They also identified this to be a major issue in addressing sustainability in a particular Australian university. The second most important barrier seems to be related to a choice that is made and whether or not systems-thinking is thought to be an important topic to be taught to students as well as resistance of staff or students.

As for facilitators that make systems-thinking in education possible, financial means and professor's expertise are seen as most important. The expertise of professors has also been recognized by Nguyen et al. (2011b). In most cases, systems-thinking is seen as something that adds a valuable lesson to students. On the other hand, there are different focuses and a choice is made on the basis of what a program aims to teach its students.

Main research question

Finally, the main research question can be answered. In the programs of the sample, 'systems-thinking' as a concept is not recognized. What is interesting to see is the division of programs as indicated in Table 1. Generally, systems-thinking seems to correlate strongly with critical thinking, as can be concluded from Group A and D. Either none or both of the concepts are part of the program. In addition, the other indicators often show that at least characteristics of systems-thinking are included in most of the tourism programs. Networks and critical thinking are the most frequently mentioned indicators of all the five categories in the programs of the sample. Interdisciplinarity is interestingly also very common in Master programs (in 49%). This is in accordance with how other scholars have identified interdisciplinarity to be inherent to tourism (Faulkner & Russell, 1997) and with scholars who found that the majority of programs already incorporates interdisciplinarity (Ring et al., 2009; Inui et al., 2006). However, there are deviations compared to the study of Ring et al. (2009). These are most likely caused by different methods of defining feedback loops, interdisciplinarity and impacts in curricula and in analyzing the data at hand. Feedback loops are recognized to some extent in the sample as well, but the concept itself is not mentioned and it does not seem to be a great focus of the programs. Finally, 'wicked problems' is the weakest indicator of this analysis, and only recognized in 26% of the cases.

As Amelung et al. (2016) and Nguyen et al. (2011b) argue, stakeholder involvement is important to achieve a systemic approach to tourism. Therefore, education institutions should also be involved in the process of achieving this. Generally, quite a lot of programs show some indication of systems-thinking (in total Group A (32%) + Group B (20%) =52%). However, acknowledging the existence of the tourism system and its complexity and teaching students how to deal with the complexities may vary greatly. A gap cannot be excluded based on this analysis. The study shows that there is in fact acknowledgement of the system, but what exactly is done with this knowledge is still not clear.

Generally, the indicators of systems-thinking are more specifically present in Master programs, with always a higher percentage in this group of programs than in the Bachelor programs. Therefore, it can be concluded that systems-thinking is more present in general in Master programs than in Bachelor programs. The two exceptions are BNL and BSWE which both show an high indication of systems-thinking. To finalize, to some extent systems-thinking elements do come back in the tourism programs of this sample. This indicates a certain awareness of the importance of it in tourism education. However, executing the systems-thinking mindset and implementing it in tourism

education may still be a bridge too far for some programs. Furthermore, there is also a necessity for vocational programs that train tourism professionals a more concrete, albeit with another goal in mind for the tourism system. It is a less theoretical and more hands-on training that is highly valued by employers as well (Tribe, 2002). The distinction between academic and vocational education cannot be seen as black and white, and the contribution of vocational education is not to be underestimated. (Tribe, 2002). Finally, some barriers to implementing systems-thinking in tourism education are lack of space and time, in the sense that a full curriculum is at hand, or time is lacking to really go into depth. Furthermore, designing a curriculum and implementing systems-thinking is also highly related to choice and each program chooses what they aim to focus on and what is deemed important on its own. Sometimes systems-thinking is simply not seen as relevant for the program at hand.

5.2   Limitations

There are a few limitations to the study conducted in this thesis. First of all, some programs were not taught in English. To be able to analyze data, it was decided to only evaluate programs in English. However, it would of course also be interesting to see whether non-English programs incorporate systems-thinking, critical thinking or any of the other categories. As a researcher, one is constrained by one's own abilities and language skills in this sense. For example, one of the programs only provided its brochure in German, although the program itself is taught in both English and German. In this particular case, it was not a problem. There was furthermore no time to consult native speakers for any other programs that may be taught in another language.

Then there are also limitations to the chosen methodology. One of which is that content analysis, as part of qualitative research, is subject to subjectivity and bias from the researcher. The researcher decides what is important and what is not. In addition to this, I myself am a student of the BNL program (BSc Tourism at Wageningen University in the Netherlands). Therefore, I am especially biased in the evaluation of systems-thinking in this tourism program, because I know exactly what is taught in this program and to what extent systems-thinking is encountered across the course contents. With other programs, it is far more difficult to reach such a conclusion based only on descriptions on websites.

Furthermore, content analysis can be very time-consuming, as many texts are used and analyzed, which all need to be read thoroughly multiple times. While doing this, errors in coding cannot always be avoided. While the researcher may try hard to take into account the context in which

the texts were written, it can be overlooked at times anyway. Another major issue with this methodology has been the limited data which was available. (University of Southern California, 2018).

This also relates to the limited response to the survey. Another limitation is that few responses of study coordinators were gathered for the survey. Only nine answers were recorded. These were only used as a start to a broader discussion about the topic of barriers and facilitators in providing systems-thinking as a skill in tourism programs, as it was impossible to make any further conclusions. Also, after the emails were sent both to the Trinet mailing list as well as individually to study coordinators and general departments at the universities of the sample, very limited response was gathered.

The sample collection was based on a distinction between academic universities and universities of applied sciences. However, such a binary organization of the two like it is in the Netherlands is not universal and in some cases, it has been difficult to distinguish between the two. This binary distinction simply does not apply to all higher education institutions around the world. This makes it sometimes difficult to identify what a school focusses on and whether or not the selected programs can be included in the analysis. In unobtrusive research, data is not directly collected from the people, but from secondary data. This can both function as an advantage as well as a disadvantage.

The sample itself was also quite small, consisting of only 50 programs in total. Although this is typical for exploratory study designs (University of Southern California, 2018), it does uncover some issues in validity and representativeness. To be able to really say anything about the wider population or about tourism programs in the world, one would need to further investigate this, and increase the sample significantly. However, in any case it is difficult to say anything about the whole 'population' of tourism programs, as each school has its own philosophy and focus.

Another important limitation is that no interviews were conducted with any study coordinators or other people involved in setting up the program. Therefore, the conclusions drawn here are based on limited information that has been available. It gives an indication of whether or not it is clear what programs offer and if they invest their time in addressing systems and systems-thinking in the curricula. However, this also raises the question if systems-thinking is implemented intentionally. A program may be evaluated in this thesis as containing systems-thinking indicators and a focus on critical thinking, while these programs may not actively invest time in increasing systems-thinking in the program. The real content of a program can only be evaluated from the outside to a limited extent. The other way around, some of the programs that have been evaluated as not containing any systems-thinking indicators may in fact in reality contain systems-thinking after all, even if it is not as evident

on the website or in program descriptions. However, as tourism programs do want to inform their prospective students on what the program is about, this may not be so likely. The intentionality of programs to either include systems-thinking or not has not been thoroughly discussed in first-hand acquired data. Programs could still contain systems-thinking without being explicitly mentioned on the websites to prospective students.

Furthermore, in many cases not the exact same amount of data is available for each program. Some have a very extensive description on what the courses are about and what the central themes are of the program. Others show not much more on their websites than the duration of the program and the costs. Therefore, the two portals that were used facilitated in having at least some sort of introduction to the programs, although here too, there were more extensive lists as well as some shorter descriptions. Sometimes this proves to be an issue, since a conclusion needs to be drawn from limited information.

In addition to the systems-thinking in tourism education, the importance to incorporate sustainability remains, as it is a complex issue. Pan et al. (2018) have shown that when tourism students are environmentally aware, they are more likely to behave more sustainably. The issues of tourism are many, ranging from biodiversity loss and pollution, to deforestation and CO2 emissions (Pan et al., 2018). However, even with environmental education, it is not automatically the case that tourists will behave more responsibly. Not only does the context and knowledge on the subject play a role, but also personal values, attitudes and a feeling of responsibility (Pan et al., 2018). Eventually the conclusion Pan et al. (2018) come to is that tourism education requires more courses on sustainability to really make a difference for environmental protection attitudes. An increased concern for the health of the planet may alter the way students will act. As Pan et al. (2018) found in their study, environmental sensitivity and responsibility affect the intentions of people to change their behaviour. This can be valuable in evaluating tourism programs and general education.

In addition to this, Forrester (1994a) talks about how systems-thinking is only a small part of a systems education, and that it is a very theoretical concept. He even goes as far as to state that education in systems-thinking does not significantly contribute to students learning the skill. Even though it can be a 'door opener and a source of incentive to go deeper into the study of systems' (Forrester, 1994a p. 21), he is concerned that the real lessons will not be implemented. However, I would argue that systems-thinking in tourism education is the first step in getting knowledge to young professionals who then may bring it to a next level and learn how to implement it later.

Even though the sample size is small and further research may be required, this study gives an indicatory introduction to the way systems-thinking is currently taught in 50 programs across the world in both Bachelor and Master level programs. The distinction between academic university level and applied sciences level eventually does not form a threat for the evaluation of systems-thinking in the programs. Even though the response to the survey was limited, it did provide a concise overview of what challenges coordinators face and how they implement systems-thinking when it is possible to do so. Even if the sample size is too small to be able to say anything about the entire population of tourism programs, it does give the indication of what these programs incorporate in their studies and provides a new view on systemic thinking in tourism education.

5.3   Further research

For further research, there are multiple suggestions to be taken into account. Firstly, for a future study, in-depth interviews with each of the study coordinators would provide more thorough information on their views on to what extent systems-thinking is part of their curricula. This would provide more explicitly and specifically defined information on what the programs aim to teach. Furthermore, a greater sample would help in adding to the representativeness of data and in increasing validity. A thorough evaluation of all the tourism programs in the world would need a greater timeframe to be able to be conducted. Then conclusions can be drawn on a wider scale. However, this thesis can be a starting point in which a selected sample of tourism programs is evaluated in this exploratory research. Furthermore, whether or not the implementation of systems-thinking as part of the program was intended can be further investigated through interviews in which these questions can be addressed directly. A more extensive time period may provide new insights on a deeper level as well. Especially interviews with study coordinators may provide interesting points as to why certain programs do not find systems-thinking a necessary component of their program, or why they deem it as essential for tourism studies. As mentioned by Ring et al. (2009) the setup of a curriculum is based on choices that are made. It would, therefore, be interesting to investigate the motivations for these choices more thoroughly to understand why tourism programs are set up in the way that they are. For example, there are other aims identified by Ring et al. (2009) that come before focusing on tourism as a holistic system. Industry preparation is the number one aim of the tourism programs they evaluated, with about 72% of program focusing on this. Second come management and leadership skills with about 53% (Ring et al., 2009). The further investigation of aims of the tourism programs of the sample used in this thesis may also generate interesting outcomes.

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A program that was encountered during the sampling was that of the MSc in Tourism Planning and Management of Systems. It was the only program that was encountered during the sampling which mentioned systems in its program title. However, it is a program taught in Italian and thus not included in this specific study. It would be interesting to look further into this program in future studies. Like this program, there are many other tourism programs in the world that are relevant to research to gain a more holistic view on what tourism programs around the world offer and where their focus lies. Finally, in the last chapter, conclusions are drawn, and the major points are highlighted.

6   Conclusion

This thesis has attempted to gather information about systems-thinking and implement an exploratory design on the occurrence of systems-thinking in tourism higher education. The goal of this paper was to find out whether tourism programs approach the tourism system with various indicators to give students a sense of the whole system. The application and acknowledgement of interactions that take place in the system, which shape what eventually becomes tourism are central. The main research question of this thesis was: To what extent do tourism programs already involve systems-thinking in their program descriptions? To answer this research question, several indicators were established from the literature and these concepts were explained more in-depth.

First of all, 'systems-thinking' does not seem to be mentioned as a concept per se, however, the indicators of systems-thinking did suggest a strong link to holistic perspectives and incorporating different and critical stances towards the tourism system as it exists now. Critical thinking is connected to systems-thinking at its fundament and the matrix has shown that most programs confirm this view by either showing both topics in their descriptions or neither. Wicked problems were incorporated in tourism programs the least. Only 26% of the sample addresses this concept. The system ('networks') is however mentioned in approximately 60% of the programs. Even though there may be a recognition of the tourism system, systems-thinking as a skill is not automatically included in the program based on this outcome. In 42% of the programs, interdisciplinarity was found. It is especially a major focus in Master programs. These programs focus on combining different perspectives and mutual learning among the disciplines to generate a systemic view. For feedback loops, there were quite some codes that were related to this category, but the concept itself did not emerge. Overall, the indicators that have been identified in this thesis are more evident in Master programs, which also leads to the

conclusion that Master programs are more likely to implement systems-thinking. When Group A and B (Figure 4 and Table 1) are put together, it can be seen that systems-thinking is indicated in 52% of the programs. This indicates that some relation to systems-thinking is present in a little more than half of the sample. Even though, it cannot be concluded whether systems-thinking is a main focus of the program or if it is taught throughout the curriculum, it does indicate that awareness of the tourism system exists to some extent.

In conclusion, the tourism programs are very diverse and there are multiple different focuses possible in tourism. As the industry itself is already very complex on its own, there are many different areas one could focus on or components of the system that need special attention. It has been interesting to see that even though critical thinking was seen as an important component of systems-thinking, there are in fact programs that do mention systems-thinking and not emphasize critical thinking. The two largest clusters of tourism programs, however, either focus on systems-thinking in its entirety or on neither one. Therefore, it seems to be an 'all or nothing' approach, in which programs either choose to incorporate systems-thinking along with critical thinking, and usually some of the indicators, or they decide to focus on, for example, vocational values and leave systems-thinking out. In general, systems-thinking is an important skill in approaching a system that is as complex as tourism and involves many different stakeholders. There definitely exist programs around the world that focus on these skills and enable their students to adapt a holistic and systemic approach towards tourism.

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Appendix

A. Selected sample Bachelor programs

Selection criteria:

- **On campus, Bachelor of Science degrees, taught in English**
- **Initially 20 programs show up. Eliminating the programs that do not have 'tourism' in their title and schools of applied sciences, the following 13 come up:**

Number	Name of Program	Name of School	Abbreviation
1	BSc Tourism	Wageningen University & NHTV	BNL
2	Tourism and Hospitality Management	International University of the Caribbean, Jamaica	BJA
3	Bachelor Tourism	Paul Smith's college, USA	BUS
4	Hotel and Tourism Management	AIM Hotel & Tourism Management Academy, Paris, France	BFRA
5	BSc in Management with Tourism	International Business School, Budapest, Hungary	BHU
6	BSc in Business Administration – Hospitality and Tourism Management	Webber International University, Orlando, USA	BWEUS
7	BSc International Hospitality and Tourism Management	Schiller International University, Madrid, Spain (Florida, Heilber, Madrid, Paris)	BSPA
8	BSc in Tourism Management	Dongbei University of Finance and Economics, Dalian, China	BCHI
9	Bachelor of Science in International Tourism Management	Dalarna University, Borlange, Sweden	BSWE
10	BSc (hons) Tourism Management	Cambridge International Business College, Freiburg, Germany	BGER
11	BSc (hons) in International Tourism and Hospitality Management	American College of Greece, Athens, Greece	BGRE
12	BSc Tourism Management	Central Colleges of the Philippines, Quezon City, Philippines	BPHI
13	BSc Business and Tourism Management (University of Salford)	Imperial Institute of Higher Education (IIHE), Colombo, Sri Lanka	BSRI

Table 2. Bachelor programs in the sample.

B. Selected sample Master programs

Selection criteria:

- **'Tourism' in the title, Master of Science degrees, on campus, taught in English**
- **Initially 39 programs show up. Eliminating the programs that do not have 'tourism' in their title and schools of applied sciences, the following 37 come up:**

Number	Name of Program	Name of School	Abbreviation
1	MSc in tourism management	Dongbei University of Finance & Economics, Dalian, China	MCHI
2	Master of Science in Hospitality-Tourism Management	Rochester Institute of Technology (RIT), USA	MUSRI
3	Master of Science Tourism (research)	Taylor's University, Malaysia	MMA
4	MSc Sports, Leisure and Tourism Management	Rennes School of Business, France	MFRARE
5	Master of Science in Hospitality and Tourism Management	Roosevelt University, Chicago, USA	MUSC
6	MSc Tourism Marketing Management	University of Strathclyde Business School, Glasgow, UK	MUKGL
7	MSc in Tourism Management	Alba Graduate Business School, Athens, Greece	MGREA
8	MSc International Hospitality and Tourism Management	Coventry University London, UK	MUKL
9	MSc International Hospitality and Tourism Management (with work experience route)	Sheffield Hallam University, UK	MUKS
10	MSc in Tourism and Hospitality	American College of Thessaloniki, Greece	MGRETH
11	MSc in International Tourism and Hospitality Management	Manchester Metropolitan University, UK	MUKM
12	MSc and MBA in Tourism	La Rochelle Education Group, France	MFRARO

13	MSc in Tourism Marketing and Management	University of Eastern Finland Business School, Finland	MFI
14	MSc International Tourism & Hospitality Management	Leeds Beckett University, UK	MUKLE
15	MSc Responsible Tourism Management	Leeds Beckett University, UK	MUKLER
16	MSc in Hospitality and Tourism Management	International Hellenic University (IHU), Thessaloniki, Greece	MGREHE
17	MSc International Hospitality, Events and Tourism Management	Oxford School of Hospitality Management, UK	MUKOXE
18	MSc International Hotel and Tourism Management	Oxford School of Hospitality Management, UK	MUKOX
19	MSc International Hospitality and Tourism Management	Varna University of Management, Bulgaria	MBU
20	MSc International Marketing with Tourism and Events	IPAG Business School, Edinburgh, UK/France	MUKIPA
21	MSc International Hotel and Tourism Management	University of Ulster, Faculty of Business and Management, UK	MUKUL
22	Master of Tourism and Hospitality Management	London Graduate School of Management, UK	MUKLO
23	MSc Business with Hospitality and Tourism Management	Northumbria University, Newcastle Business School, UK	MUKNEW
24	Master of Science in Hospitality and Tourism Management	Eugene M. Isenberg School of Management, University of Massachusetts, Amherst, USA	MUSEU
25	MSc in Tourism Management and Marketing	Bournemouth University, UK	MUKBOM
26	MSc in Tourism Management	Bournemouth University, UK	MUKBO
27	MSc in International Hospitality and Tourism Management	Bournemouth University, UK	MUKBOH
28	MSc Heritage and Cultural Tourism Management	Edinburgh Napier University, UK	MUKEDI

29	MSc in Tourism Management	University of Mediterranean Karpasia, Cyprus, Turkish republic of Northern Cyprus	MCY
30	Master of Science in Hospitality and Tourism Management	University of New Orleans College of Business Administration, USA	MUSNEW
31	MSc in International Hotel and Tourism Leadership	University of Stavanger, Norway	MNO
32	MSc in Hospitality and Tourism Management	Hotel and Tourism Management Institute (HTMI), Luzern, Switzerland	MSWI
33	MSc in International Tourism Management	Glasgow School for Business and Society (GCU), Glasgow, UK	MUKGCU
34	MSc in Service Management, Tourism	Lund University, Sweden	MSWE
35	MSc International Tourism Management	Oxford School of Hospitality Management, UK	MUKOXITM
36	MSc in International Tourism and Hospitality Management	London South Bank University, UK	MUKLSB
37	Master of Tourism and Hospitality Management	Millennium City Academy, London, UK	MUKLMCA

Table 3. Master programs in the sample.

C. Survey

Dear participant,

My name is Valeska Oudhof and I am a third year BSc Tourism student at Wageningen University. For my bachelor thesis, I am conducting a research to find out whether tourism programs incorporate systems-thinking in their curricula. Systems-thinking is defined as: 'developing an increasingly deep understanding of underlying structure' (Richmond, 1994). For example, the tourism system is dependent on many different actors and understanding the interactions between them facilitates a

better understanding of how the system functions in general. Structures and relationships between different disciplines play a vital part, which provides a holistic approach. Different indicators for the study are: interdisciplinarity, wicked problems, feedback loops and critical thinking.

I would like to know if these indicators are incorporated in the tourism programs that you represent, and to see if there are barriers or facilitators as to why systems-thinking is incorporated or not.

You can withdraw from participating at any given time and the answers are anonymous. All answers will be treated confidentially, and the results will only be used for this thesis.

Thank you for participating in this survey.

1) Which tourism program are you representing?

   Name of study program:

2) Name of university:
3) Place of study program (City, Country):
4) Is systems-thinking implemented in your tourism program? (For example, are wicked problems, feedback loops, critical thinking and interdisciplinarity part of the program curriculum? Are you satisfied with the degree to which systems-thinking is implemented?)
5) What are barriers to involving systems-thinking in the curriculum of the program? (Multiple answers are possible).
   a) Systems-thinking does not fit the program
   b) There is no interest in implementing systems-thinking
   c) Wicked problems are not considered an issue
   d) The focus lies on other skills (specific vocational training, etc.)
   e) The curriculum is already full – there is no room to add systems-thinking as such (Wilson & Von der Heidt, 2013)
   f) There is little time to go into depth and explore complexities and a holistic approach through direct interaction with the students (Wilson & Von der Heidt, 2013)
   g) There is resistance of students or staff to learn these skills, because the necessity is not recognized (rather 'a traditional business-focused teaching paradigm' (Wilson & Von der Heidt, 2013 para. Staff and student resistance)
   h) The organization of the university itself does not allow large alterations
   i) There are no staff members currently focussing on systems-thinking, which makes it hard to incorporate it in the courses
   j) The program curriculum is currently being adapted to incorporate systems-thinking
   k) Other: _____
6) What are facilitators to incorporate systems-thinking in the curriculum? (Please describe how and why systems-thinking is incorporated in the program, e.g. specific professors with expertise, course material, demand of employers for students with the skill, etc.)

7) Are you aware of other study programs that incorporate systems-thinking? If yes, please specify: _____

8) I s there someone I can contact from the tourism program that you are representing who may have additional information for this research? (Or another tourism program that may be relevant?) If so, please specify the name and/or email address:

9) Do you have any additional comments? _____

10) Thank you for your participation! If you wish to receive results of the thesis study, please enter your email address: _____

D. Content Analysis

Categories	Codes	Quotes
Networks /systems – global transformations	system system analysis holistic approach in-depth global context wider tourism industry broad understanding deeper knowledge	Develop a broad understanding of the tourism domain; specific course called 'tourism systems analysis'; tourism is very sensitive to global transformations such as climate change, economic development and geopolitical risks (BNL), opportunity to study most aspects of tourism in depth (BHU) analysis of international tourism destinations and organizations, the tourism supply chain, tourism demand and global forces which might impact on the sustainability of tourism systems (MUKLE), intensive but generalist approach (MBU), the course enables you to acquire an understanding of the policy, strategy and leadership aspects of international tourism industry (MUKUL), you'll develop a systematic understanding of the unique needs and critical resources that exist within key sectors and activities of Tourism, Hospitality and Events (MUKBOM), focus on the relationships between tourism and the wider economic, environmental and socio-cultural context (MUKBO), offer skills to operate within the tourism systems, in homogeneous or integrated contexts (MIT, translated), how the tourism and travel industry is structured (MCY)
Connectedness/ interdependency	interconnected interrelationships structures integrated	The program deals with developments in tourism and the interrelationships between tourism, the economy, society and the environment (BNL)

		explore the relationships between host communities, their unique cultures and heritage, and the tourists who visit these destinations … relationship between tourism and natural resources (MUKLER), relationships between the customer experience and marketing organizations, research planning, budgeting, marketing strategies and communication; the module analyses the value chain of the industry and examines the role of each stakeholder in the tourism and hospitality value system and identifies linkages, interrelations, and collaboration requirements (MUKBOM), provide the context for an exploration of the complex and interrelated activities of tourist activities (MUKBO) integrated offer of cultural, environmental, agri-foodstuffs and tourist attractions or the widespread presence of tourism businesses ; aimed at integrating social, environmental and economic objectives (MIT, translated), focussing on the inter-relationships between systems, services and technical factors, product quality, capacity and productivity (MUKBOH), examine the interconnections of these three expanding fields of study by recognizing the variety of experiences through participation and spectator relationships (MUKGCU)
Dynamics	dynamic non-linear ever-changing fast-evolving trends transformations	Identify new trends (MGREA), travel and tourism is an ever-growing, global and international business (MFI), the current issues and innovations (MUKBOH), we understand how the international tourism sector is constantly evolving, from advances in destination management and sustainability to the dynamic influence of global events (MUKGCU)
Wicked problems	complexity responsibility multi-stakeholder governance problem/conflict solving decision-making complex challenges making tourism better	It (tourism) is a complex phenomenon (BNL) Complex global phenomena, tackle core, contemporary and emerging issues (MCHI), tackle the major evolutions in the tourism industry (MFRARO), we aim to make tourism better. Better for businesses, better for tourists, better for the environment and better for local communities, our students are problems solvers who enjoy challenges, identify and tackle complex problems in the field of tourism, give you a chance to make tourism better (MFI), examine the challenges of contemporary work in the area (MUKGCU), identify innovative solutions to their current challenges (MUKOXITM) making better places for people to visit and to live (MUKLER)

Critical thinking	analyzing assessing reasoning synthesizing awareness moral and ethical challenge understanding values	While the research component develops critical thinking and analytical skills required for decision making and problem solutions in the industry (BJA) understand, analyze and synthesize data; ethical and socially responsible practices (BUS), you will learn how to critically analyze the prerequisites for destination development (BSWE), demonstrate critical thinking, writing, analytical and decision-making skills, exhibit awareness and knowledge of industry trends and best practices (BSPA) Critically challenge your understanding of the industries in practical contexts (MUKS), it emphasizes the cross-cultural, moral, ethical, institutional and environmental issues in the management of tourism organizations; courses such as 'international tourism environment' (MGREA), aim to advance your critical thinking and writing skills (MUKM), you'll develop a critical understanding of contemporary issues in marketing and the ability to question current marketing patterns and trends; you'll critically reflect upon the significance and impact of tourism on a variety of ecosystems (MUKBOM), awareness of the ethical, cultural, environmental and social settings; questioning approach to the industry, examining growth and development through the prism of social responsibility and sustainability (MUKLSB)
Interdisciplinarity	trans/multi/interdisciplinarity multifaceted different/key disciplines overview of core concepts perspectives range of areas/disciplines	From different scientific perspectives, interdisciplinary bachelor… explore tourism as a multifaceted phenomenon. You will be introduced to the disciplines of sociology, economics and environmental sciences and their contribution to tourism (BNL), exposed to a wide variety of tourism and hospitality theories and concepts (BGRE) Courses such as 'approaches to tourism and hospitality business management' (MUKS), three central themes: wellbeing tourism, sustainable tourism and nature-based tourism (MFI), the unit explores the principles, concepts and practices of tourism from the perspective of social science and cultural studies theories. More specifically, the unit discusses the contributions of social science disciplines in understanding the multiple dimensions (MUKBOM), multidisciplinary framework to explore the wider inter-relationships between operations, marketing, and accounting (MUKBOH), how tourism businesses operate within their political,

		economic and socio-cultural environments (MCY), explores the geopolitical, economic, social and technological environments in which businesses operate (MUKGCU), you will explore the political, social, economic challenges facing the tourism industry (MUKOXITM)
Feedback loops	cycles issues shaping tourism developments / tourism development comprehensive variety of issues value chain reflect/review/evaluation	You will also gain an understanding of the impacts of current international initiatives around tourism leadership and innovation (BSRI) comprehensive understanding, implications for local sustainability, policy-making, and decision-making processes related to tourism as well as tourism destination development, planning and airline management (MCHI), major influences affecting international hospitality business environment, as well as deep-rooted understanding of the issues currently shaping the management of international hospitality corporations (MUKM), it will evaluate the potential barriers to continued growth and explore the conflicts and challenges of meeting economic and environmental targets; changing demands; supply structures and impacts on and responses from sport and tourism providers.(MUKBOM), gain insights of the issues affecting hospitality and tourism (MUKBOH), critically analyze different multilateral institutions and transnational organization including an evaluation of their impacts involved in international tourism and heritage tourism management (MSWI), respond to these challenges through the development of innovative solutions (MUKOXITM)
Consequences - effects of tourism	effects / influences of/on tourism impact / consequences adapt and respond risk reduction	You will learn how to critically analyze the prerequisites for destination development and the consequences of different strategies, as well as marketing, communications and product development (BSWE) Adapt and respond effectively to ensure sustainability at organizational and societal level (MGREA), knowledge to prepare and adapt to changes to come … to keep up to date with the latest economical and technological developments (MFI), analysing the major influences affecting the international tourism and hospitality business environments … deep-rooted understanding of the issues, explore the issues that make an impact on the management of human resources in the tourism and hospitality industries (MUKLE), an increasing focus

		on the need to adopt responsible business practices that improve the quality of life for communities and conserve the environment and local cultures, minimising the environmental impact (MUKLER), aimed at addressing the need to integrate tourism and events within risk reduction, response and recovery strategies (MUKBOM), various ways in which tourism planning affects destinations, the tourism industry and tourists is an essential component of understanding of tourism (MUKBO), to learn about tourism developments and impacts in the world (MCY)

Table 4. Overview of codes used for content analysis and specific quotes illustrating the use of the codes in-text.