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Individual Learning in Virtual Teams

The impact of team context, individual behavior
and reflection on individual learning

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Sworn Declaration

I hereby declare under oath that the submitted Master's degree thesis has been written solely by me without any third-party assistance, information other than provided sources or aids have not been used and those used have been fully documented. Sources for literal, paraphrased and cited quotes have been accurately credited. The submitted document here present is identical to the electronically submitted text document.

Linz, October 2015

Julia Eder
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List of Abbreviations
ed. ................................................................. edition
Ed. ............................................................... Editor
Eds. ............................................................. Editors
ELC ................................................................... Experiential Learning Cycle
ELT ................................................................... Experiential Learning Theory
et. al. .............................................................. and others
Fig. ................................................................... figure
HLO ................................................................... High Learning Outcome
Iss. ................................................................... issue
ILVT ............................................................... Individual Learning in Virtual Teams
LLO ................................................................... Low Learning Outcome
LSI ................................................................... Learning Styles Inventory
MLO ................................................................... Middle Learning Outcome
p. ................................................................. page
pp. .................................................................. pages
VI Bu .................................................................. Virtual Teams in International Business
Vol. ................................................................... volume

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1. INTRODUCTION

“A fast growing trend in today’s global economy is the increased prevalence of virtual teams – individuals collaborating in geographically dispersed work teams who may reside in different time zones and countries”

(Horwitz et al., 2006, p. 472)

Today’s business world is characterized by fast changing environments, increasing globalization and multiculturalism as well as advances in information and communication technology. Systems and processes become more flexible and dynamic than in the past, which has lead to a swift increase in team-based work units (Cascio, 2000; Ebrahim et al, 2009). The benefits of implementing teams in organizations range from better problem solving, increased productivity and enhanced innovation and creativity to higher quality products and services (Lurey and Raisinghani, 2001). Supplementary, the rise of multinational corporations where individuals are working together from subsidiaries in different countries calls for new and virtual working methods. In response to these changes companies have altered their work procedures towards more efficient and flexible communication alternatives (Clark et al., 2010; Kirkman et al., 2002).

Virtual work can be described as work that is realized and supported through technology and is often seen a possibility to raise reactivity and flexibility while minimizing costs (Corbitt et al., 2004). One special type of virtual work which has raised the interest of many researchers and which is implemented in numerous multinational organizations all over the world are virtual teams. A virtual team can be defined as a group of individuals who are communicating, exchanging knowledge and performing tasks by using information and telecommunication technologies and who are unable to regularly meet face-to-face because of geographic or organizational distance (Jarvenpaa and Leidner, 1999; Powell, 2004). As companies have to operate in increasingly dynamic and complex business environments virtual teams are extremely valuable for organizations and this special type of virtual work setting gained more and more importance (Horwitz et al., 2006). Factors like a high level of trust between team members, a clear and open communication and a strong leadership which establish successful face-to-face teams are also essential for virtual teams (Bergiel et al., 2008). In addition, cross-cultural understanding, commitment to the organization and clear defined roles and norms contribute to the effectiveness of virtual teams.

In comparison to traditional teams, where team members can meet at the same location and talk to each other in person, virtual teams face various challenges caused by the virtual context. Socio-emotional processes like relationship building, team cohesion and trust
development are harder to achieve than in traditional teams, because of the reliance on electronic communication tools and the often limited life span of virtual teams (Powell et al., 2004). In addition, obstacles due to language problems, multiple time zones, different approaches to conflict resolution (Bergiel et al., 2008) and issues of trust and identity can emerge in virtual settings (Kimble et al., 2000). Furthermore, virtual teams can be challenged by lack of technical knowhow of participating team members or by the fact that this type of teamwork did not fit into the organizational environment of a company (Bergiel et al., 2008). Also a coordination of team procedures and a fit between tasks, technology and structure plays an important role and can hinder the effectiveness of virtual team performance (Maznevski and Chudoba, 2000; Robey et al., 2000). Finally, obstacles can occur during communication processes, as for example technical challenges, lack of mutual understanding or missing nonverbal communication (Lurey and Raisinghani, 2001).

However, using virtual teams for accomplishing tasks and goals can also pose a chance to achieve great performance and the outcomes of virtual team work can be very efficient. Advantages of working virtually are for example flexibility of coordination and organization and frequency of communication between team members. Furthermore using virtual teams can be extremely cost saving for organizations due to reduced travelling costs and time (Suchan and Hayzak, 2001). Thus, it fosters flexibility of employees and enables individuals to stay in their familiar environment (Holtbrügge and Schillo, 2006). Another factor which is positively associated with virtual teams is the possibility to recruit talented people all over the world who bring different backgrounds, experiences, skills and ideas into the organization. In further consequence this aspect can lead to access on global markets and improved customer service (Cascio, 2000). In addition, working in virtual teams diminishes age and race discrimination and provides equal workplace opportunities for all team members (Bergiel et al., 2008). According to Kimble et al. (2000) even time differences in virtual teams should not only be seen as constraints, but also as chances to work in progress around the clock. A further benefit of using virtual teams is that performance as well as communication processes can be documented and reviewed very easily, because of the automatic recording of electronic tools (Gibson and Cohen, 2003).

Although the application of virtual teams brings along many challenges for organizations the right use of virtual teams can lead to great results which can outperform traditional face-to-face teams (Suchan and Hayzak, 2001; Bergiel et al., 2008). In order to exploit the potential of such virtual teams it is necessary that individual team members as well as the whole team learn continuously and pass through persistent learning processes. Researchers have revealed that learning is most efficient when people work and fulfill tasks together in teams,
because individuals share ideas with other team members and collaborate to obtain common team goals (Johnson et al., 2002, Olivera and Straus, 2004; Kozar 2010). On that account learning plays an essential role for achieving great performance and it is a key requirement to become a successful (virtual) team. In the next paragraph the existing literature gap is discussed and the overall research question of this thesis is formulated.

1.1 Literature Gap, Relevance and Research Question

The focus of this master thesis lies on the individual learning in virtual teams, whereby the influence of experiences in virtual teams on the learning progress of individual members is emphasized. As a virtual team can only be successful if single team members learn to cope with the challenges of the virtual context, it would be very interesting to reveal factors and variables that are influencing the learning process and behavior of individuals in such teams.

The assumption behind this statement is that team members of virtual teams experience different situations and conflicts, handle and fulfill tasks together and communicate with other team members (Zakaria et al., 2004; Ortega et al., 2010). These team processes are assumed to influence and change individuals’ thinking, reflection processes and learning. By reflecting the experiences and lessons learned within a team the conceptions and opinions of single participants can alter and thus individual learning progresses are starting. On the one hand individual learning through experience can occur about a person itself, as for example changes in preferences, values or beliefs take place. On the other hand individual learning contains thoughts and ideas about the whole team. This can comprise improvement suggestions about team processes, propositions for better communication or new ideas about goal achievement. When individuals discuss their personal ideas and thoughts with other team members it can in further consequence lead to changes in team structures and processes that often go along with team learning. In the sequel, individuals witness new situations and experiences in the team and the process between individual and team learning proceeds.

In order to find confirmation and recognition for this concept of a continuous process between individuals and teams, research about team learning as well as individual learning is discussed. First of all, a variety of researchers are focusing on individual learning in organizations, as for example Argyris (1976, 1995) who is dealing with the difference between single-loop learning and double-loop learning. These approaches stress the importance of feedback in order to change learning patterns of individuals and to overcome errors and counterproductive group dynamics. Apart from that, one very interesting stream of literature, namely experiential learning, asserts that effective learning only occurs through
active experience of individuals. Individual learning is here defined as a continuous experiential cycle and the model enumerates four stages a learner has to pass in order to gain new knowledge (Kolb 1984; Kolb and Kolb, 2005; McCarthy, 2010; Manolis et al., 2013).

Beside relevant literature dealing with learning of individuals, an abundance of articles about team learning can be found (e.g. Grünfeld et al., 2000; Chan et al., 2003; Wilson et al., 2007; Savelsbergh et al., 2009; Van den Bosche et al., 2011; Boon et al., 2013). The content of these studies comprises theoretical frameworks and models (Druskat and Kayes, 2000; van den Bosche et al., 2006), team learning processes (Huber, 1991) as well as the distinction of different team learning types (London and Sessa, 2007).

Furthermore, literature dealing with the influence of team participation on individual learning in context of traditional teams is emphasized. The relationship between individual and team learning raised the attention of Brodbeck and Greitemeyer (2000) who examined the effects of individual and group experience on group member learning and group performance. According to Olivera and Straus (2004) individuals can profit from the experience of being a member of a group and approaches for problem solving or special learning strategies developed inside this group can be applied for individual tasks. In addition, also Stasson et al. (1991) as well as Gabbert et al. (1986) proved a positive group-to-individual transfer of learning in traditional teams.

Due to the fact that teams in today’s business world become more dynamic and flexible virtual teams gain high popularity in organizations (Hunsaker and Hunsaker, 2008). In order to exploit the potential of virtual teams it is necessary that individual team members as well as the whole team learn steadily and pass through continuous learning processes (e.g. Zakaria et al., 2004). Thus, new research findings are necessary to close the actual research gap in virtual learning literature and to reveal if there are differences between learning in traditional teams and learning in virtual teams. On that account, literature about learning in virtual teams and literature about the relationship between individual and team learning are discussed. Furthermore, social, contextual and cognitive factors that are assumed to influence individual learning in virtual teams are treated (Geister et al., 2006; Ortega et al., 2010).

Although, a very small number of researchers are dealing with individual learning in virtual teams (e.g. Miller et al., 2010; Li et al., 2011), traditional learning literature implies that there is a relationship between team collaboration and individual learning processes. To contribute to this research gap studies are needed to detect if and how this is impact originates and
how experiences in virtual teams can affect individual learning.

Therefore the research question is:

“How can experiences in virtual teams influence individual learning?”

In order to get more detailed insights in the field of virtual learning the following sub-question is asked in the thesis:

“Does the way how people reflect experiences has an influence on individual learning?”

1.2 Structure and Objective of the Thesis

The master thesis is divided into two main sections namely the theoretical framework and the empirical study. The aim of the paper is to reveal the mutual relationship between individual learning and collaboration in virtual teams. More precisely the impact of experiences in virtual teams on individual reflection and on individual learning is examined. The goal is to detect how and what individuals take along and learn from their participation in a virtual team and what contextual factors are influencing this process.

The first part of the master thesis covers the conceptual background which provides a literature review of the two main areas of interest. Starting with relevant definitions, concepts and studies an overview about virtual teams is given. In addition, benefits and challenges of virtual teams in comparison to traditional teams are demonstrated. The second focus of the literature review deals with learning. In this part a general definition of learning is provided and relevant learning streams that contribute to the main focus of this thesis are introduced, including the experiential learning theory, the role of reflection on learning, the constructs of single-loop and double-loop learning as well as relevant team learning concepts. Besides, the relationship between individual and team learning is addressed and pertinent papers are examined. In a next step, the topic of learning is combined with existing literature about the virtual context. In this part research findings which connect learning with virtuality are provided and different streams are highlighted.

After discussing relevant topics in the literature review, the focus of the empirical part of this thesis is to discover the influence of experiences in virtual teams on individual learning. For this purpose a case analysis is realized where essays and team assignments of students collaborating in a virtual simulation game are analyzed. The essays comprise reflections of
students about their experiences and lessons learned during their participation in a virtual simulation game. The team assignments written in teams include two SWOT analyses and a plan for future strategy.

The outcomes of the master thesis should detect the impact of experiences in teams on individual learning. Many researchers were dealing with individual learning in virtual teams in the last years (e.g. Häkkinen, 2004; Li et al., 2011), but only a small number of studies addressed the question of what individuals can take along from their active participation in virtual teams. Hence, the empirical study should contribute to the actual literature gap in the field of virtual learning and give implications for individuals who are part of virtual teams.

2. VIRTUAL TEAMS
2.1 Introduction and Definitions
In light of the increasing globalization and de-centralization many forward-thinking organizations replied to their dynamic and complex environment by implementing new and flexible team structures (Ebrahim et al., 2009). In addition, the rapid development from information and communication technology in the last decades has advanced this trend and has created an opportunity for teams to communicate and work together independent of geographic, organizational and time constraints (Corbitt et al., 2004, Hertel et al., 2005). In response to these changes many organizations implemented virtual teams in their daily operations and virtual teaming increased rapidly all over the world due to the great benefits it brings along (Hunsaker and Hunsaker, 2008). Virtual teams enable companies to bridge intra- as well as interorganizational boundaries, to improve productivity and efficiency and to get access to most qualified individuals all over the world (Furst et al., 1999).

In order to clarify the concept of virtual teams, first of all it is necessary to provide a definition of a team itself. Although teams play a crucial role in a huge body of empirical studies there is no overall agreement on a general definition about a team and disagreement prevails among researchers about different characteristics a team has to entail. Salas et al. (1992) define a team as “a distinguishable set of two or more people who are assigned specific roles or functions to perform dynamically, interdependently, and adaptively toward a common and valued goal/object/mission, who have each been assigned specific roles or functions to perform, and who have a limited life span of membership” (p.126). However, Edmondson (1999) describes teams as “groups that exist within the context of a larger organization, have clearly defined membership, and share responsibility for a team product or service” (Edmondson, 1999, p. 351).
In order to get a clear meaning of a team the following definition by Boon et al. (2013) is applied in this thesis, which is a combination of existing definitions and which provides an overview of the most important criterions that embody a team. In their point of view interdependence, shared responsibility, ability to draw the boundaries of a team, boundary crossing and development of a shared mental model are the five most relevant characteristics representing a team (Boon et al., 2013, p. 358; Cohen and Bailey, 1997; Salas et al., 2000). Although teams and groups are often described as different concepts in literature, it should be clarified that this thesis applies an understanding of teams and groups as synonym concepts. In the next section the focus is on virtual teams and definitions and characteristics of such teams are provided.

In literature a variety of definitions of virtual teams can be found. According to Hertel et al. (2005) scholars agree that virtual teams “consist of (a) two or more persons who (b) collaborate interactively to achieve common goals, while (c) at least one of the team members works at a different location, organization, or at a different time so that (d) communication and coordination is predominantly based on electronic communication media (...)” (p. 71). Ebrahim et al. (2009) defined virtual teams as “small temporary groups of geographically, organizationally and/or time dispersed knowledge workers who coordinate their work predominantly with electronic information and communication technologies in order to accomplish one or more organization tasks.” (p. 1578)

Kimble et al. (2000) have tried to classify virtual teams in order to better structure the complex setting of such teams. First of all virtual teams can be distinguished by the factor of time. Team participants can either communicate and interact at the same time or at different times. This so called work-cycle-synchronicity is influenced by the choice of communication tools as it is possible to select between synchronous and asynchronous ways of technical communication. In addition, time is influenced by different time zones and the question whether team members are coming from the same or from different time zones. The second factor in the classification is place. Virtual teams can be categorized whether participants are physically close to each other or geographically separated (Jarvenpaa and Leidner, 1999). Last but not least virtual teams can be classified by the organization they are employed, so if all team members are working in the same organization or in different companies (Lipnack and Stamps, 1997).

In this thesis virtual team are seen as “groups of geographically, organizationally and/or time dispersed workers brought together by information and telecommunication technologies to accomplish one or more organizational tasks.” (Powell et al., 2004, p.7).
Since there are numerous definitions and perceptions about virtual teams the next paragraph summarizes the most relevant characteristics of virtual teams in order to provide a clear overview of this special type of team collaboration.

One main criterion of virtual teams is the geographic dispersion of team members (Wong and Burton, 2000). People participating in virtual teams are often working in various locations of international companies all over the globe and thus it is not possible for them to meet regularly face-to-face. Sometimes it is even not feasible for team members to meet in person at beginning of team work, which is extremely important for becoming acquainted and for developing trust and a common understanding (Bergiel et al., 2008). The spread of team members around various countries often goes along with different time zones, which is why time shift is a further characteristic of virtual teaming. People have to cope with the challenges of time zone differences and have to coordinate their tasks and processes over different times and locations (Ebrahim et al., 2009). Geographic dispersion usually brings along a further characteristic of virtual teams, namely national diversity and various cultures. As team members are spread around countries all over the world they are grown up in diverse cultures with different lifestyles, opinions, approaches of problem solving and communication patterns. For virtual teams this means on the one hand a great opportunity for innovation, creativity and diversity but on the other hand different cultures can clash and problems can occur (Mockaitis et al., 2012). Another common characteristic of virtual teams is that communication is supported and enabled by as well as dependent from information and communication technologies (Berry, 2011). With the increasing expansion of technology the opportunities to work together from any location with internet connection are enormous. If team members want to talk to each other they have the possibility to select between different synchronous and asynchronous types of media such as chats, e-mails or web conferences (Peters and Manz, 2007). In addition, virtual teams are characterized by cross-boundary collaboration between team members. People have to work together across barriers and boundaries such as geography, culture, language and time. This can be extremely challenging for team members and thus collaboration is one main criterion of virtual teaming (Rezgui, 2007). Finally, a virtual team is guided and driven by a common purpose. Having a mutual goal as well as a similar understanding about the overall purpose of team work is important for traditional as well as virtual teams (Hertel et al., 2005; Ebrahim et al., 2009).

After explicitly defining a virtual team, it is necessary to shortly classify and differentiate virtual teams from other similar concepts in literature in order to delineate those concepts from the understanding of virtual teams in this thesis (see Figure 1). First of all, it should be
clarified that virtual teams are different to e-learning or online learning teams applied for educational purposes (e.g. Johnson et al., 2002; Saab et al., 2011). In those teams the main purpose is to promote a transfer of knowledge and skills and to foster learning progresses of students via networks and the Internet (Miller et al., 2010). E-Learning can be defined as “[l]earning conducted via electronic media, typically on the Internet: successful e-learning depends on the self-motivation of individuals to study effectively” (Oxford Dictionary, 2015). E-Learning includes computer-based learning, virtual classrooms, web-based learning, applications as well as digital collaboration and the learning content is assigned and delivered via CD-ROMs, the Internet, audio tapes, video tapes or TV (Saab et al., 2011). In addition, it is necessary to distinguish virtual teams from virtual 3-D worlds, which approach how virtual world capabilities are influencing learning in this context (e.g. Goel et al., 2013; Ibáñez et al., 2013; Nicholas et al., 2015). Virtual worlds can be described as “virtual environments that enable multiple users to simultaneously access virtual contexts, interact with digital artifacts, represent themselves through avatars, communicate with other individuals and computer-based agents, and engage in collaborative learning activities.” (Li et al., 2011, p. 268). Besides, virtual teams should be differentiated from virtual Communities of Practice (CoP), as those can be defined as “activity system[s] about which participants share understandings concerning what they are doing and what that means in their lives and for their community” (Lave and Wenger, 1991, p. 98).

For getting a holistic view about virtual teams, benefits as well as challenges virtual teaming brings along are discussed in the next sections.

2.2 Advantages of Virtual Teams
Implementing and applying virtual teams for accomplishing tasks and goals brings along

![Figure 1: Classification of Virtual Teams (developed by the author)](image-url)
numerous potential advantages for society, organizations, teams and individuals (e.g. Kimble et al., 2000; Berry, 2011).

In a global point of view virtual teaming entails environmental benefits and helps to reduce pollution (Cascio, 2000). This added value for the whole society can be ascribed to saved business trips (e.g. by car or by plane) or decreased electricity consumption (Johnson et al., 2001).

For organizations using virtual teams can be extremely cost saving due to reduced travelling costs and time of employees (Suchan and Hayzak, 2001). Moreover, less office and parking space are required because of the opportunity for individuals to work from home (Johnson et al., 2001). In further consequence this leads to a decrease of heat and electricity costs for companies. In addition, introducing virtual teams can reduce relocation time and costs if the decision is between changing one’s place to move nearer to the organization and participating in a virtual team unconcerned from which place (Bergiel et al., 2008).

Furthermore, virtual teams can overcome limitations arising due to different time-zones, various locations and organizational boundaries (Ebrahim et al., 2009). With the support of information and communication technology the options of virtual teams are enormous and companies have the ability to bridge space and time (Berry, 2011).

Another factor which is positively associated with virtual teams is the possibility to recruit talented people all over the world who bring different backgrounds, experiences, skills and ideas into the organization (Furst et al., 2004). Proximity to the company is not required anymore (Cascio, 2000) and therefore organizations get easier access to experts and other sources of information all over the globe (Nydegger and Nydegger, 2010). The possibility to recruit staff based on expertise and not on local availability presents a great strategic advantage for companies (Hertel et al., 2005). On that account diverse cross-cultural teams are formed that foster creativity and innovation due to the diversity of participating team members (Bergiel et al., 2008). According to Cascio (2000) so called “Centers of Excellence” emerge since a company can hire the best employees for a specific job regardless of location or time. In further consequence the spread of employees and team members all over the world can lead to access on global markets and improved customer service due to a broader geographic reach and effective contact with employees and customers (Berry, 2011). This aspect can by implication lead to a reduced time-to-market (Chen, 2011).

In comparison to traditional teams where communication processes are synchronous
communication in virtual teams is often asynchronous (Berry, 2011). This can lead to efficient outcomes because participants are acting and collaborating parallel and not serial (Klein and Kleinhanhans, 2003). According to Kimble et al. (2000) even time lags in virtual teams should not only be seen as constraints, but also as chances to work in progress around the clock. Thus, organizations can follow the sun and 24/7 work schedules are standard (Berry, 2011).

A further benefit of implementing virtual teams is that due to automatic recording of electronic tools, performance as well as communication processes can be documented and reviewed very easily (Gibson and Cohen, 2003).

Additionally, virtual teams work task-oriented rather than social-oriented, because if people never see each other face-to-face and never or rarely meet face-to-face it is more difficult to develop relationships and social bonding between team members. This task focused work environment can lead to superior task outcomes and increased team performance (Berry, 2011).

Beside the positive effects virtual teaming entails for society, organizations and teams, it additionally brings along many benefits for individuals. First of all, virtual teams foster flexibility of employees and enable individuals to stay in their familiar environment (Holtbrügge and Schillo, 2006). This leads to greater freedom of employees (Ebrahim et al., 2009), reduces stress (Dubé and Robey, 2008) and supports a better work-life balance for individuals (Nydegger and Nydegger, 2010). Consequently, absenteeism of employees can be reduced and organizations face decreased sickness absence rates and lower burn-out rates.

In addition, virtual teams might decrease injustice and disparity. The removal of physical boundaries in virtual teams has created equal opportunities for every employee. Especially for handicapped people the possibility to participate in virtual teams is a great facilitation, because they get easier access to their workplace (Chinowsky and Rojas, 2003). In addition working in virtual teams might diminish age and race discrimination and provides a homogenous workplace for all team members (Bergiel et al., 2008).

With the support of advanced communication and information technologies a more effective use of team resources is provided, because documents can be accessed online at any time and from any location (Nydegger and Nydegger, 2010) and enables individuals to work at any hour of the day which can lead to increased productivity of virtual teams (Cascio, 2000). This flexible and configurable infrastructure of virtual teams (Ebrahim et al., 2009) leads to
empowerment of team members which raises motivation and team effectiveness (Hertel et al., 2005).

Although there are many benefits associated with the implementation of virtual team settings, virtual teaming brings along various challenges. Kirkman et al. (2002) state in their paper that the five main challenges to virtual team success are building trust between team members, maximizing process gains, overcoming feelings of isolation, balancing technical and interpersonal skills and assessing and recognizing virtual team performance. According to Kimble et al. (2000) were among the first ones who dealt with virtual teams and identified various technological, organizational and cultural barriers. Beside these factors, which are in a way still true, the next paragraphs addresses the most relevant challenges that could hinder learning processes in virtual teams in detail.

2.3 Challenges of Virtual Teams
In comparison to face-to-face teams, where team members can communicate at the same place and talk to each other in person, virtual teams face various challenges caused by the virtual context. Companies, teams as well as individuals have to cope with issues and discontinuities of time, geography, technology, organizational cultures, work practices, languages and national cultures (Dubé and Robey, 2008).

First of all, socio-emotional processes like relationship building, team cohesion and trust development are harder to achieve in virtual settings than in traditional teams (Kimble et al., 2000). This can be explained due to the reliance on electronic communication tools, the missing personal contact and the often limited life span of virtual teams (Powell et al., 2004). In further consequence a lack of mutual trust increases turnover intentions, lowers employee’s support of management and decreases work performance of virtual teams in companies (Cascio, 2000, Nydegger and Nydegger, 2010).

In addition, several challenges appearing in virtual teams can be linked to culture (Cascio, 2000; Horwitz et al., 2006). Issues and conflicts stemming from cultural aspects are for example differences in value systems (Dubé and Robey, 2008), local priorities (Berry, 2011) or diverging approaches for conflict solving. (Bergiel et al., 2008). The often mistaken opinions and perceptions of problem reasons in virtual teams make it very difficult to deal with the actual causes of problems (Nydegger and Nydegger, 2010). That is why in virtual settings conflicts are hidden for a long time (Fischlmayr, 2011), which can lead to unproductive and negative team atmosphere and reduced performance.
A further challenge of virtual teams deals with information sharing. People initially share less information in virtual teams in comparison to traditional teams due to aspects such as missing personal contact or technical challenges. This can consequently lead to a weaker shared understanding of goals, a missing overall strategy and thus to a negative effect on the team performance (Berry, 2011).

One very interesting issue is dealing with the communication processes and patterns of virtually connected team members. In the virtual world challenges occur when people are communicating with each other, as for example technical challenges, lack of mutual understanding or missing nonverbal communication (Lurey and Raisinghani, 2001). The reliance on electronically mediated communication can increase conflict, hinder group cohesion and prevent or decelerate knowledge sharing (Dubé and Robey, 2008). Technological barriers such as selecting the appropriate technology and service, upgrading systems or the fact that most equipment is designed for conventional offices are challenges virtual team members have to cope with (Kimble et al., 2000). In addition, electronically mediated communication requires expensive setup and maintenance costs for hardware and software (Cascio, 2000, Nydegger and Nydegger, 2010) as well as complex technological applications (Ebrahim et al., 2009).

Further disadvantages of virtual teams can be the lack of knowhow and expertise in technological applications (Bergiel et al., 2008) or the poor communication quality stemming from bad internet connection or not working technology (Horwitz et al., 2006).

Alongside with challenges for companies and teams, virtual teaming entails challenges for individual team members. One problem which can occur in virtual teams is the fact that some people are unsuited to work in an entirely virtual space and therefore they feel uncomfortable and are not able to reach equal performance as in traditional teams. Apart from that, it is also possible that virtual teaming did not fit into the organizational environment and to the norms and values of a company (Bergiel et al., 2008). The application of virtual teams would in both cases lead to decreased motivation, performance and efficiency of employees.

Leaders of virtual teams often face decreased monitoring and control of activities of team members due to the absence of face-to-face presence or regular personal meetings (Ebrahim et al., 2009). This lack of visual contact can lead to a perceived loss of loyalty and control of the leader (Kimble et al., 2000).

For team participants the absence of physical presence and missing face-to-face meetings in
virtual teams often implicate feelings of isolation of single team members. (Berry, 2011, Cascio, 2000, Fischlmayr, 2011). This aspect of being ignored over the internet, not answering messages of other team members or not reacting on somebody’s comments is called cyberostracism (Williams et al., 2000). Cyberostracism is a great challenge in virtual teams that can lead to decreased team performance, sunken trust between team members as well as reduced communication (Fischlmayr, 2011).

On the basis of literature summarized above it can be stated that the application of virtual teams brings along many challenges for organizations. However, the right use of virtual teams entails huge opportunities and leads to great results which can outperform traditional face-to-face teams (Hunsaker and Hunsaker, 2008). In order to exploit the potential of such virtual teams it is necessary that individual team members as well as the whole team learn continuously and pass through persistent learning processes (e.g. Kirschner and van Bruggen, 2004; Zakaria et al., 2004). Learning is most efficient when people work and fulfill tasks together in teams, because individuals share ideas with other team members and collaborate to obtain common team goals (Johnson et al., 2000). On that account it can be stated, that individual and team learning processes play an essential role for achieving great performance in the virtual context and are key requirements for a successful virtual team (Ortega et al., 2010). Although the main focus of this thesis is on individual learning processes in virtual teams, the first step now is to address and discuss traditional learning literature. This research about learning in face-to-face teams is assumed to make a contribution to following literature parts as well as it is supposed to conduce to the answering of the research question. In order to get an overview about the topic of traditional learning, relevant individual as well as team learning literature is provided. Moreover, studies dealing with the influence of team collaboration on individual learning are discussed and relevant research outcomes are pointed out.

3. LEARNING

3.1 Introduction and Definitions

There is a lack of consensus about the exact definition of learning in literature, but in general two streams of definitions can be distinguished. On the one hand learning can be defined as a change in behavior of individuals based on experience (functional approach), meaning that learning is seen as an effect of experience on behavior (Edmondson, 1999). Other authors prefer a more mechanistic view which describes learning as changes in the organism that emerge from experience (mechanistic approach) (e.g. Chiesa, 1992; Bechtel, 2005; Houwer et al., 2013). The phrase “emerge from” can be defined as “to become known” or “to survive a difficult situation or experience” (Oxford Dictionaries, 2015, website). Thus, the mechanistic
approach implies that there must be the presence of coherent causes of behavior that influence learning. By interpreting the dictionary definition of learning where learning is described as “the acquisition of knowledge or skills through experience, study, or by being taught” (Oxford Dictionaries, 2015) learning comprises two meanings. On the one hand it describes the ability of individuals to bring out some action or performance and on the other hand it means to enunciate a conceptual comprehension of an experience (Kim, 1993). Generally speaking learning is seen as a process of action and reflection conducted and altered by the actor in order to obtain requested results (Kolb 1984).

Researchers who focus on learning processes propose that learning occurs at three levels in organizations, namely at individual level, team level and organizational level (Kim, 1993; Bapuji and Crossan, 2004). Additionally a fourth level of learning could be added which is called society learning, but if the unit of analysis is the organization as such, researchers agree that learning is considered to happen on three of these four levels (Li et al., 2011). All three types of learning influence each other and team as well as organizational learning cannot occur without individual learning (Crossan et al., 1999).

On that account the next paragraph highlights relevant individual learning literature and concepts. First of all, an introduction about individual learning is given and relevant learning streams are presented. This includes the experiential learning approach as well as the concept of learning through reflection. Moreover, the reader is introduced in the models of single-loop and double-loop learning by Argyris (1995).

3.2 Individual Learning

Individual learning addresses learning processes and behaviors of single persons. It can be defined as “a relatively permanent change in knowledge or skill produced by experience” (Weiss, 1990, p.172). In order to start learning progress, individuals have to encode, store, and retrieve information that exists in their environmental setting (Ellis et al., 2003).

According to Crossan et al. (1999) individual learning mostly occurs through intuition and subconscious processes. This means that an individual person uses its own experiences, pictures, metaphors and patterns in order to solve problems or tasks. Intuition is a highly subconscious process which drives the actions of persons, but does not influence other individuals as long as there is no interaction (Weick, 1995). Even if individuals communicate with other people it is hard to pass on their own intuitive ideas or visions and to share their learning. The use of metaphors can help to explain personal insights to others and to get a common language and understanding, which leads to a process of interpretation. (Crossan
et al., 1999). During this process individuals develop cognitive maps which help them to operate in different environments and to build an understanding of what is possible (Kim, 1993; Huff, 1990). A cognitive map can be defined as “a mental representation of one’s physical environment.” (Oxford Dictionary, 2015). Language plays an essential role in the interpretation process as it enables individuals to describe their feelings and thoughts (Srivastava and Barrett, 1988). By trying to find out connections between personal ideas and thoughts conscious elements of the individual learning process were picked up and related. Interpreting proceeds in regard to a specific environment and thus it is crucial to know from which surrounding information is extracted in order to understand the process of interpreting. Individuals interpret equal signals in a different way because they base their interpretation on their personal cognitive maps (Spicer, 1998). On that account it can be stated that intuiting as well as interpreting are necessary processes enabling individual learning.

A central concern of studies dealing with individual learning is the relationship of exploring new possibilities and exploiting old certainties (Schumpeter, 1934). “To explore” can be defined as “to examine something completely or carefully in order to find out more about it” (Oxford Dictionary, 2015). In contrast “to exploit” means to “make full use of and derive benefit from (a resource)” (Oxford Dictionary, 2015). Achieving a suitable balance between these two forms of learning is a major goal for system survival and achieving great performance (He and Wong, 2004). Exploration is associated with experimenting alternative ways of coping with a dynamic environment and thus it fosters innovation and novel ideas. Individuals attempt new possibilities, routines and techniques in order to react to a steadily changing surrounding and existing competencies are refined and adjusted continuously. Therefore, individuals that use explorative learning techniques are able to adapt quickly to new circumstances and opportunities (Gupta et al., 2006). By contrast, exploitative learning means to adapt to existing environments and to reutilize traditional practices and methods. Existing recipes of success are exhausted and utilized which can lead to high learning effort. Both types of learning bring challenges with them. By only using explorative learning methods it can lead to a disruption of routines and a negative outcome whereas exploitation can cause structural inertia and hindrance to adapt to future changes. On that account it is necessary to balance these two learning types in order to achieve learning progress (March, 1991).

Beside the concept of explorative and exploitative learning, individual learning can be seen from different views and perspectives. One stream of researchers assumes that individuals learn through direct experience and monitoring of action (Kolb, 1984). Another approach of individual learning emphasizes human capabilities such as symbolizing, forethought,
modeling and self-regulation and supposes that those capabilities affect learning processes at the individual level (Bandura, 1986). In addition, the focus of individual learning can be on the process of retention, production and motivation as contributing processes to a persons’ learning improvement (Castaneda and Rios, 2007). Although, there are various streams and meanings of what represents learning at the individual level, in this master thesis individual learning is based on the experiential learning theory (Kolb and Kolb, 2004), as the author of this thesis tries to reveal what individuals can learn from their experiences in virtual teams. Individual learning is therefore defined as “the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience.” (Kolb, 1984, p.41).

3.2.1 Learning through Experience

Experiential Learning Theory is a well-elaborated theory, which is based on life-cycles as drivers of change and learning (Kolb, 1984). “A life-cycle model depicts the process of change in an entity as progressing through a necessary sequence of stages. An institutional, natural, or logical program prescribes the specific contents of these stages.” (Van de Ven, 1995, p. 520) Experiential Learning Theory emphasizes a holistic learning progress that comprises experiences, behaviors, cognitions and perceptions of individuals (McCarthy, 2010). Experiential learning can be defined as a process of knowledge creation through adaption and transformation of experience, whereby experience is seen as a crucial predecessor for individual learning (Kolb and Kolb, 2005).

One stream of researchers views self-efficacy as an important factor that represents the foundation of experiential learning (Bandura, 1986). Self-efficacy can be defined as “personal judgments of one’s capabilities to organize and execute courses of action to attain designated goals” (Zimmerman, 2000, p. 83). According to this theory “individuals tend to attempt undertakings that they believe they can complete successfully and tend to avoid undertakings that they believe exceed their capabilities.” (Manolis et al., 2013, p.45) Thus, self-efficacy is assumed to influence decisions and actions of individuals during their learning experience. Simultaneously, personal experience is in turn seen as the most important factor impacting self-efficacy. Learners have the opportunity to directly make use of the gathered information in order to learn from their experiences and increase their self-efficacy (Manolis et al., 2013). This reciprocal relationship and influence between self-efficacy and experiential learning plays an essential role in the Experiential Learning Theory (Healey and Jenkins, 2000).

Six main propositions form the cornerstones of the Experiential Learning Theory. The first
assumption describes learning as a process rather than an outcome (Kolb and Kolb, 2006). This means that individuals have to be actively included in feedback and learning processes in order to enhance their learning progress. The second proposition states that “[a]ll learning is relearning” (Kolb and Kolb, 2005, p.194). This phrase signifies that individuals examine and reconsider their ideas and beliefs through a continuous process whereby in the end more precise conceptions are the result. Furthermore individual learning is driven by conflicts and disagreements, which means that a person moves forward and backward between acting, thinking and reflecting (Healey and Jenkins, 2000). In addition, learning can be seen as an integral process of adjusting, meaning that learning involves the person as a whole unit (Manolis et al., 2013). The fifth proposition of experiential learning is that Learning results from synergistic transactions between the person and the environment.” (Kolb and Kolb, 2006, p.47). In other words, the choices and decisions we make impact to some degree the events we experience and these events influence our decisions in the future (Kolb and Kolb, 2008). Finally, learning can be seen as knowledge-creation (McCarthy, 2010). This proposition emphasizes a constructivist view, in which social knowledge is created and recreated in the individual knowledge of the learner.

The Experiential Learning Cycle (ELC) describes a periodic process of learning experiences where individuals have to go through the entire cycle in order to learn effectively (McCarthy, 2010). Knowledge is constructed by passing through four learning stages, namely experiencing, reflecting, thinking and acting (McCarthy, 2010) (see Figure 2).

![Figure 2: The Experiential Learning Cycle](developed by the author; adapted from Kolb, 1984)

Concrete experiencing emphasizes the active performance of individuals. In this stage it is essential that learners execute tasks by their selves and that they experience physically new situations, because simply watching, reading or listening does not lead to effective learning
(Kolb, 1984). In the next step of the Learning Cycle reflective observation takes place where learners are reviewing their experiences and decisions (Kayes et al., 2005). Discussions and communication play an essential role in this stage as they help to answer questions and clarify obscurities. The third stage of Kolb’s Learning Cycle is called abstract conceptualization (Manolis et al., 2013). In this phase individuals try to make sense of what has happened and interpret and think about relationships and passed events. This stage of learning is often accompanied by comparison between past theoretical knowledge and new ideas and concepts. In the final stage of the Experiential Learning Cycle – active experimentation – learners think about how they can implement what they have learned and experienced into practice (Healy and Jenkins, 2000). In this phase it is important to plan future actions and to ensure that these actions and ideas fit into the relevant context (Mobbs, 2015). In general, learners can enter the cycle at any stage and it is necessary that they decide which set of learning ability is applicable in which situation (McCarthy, 2010).

A well-known model by Kolb (1984), which is called Learning Styles Inventory (LSI), is based on the Experiential Learning Cycle. In this model the four learning stages - concrete experience, reflective observation, abstract conceptualization and active experimentation – are located on two continuums and build the cornerstone of this framework. These two impartial continuums address the questions of “how we do things” and “how we think about things”. The first continuum, namely perception continuum, approaches whether individual prefers abstractness or concreteness in obtaining knowledge (“how we think about things”) whereas the second continuum, called processing continuum, addresses whether a person favors reflection over action or vice versa (“how we do things”). The individual learning modes compose of a combination of these two independent continuums. Consequently, four learning modes can be identified which are called divergers, assimilators, accommodators and convergers (Manolis et al., 2013). As individuals are thought to generate preferences for specific learning styles over some time and for different situations, the aim of LSI is to estimate and classify the preferred learning modes of individuals (McCarthy, 2010). According to Kolb and Kolb (2005) the preference for a specific learning mode is governed by factors as culture, personality, education and career choice. In the next paragraph the four individual learning styles are explained in more detail (see Figure 3).

The diverging learning mode is determined by reflective observation and concrete experience (Kayes, 2005). Divergers learn through experiencing a situation and looking at it from many points of view (Kolb, 1984). Through these diverse insights and perspectives persons with a diverging learning mode are open to individual feedback and are extremely suitable for working together in groups (Healy, 2000). Beyond, divergers develop strong
communication skills and they are suitable for brainstorming and generating new ideas. Further strengths of individuals with diverging learning style are imaginative ability as well as broad cultural understanding (McCarthy, 2010).

The assimilating learning style involves reflective observation and abstract conceptualization (Kayes, 2005). Assimilators prefer having a wide range of information and arranging this information in a concrete and logic way. They are focused on ideas rather than persons and prefer logic over practical value (Hayes and Jenkins, 2000). Individuals using the assimilating learning mode are proficient in analyzing, planning and organizing information as well as in inductive reasoning. Additionally, assimilators have the ability to create and establish theoretical models and to develop new theories (Manolis et al., 2013).

The converger uses both active experimentation and abstract conceptualization to learn and process information (Kolb and Kolb, 2005). Thus, individuals with preference of the converging learning mode learn through carrying out simulations or being involved in first-hand techniques such as practical experiments (Geiger, 1992). In addition they prefer to solve technical tasks and issues rather than dealing with social and interpersonal problems (McCarthy, 2010). The strengths of this learning type are to apply solutions of past problems for new situation and to find practical applications for learned theories and ideas (Kolb, 1984). Convergers are extremely qualified in setting goals, solving problems and making decisions (Healy and Jenkins, 2000).

Individuals with accommodating learning style also approach knowledge through active experimentation however they prefer it through concrete experience (Kayes, 2005).
Accomodators want to be actively involved in concrete situations and new activities as well as challenges by which they learn (Manolis et al., 2013). They make intuitive decisions, act based on their gut instincts and favor working together in teams (Kolb and Kolb, 2005). Individuals with accommodating learning mode best fit into dynamic situations where changes are needed in order to meet new circumstances. Their strengths are carrying out and implementing plans as well as their adaptive and risk-taking personality (McCarthy, 2010).

After explicitly dealing with the experiential learning approach as well as with Kolb’s learning cycle (1984), the question arises to which extent the reflection of these experiences would obtain to even higher learning outcomes. This topic raised the attention of a huge stream of researchers such as Daudelin (1996), Hoyrup (2004) and Gray (2007) to mention a few. Therefore, relevant definitions as well as main findings addressing the impact of reflection on individual learning are discussed in the next section.

3.2.2 Learning through Reflection

“To make meaning means to make sense of an experience; we make an interpretation of it. When we subsequently use this interpretation to guide decision making or action, then making meaning becomes learning.” (Mezirow, 1990, p. 1)

Nowadays it is not possible anymore to predict coming incidents and to prepare perfectly for future demands, as the business environment is influenced by dynamic and unpredictable changes (Klitmøller and Lauring, 2013). Thus, for the future it is necessary to develop a flexible and more adaptive system for learning in organizations (Hoyrup, 2004). For this purpose it could be helpful to realize the huge learning potential cached in day-to-day’s experiences, problems and challenges (Bolinger and Stanton, 2014). With the use of trial-and-error experiments and the reflection of past events it is possible to challenge these work experiences and to trigger learning (Daudelin, 1996).

Reflection is a very natural and well-known process as individuals use it in their daily private as well as business life. Examples for these everyday reflections are papers in school were questions have to be answered, critical reports in work or discussions with friends about a challenging situation (Higgins, 2011). Reflection can be defined as “the process of stepping back from an experience to ponder, carefully and persistently, its meaning to the self through the development of inferences.” (Daudelin, 1996, p. 39). It is a highly personal cognitive process that is often unprompted and sometimes outside an individual’s appreciation (Hoyrup, 2004). By reflecting, people take an experience from the external world and bring it
inside their mind (Mezirow, 1990). In sequel, the new experience is connected with previous experiences and strained through personal modes of thoughts. If the outside, namely the surrounding beyond the team, is then approached in a different way as without the reflection the individual has learned something new (Bulpitt and Martin, 2005).

There is no agreement upon a general and concrete concept of reflection (Bolinger and Stanton, 2005). In order to capture the full complexity of this concept it can be differentiated between various forms of reflection (see Figure 4). One approach opposes the concepts of normal and critical reflection (Mezirow, 1990). Normal reflection is defined as an evaluation of how a person has noticed, sensed, thought or acted (Hoyrup, 2004). The main process of this form of reflection is to explore a specific action in a certain situation, to review this experience, to analyze the causes and to draw conclusions for future events. The emphasis here lies on the individual perspective whereas critical reflection includes the reflection of the social context together with others (Reynolds, 1998). Critical reflecting focuses on questioning taken-for-granted assumptions and contextual aspects (Brookfield, 2000). It means that individuals reflect on the premises of problem solving and that they challenge the validity of requirements. Critical reflection bridges experiences with learning by involving both cognition and feelings and tempts to figure out why individuals act or think in a specific way (Gray, 2007). By trying to answer this question the reasons and consequences of what people do are scrutinized. In the sequel, this leads to deeper level learning and a transformation of psychological mechanisms that base the interpretations of an individual. But critical reflection can also be applied by individuals alone, which is then called critical self-reflection (Hoyrup, 2004). This process can be described as reassessing the way individuals constitute problems as well as scrutinizing their orientation to perceive, believe and act (Mezirow, 1990). By critical self-reflection, self-identity and personal values are questioned and reflection chains individual learning with organizational learning (Reynolds, 1998).

A further distinction can be made between coached reflection and reflection-in-action, whereby the latter is a complement to coached reflection rather than a counterpart (Schön, 1995). In some situations it is important that individuals are supported in the reflection processes so that they can make sense out of their experiences (Daudelin, 1996). This so called coached or guided reflection is facilitated by an outsider and designed to foster a review of an experience (Bulpitt and Martin, 2005). In this case reflection is planned and includes the provision of formal, structured tools in order to help learners to think about their experiences and to draw conclusions from them. Individuals are physically separated from their experience, meaning that process of reflection and learning is happening after the
experience and not during it (Daudelin, 1996). Coached reflection is not the only type of valuable reflection, as unstructured reflection is equally important for stimulating individual learning. This type of reflection naturally arises during challenging experiences and therefore it is called reflection-in-action (Schön, 1995). According to Seibert “reflection-in-action is an informal and natural cognitive response to an unfamiliar and stretching experience.” (Seibert, 1999, p. 55) As reflection is often an impulse and induced by issues or problems, reflection-in-action deals with the process of how learners are trying to make a meaning out of their experiences while they are in the middle of experiencing them (Daudelin, 1996). This reflection process includes the intuitive adjustment with a specific situation as well as criticizing, restructuring and testing of spontaneous comprehension of experiences. It is conducted by the learners themselves and is an ongoing, unplanned and active process. In comparison to coached reflection reflection-in-action emerges in real-time, which means that the situation can still be influenced by the conclusions of the reflection (Seibert, 1999). On that account it is helpful to better understand the procedure of this impulsive type of reflection in order to foster individual learning (Schön, 1995).

The process of this spontaneous reflection can be separated in four related stages (Daudelin, 1996) (see Figure 5). The first step comprises the articulation of a problem, where individuals define the difficulty that they are dealing with during the reflection process (Mezirow, 1990). This is often extremely helpful as the clear definition of an issue gives insights in the mind of individuals and brings clarification about the problem. The next stage, which is named analysis of an issue, deals with the search of different possibilities for resolving doubts and confusion (Daudelin, 1996). In this step asking questions about the current situation and reviewing past incidents can be very supportive in order to proceed in the reflection progress. In stage three, an individual frames and tests the preliminary theory in order to describe the present problem (Hoyrup, 2004). During this process it is necessary to find ideas that were possibly preserved in the mind but out of the conscious coverage. The
goal in this stage is to enter the consciousness area and to capture possibly pertinent ideas and thoughts. The last step in the spontaneous reflection process is the decision whether to act or not. This choice provides a new trajectory and guideline for prospective events. Since learning can be defined as “the creation of meaning from past or current events that serves as a guide for future behavior” only in this stage true learning takes place (Daudelin, 1996, p. 41).

When discussing reflection, a very important aspect should be taken into considerations, namely the huge influence of context specific and environmental characteristics in which individuals undergo experiences (Seibert, 1999). In order to enhance individual learning an eye should be kept on these conditions which are able to positively influence the reflection process of individuals. Reflective conditions have an empowering impact on the ability of individuals to reflect during a learning event (Moon, 1999). These environmental characteristics generate different psychological states that foster reflection processes of individuals. Therefore it is necessary to pay attention to these environmental states of influence and to identify which of them are enhancing respectively preventing individual learning (Strampel and Oliver, 2007). Reflective conditions are among others autonomy, feedback, interaction with others, pressure and momentary solitude (Seibert, 1999) (see Figure 6). In the next paragraph these conditions are explained in more detail.

Autonomy is characterized by enough freedom and discretion for own decisions and allows structuring tasks and work to one´s direction (Seibert, 1999). Experiencing autonomy can lead to enhanced reflection-in-action as it fosters scrutinizing applied practices and underlying values (Mezirow, 1990). However, limited autonomy hinders reflection processes and thus can have a negative impact on learning progresses (Gray, 2007). A further
condition, which can positively or negatively influence reflection processes, is feedback giving (Schippers et al., 2014). Feedback can be defined as information that is gained through outcomes of an action, whereby the information is the basis of reflection (Argyris, 1995). There are many different sources of feedback as for example colleagues, supervisors or customers through whom individuals can feel well informed. This triggers the reflection process due to the fact that the needed information is always available (Mezirow, 1990). A further condition which has an impact on reflection is the interaction with other people. This includes access to consultants or functional experts, connections with others through a supportive relationship as well as interactions with people who think in different ways and who are challenging own assumptions and perceptions. In this case other people can provide innovative ideas and new perspectives that have the ability to induce personal reflecting patterns (Bolinger and Stanton, 2014). In addition, having pressure to reflect and learn something can positively influence reflection progress, as pressure is stimulating the active reflection of experiences by individuals (Seibert, 1999). A further environmental characteristic can be described as momentary solitude, because it is assumed that temporary isolation from others can serve as a chance to reflect and think about the latest experiences. For reflection to emerge, at least three of five conditions have to be fulfilled. Thus, promoting and cultivating these five conditions can foster reflective and critical thinking and in consequence individual learning (Seibert, 1999).

Summarizing, there is evidence on the positive effect of reflection on experiences on individual learning. The reason why teams as well as organizations rarely use reflective practices as a way to foster learning is the preference of action over reflection (Daudelin, 1996). But as stated above, it is necessary to recognize the potential of critical reflection from experience and to provide promotive conditions in order to create an active learning environment for individuals (Seibert, 1999). A well-known concept dealing with the power of reflection and feedback is called action science (Argyris et al., 1985). The emphasis in this

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**Figure 6**: Reflective Conditions (developed by the author; based on Seibert, 1999)
approach is on two different ways of learning, namely single-loop and double-loop learning (Argyris, 1995). It is supposed that only through reflecting experiences, questioning existing values and changing traditional patterns learning can be improved.

3.2.3 Learning through Feedback Loops
In this approach individuals are seen as designers of action who monitor, reflect and evaluate their past effective decisions in order to learn from them (Romme and van Witteloostuijn, 1999). They are assumed to construct meanings and theories in order to make sense of their environment (Peschl, 2007). By monitoring the efficiency of their action, learners at the same time control the suitability of their construction with the environmental context (Argyris, 1976). As it would be extremely inefficient to construct theories and action plans for every new situation at each time from scratch, individuals memorize mental maps which had worked once before and invoke them when they are needed. This repertoire of concepts and strategies, which is termed theories of action, can be used to design representations for new and unique situations (Argyris et al., 1985).

In general, two theories of action can be distinguished – espoused theories and theories-in-use (Argyris and Schön, 1996). The former are concepts and strategies individuals believe to follow whereas theories-in-use are those which are really conducted by them. By definition, espoused theories are world view and values people think their behavior is based on (Greenwood, 1998). On the contrary, theories-in-use are the world view and values implied by individual behavior and mental maps persons utilize to take action (Argyris, 1995). The discrepancy between these two theories of action can be explained due to the fact that people are mostly unaware of their theories-in-use and act in another way as they explicitly espouse (Easterby-Smith and Lyles, 2003). Although persons model their actions and are responsible for them, they often did not even know how the design looks like and how it differs from their espoused models. Hence, if individuals want to effectively manage their actions and behavior they have to develop congruence between theories-in-use and espoused theories (Argyris et al., 1985). The model by Argyris and Schön (1974) declares how theory-in-use are developed and retained and has the purpose to support individuals to make informed decisions about the actions and behavior they plan and carry out.

![Figure 7: Model of Theories-in-Use (developed by the author; adapted from Argyris et al., 1985)](image-url)
The model of *theories-in-use* consists of three dependent variables, which help to explain how *theories-in-use* emerge (Argyris and Schön, 1996) (see Figure 7). The first element in the model is called governing variable (Tosey, 2011). These variables are values a single person wants to keep within an acceptable range. Each action an individual conducts has an influence on a governing variable and thus any situation may cause a trade-off among governing variables. Examples for such governing values include the effort to achieve the intended purpose, to maximize winning and minimize loosing, to suppress negative feelings and to behave rational (Argyris, 1995). The next factor in the model of *theories-in-use* are action strategies, which are strategies exerted by individuals in order to keep their governing values within this reasonable range (Argyris and Schön, 1996). This means that people at least strive to achieve a minimum acceptable level of winning, a specific purpose and the control of results. Action strategies can include strategies to advocate your position, to control the environment or to protect yourself as well as others unilaterally (Argyris, 1982). Action strategies lead to intended as well as unintended consequences. The former are consequences the person assumes to occur whereas unintended consequences are not considered before. Such consequences can be low freedom of choice, defensive relations and decreased development of relevant and valid information. In addition, the application of the model of *theories-in-use* often lead to defensiveness, misunderstanding and self-fulfilling prophecies (Argyris, 1995). If there is accordance between the intention and the consequences then the theory-in-use is approved. But if the results are unintended and misleading to meet governing values of a person there is a mismatch between purpose and outcomes. In this case two possible reactions can occur, which are described in the concepts of single-loop-learning and double-loop-learning (Argyris et al., 1985) (see Figure 8).

Learning includes the revealing and correction of error (Easterby-Smith and Lyles, 2003). It is assumed that the first reaction to a mismatch between intention and results is to think about a new strategy that helps to achieve the governing values. Thus, the modification is merely in the action strategy and not in the governing variable itself. In other words, given values, plans and rules are operationalized and governing values are not questioned. After the error is revealed and corrected the person precedes with its current policies and goals. This process of error-correction is called single-loop-learning (Argyris, 1977; Smith, 2001, 2013). For better comprehension, single-loop-learning can be seen as a thermostat that learns when it is too cold or too hot and in the sequel turns the heat on or off. Through getting information from the temperature in the room the thermostat can accomplish this correction and take action in order to adjust to the desired temperature (e.g. 25°) (Argyris, 1977).

The second possible reaction to a disagreement between purpose and outcomes is to
critically reflect, scrutinize and alter the governing values. In this case errors are detected and corrected by modifying underlying norms, values and goals and by shifting the way in which strategies and consequences are conducted (Smith, 2001; 2013). Thus, not only the action strategy but also the governing variables are changed which consequently causes double-loop-learning (Argyris and Schön, 1974). Coming back to the example of the thermostat, in this case the desired temperature (e.g. 25°) is questioned and in the sequel adjusted to a new temperature (e.g. 23°) (Argyris et al., 1985). As the main request is to bring theories-in-use and espoused theories of an individual into congruence, a four step process has to be ensued (Argyris, 1976). The first move aims on discovering theories-in-use and espoused theories and on becoming aware of their incongruity. In the sequel, ideas and devices for new meanings are planned and developed, which then cause novel actions and strategies. The last step in this theory process is the generalization of outcomes. By following these four mentioned steps double-loop-learning can lead to increased effectiveness in decision-making and better approval of mistakes (Argyris, 1995).

Summing up, single-loop learning depicts instrumental everyday learning, whereas double-loop learning leads to changes about the way individuals think about things (Argyris and Schön, 1974). Kolb’s (1984) experiential learning cycle – including the stages experiencing, reflecting, thinking and acting - describes the process of single-loop learning, as it can be seen as a simplified version of individual learning. Reflecting is the stage at which individuals may get to double-loop learning, which can be triggered by emotional energy (Brockbank and McGill, 2007) Emotional energy describes the “hunger for truth” and the “thirst for knowledge”
of individuals and is seen as essential for driving learning processes (Brookfield, 1987). In that case, reflection causes a questioning of governing values that lead to a paradigm shift and in the sequel to emergent knowing and complete new understanding (see Figure 9).

![Figure 9: Combination of Experiential Learning Cycle and Double-Loop Learning (developed by the author)](image)

After discussing and combining relevant individual learning approaches such as learning through experience and learning through reflection as well as the processes of single-loop and double-loop learning, the next step of this thesis addresses the concept of team learning. The main reason for considering team learning in this thesis is that the knowledge about team learning processes is necessary for contrasting it with individual learning in the empirical part.

3.3 Team Learning

“A team learns when one member initiates a learning activity and the rest of the team responds to create new meaning, communicate the new meaning, and eventually build consensus.”

(Li et al., 2011, p. 274)

Team work is getting more and more important in today’s business world since it is associated with gaining competitive advantage through improvement of quality, innovation and customer as well as employee satisfaction (Chan et al., 2003). In addition, teams are often more effective than individuals, as collaboration in a team fosters creativity, critical thinking, innovative ideas and a higher motivation of participants (Chen et al., 2011). Beyond, teams are assumed to be more adaptable to technological changes, to reduce operating costs and to increase comprehensive solutions to complex problems. This improved performance and capacity of team work can be explained by a so called collective intelligence of a team that surpasses the aggregate amount of intelligence of all individual
But "effective teamwork can only be sustained, however, if it is supported by a process of team learning" (Savelsbergh et al., 2009, p. 578). Therefore, a myriad of researchers developed different methods, approaches and models to promote and foster team learning in organizations (e.g. London and Sessa, 2007; van den Bosche et al., 2006; O’Leary et al., 2011). Examples are communities of practice (e.g. Robey et al., 2000) or an increasing the number of average team meetings. Such regular appointments between team members enhance team learning behavior, mutually shared cognition inside the teams and psychological safety (Boon et al., 2013). Further factors that are positively influencing team learning are the development of respect and trust (Chan et al., 2003), the creation of a balanced equilibrium between the variety and the number of team members within a group (O’Leary et al., 2011) and the diversity of experts inside a team (Grünfeld et al., 2000). Individuals from different backgrounds and with various states of knowledge have different views and perspectives, which promotes identification and learning success within a team (Van der Vegt and Bunderson, 2005). In addition, for stimulating team learning it is essential to provide a proper and promoting team structure that enhances cognitive ability and agreeableness (Ellis et al., 2003). On that account it can be stated that the emergence of team learning within a team positively affects team performance and outcomes (Van den Bossche et al., 2006; Boon et al., 2013).

In literature still little consensus about the definition of team learning can be found and researchers have varying views about what this phrase exactly means (Decuyper et al., 2010; Boon et al., 2013). As with individual learning, the main difference in team learning definitions is whether team learning is seen more as an outcome or more as a process. For instance, Ellis et al. (2003, p. 822) defined team learning as a “relatively permanent change in the team’s collective level of knowledge and skill produced by the shared experience of the team members”. This way of defining team learning includes interaction of group participants by discussing, testing assumptions, combining knowledge and forming new routines and processes. The definition by Ellis et al. (2003) suits with the definition of team learning by Wilson et al. (2007) in that sense that learning as an outcome represents a new shared understanding. For this conceptualization it is essential to distinguish learning as a result itself from variables such as decision making or performance (Wilson et al., 2007). Another definition of team learning is that it is described as an aggregate of individual learning and that it arises when individuals create and share specific knowledge and ideas (Druskat and Kayes, 2000). Another perspective portrays group learning as a cycle of activities, whereby the consequence of learning is here a change in group performance and group dynamics.
The main activities of the learning cycle comprise conducting experiments, reflective communication and knowledge encoding (Gibson and Vermeulen, 2003). Last but not least, team learning can be described using the idea of a team as a system (London and Sessa, 2006). In this definition team learning is seen as a dynamic system in which group behaviors, learning processes as well as group participants alter as the group learns (Argote et al., 2001; London and Sessa, 2007).

In this thesis, team learning is based on a definition by Edmondson (1999) who defines team learning as “an ongoing process of reflection and action, characterized by asking questions, seeking feedback, experimenting, reflecting on results, and discussing errors or unexpected outcomes of actions.” (Edmondson, 1999, p. 353).

Furthermore, it is necessary to distinguish between two different approaches of team learning, namely whether the focus of analysis is on individuals who are learning in the context of a group or whether the emphasis is on the learning progress of a whole group. It is extremely important to consider and clarify the direction of research, as these two literature paths treat completely different topics and lead to diverging outcomes (Wilson et al., 2007; Goodman and Dabbish, 2011). While the focus in this chapter lies on learning of a team as a unit, in the subsequent chapter the topic of individual learning in teams is addressed.

3.3.1 Cognitive Team Learning Framework

Based on the definition of team learning as a process, different approaches dealing with this learning type can be distinguished. Some researchers describe team learning as a process across four main learning stages and identify those stages as information acquisition, information distribution, information interpretation and storage and retrieval (e.g. Huber, 1991; van Offenbeek, 2001, Wilson et al., 2007). Others focus on a cognitive perspective and reveal what teams are learning during this process, such as Van den Bossche et al. (2006) who emphasize the construction and co-construction of meaning. London and Sessa (2007) as well as Senge (1990) differentiate between three behavioral processes of team learning, namely adaptive, generative and transformative team learning. In the next section all these constructs are combined to a cognitive framework of team learning and a discussion of how they fit together is provided (see Figure 10).

The first stage in the team learning framework is called information acquisition (Daft and Huber, 1987). In this step information is gained by participants through monitoring and probing. Monitoring is an activity where individuals identify issues and opportunities through scanning internal as well as external surroundings whereas probing is more active and
emphasizes gathering desired and relevant information (Argyris and Schön, 1974).

The ensuing process of *information distribution* (van Offenbeek, 2011) and *information sharing* (Wilson et al., 2007) comprises the allocation from various sources by a team participant to all other group members in order to generate a mutual understanding and a spread of new information behaviors, and routines among group members (Huber, 1991). This process of knowledge sharing is a crucial team learning behavior that distinguishes a
team from a group of loosely linked people (Edmondson, 1999). The concept of construction, that aims to build shared conception and meaning of a specific issue among team members, can be assigned to this second stage of this team learning framework (Webb and Palincsar, 1996). Construction emerges when single team members express their personal meaning and share their views with other members of the team (van den Bosche, 2006). These team members are paying attention and trying to catch the given explanation by using this understanding to make sense of a specific situation. Therefore, interpersonal understanding of other team members is crucial in this stage, as it implies that individuals in a team occupy a detailed understanding of spoken and thought desires as well as preferences and tendencies of other team members (Druskat, 1996). In addition, they mutually recognize their strengths and weaknesses and thus there is a clear sense of knowing each other. On that account, team members are able to forecast ideas or actions of other team participants and therefore effective communication, collaboration and interaction is promoted. A team with interpersonal understanding takes benefits from each members’ knowledge, skills and strengths and thereby raises knowledge sharing and team learning (Druskaat and Kayes, 2000). This process of information distribution between team members and construction of meaning can be suited with the concept of adaptive learning (Sessa et al., 2011). In order to cope with challenges, issues or new situations groups nearly automatically react to external stimuli in order to change their group processes or outcomes (Senge, 1990). Examples for these triggers are feedback or an impetus from the organizational surrounding. By applying and reusing traditional patterns and typical behaviors groups contribute to a repetitive and gradual change process (Pulakos et al., 2000). The concept of adaptive group learning derives from traditional behaviorist theories. It is similar to the concept of single-loop learning on the individual level (Argyris and Schön, 1996) as well as with the exploitative learning approach by Vera and Crossan (2003) (see Table 1). In all of these theories the learner does not question underlying values, norms or assumptions, but just reacts automatically and with well-known ways to different situations. When the adaption is in accordance with the group’s vision and aims adaptive learning can be extremely successful and can lead to a strong sense of group-efficacy. Especially when groups receive a positive feedback about the adaption the commitments as well as the group cohesiveness raises. This causes strong identification with the group and all members and the effective adaption becomes part of the shared mental models within a group (Appelbaum and Goransson, 1997). Thus, these groups are better prepared for unforeseen future problems and challenges and are able to adapt quickly to new circumstances (London and Sessa, 2007). But adaptive learning can also give rise to avoidance of confronting situations and underestimation of detrimental consequences (Appelbaum and Goransson, 1997). If the climate is disadvantageous and suppressing group work individuals feel incapable to perform necessary tasks or functions.
This can cause unprepared and overcharged groups that are unable to react to changes in the external environment. In such a case it is essential to discuss and debate relevant issues and challenges together in the group before taking action. These so called interventions pave the way for generative learning (London and Sessa, 2007).

Generative learning includes reflecting action, exploring alternatives, asking questions, challenging assumptions and evaluating alternatives (Senge, 1990). It means that individuals are proactively learning, deploying new knowledge and developing novel skills in order to enhance the performance of a group (Appelbaum and Goransson, 1997). In this so-called process of co-construction, team members are mutually improving, refining, discussing, modifying and critically debating new received information (Boon et al., 2013). Providing inter-member feedback as well as proactively exploring and evaluating problems can enhance and foster these discussions and debates of team members (Druskat and Kayes, 2000). The outcomes of this co-construction process are novel experiences, views, meanings and expertise that were not available to the team beforehand (van den Bossche et al., 2006). According to London and Sessa (2007) generative learning entails “a mastery learning orientation”, “self-efficacy derived from learning from others” and individuals who are responsible for their own learning progress (p. 656). Generative group learning originates from the cognitive learning theories and is similar to the concept of double-loop learning by Argyris and Schöen (1996) as well as with the approach of explorative learning on the individual level by Vera and Crossan, (2003) (see Table 1). The main process of generative learning is to steadily investigate opportunities that have potential for new sources of growth and change and continuous improvement becomes an important group behavior (Sessa et al., 2011). Novel knowledge and information is interpreted by the team, whereby discussions, dialogues, testing assumptions and analyzing from different points of view are the main procedures of this learning stage (Kim, 1993). As the primary interpretation of a situation is equally important as the transformation of this interpretation into a new comprehension, two different types of interpretations can be distinguished. These two forms are called converging and diverging interpretations and deal with the processes of framing and reframing (Kasl et al., 1997). The former is concerned with collective activities entailing a concrete order of information whereas converging includes various meanings and questioning assumptions that lead to disorder. Only this counterplay of order and disorder can give rise to successful interpretation inside a team (Weick and Westley, 1996). Thus, when generative learning in a group works well it fosters members who are open to innovations and mutations and who are better prepared for an uncertain future. Thus, a culture of experimentation and attempting new ways of handling situations emerges (Appelbaum and Goransson, 1997). A negative aspect of this learning type can be that a group continuously applies generative learning
patterns when it is not necessary or even when it leads to negative performance outcomes. Unforeseeable reactions to big changes or not conducting experiments can cause such dysfunctional generative learning (London and Sessa, 2007).

The following stage in the team learning framework can be termed constructive conflict (van den Bosche et al., 2006). It is proposed that confronting others who are breaking underlying norms and values encourages team learning (Druskat, 1996). Even though agreement within a team is crucial for generating a mutually shared cognition and knowledge base, it is obvious that disagreement and contentions occur between team members while they share meaning and experiences (Boon et al., 2013). This so called cooperative or constructive conflict between individuals in a team can lead to refinement of knowledge through negotiation of the different views, interpretations and arguments (Dillenbourg et al., 1996). It can be defined as “expressing opposing views openly and respectfully, seeking mutually acceptable agreements, listening and understanding each other, and combining ideas” (Tjosvold and Yu, 2007, p. 658). This process of bargaining leads to a new shared cognition and a convergence of meaning (Boon et al., 2013). Thus, transformative team learning, that signifies to change the centerpiece of a group by altering the purpose of this group, the group’s goals or the group’s underlying values and norms, can be assigned to the process of constructive conflict (Kasl et al., 1997). Giving up former patterns of behavior as well as old interaction schemes are core processes of transformative learning. Group members are unfreezing traditional manners, producing innovative ideas, evaluating them and taking action. These learning processes include group members’ experience of disorientation and embarrassment which in the sequel leads to a reorientation as an innovative way for growth. The reorientation causes novel group strategies, aims, structures, visions and objectives. As a consequence individuals change their perceptions about their roles, connections and accountabilities (Sessa et al., 2011). These high conscious processes lead to critical reflection about issues and experiences and thus to a rethinking of beliefs, perceptions and mindsets (Cope, 2005). After successful transformation, a group turns into a completely new group, which means that the participants collaborate in a completely new way with their surroundings (Boyd and Myers, 1988). But there is always the risk for the occurrence of unconstructive or negative conflict, causing escalation and negative consequences on team performance. On that account the group transformation would fail, which leads to dissolution or closing of group collaboration and which makes it impossible for a group to act and perform successfully in the future (van den Bossche et al., 2006). By fostering open communication, discussion, negation and elaboration in a team this negative conflict as well as a miscarriage of the transformation process can be avoided and constructive conflict is stimulated (London and Sessa, 2007).
Storage and retrieval can be seen as the last stage in the team learning framework, as these integrated activities form the team mind together with the information structure and its content (Hinsz et al., 1997). The process of storage and retrieval can follow both the stage of generative learning as well as of transformative learning. Storing information deals with the keeping of relevant information for future actions whereas retrieval is the way of detecting and employing saved information for the team (Walsh and Ungson., 1991). Wilson et al. (2007) defines storage as essential for learning in order to insist over time and retrieval as the procedure of finding and accessing these stored knowledge for prospective usage. The process of storing and retrieval in group learning can be equated with individuals using exploitative learning practices, as both concepts are addressing the exhausting of existing knowledge for future actions (March, 1991; Olivera, 2000).

Although the five main stages of this cognitive team learning framework are described separately for the sake of clarity, in practice these processes are intertwined and interacting (see Figure 10). All processes can emerge at various times within a team and some team interactions include elements of each process (Sessa et al., 2011), but in order to enable efficient team learning each of them has to occur (Wilson et al., 2007).

After providing relevant individual and team learning literature, in the next step those models and approaches are classified and combined in order to provide a holistic overview of individual and team learning concepts.

3.4 Individual Learning and Team Learning

3.4.1 Classification of Individual Learning and Team Learning

Learning literature provides various concepts and types of individual and team learning (see 3.2 and 3.3). In order to provide a better overview, these approaches are classified in a three-stage model, whereby in the first stage learning occurs on a lower level compared to the second and third stage. In addition, critical reflection and questioning of underlying values increase from stage one to stage three. Thus, high critical reflection is assumed to enhance learning on individual and team level.
The first stage encompasses experiential learning theory (Kolb, 1984), the concept of single-loop learning (Argyris, 1995) as well as the approach of exploitative learning (Vera and Crossan, 2003). On team level adaptive team learning (Senge, 1990) as well as the cognitive processes “construction” (van den Bosche et al., 2006) and “sharing” (Wilson et al., 2007) are part of this stage. In addition, storage and retrieval (Huber, 1991) are assigned to this first classification, as retrieval can be equated with exploiting and reusing well-known action strategies from the past. In all concepts assigned to stage one, individuals and teams are learning through correcting their rules or plans for action, but are not scrutinizing or changing underlying values or norms.

Table 1: Classification of Individual Learning and Team Learning
(developed by the author)
The second stage of this classification includes individual learning theory of double-loop learning (Argyris, 1995) and the process of exploration (Vera and Crossan, 2003). Both concepts can be equated with co-construction of meaning (van den Bosche et al., 2006) and information interpretation (van Offenbeek, 1991) on team level. As generative learning (London and Sessa, 2007) means to explore new possibilities, interpret novel information, question assumptions and discuss new ideas it can be stated that those individual and team learning approaches have a similar meaning.

Transformative learning (Senge, 1990) can be ascribed to the third stage of this learning classification, as it constitutes the highest level of learning and reflection. In this stage constructive conflict (Druskat and Kayes, 2000) leads to a change of the purpose and values of a whole team. By defining triple-loop learning as a level beyond Argyris´ and Schön´s (1995) double-loop learning, triple-loop learning is assumed to provide a deeper purpose that contains and notifies strategic thinking. Triple-loop learning is therefore responsible for the change that determines the governing values and can be seen as the highest form of learning (Peschl, 2007). Thus, triple-loop learning can be allocated to this third stage of learning.

3.4.2 Individual Learning in Teams

The impact of group experience on individual learning is extremely important, as many tasks in companies are performed by individuals. Single persons are members of various groups at the same time and simultaneously have to accomplish tasks and goals individually (Hollingshead, 1998). Individuals who are switching their membership enable knowledge transfer between different groups and thus the scope of what a member can learn and take along from group interaction can contribute to the overall performance of a company (Grünfeld et al., 2000). On that account, a couple of researchers dealt with the issue of individual learning in groups or teams in the last decades, as for example Gabbert et al. (1986), Stasson et al. (1991), Olivera and Straus (2004) and Kozar (2010).

Two different streams of literature that are both addressing individual learning in groups can be distinguished. The first one aims at fostering mainly individual students learning (e.g. Dooly, 2008; Kozar, 2010). Collaborative as well as cooperative learning can be assigned to this type of research stream (Johnson et al., 1998). Cooperative learning can be defined as an “instruction that involves students working in teams to accomplish a common goal” (Felder and Brent, 2001, p. 2). Collaborative learning, however, is a social activity, where individuals have the responsibility to communicate and collaborate with each other. The main
goal of collaboration is to create new insights and views through communicating with other team members and to introduce individuals to new and different perspectives (McInerney and Robert, 2004). Thereby a synthesis of information takes place, which means that group participants create a new understanding through combining various ideas and perspectives of other individuals (Kozar, 2010). The main difference between these two learning approaches is that cooperation implies that all group members can accomplish their assigned tasks individually and in sequel bring their results together, while collaboration requires individuals to share their ideas and perspectives and interact with each other in order to perform a mutual process of knowledge creation (Dillenbourg et al. 1996).

The second main approach of individual learning in teams emphasizes individual learning as a byproduct of team collaboration and team participation in business teams (Stasson et al., 1991). Surprisingly, only a few researchers have covered this influence of teams on individual learning and individual performance so far (e.g. Hollingshead, 1998; Brodbeck and Greitemeyer, 2000; Barron, 2000). Nevertheless the so-called “group-to-individual transfer of learning” is an important research area, due to the fact that both individual as well as group efforts play a huge role in today’s organizations (Oliver and Straus, 2004). Teams are positively influencing individual learning, because mutual team knowledge is located partly in single team members (Argote et al., 2000). Through discussing, experimenting and feedback seeking individual members share and combine information which positively influences individual and team learning processes. Furthermore individual’s task-related skills are enhanced through experience in teams which in the sequel influences team performance (Littlepage et al., 1997). However, existing research about the direct effects and impacts of team experience and collaboration on individual learning are ambiguous and mixed results and opinions can be found in literature. Different studies account for positive transfer effects (e.g. Brodbeck and Greitemeyer, 2000), negative transfer effects (e.g. Klausmeier et al., 1963) as well as no significant effect of team participation on individual learning at all (e.g. Hollingshead, 1998).

By determining cooperative and collaborative learning theory as starting point, it can be stated that cognitive as well as social processes promote learning advances of teams and individual team members (van den Bossche et al., 2006). On that account, individual learning in teams is successful on one side due to cognitive factors (O’Donnell and Kelly, 1994). This implies that teams provide opportunities for the evolution of individuals’ cognitive structures (Barron, 2003). The cognitive processes in a team are composed of two central approaches, namely the cognitive developmental approach and the cognitive elaboration approach (Webb & Palincsar, 1996). The former states that social interaction fosters the development of
cognitive structures of team members through the process of modeling or when individuals match differences between their own perception and those of others (Teasley, 1995). Cognitive elaboration, however, concentrates on information processing of individuals that emerges during interaction with other team members. (Olivera and Straus, 2004) In this approach the role of verbal elaboration on the progress and diversification of cognitive structures of individual team members is highlighted. Helping each other, asking questions and explaining reasons are part of the verbal elaboration process and are assumed to concur to individual learning of team members (Webb, 1992). Besides, giving as well as seeking for feedback plays a huge role in promoting individual learning in teams. Providing feedback means to provide honest opinion to others and reflect on their ideas, tasks and actions (Druskat and Kayes, 2000). In addition, the processes of construction, co-construction and constructive conflict (see 3.3.1) can be assigned to cognitive team factors (van Offenbeek, 2001).

Beyond that, social approaches of cooperative learning attribute the positive impact of teams on individual learning to social and contextual factors existing in teams (Edmondson, 1999). As the conditions under which interaction and collaboration among team members emerge are influencing team and individual learning processes, it is important to reveal these social factors of influence to get an enhanced knowledge of successful individual learning (Olivera and Straus, 2004). By supposing team learning as the social process to achieve mutually shared cognition it is therefore essential to involve the social context in deliberations about of team learning and team effectiveness (Van den Bossche et al., 2006). By definition, mutually shared cognition is the primary result of team learning and emerges through a process of sharing and storage of knowledge. It can be described as a mental model that comprises a common understanding and representation of knowledge about the main routines and elements of a teams’ surrounding (Boon et al., 2013).

One social factor that is assumed to play a huge role in influencing team as well as individual learning is motivation. Both extrinsic rewards as well as intrinsic incentives in order to raise a group members’ motivation to accomplish a task and achieve group goals can be assigned to motivation (Olivera and Straus, 2004).

Another factor of the interpersonal and social context in teams is titled social or group cohesion (Mullen and Copper, 1994). The most common definition of this concept is stemming from Festinger (1950). He defines cohesion as “the resultant of all the forces acting on all the members to remain in the group” (Festinger, 1950, p. 274). Thus, group cohesion is the power that keeps a team together and that has a positive influence on team
As group cohesion is a very broad concept, it is helpful to distinguish between the two most important constructs of cohesion, namely task cohesion and social cohesion (van den Bosche et al., 2006). Task cohesion can be described as a shared commitment among team members to reach a common aim that demands the joint endeavor of the whole team. Team members therefore are motivated to actively participate on group work because of their striving to complete a specific task (Van Vianen and De Dreu, 2001). Social cohesion concerns members’ attraction to a team due to beneficial interpersonal relationships with other team members (Boon et al., 2013). In case of social cohesion team members make efforts for the sake of their team members. These positive interpersonal relationships foster the readiness to support other team members which can have a positive influence on team learning. On the other hand, high social cohesion gives rise to groupthink, which implies that the group uncritically accepts solutions and ideas and do not question anything (Mathieu et al., 2000).

Psychological safety can be defined as “a shared belief that the team is safe for interpersonal risk-taking” (Edmondson, 1999, p. 354). As learning is often alleviated by taking risks and thinking freely team members need a feeling of security in order to conduct changes (van den Bosche et al., 2006). Thus, the creation of psychological safety inside a team stimulates team learning, because it creates an atmosphere of openness were individuals are not disgraced, refused or penalized for mincing words (Boon et al., 2013). In addition, psychological safety enhances team learning processes such as feedback seeking, asking questions and starting critical discussion (Edmondson, 1999).

Interdependence, which is seen as a further social factor in teams, means to be mutually reliant on and dependent from other team members (van den Bosche et al., 2006). In general, two key concepts of interdependence can be distinguished, namely task and outcome interdependence (Wagemann, 1995). Task interdependence refers to the scope to which single team members rely on each other to efficiently conduct a certain piece of team work (Ortega et al., 2010). In other words, the execution of a single task is dependent on the finalization of other definite work tasks. Task interdependence triggers communication and knowledge sharing and fosters a culture of helpfulness among team members (Crawford and Gordon, 1972). As individual team members feel accountable for the task accomplishment of others it causes a shared responsibility in the whole team (van den Bossche et al., 2006). “Outcome interdependence can be defined as the extent to which successfully reaching the team goal influences the outcome for each of the team members separately” (Boon et al., 2013, p. 360). It means that single team members’ personal benefits and costs are dependent from the goal achievement of other team members (De Dreu, 2007). If both task
and outcome interdependence is present, the extent to which team members learn from each other increases. This can lead to a shared responsibility and cooperative social interaction in the team (Cohen and Bailey, 1997; Edmondson, 2002).

Group potency or team efficacy describes the collective convinacement of all team members that a group has the capability to be successful and effective (Ortega et al., 2004). The concept is based on the idea of self-efficacy in individual learning (Bandura, 1982). The main difference between these very similar concepts is that team efficacy describes the collective belief that the team can be effective by accomplishing a specific task, whereas group potency concerns diverse tasks in various surroundings (Shea and Guzzo, 1987). It is assumed that group potency (or team efficacy) has a positive impact on motivation of team members as well as on overall performance. In addition, group potency promotes the self-reliance inside a team which in the sequel helps to better assess if a situation is a chance or a risk (Edmonson, 1999). Figure 11 summarizes those factors that are assumed to influence individual learning in teams, comprising social as well as cognitive team factors.

Figure 11: Factors influencing Individual Learning in Teams (developed by the author)

A crucial limitation of empirical studies about group-to-individual transfer of learning (e.g. Stasson et al., 1991, Brodbeck and Greitemeyer, 2000) is that only traditional face-to-face groups are included in the sample (Olivera and Straus, 2004). Nevertheless, in today’s business world teams are often compounded of diverse members working together from different locations and time zones (Ebrahim et al., 2009). Such distributed teams are often reliant on communication and information technologies as well as on special software for
knowledge sharing (Corbitt et al., 2004). Therefore, elaborate communication is more difficult than in traditional face-to-face teams and costs of engaging in this complex communication are high (Lurey and Raisinghani, 2001). On that account, the so-called virtual context complicates synchronous communication as well as it hampers initial contact of group members (Kimble et al., 2000). Due to the fact that such virtual teams gain great importance in the last years (Hunsaker and Hunsaker, 2008) it is necessary to include the virtual context in the considerations about group-to-individual transfer of learning. Olivera and Straus (2004) agree with this demand and state that "research is needed to understand the factors that affect transfer of learning in distributed groups and how organizations can structure such groups to facilitate learning." (p. 457).

4. LEARNING IN VIRTUAL TEAMS

4.1 Introduction and Definitions

Due to the great advantages virtual teaming implies, there is an increasing attention on implementing virtual teams in organizations (Kimble et al., 2000). But virtual teams can only be successful through efficient learning processes (Zakaria et al., 2004; Häkkinen, 2004). In this thesis learning in virtual teams is understood as a durable change in team members’ knowledge or skills driven by virtual team participation and experience (e.g. Weiss, 1990; Kirschner and van Bruggen, 2004).

Nevertheless, only little research about individual learning in virtual teams and the influences of virtual team participation on learning progresses of individual team members can be found (Ortega et al., 2010). However, due to the fact that virtual teams entail completely different advantages and disadvantages in comparison to traditional teams, it is necessary to incorporate the virtual team context in the considerations about individual learning in virtual teams. Thus, it is essential to include processes and factors that could influence individual learning progress in considerations about this topic in order to get a holistic picture about individual learning in virtual teams.

4.2 Learning in the Virtual Context

The context of a virtual team has a crucial impact on individual learning, as the surrounding, the technology or the space for action can positively or negatively influence the learning process of team members (Häkkinen, 2004). Individual learning in virtual teams is thus directly affected by the context in which social activities and action takes place (Li et al., 2011). On that account knowing and understanding the virtual context is crucial in order to develop a mutually shared understanding within the team and to identify how individuals can learn from virtual team participation (Miller et al., 2010).
Various contextual factors are influencing learning behavior in virtual teams (Dubé and Robey, 2008). These so-called contextual team factors are different in virtual teams in comparison to traditional teams due to the fact that the surrounding is completely distinct (e.g. face-to-face contact vs. missing face-to-face contact, synchronous communication vs. asynchronous communication etc.) (Cascio, 2000). On that account, it is necessary to include those virtual contextual factors in the considerations about individual experiences as well as individual learning in virtual teams. Culture, communication, information sharing, leadership, missing face-to-face contact and trust can be assigned to these team factors (Kimble et al., 2000; Nydegger and Nydegger, 2010; Berry, 2011). The important role of culture in affecting learning in virtual teams can be explained due to different preferences and behaviors individuals from different cultures display (Dekker et al., 2008). These individual cultural values are influencing learning style preferences of team members from different countries which can lead to different learning outcomes (Holtbrügge and Mohr, 2010). Individual learning in virtual teams is also presumed to be influenced by virtual communication (Lurey and Raisinghani, 2001) Thus, missing personal contact, lack of nonverbal cues and dependency on technology are contextual factors highly relevant in virtual teams (Powell et al., 2004). Furthermore, trust is supposed to have an essential impact on individual learning in virtual teams (Chen et al., 2011) and for working together effectively trust is of significant importance in virtual teams (Kimble et al., 2000).

Although it is already known which contextual factors virtual teams entail, there is no pertinent study that emphasizes the concrete topic of individual learning in virtual teams. On that account, it is necessary to combine the existing literature about individual learning, team learning and virtual teams to reveal the process of learning in virtual teams. This process includes the virtual context as well as other influencing team factors and provides a basis for the empirical part of this thesis.

4.3 Process of Individual Learning in Virtual Teams

The “Process of Individual Learning in Virtual Teams” combines existing literature addressing individual learning, team learning and virtual teams in order to provide a basis for the empirical part of this thesis (see Chapter 2 and Chapter 3). It constitutes the supposed process of individual learning in virtual teams through experiences and reflection (see Figure 12).

In this process it is assumed that learning in the virtual setting is influenced by a complex set of team variables, including social, virtual and cognitive factors that are intertwined and
affecting each other (Häkkinen, 2004). Social team factors include motivation, team efficacy, psychological safety, team cohesion and interdependence within a team, whereas cognitive factors emphasize team processes such as construction of meaning, feedback or discussions between team members. Furthermore, the virtual team context is presumed to have a crucial impact on individual learning in virtual teams, because of the various specialties virtual teams entail (e.g. missing face-to-face contact, dependence on technology).

In this process individual experiences can be categorized in social and task experiences, whereby the former encompasses all experiences that contain interactions with other team members. These are experiences with knowledge sharing, work distribution, communication or conflicts happening within the team. Task experiences, however, include experiences with software, technology or the task itself.

The red arrow in the model represents the research question of this thesis and scrutinizes how experiences in a virtual team can influence individual learning. The yellow arrows constitute the sub question and scrutinize how reflection of experiences can influence learning progress of individuals.

Figure 12: Process of Individual Learning in Virtual Teams (developed by the author)
The grey arrows depict that if individual learning occurs it can subsequently impact the ensuing reflection process as well as new experiences in the team. In addition, individual learning is assumed to be able to affect and change the team context, namely the social, virtual and contextual team factors. This implies that individual learning has an impact on team processes and hence individual learning and team proceedings are mutually affecting each other.

The empirical part aims at finding out how and what individuals can learn from their experiences in a virtual team by using the “Process of Individual Learning in Virtual Teams” as a foundation. In addition, the empirical part should reveal how the way individuals reflect experiences has an impact on individual learning.

5. RESEARCH DESIGN
The intention in this methodological part is to analyze individual reflection papers of students which participated in the virtual online game in order to find out what individuals learn in virtual teams. In addition, team assignments of these students which include SWOT analyses as well as plans for future strategy are analyzed, whereby the main emphasis of the team assignment analysis is on the future strategy about team work and team collaboration. These two objects of analysis, namely the individual reflection papers as well as the team assignments, were chosen because analyzing papers of individuals as well as papers of whole teams contributes to establish the relationship between individuals and teams. As individuals are members of these groups it is therefore possible to compare and match the learning progress on both levels of learning and to detect coherences. Furthermore, it contributes to reveal the influence of reflection on individual learning progress. The outcomes of the empirical study should demonstrate the impact of experiences within a team on individual learning and change as well as the influence of deep reflection on individual learning processes.

In the next section the methodology that has been applied is explained and reasons for the choice of this method of analysis are provided.

5.1 Case Study Analysis
According to Baxter and Jack (2008) a case study design should be deliberated when “(a) the focus of the study is to answer “how” and “why” questions; (b) you cannot manipulate the behaviour of those involved in the study; (c) you want to cover contextual conditions because you believe they are relevant to the phenomenon under study; or (d) the boundaries are not clear between the phenomenon and context.” (p. 545). Therefore, in this thesis case study
analysis is applied due to several reasons. First of all, condition (a) is fulfilled, as the research question is to find out how individual experience in virtual team collaboration can influence individual awareness and consequently individual learning processes. In addition, a primary point of interest is to reveal how reflection processes can affect learning behavior. Furthermore, also (c) plays a crucial role in this thesis, as the virtual context is supposed to be highly relevant for research outcomes. As individual learning as well as team learning was happening in virtual teams that greatly differ from traditional teams, the inclusion of the virtual context in the analysis is of huge importance. On that account, the researcher decided to use a case study approach for the empirical part of this thesis, as it is optimal for the needs of this study.

The case study approach is “a research strategy which focuses on understanding the dynamics present within single settings” (Eisenhardt, 1989, p. 534). It is based on constructivist paradigm that claims that truth is relative and contingent on someone’s perspective (Baxter and Jack, 2008). By applying a case study method it is possible to analyze within single cases as well as across different cases. Both qualitative and quantitative data can be applied for case study approach, as for example questionnaires, interviews and observations. The aim of this method is to provide description, to test theory and to generate theory, whereby the main focus is on generating new theories. The case study approach is best suitable for new research areas where little is already known (Eisenhardt, 1989; Ravenswood, 2011).

Eisenhardt (1989) provides a detailed step-by-step process that instructs to build theories from case study research. First of all, a researcher should start by determining a research question as well as some variables before beginning with research. In a next step it is necessary to select the population and to determine the cases (Eisenhardt, 1989). A case can be defined as “a phenomenon of some sort occurring in a bounded context” (Miles and Huberman, 1994, p.25) and thus a case can be seen as the main unit of analysis. It is important to bind a case and consider boundaries, such as time, place, activity or context in order to avoid too broad or too many objectives for one study (Miles and Huberman, 1994). After specifying a case, a data collection method should be selected, whereby choosing more than one method is assumed to strengthen the theoretical constructs (Ravenswood, 2011). A further step in the process of building theories from case studies is the overlapping of data collection and data analysis. The data analysis starts with a within-case analysis, which is a process whereby the researcher gets familiar with every single case (Eisenhardt, 1989). This within-case study conduces to the across-case analysis that follows this process. Different approaches to conduct across-case analysis exist, as for example to compare
respectively two case pairs and list similarities and disparities (Ayres et al., 2003). Another possibility is to select different categories or to divide the data by the various applied collection methods. Similarities of cases strengthen the findings whereas differences often lead to a deeper scrutinizing of the data (Stake, 1995). In general, the main characteristic of the case study approach is an iterative process of theory building (Yin, 2003). Only if data and theory fit together perfectly the theory is empirically applicable. Internal validity is achieved by finding evidence that confirms the constructs of each case. At this point existing literature can be included in the arising theories and analogies as well as distinctions are contrasted (Eisenhardt, 1989). Accordance between existing theories and new constructs leads to a confirmation of these new concepts, whereas a difference causes questioning and more creative thinking (Yin, 2003). In this step it is necessary to include a wide spectrum of literature in order to get “a theory with stronger internal validity, wider generalizability, and higher conceptual level” (Eisenhardt, 1989, p. 544). The completion of research is reached when the iteration process did not lead to new findings and a theoretical saturation of case studies is achieved (Ravenswood, 2011).

In general, it is necessary to distinguish between single and multiple case studies as well as between holistic and embedded case studies, as demonstrated in Figure 13 (Yin, 1994). On that account the author has to consider which combination is appropriate for understanding the examined phenomenon (Baxter and Jack, 2008).

![Figure 13: Basic Types of Designs for Case Studies (based on Yin, 1994)]
A holistic single case study design addresses one person or a similar group of people that are facing the same unique or extreme context. By analyzing a single case with embedded units the focus is on sub-units that are situated within one big case. Thus it is feasible to compare within subunits separately, between two subunits as well as across all subunits. In comparison, in multiple case studies the context for each case is different and thus it enables the researcher to analyze within each setting and across settings. The main difference between a single case study with embedded units and a multiple case study is that in the former it is only possible to analyze one unique case, whereas in multiple case studies it is possible to find out similarities and differences between cases (Baxter and Jack, 2008).

On that account, in this thesis a holistic multiple case study design is used, as each team represents a case that experiences a different context (see Figure 14). The specific context of each team is composed of cognitive, virtual and social team factors as explained in the “Process of Individual Learning in Virtual Teams” (see Figure 12). In each team it is presumed that the team factors are distinct (e.g. due to different cultural backgrounds of team members, different personalities of team members, different motivation of team members, different skills and knowledge of team members, different situations within the team, different conflicts between team members etc.) and therefore each team is surrounded by a unique team context.

In the next section an overview about the applied sampling method is provided and the chosen teams are described in detail.
5.2 Sample

The data used for analysis was already available for the author of this thesis, as students had to write reflections as well as team assignments as a (mandatory) task for accomplishing their master course in the year 2011. A pre-selection of teams took place by other researchers and therefore eleven out of all seventeen teams that participated in the online simulation in the year 2011 display the starting point for empirical research (pre-selection of teams by Fischlmayr, I. and Wessely, S., 2015). In a next step, the primary concern of the author was to find a representative sample out of these eleven teams that contribute to answer the research question. Therefore, the population was selected through a purposive sampling method. Purposive sampling is a type of non-probability sampling technique, which relies on the judgment of the researcher when it comes to selecting the units that are analyzed (Suri, 2011). “The logic and power of purposeful sampling lie in selecting information-rich cases for study in depth. Information-rich cases are those from which one can learn a great deal about issues of central importance to the purpose of the inquiry, thus the term purposeful sampling. Studying information-rich cases yields insights and in-depth understanding rather than empirical generalizations.” (Patton, 2002, p. 230) The primary aim of purposive sampling is to focus on particular interesting characteristics of a population that contribute to answer the research question(s). The sample being studied does not represent an entire population, but this is not considered to be a weakness rather it is seen as a choice of the researcher. Depending on the goal of research different types of purposeful sampling can be distinguished, as for example intensity sampling, maximum variation sampling, homogenous sampling or typical case sampling (Patton, 2002; Suri, 2011). In this thesis the method of intensity sampling is used, because “excellent or rich examples of the phenomenon of interest, but not highly unusual cases” (Patton, 2002, p. 234) are selected for analyzing purposes. On that account, teams which seemed to be interesting and rich samples in the authors´ point of view (e.g. teams with very different individual members, teams that showed high learning progress over time, teams with opposing criterions for the purpose of comparison) were chosen. Consequently, from a total number of eleven teams data is used from four teams, as those teams are seen as rich representatives of the topic of interest from the researcher´s point of view.

The reflective essays as well as team assignments treated in this thesis were written by students in the year 2011, more precisely they are dealing with two virtual simulation days which took place in October 2011. This study comprises a total number of 31 participants, who are students enrolled in a master degree program and who are participating the virtual simulation game VIBu. The entire sample of participants represents 16 countries all over the world: Finland, Austria, Russia, Australia, China, United States of America, Sweden,
Lithuania, Slovakia, Switzerland, Iran, Azerbaijan, Spain, Canada, Malaysia and Macedonia (see Figure 15).

The participating students were enrolled in five different universities or stayed there as exchange students, whereby nearly half of them were coming from Turku School of Economics. The other participating universities are University of Melbourne, IMC Krems, Johannes Kepler University Linz and New York Stern University. 52% of participants were men and 48% female.

The total number of essays treated in the master thesis is 54, whereby 29 essays are assigned to the first reflection rounds of VIBu and 25 essays to the second ones. In addition, four team assignments, one from each team, are analyzed. In the two targeted simulation days a total number of 17 different teams participated in VIBu, whereby most students attended this online game because it was a requirement for a particular course and the essays as well as team assignments written by them were contributing to their course grade.

In order to provide an overview about the context and surrounding the participating students experienced, the online simulation game VIBu is explained briefly in the next paragraph.

5.3 Online Simulation: VIBu Real Game™
VIBu (Virtual Teams in International Business) Real Game™ is a training concept which familiarizes participants with communicating and collaborating in the virtual world. The aims of this virtual game are to confront the attendees with the challenges and problems that can occur in virtual multicultural teams, as for example cultural diversity, different time zones or
language barriers, in order to provide participants training and acquiring of virtual skills. Furthermore, it helps to get a holistic view of an international company and improves technical skills of participants. (Köhler et al., 2013). According the VIBu homepage “VIBu is a global online business simulation that joins international students in a shared operations environment.” (VIBu – Virtual Teams in International Business, 2015, website).

VIBu is played by participants (mainly students) from different countries and universities as well as time-zones. For the simulation, students get together in teams with a minimum of six members and each group represents a company. In general, there are two different types of companies: sub-producers and bio-analysis instrument manufacturers. The real-time online business simulation proceeds over two simulation days which last about 18 hours and the participants have to consider in their teams how they arrange the time frame. Each member is required to stay online and actively collaborate at least six hours. Communication within and between the teams is happening via Skype call, Skype chat and e-mail. After the first simulation students have to write an individual reflection paper about their learning experiences, team processes, problems and critical incidents. In addition, every team has to write a team assignment, which includes a SWOT analysis from the company’s perspective, a SWOT analysis from the team perspective and a future strategy that should include ideas and plans regarding the business and team processes for the second day of online simulation. These future strategies should provide a guideline and support for the teams on the second simulation day, which takes place in the same setting as the first one. After the second simulation round the students again have to reflect on their feelings and experiences in form of reflective essays. These essays should combine the theory learned in class with the practical experiences in the simulation in order to enhance individual learning. In the end, a face-to-face meeting takes place in each class, where the learning progress and the experiences are discussed with other participants in detail (Köhler et al., 2013).

After explicitly explaining the applied research design, the sampling method as well as the virtual simulation game, the next step is now to provide an overview about the procedure and implementation of the case study analysis in this thesis.

5.4 Procedure and Tasks

The first step in the research process is to conduct a literature review about relevant approaches and concepts dealing with the topic of virtual teams and learning. Out of this literature review a model is developed which constituted the basis of the empirical part of this thesis. The gap in virtual learning literature leads to the definition of the research question as well as sub-question. In a next step the sample is selected and the data is coded and
classified in maxQDA in order to divide various topics in sub-categories. Subsequently, a within-case analysis is performed, whereby each team and the experiences within the teams are analyzed in detail. Afterwards, an across-case analysis is conducted and the teams are compared. In a next step literature is included in the analysis and compared with empirical results. Finally, the iteration process of finding similarities and differences between the research outcomes and the literature leads to the results and the answering of the research question. The research process and method of this thesis is depicted in Figure 16.

For analyzing the individual reflective essays as well as team assignments maxQDA is used, which is a professional software for qualitative and mixed methods data analysis (MAXQDA: The Art of Data Analysis, 2015). Each reflective essay and team assignment is populated in the software via drag and drop and successively coded. In the beginning it is necessary to compile new codes for each category of interest, but after coding some essays the relevant codes already exist and the pertinent text parts are assigned to these codes (see Figure 17). In maxQDA it is possible to create sub-codes, which is mainly used for positive or negative experience with a special category. Furthermore maxQDA enables the user to assign the same text part to several codes, which is used for statements that fit in two or more categories. Green codes represent social experiences whereas red codes are used for task experiences. An example of the document viewer in maxQDA depicting the coded text parts is shown in Figure 18.
In this sample 101 different codes and sub-codes are developed for classifying the relevant content of the reflective essays and team assignments. In sum, 1668 coded text parts are analyzed and serve as a basis for discussion.
6. EMPIRICAL ANALYSIS & RESULTS

This part aims at answering the research question as well as the sub question. First of all, a
descriptive characterization of each team is provided in order to get a basis for further
analysis. Experiences within the teams are delineated and conclusions on the classification
of teams and individuals in high-, middle- and low-learning categories are drawn. Subsequently, team context and individual behavior of team members are analyzed and
discussed. Teams and individuals are compared in order to find similarities, differences and
coherences between them. In addition, the role of reflection for individual learning is
addressed and revealed. The research findings are matched with literature presented in the
literature review part of this thesis and conclusions are drawn out of these discussions.

6.1 Team Description

In this part each team is described separately in order to get an overview about the specific
team characteristics as well as team members.

Team A is composed of nine members. Five members wrote the first as well as the second
reflective essays, two of them only the first reflective essay and two members handed in just
the second reflective essay. On that account 14 essays were coded and analyzed in order to
get familiar with team A. Five of the team participants were male and four of them female.
Team members were coming from five different countries, namely Finland, Russia, United
States of America, Austria and Sweden and were enrolled (or exchange students) in three
different universities (Turku School of Economics, Finland; IMC Krems, Austria; University of
Melbourne, Australia).

In the beginning team B consists of ten members, whereby only seven team participants
wrote the first reflective essay and five of them the second reflective essay. In sum twelve
essays of team B were analyzed. Therefore, the relevant participants of this team are seven
students coming from six different countries, namely Australia, Austria, China, Finland,
Macedonia and Russia. The seven team members are enrolled or exchange students in
three universities, including JKU Linz (Austria), University of Melbourne (Australia) and Turku
School of Economics (Finland). Four of them are female and three male.

Team C comprises eight members, who were coming from China, Azerbaijan, Iran,
Switzerland, Spain, Slovakia, Malaysia and Lithuania. Team members were enrolled or
exchange students in following universities: Turku School of Economics (Finland), IMC
Krems (Austria), University of Melbourne (Australia) and New York Stern University (United
States of America). Six team members were male and two female. Seven team members
handed in both reflections and one team member wrote only the first reflection, thus 15 essays were analyzed in team C.

Team D is composed of seven team members, two of them are male and five female. They were enrolled (or exchange students) in three different universities, namely University of Turku (Finland), IMC Krems (Austria) and University of Melbourne (Australia). Team members of team D are coming from Austria, Australia, Finland and Canada. In sum 13 reflective essays were analyzed to become familiar with team D, whereby six team members wrote the first reflective as well as the second reflective essay and one team member only wrote the first reflective essay.

6.2 Within-Case Analysis
In the within-case analysis relevant experiences and situations in each team are described in order to provide a holistic picture about the processes and relations within each team. Furthermore, teams and individuals are classified in different learning categories for the purpose of comparability. The within-case analysis is extremely important for the ensuing across-case analysis, as the conditions as well as experiences in each team are assumed to have an influence on individual learning in teams (see Figure 12).

6.2.1 Experiences in Virtual Teams
The focus in this part lies on the analysis of social and task experiences of each team. The aim is to constitute the atmosphere of each team and to become familiar with the composition of individuals that form the teams.

In the discussion, individual team members are anonymized and their direct citations are labeled with the team name (e.g. A, B, C, D) and in each team, members are serially numbered on a random basis beginning by the number one (e.g. A.1; C.5). In addition, direct citations out of first reflective essays are denoted by a one behind the slash and citations out of second reflective essays are marked with a two behind the slash (e.g. A.1/1; C.5/2).

a. Team A
In general team A did not experience big cultural issues or problems due to cultural differences or different language skills. Decision making is delineated as fair and equal from almost all team members. In the sub groups important decisions were discussed with all online members and everybody had the possibility to state his/her argument. In general, there was the tendency that members who were online for a longer time conduct the decisions whereas new people firstly joined the conversation and just trace the decisions.
Team A improved their knowledge sharing between people of different shifts in the second simulation round in comparison to the first simulation round. The problems emerging on the first simulation day include the missing overlapping between the old and the new shift and in general a lack of plan about how to pass on important knowledge. One team member described the situation very pointedly: “We did share some information to new members when they joined the game, what we had heard from previous shift. Basically this worked like a “Chinese whispers”, meaning that the message was more unreliable every time a shift changed.” (A.1/2)

In the first simulation round there was no concrete distribution of tasks between team members and everybody could perform what he/she wanted to, based on personal skills and knowledge. In every shift two to three team members were online, whereby one person controlled the simulation and the other two members negotiated with the other teams in order to buy raw material. Individuals who were handling the mouse during the game were in general assumed to have more power than team members who negotiated with suppliers. In addition, team members with experience about virtual simulation games or with other valuable knowledge about economics had more power than team members who had never participated in such a virtual simulation before. On that account, temporary leaders in different sub groups as well as during the accomplishment team assignment and organization of the shift plan occurred.

Team members of team A experienced trust very similar, as the majority described their trust to people from their sub-group higher than the trust to remaining team members. For example A.5 described his trust experience in the following way: “[...] this did increase my trust towards the people who contributed to the assignment. It sort of created a trustworthy sub-group within our team.” (A.5/2)

Communication within the sub-groups is described as smooth and active during the simulation, but between the two simulation days, when team members had to accomplish the group assignment, communication was completely different. One team member tried to organize a Skype call with all members to discuss the future strategy as well as the SWOT analysis, but it was impossible to get all people together at a point of time, due to different time zones and personal appointments. On that account the idea of having a Skype call was abandoned and team members communicated via e-mail. A few people did not actively participate in e-mail discussions and strategy finding of the team assignment, as shown by the following example: “After all [I] think that some team members were quite passive in team
assignment, on some did not have anything to add because they could not participate for first playing round." (A.2/2) Therefore the participation and contribution of team members to the team assignment is not equally distributed within team A. One team member tries to find an explanation for this: “Maybe some felt, that since we were ten persons in the team, no one would notice if one person wouldn’t help. One reason for the low participation could also be that we didn’t really get to know each other during the exercise, especially the ones who were not online at the same time. That probably makes it a lot easier to slack off, since you don’t know who you are letting down.” (A.5/2) This citation reveals problems such as free-riding, which is assumed to be higher in virtual teams than in traditional face-to-face teams (e.g. Nydegger and Nydegger, 2010) as well as the missing familiarity and commitment in the team.

According task experiences it can be concluded, that some team members mentioned technological issues, which had negative effects on their participation. For example one team member was not able to use Skype chat: “[…] I experienced a myriad of technical difficulties. […] Without the ability to use Skype, I was virtually useless. The only way I could communicate to my team members was by email, which proved to be much to slow.” (A.4/1) These technical issues were not only described as negative by the concerned members, but also by other team members: “As some of the members had had problems to connect to VIBU as well as Skype they did not have much input on the actual game experience and collaboration.” (A.8/2)

Team A handed in a rather short team assignment and did not describe the SWOT in more detail. Communication within the team, responsibility to teach the next shift how to play the game and flexibility of tasks were seen as team strengths, whereas communication between the shifts and between the sessions were depicted as main weaknesses. By analyzing the individual reflections confirmation can be found for the mentioned strengths as well as weaknesses. For example, teaching the next shift how to play was mentioned very positively by six out of nine team members: e.g. “When a new team member started its shift, he watched how the other members operated the company and asked questions so that he would learn how to play the game efficiently. So I can say we had some sort of a tutoring system to make sure everyone understands the fundamentals of the simulation.” (A.1/1) Communication between the sub-groups, which is described as main weakness in the team assignment of team A, is also seen as weakness by several team members: “Only thing what we didn’t consider was that the shifts should be overlapping, because you always should inform other teams what has happened and what are we doing.” (A.2/1)
Delegating tasks and exploiting different expertise in team work are named as opportunities for enhancing team work and threats include a misconception in communication as well as lack of common strategy. Interestingly, the described threats and opportunities seem to come from a few team members, as they mention similar possibilities and dangers in their individual reflections: e.g. “When it comes to deciding on our strategy for the next session, I think we should organize ourselves and divide tasks a bit better.” (A.5/1)

In the future strategy of team A only one main topic is treated, which is communication within the team and with other teams. The idea is to organize a Skype conversation with all team members in order to improve communication between team members. In addition, team members decide to split the negotiation part in two roles in order to guarantee a better communication with suppliers. From the second reflective essays it can be inferred that the Skype conversation really took place: “Then we started a Skype conversation with the other members and they described the events what have happened during their session and how we should continue working in our shift.” (A.1/2) Also the split of the negotiation part is implemented, which shows the ability of the team to realize plans and strategies.

All nine team members described the simulation as a very positive and valuable experience in their final reflection. For example one guy depicted that the VIBu session “has been fun, interesting and it has enriched me we with a great experience of cooperating over time and geographical borders” (A.8/2). Another team member stated that “it was a very enjoyable and unique experience and I am grateful that I got to be a part of it.” (10.5/2) These quotations show that in general team members are satisfied with the team collaboration and the team itself.

b. Team B
In team B discussions between some team members about cultural issues took place, whereby mainly general cultural differences, such as punctuality, attitude toward working or problem solving approaches were debated. Almost all team members wrote in their reflective essays that issues or problems due to different cultural backgrounds of team members did not play a crucial role in their team. Communication is seen as extremely important for being efficient in team B. Seven out of seven team members were satisfied with the communication and collaboration in their team. This is in compliance with the team SWOT, where smooth communication, without major problems with the level of English and equal good spirit of working together are named as major strengths. Nevertheless, some issues are described by a few team members, including problems with technology as well as general issues of virtual communication. Beyond, communication was enhanced from the first to the second
simulation round, as clarified in the following quote: “Beside the improved way of collaborating, also communicating with the team members got easier than it had been during the first simulation round.” (B.4/2)

The efficiency and fairness of decision making was seen different among team members. This can possibly be ascribed to differences in decision making processes in various shifts and sub-groups or to differences in cultural or personal perceptions of team members. One girl described decision making as largely influenced by a few team members, as demonstrated in the following citation: “And the decision making was unfortunately mostly that couple of people suggested and others agreed, it could be better if the whole group would take the responsibility […]” (B.2/2) In contrast, B.3 delineated the decision making process in her shift as very positive and equally distributed: “We discussed all our decisions and nobody made anything without agree all members of team.” (B.3/1)

Knowledge between the shifts was mainly shared via Skype call and members who stayed online for a longer time explained newcomers the actual situation. In addition, e-mails were used to inform other group members about important decisions and strategy changes. One team member mentioned in his reflection that during the course of the two simulation rounds an enhancement in knowledge sharing took place: “I felt like we made continuous improvement, and relayed the ongoing strategy and techniques to the following shifts.” (B.1/2) B.4 highlighted the positive fact, that there was one team member who stayed online for a very long time and due to the fact that this member explained newcomers the most important aspects of the game knowledge was not lost between shifts.

Power distribution was described by one team member as dependent upon integration and active participation of single team members: “The ones who wanted to take more responsibility had more power, they wanted to make things work and shared their opinions” (B.2/2) Therefore team members were able to decide on their own how much responsibility and power they want to have in their team. Nevertheless, four out of seven members identified one and the same team member as the leader of the whole team and as those person with the most power: “[T]here was one guy who took the leader position in the whole game. He was online almost the whole day and always tried to help new players and explain them what's happened. But he was more like the coordinator than the leader.” (B.3/1); “He was somehow the unofficial leader of our group and therefore the whole team performance was based upon his proposals and decisions.”(B.4/2);

In the beginning of the first simulation there was no clear distribution of tasks. B.3 highlighted
the main advantage of not determining the responsibilities previous to the game: “We found our own place in team work according to our strengths.” (B.3/2) The automatic task division in the team led to two main areas of accountability. Thus, some members were responsible for negotiating with customers and others were running the company. In general, work distribution and task division was described as enhanced in the second simulation round, as all team members had a much better understanding of the different tasks.

The largest weaknesses of team B were seen in the preparation for the game session and in technical problems, as for example some team members did not have microphones or headsets, which led to difficulties in understanding. The self-assessment of team B about their strengths and weaknesses shows that they did not deeply reflect about their social problems within the team, rather they emphasized game related issues. In addition, opportunities of team B are only described from a company’s point of view and threats are seen in repeating the mistakes made during the first session again as well as decreasing motivation of some team members.

c. Team C

In team C culture played a crucial role for almost all team members. It is very interesting to find out that some members had prejudices about people of some other cultures and that they were positively surprised about their incorrectness, as demonstrated in the following quotation: “When it came to cultural differences, I was expecting Finns to be less active and more quite. However, they were our most active and talkative members in the team.” (C.2/2) One critical incident in team C demonstrates how distinct understanding and perceptions of people from several cultures can lead to anger as well as isolation. Two guys mentioned an annoying critical incident which was triggered by this Spanish girl in their point of view. One of them described the situation as follows: “Once a while some Spanish speaking group members joined in but did not really contribute. The team reacted as group and asked them to stop talking in Spanish and making their contribution. After some minutes they disappeared and the group was back on operation. This was really a disturbing factor.” (C.3/1) Whereas this event is seen as very disturbing in the boy’s opinion the Spanish team member felt like she was barred because of her cultural differences to the other team members: My language skills, my culture and my poor knowledge about the technology could have led me to the “ostracism”.” (C.4/1) In her reflection she ascribed most issues and problems occurring in the team to cultural differences between her and the other members. In her opinion it was very difficult to collaborate and communicate with the other team members due to her high-context culture. In addition she described virtual communication as very precise, concise and task-focused, which in her point of view did not fit into low context
cultures such as Spain. The following citation clarifies her perceptions about virtual communication: “And this [Virtual communication] can fit in low context cultures, where task processes (communication, coordination, task-technology-structure fit) are more important. But it doesn’t fit in high context cultures (like the Spanish one) where the socio-emotional processes (relationship building, cohesion, trust) play a big role. This explains why I have had more difficulties in communicating than the rest of my teammates.” (C.4/2)

According to six out of eight team members no conflict or critical incident happened in both simulations at all. Nevertheless one girl described a huge conflict which took place on the first simulation day: “Even we had a conflict due to this situation. As a result of my low participation, one of my peers thought I was part of another team. This incident shows how the lack of a physical space makes more difficult to identify the community and also how the dependency on e-communication can lead to misperceptions and misinterpretations.” (C.4/1) In addition, team members mentioned disturbing conversations in native languages or the volume of one member’s keyboard strokes which were louder than the member’s voice as the most annoying discontinuities.

In team C team members who actively participated in the game had more power to make important decisions than those who were passive. One guy described the decision making process as influenced by the distributed roles: “Company steerers or managers were carrying the burden of decisions. Negotiators were just doing their job on the market/skype.” (C.5/2) Thus it can be stated, that in team C some team members had more power to make decisions than others, which was not improved from the first to the second simulation day. On that account, general power distribution in team C is seen as rather unequal, as some team members attribute other members more power due to active participation, technological knowledge, work distribution and better understanding of the game. “I think that I found a passive form of power since those people that had more technological knowledge were in a better position to become leaders.” (C.4/1) Although six members described in their reflection that there is no official leading person in the team, three out of those six mentioned a person which was seen as an unofficial or not-elected leader. Interestingly all three team members mentioned a different person for this position. “He had really deep knowledge about game mechanics. When he said something, it seemed to be straightforward logical. There could be no arguments against his opinion. So, he was like “not elected leader.” (C.5/2); “In terms of "power" I think [C.2] had made a name for himself by proving how adept and competent he was at manipulating the game.” (C.6/2)

Team members had very differing views about participation in team C. Three team members
described participation as rather unfair, due to the fact that some members of the team list did not even contribute from the beginning on and others were not actively collaborating during the sessions. This point of view is demonstrated by a citation from one of those team members: “Not all of the team members were willing to equally participate. At the beginning we lost two people completely and also at times when we were online we could hear that other members were chatting to other people and not doing anything other than being ‘online’.” (C.7/2) On the other hand participation is mentioned positively by three other team members, who stated that all members actively participated in the game on both simulation days (except those two who did not show up from beginning on).

Team C tried to organize the communication about the team assignment via Skype call, but due to time zone differences and personal schedules this was impossible. Thus, the team assignment was realized in the way that questions were divided among team members and everybody could voluntarily choose one part. Each member had to upload his/her part in a Google document and one member had to edit the whole file. In general this worked very well, as almost all members added their answered question in Google Document. However, the splitting of questions lead to a team assignment where nothing was discussed between the team members, as everybody has just to answer one part according to his/her opinion. On that account, ideas, plans or problems of the team are not debated within the team and by comparing individual reflective essays with the team assignment, it can be detected which part in the team assignment is written from whom. For example, the idea to form a cartel with other teams in order to increase financial results was described as the main opportunity of the team, but this suggestion can be assigned to opportunities of the company instead of the team. This idea stems from one team member, who describes the possibility to form a cartel in his reflection: “It would be very interesting to see how the tutors react if the sub producers offer all the same prices like in a cartel.” (C.3/1) As none of the other team members mentioned the idea with a cartel it can be concluded that C.3 did the opportunity part in team assignment and that the idea is not discussed with other team members.

Team C handed in a rather detailed problem analysis, where a sense of cohesion, good teamwork, collective behavior and rapid coordination after the first hours ranked among the main strengths. Weaknesses of team C encompass the coordination of tasks in the first game hour as well as inability to communicate directly and personally due to the virtual context. Threats were described only from a company’s point of view, including market forces and competitors undercutting general prices that are below average cost of production. In the team future strategy topics such as communication, negotiation, power relations, differences in language skills, virtuality, role distribution, group composition,
decision making process and cultural differences were treated. In each of these categories the situation in the first simulation round is analyzed and described, but plans or improvement proposals for further procedures are not discussed at all. Thus, the future strategy is more a deep analysis of the teams’ characteristics than a strategy for the second simulation round. This statement can be witnessed by the following citation, which is taken out from the introduction of the team future strategy: “In this part of the assignment, we are going to focus on how the processes in our own team have worked.” (SWOT Team C). On that account, it can be inferred that team C is problem aware rather than future oriented and that a future plan dealing with the second simulation day is missing.

Interestingly, three out of seven team members described the second simulation day as very boring and a waste of time. This is highlighted in the following quotes of those three team members: “However, the second session was not as fun and challenging.” (C.2/2); “The second round was very very boring and from my point of view a waste of time. I was really happy when I passed my time online and made my contribution to the group.” (C.3/2); “I found myself very bored during the second session as everything was known on how to run the company and would have found it much more effective just having one session.” (C.7/2) The fact that three out of eight team members negatively described the second simulation day shows that team C does not manage to create a high commitment and team cohesion between all team members. Those three team members do not experience the second simulation round as chance to enhance team processes or to learn from new experiences and situations. It seemed that they had a negative impact on the whole team collaboration, as their missing motivation influenced the processes within the team.

d. Team D
Team D experienced some cultural issues during communication and interaction and several team members tried to explain their experiences with other team members due to different cultures, as shown above. However, no big problems due to different cultural backgrounds emerged and team members even described that there were not any issues caused by culture and that the team “was a really nice mix of people.” (D.7/1)

Communication in team T was very active and different opinions were discussed and carefully considered: “Working like this leads to lot of discussions and different looks of team members but we always were able to find a solution where [all] of us were satisfied.” (D.1/1) Although the communication within the team is described as efficient and positive in the first simulation round, team D managed it to improve communication processes on the second simulation day: “It must be noted that one of the main successes of the second session was
the way in which communication was both fluent and comprehensive during the course of the game.” (D.2/2) Team members described the communication in round two as very open, smooth and effective: “Skype worked well and we discussed about it. No one shamed anything and it was very easy to be open and create the open atmosphere in the virtual context.” (D.4/2) Furthermore also team collaboration and interaction was improved from the first to the second simulation round.

Out of seven team members four actively participated in organizing and decision making of the team assignment and the rest of the team contributed ideas and opinions. In general, SWOT analyses and team strategies are well-considered and elaborated. Strengths of team D are described as fixing the time schedule through different time zones, good communication, active participation and team work. Strategy misunderstandings, connectivity issues faced by some members, lack of preparation and issues of social loafing are seen as main team weaknesses. Team D also described many opportunities as for example professional experiences of team members, ability to co-operate and fluently work as a team or a better implementation and co-ordination of overall business strategy. On contrary, threats are among others different expectation of team members from various cultures, the loss of morale and potential for interpersonal conflict due to difference in opinion, communication barriers and message distortion.

On the first simulation round knowledge sharing was very difficult due to a missing overall strategy in team D: “Sharing knowledge through all team members was a little challenge for us because e.g. in the first round it did not work at all that the last shifts received the information from the first ones.” (D.1/1) On that account, some conflicts occurred due to inefficient knowledge transfer, but team D managed it to enhance their knowledge sharing process between the shifts by defining a strategy between the two simulation rounds: “During the 2nd round, the change in shifts and information flow worked really well.” (D.1/2)

Team D did not have an official and overall leader, which was seen as an advantage by a myriad of team members due to the equal power distribution within the team: “During both rounds we decided to not having a leader – it had one big advantage, namely that everyone was able to have a look at all tasks. […] As per my opinion it was not that bad not having a leader because everyone should benefit from the game and everyone should make his/her experiences and should know how to react in which case.” (D.1/2) Another team member stated in her essay that in the beginning she wanted to have an official leader but in the end she experienced the positive aspects of not having a leader at all: “There should be one person acting as a leader while playing. The person who takes the leader’s place has to be
decided together in the beginning of every shift”, we included also into the strategy. This goal didn't materialize, but I don't think that we failed anyway. We didn’t need the leader to lead us in the game. Our leadership was shared. [...] This all was about to be a team play and I think we really did it.” (D.4/2) In addition, also D.6 mentioned “shared leadership” as the best term to describe the situation in team D. (D.6/2)

In addition, also the decision making process was enhanced on the second simulation day which was caused by a broad horizontal team structure: “The decision-making in the team was much more efficient than last time and seemed like as if the right decisions were made most of the time.” (D.2/2) This equal participation in decision making within team D lead to prevention of conflict and efficient decisions in team members’ point of view.

Five out of seven team members described the factor trust as very positive in their second reflective essay and two did not even mention its influence on team performance and collaboration. The following quotation demonstrates the positive influence of trust on the whole team: “The trust between the operating team members was very good” (D.5/2)

Roles were not distributed before the first as well as the second simulation round and therefore it was a natural and random allocation of tasks within the team: “We had no “assignment” of roles, everybody did everything.” (D.5/1) This is described as fair from almost all team members: “The distribution of responsibilities seems adequate and in line with both nature of the business and the amount of personnel involved. As the roles were interchangeable during most of the sessions, it was quite a fair and relevant distribution.” (D.2/1)

According the team strategy it can be summarized from all reflections that for the first round a defined strategy did not exist. However, between the two simulation rounds the team formed a strategy for the second simulation day, whereby the goals of the team strategy were according to the myriad of team members partly achieved: “The team was proficient in executing most of all the discussed team strategies” (D.2/2); “Though this strategy was not implemented completely during the 2nd session” (D.5/2); “We included into the strategy that we have to take better into consideration the more precise roles and responsibilities. I think we partly succeeded in it.” (D.4/2)

The following two figures depict an overview of the most relevant social and task experiences, individuals in the four virtual teams witnessed. The numbers behind the columns represent the total number of codes for each category in all four teams.
The most important social experiences are work distribution, communication, cultural background, decision making, power and leadership, participation, team strategy and knowledge sharing. In addition, team members write about their experiences and issues with trust, language, commitment, familiarity, motivation, fun, organization, team effectiveness, presence and ostracism (see Figure 19). Beside, the most relevant task experiences include technology, confusion about the game, preparation, company effectiveness and company strategy (see Figure 20). By looking on the codes, only a very small amount addresses task experiences in comparison to social experiences. This can be explained due to the fact that the questions provided as a guideline for the reflections were mostly geared to social experiences and/or that social experiences played a major role for team members.
Based on the experiences in each team, all four teams are categorized in three different learning groups in the next section. This procedure is necessary for the following steps, as in the across-case analysis teams as well as individuals are compared in order to find similarities, differences and coherences between them.

6.2.2 Classification of Teams

Teams were classified in three main categories, namely in high-, middle- and low-learning teams. The categories were built using theoretical concepts treated in chapter 3.3 "Team Learning". On that account, the three team learning types, adaptive, generative and transformative team learning (Senge, 1990) as well as the model of cognitive team learning behavior by van den Bosche et al. (2006) and the concept of a team learning process (Wilson et al., 2007) were used to build accountable team categories. The following table should provide an overview about the main characteristics of each team type and serve as a basis for the ensuing team allocation (see Table 2).

<table>
<thead>
<tr>
<th>TEAM CLASSIFICATION</th>
<th>Types</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIGH-LEARNING TEAM</td>
<td>Transformative Team Learning; Constructive Conflict; Team Assignment: deep and critical reflection of team SWOT; well-elaborated team future strategy</td>
<td></td>
</tr>
<tr>
<td>MIDDLE-LEARNING TEAM</td>
<td>Generative Team Learning; Co-Construction and Interpretation of Information; Team Assignment: deep reflection of team SWOT; team future strategy</td>
<td></td>
</tr>
<tr>
<td>LOW-LEARNING TEAM</td>
<td>Adaptive Team Learning; Information Distribution and Construction of Meaning; Team Assignment: reflection of team SWOT; missing team future strategy</td>
<td></td>
</tr>
</tbody>
</table>

Table 2: Types and Characteristics of Team Learning (developed by the author)

Low-learning teams distinguish themselves by processes of information distribution and construction of meaning. In order to cope with challenges and novel situations those low-learning team automatically react to external stimuli. Low-learning teams are problem oriented rather than solution oriented. This can be for instance seen in the team assignment, in which low learning teams have a very short or even missing future strategy planning.

Middle-learning teams show characteristics of generative team learning (Senge, 1990), as team members are discussing, modifying and critically debating novel information and situations. Continuous improvement of the team becomes an important behavior. The team
assignment of middle-learning teams includes a quite well-elaborated SWOT analysis and a rather short team future strategy.

High-learning teams are defined as teams who hand in a very deep and critical reflection in the team SWOT analysis as well as a well-elaborated team future strategy. In addition, in high-learning teams there is an atmosphere of constructive conflict and active communication. Some processes within those teams show attempts for transformative team learning (Kasl et al., 1997), as high learning teams fix it to improve nearly all team processes during the short period of time. Thus, high-learning teams achieve a change from a loosely group of individuals to a team with high learning potential.

Chapter 6.2.1 “Experiences in Virtual Teams”, which is dealing with the discussion and analysis of experiences in each of the four virtual teams, provides the basis for the allocation of the teams into three classification groups. Thus, by comparing the experiences and processes in each team with the theoretical classifications in Table 2 each team can be allocated to one of the three learning groups. In order to reduce complexity and avoid redundancy only a few arguments in favor or against an allocation of a team to a learning group is discussed in the following paragraphs. However, valid and comprehensible examples are demonstrated for each of the four teams.

The analysis of experiences in team A shows that team members are actively discussing and interpreting new information and issues together during the simulation days, which is a form of generative team learning: “During our group discussion each participant had [his/her] own opinion as well as opportunity to say it. Some persons active argued their position.” (A.3/2) Furthermore, experiences with communication, organization and participation, which are discussed in the previous chapter (6.2.1), lead to the conclusion that team A is largely applying the process of generative team learning. On that account, by including information from the individual essays and the team assignment, team A is allocated to the group of middle-learning teams due to the above discussed reasons.

Team B conducted a very superficial SWOT analysis and future strategy. In fact team B does not hand in ideas or plans for a team strategy for the second simulation round at all. In addition, in team B communication and organization of the team assignment is performed only by a few team members. Therefore, team assignment is not seen as very useful for the second simulation day, as a discussion with all team members about relevant issues or ideas about future strategy did not take place: “[…]but due to the fact that we did not really discuss the whole work or communicate in advance, I did not perceive it as that helpful.” (B.4/2) The
citation from another team member confirms this statement and clarifies that the team assignment is generated by exchanging ideas via asynchronous communication tools: “Our group did change thoughts via e-mails and we shared all the things in word document by sending it to each others.” (B.2/2) Nevertheless, team members of team B were discussing, modifying and critically debating situations and challenges, which can be ascribed to the team process of generative learning. Furthermore, team B explored alternatives and asked questions how to improve several team processes: “I felt like we made continuous improvement, and relayed the ongoing strategy and techniques to the following shifts.” (B.1/2) Thus, based on the definitions of different learning groups in Table 2, team B can be assigned to the category of middle-learning teams.

As described in the previous chapter (6.2.1), in team C the team assignment was divided among team members and a joint discussion was missing. This shows a lack of social experiences, as team members did not interact with each other to accomplish the team tasks. Furthermore a future strategy is completely missing. In order to cope with problems team members in team C did not really discuss possibilities or plans, but just react without questioning the goals behind. This team behavior can be matched with adaptive team learning, whereby teams answer to different situations in well-elaborated ways. Due to a missing discussion between the two simulation days, many processes and approaches remain the same on the second simulation day, even if they were not efficient beforehand. An example for this is provided in the following citation: “Our problem solving methods were terrible. Sometime discussing an issue would lead to a solution, but in most cases, it would lead to an unfinished discussion with everyone waiting for others to make a decision or come up with an answer.” (C.2/2) Therefore, team C is identified as a low-learning team, based on the classification in Table 2.

It seems that team D, or at least several team members, really discussed and analyzed the first simulation round together in order to find improvement suggestions for the second simulation day. This can be confirmed by comparing individual essays with the team assignment, where suggestions, ideas and plans that are described in the team assignment are mentioned in reflections of different team members. The team strategy includes valuable ideas and strategies in order to avoid problems and issues that appeared on the first simulation day. It seems that team members of team D were aware of their team issues as well as business problems and beyond tried to enhance their performance through strategy definition for the second round. Strategy is formulated straightforward, clear and in “we” form, demonstrated by the following examples: “We try to have at least two people on at all times in order to insure fluently working communication between the team members and to insure
the effective management of the business, of which one person should be employed primarily to as negotiator/scout on the Skype general forum, so as to garner the best prices for both buying and selling.” (SWOT Team D); “We have to ensure that the time on the game is equally shared and unfair burden isn’t imposed on others” (SWOT Team D). As a consequence of this joint team learning, team D managed to improve nearly all team processes on the second simulation day. This can also be ascribed to the active discussions and debates about future strategy and plans and the good team collaboration: “In comparison to the previous session, it seemed that the team as a whole was much more efficient” (D.2/2) Furthermore, the reflections of experiences show that in team D processes occurred, that can be compared with transformative team learning (Kasl et al., 1997). Thus, team D succeeded in turning a group of loosely people in a well performing team, which is why team D is classified as a high-learning team.

After allocating the four teams into the three learning classifications, individual team members are - independently from the team allocation – as well classified in sub groups depending on their learning progress.

6.2.3 Classification of Individuals

On that account, three different individual learning types can be distinguished: high-learning individuals, middle-learning individuals and low-learning individuals. These classifications and allocations of team members are based on concepts in previous parts of individual learning literature, more precisely on the models of single-loop and double-loop learning (Argyris, 1995) as well as on the chapters 3.2.1 “Learning through Experience” (e.g. Kolb, 1984) and 3.2.2 “Learning through Reflection” (e.g. Seibert, 1999). The following table summarizes the three types of individual learners and provides an overview of the most relevant allocation criteria (see Table 3).

Low-learners reflect very superficially and their essays are descriptive and just depicting what has happened in the teams. Their learning style can be seen as single-loop learning, as there is no improvement process from the first to the second simulation round and they do not try to get something out from their virtual team participation.

Although middle-learning individuals sometimes act according to the concept of single-loop learning, there are signs that in some situations they deploy a higher form of learning as well. As those individuals deeply reflect about their experiences and question processes, assumptions and governing values, a process of double-loop learning can be established.
High-learners, however, are individuals who reflect about their experiences very deeply and critically and who scrutinize underlying values, assumptions and perceptions. Furthermore high-learners try to analyze and understand individual and team learning processes and relations, which can be linked with the concepts of double-loop and triple-loop learning (Peschl, 2007). A change in individual conceptions and notions triggered by experiences within the team can be also ascribed to the group of high learning individuals.

On the basis of Table 3 individuals are assigned to one of these three classifications based on their characteristics and reflections. In the following section the allocation of individuals in high-, middle- and low-learning categories is explained. In order to avoid repetitions and wordiness not all classifications of individuals to the three groups are argued in detail, but in each team examples are given for the purpose of transparency and comprehensibility.

For example A.3 is identified as high learner, as she realizes what her main skills are and in which things she is good in and vice versa. This can be proven with the following citations: “In conclusion I can say that after second session of simulation game I understood that I’m good performer, but not team leader.” (A.3/2); “These sessions helped me identify my strengths as a team member and also weaknesses [...]” (A.3/2) Her reflections are very critical and deep and she tries to find explanations for incidents and processes, which is marked by the codes “problem aware” and “solution oriented” in MAXQDA. Furthermore A.3 is able to learn from her own mistakes as well as from team problems: “I suppose bad experience is experience too and next time I’ll try to be open as clear as possible when communicating to avoid mistakes and misunderstanding.” (A.3/1) On these grounds A.3 is allocated to the group of high-learning individuals.

<table>
<thead>
<tr>
<th>Types</th>
<th>Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW-LEARNING INDIVIDUAL</td>
<td>Single-Loop Learning; Superficial reflection; Descriptive rather than analytical: No analyzing of experiences; No questioning of processes or underlying values.</td>
</tr>
<tr>
<td>MIDDLE-LEARNING INDIVIDUAL</td>
<td>Double-Loop Learning; Deep reflection; Try to find explanations of experiences and processes; Questioning and scrutinizing of underlying values and assumptions.</td>
</tr>
<tr>
<td>HIGH-LEARNING INDIVIDUAL</td>
<td>Triple-Loop Learning; Deep and critical reflection and scrutinizing of underlying values; Analyzing of individual and team learning processes; Changes in individual assumptions and perceptions.</td>
</tr>
</tbody>
</table>

Table 3: Types and Characteristics of Individual Learning (developed by the author)
A.9 is ascribed to the group of low-learning individuals due to some reasons. First of all his reflection about the simulation is very superficial and he just describes what has happened instead of analyzing or questioning his experiences: “In general we communicated on a constant basis. Everybody contribute his ideas and participate equally. There was a lot of respect of the other and interest as well. As a team we worked together and had success.” (A.9) This quotation is just an extract of the reflective essay, but it should display how A.9 writes about his team participation. A critical analysis of team processes or individual learning is completely missing and A.9 only depicts what he experiences during the simulation days. A.9 even mentions that in his point of view he did not learn much from the simulation, which is shown in the following citation: “For me personally there were no big learning activities. In simulation it is rather easy because it is for just a short time period and no risk is behind. It is more fun. But in real life it is different.” (A.9/2)

In team B, B.6 is ascribed to the group of middle-learning individuals as in some parts of her reflection she questions and analyzes processes within the team and draws conclusions and improvement proposals for future plans and strategies: “In my opinion now it is important to be more organized and follow some plans and tactics because we already know each other and the game, and we know what to divide to which member, also how to use the opportunities and avoid the threats the game gives to us. Having a well planned strategy with many sub plans is the best tool for success.” (B.6/1) This quotation demonstrates that B.6 bothers about the team and the future strategy and that she not just describes what has happened. Furthermore, B.6 is aware that she has learned something about herself during the game: “Also, I had an opportunity to try my skills in a field I had never had a chance before … it made me feel more secure in myself and convinced in what I want to work in the future, maybe revealed me some roots of my future profession.” (B.6/1) On the other hand B.6 cannot be classified into the group of high-learners as she does not scrutinize underlying team values, and changes in her personal thoughts and perceptions cannot be discerned.

B.7 is seen as a low-learner not only because she just hands in the first reflective essay, but also because her whole first reflection is very superficial. In addition, she largely discusses game related issues, as demonstrated with the following example: “[…] another major problem our team has is the price. At the beginning, we did not know how is the market going, so we just set our price relatively low compare[d] with other SubProducer[s] […]” (B.7/1) This emphasis on game related problems in contrast to the treatment of social issues and situations can be discerned from the codes in MAXQDA. Thus, the citations of B.7 are to a great extent assigned to the sub-codes “game” in comparison to the sub-codes “team” (e.g.
“problem aware game”, “future orientated game”). In addition, B.7 is problem aware and recognizes team and game issues, but does not consider solutions or improvements.

C.4 really tries to think and reflect about her underlying values and assumptions after the second simulation day. It can be stated that this deep reflection and analysis identifies C.4 as a high learner: “Some of my previous assumptions have been changed. For example, now I think that leadership doesn’t mean an authoritarian leader whose rules have to be obeyed. Teams can be more effective if everyone has the opportunity to talk and express his/her ideas. And also some of my previous assumptions have been enforced. For example, I still prefer the face-to-face communication, since I think it helps to avoid misperception, misunderstanding and misinterpretation of the messages. But I also know that face-to-face contact doesn’t work in a world that every day is becoming more global and fragmented” (C.4/2) This quotation shows that C.4 not only enhances her previous assumptions and perceptions but some of them changed during the simulation. This change in underlying values is a main process in triple-loop learning. In addition, C.4 scrutinizes and analyzes team processes as well as her own behavior very critically and always tries to find explanations: “I think that I am very dependent on my country context. In Spain, high context communication rules and I would have preferred to be on a physical context in order to have a better understanding of the messages. And I am sure that if we had been in a physical environment and not in a virtual one, my level of participation would have been higher.” (C.4/2)

One guy in team C explicitly mentions in his reflection that in his opinion he does not learn much from the whole simulation round: “I will not be taking much away with me after this simulation. It was a fun experience but none the less I have not learned more about cultures nor on how to run a company as this simulation was a major oversimplification of how things work in the real world.” (C.7/2) In MAXQDA this quotation is coded with “no conscious learning”, as C.7 believes that he does not take along learning outcomes from his team participation. Nevertheless, C.7 is not allocated to the group of low-learning individuals but identified as middle-learner. This can be explained by the fact that in some parts of his reflection he tries to find explanations for team processes and not only provides a description of experiences. An example is shown in the following citation, where C.7 tries to declare the power situation in team C: “This I believe is also due to the fact as only the people that were willing to participate were participating and there was no need to motivate them and also coordination was done via the team Skype chat and everybody was participating.” (C.7) Although, C.7 does not always try to find a solution or an explanation for team processes or individual behavior, in his second reflective essay he analyzes more deeply than in the first
reflection, which is a further reason why C.7 is seen as a middle-learning individual.

In team D, D.4 is identified as high-learner because her reflections about the team and about her own behavior and skills are very critical. D.4 realizes the value of the team and its members for being efficient: "The team itself plays the most important role and how individual members have an aspiration to contribute for the progress of the game. When someone is eager, it seizes on the others as well." (D.4/2) She describes what is necessary for a good team and recognizes that for individual and team progress and learning, team dynamics and communication is of high importance: "Concentration may depend on the dynamics of the team; How attached you feel when working with the team etc.. That's why the continuous communication is crucial in order to keep the team together and not to let the members start to dream their own matters." (D.4/2) In addition, her first as well as her second reflective essay are structured very clear and after depicting a problem D.4 always tries to find solutions or improvements for the future.

D.7 is ascribed to the low-learning group due to some reasons. First of all, the reflective essay of D.7 is very superficial and delineative. In MAXQDA this is denoted with the code “descriptive” contrary to the codes “problem aware” or “solution oriented”. This descriptive rather than analytical style runs through the whole reflection of D.7. An example should provide an idea of this descriptive style: "My task was to negotiate prices with other teams on the group Skype, so I negotiated low prices, and found the products we wanted. I also worked on selling our finished goods to other teams, and finding people who needed them.” (D.7/1) This quotation shows that an interpretation or questioning of experiences does not take place and D.7 does not try to find solutions or explanations for team processes. Thus, D.7 is a true example for a low-learning individual.

6.2.4 Outcomes Within-Case Analysis

As demonstrated with the examples and the analysis of experiences in the teams, each team and each individual is assigned to one of the three learning classifications. Figure 21 depicts the allocation of individuals as well as teams in the high-, middle- and low-learning individuals and high-, middle- and low-learning teams.

Thus, on the basis of Table 2 and the experiences discussed in each team in chapter 6.2.1, team C is assigned to the group of low learning teams, team A and B to the type of middle learning teams and team D is allocated to the group of high learning teams (see Figure 21).
From the analysis of reflective essays of individuals in team A, it can be concluded that there are two team members who are characterized as high learners (A.3, A.5) and three team members who can be allocated to the type of middle learning individuals (A.1, A.2, A.8). A.4, A.6, A.7 and A.9 are seen as low learners according to the definition, as they did not reflect very deeply and did not analyze or question why something was happening.

Based on Table 3, in team B only one low learning individual can be identified (B.7). This can be explained due to the fact that this team member just handed in the first second reflective essay and thus it cannot be concluded if this team member had improved his learning through experiences during the second simulation round. Four team members in team B can be characterized as middle learners (B.1, B.2, B.3, B.6) and two individuals are seen as high learners (B.4, B.5).

In team C the myriad of four team members can be allocated to the group of middle-learning individuals (C.2, C.5, C.6, C.7). One individual is characterized as high learner (C.4) and the remaining two team members (C.1, C.3) are seen as low-learning individuals, due to their missing deep reflection and analysis of learning processes and experiences in the team.

Team D consists of four high-learning individuals (D.1, D.2, D.4, D.6), two middle-learning individuals (D.3, D.5) and one low-learner (D.7).

The conjunction of individual and team allocation to one figure reveals interesting outcomes. As the classification of both individual team members as well as teams was done independently and based on two different approaches towards learning, the distribution of individuals to the three learning types can provide insights in the team dynamics and
relations between individual and team learning.

Interestingly, by taking a closer look on the high learning team D, it can be inferred that in this team most of team members are high learning individuals, and only one team member is identified as a low learner. This classification of team members within team D can be explained by the fact that the team context in team D positively influences the individuals in this team. This is congruent with Li et al. (2011) who describe the context as a highly relevant for team learning. Thus, all individuals could benefit from the high learning context in their team, as teams are positively influencing individual learning (Argote et al., 2000). Nevertheless, only the four high learning individuals and the two middle learning individuals (partly) profit from their high learning team and manage it to learn during the team collaboration. However, the question arises why the one low-learning individual does not benefit from the high learning team and the other high and middle-learning individuals. This can be explained by the fact that the low learning individual in team D (D.7) does not reflect very deeply and just describes what has happened during the simulation. Furthermore she is not actively integrated in the team assignment and seems to be bored by the whole simulation: “I considered this to be a fruitful experience, but I really think the program should be more user-friendly and more intriguing. The colors and the layout of the current virtual system are very boring to look at, and there is nothing exciting about working on it.” (D.7/1) In comparison to other team members, D.7 does not discuss actual team problems or own ideas and plans for a future strategy. In literature, critical reflection of problems and challenging the validity of requirements is an important process of individual learning (Brookfield, 2000). On that account, the low learning member in a high learning team demonstrates the importance of individual behavior and reflection in order to benefit from team collaboration.

In the low-learning team C only one individual is classified as high learner. All other team members were assigned to the group of middle (4) or low learning individuals (2). The fact that six out of seven individuals are low and middle learners can be explained by the low-learning team context that did not provide an optimal basis for team members to gain high learning outcomes in comparison to a high learning team. In MAXQDA this low learning team context of team C is manifested by the huge number of individual quotations that are assigned to negative sub-codes of experiences. Those negative sub-codes are labeled with a minus, as for example “Communication –“, “Work Distribution –“, “Trust –“). Only if an individual manages it to compensate the low-team learning context with his/her individual behavior high learning outcomes are possible (e.g. C 4).

On that account it can be assumed that a combination of team contextual factors,
experiences within the team and individual behavior are influencing individual learning in virtual teams. Furthermore, also the way how individuals reflect about their experiences seem to be highly relevant for individual learning. In the across-case analysis this assumptions are discussed and the results and findings of the qualitative research study are presented and compared to theory in order to provide a holistic picture about individual learning in virtual teams.

6.3 Across-Case Analysis
The across-case analysis reveals interesting insights on the questions about how the team context and individual behavior influences individual experiences and how these experiences affect individual learning. The results are based on the meanings and reflections of individuals who participated in ViBu and highlight similar but also differing outcomes in comparison to literature. The “Process of Individual Learning in Virtual Teams” developed in Chapter 4.3 is used as a foundation for qualitative research and is altered and enhanced on the basis of new empirical findings.

6.3.1 Social Team Factors
Literature reviewed in previous chapters suggests that social, cognitive and virtual factors are building the team context and are influencing experiences in virtual teams (e.g Kimble et al., 2000; van Offenbeek, 2001; Wilson et al., 2007; Boon et al., 2013). The analysis of reflective essays as well as team assignments reveals the most important contextual factors in virtual teams and demonstrates the pertinent role of team context for enhancing or hampering individual learning.

First of all the social team context is influencing individual learning in teams (Edmondson, 1999). The most frequently discussed conditions and social variables that have an impact on learning in traditional teams are motivation, psychological safety, team efficacy, social cohesion, task cohesion and interdependence (Mullen and Cooper, 1994; Olivera and Straus, 2004; van den Bosch et al., 2006). A study by Ortega et al. (2010) revealed that only three of these factors, namely psychological safety, task interdependence and collective efficacy are affecting learning in virtual settings (Ortega et al., 2010). The analysis of reflective essays shows partial compliance with previous research findings and is discussed in the following paragraphs.

According to Ortega et al. (2010) a climate of psychological safety is able to neutralize the obstacles of virtual collaboration such as geographic spread of team members, constrained communication and lack of face-to-face contact. This neutralization of virtual barriers can
emerge due to a more open and impulsive communication and by a strengthened interpersonal trust between team members. Furthermore, team members participating in a virtual team with high psychological safety are assumed to increasingly communicate, interact and share their ideas and perceptions (Ortega et al., 2010). By analyzing the reflective essays, it can be inferred that in all four teams psychological safety is present, which is expressed in active communication and interpersonal trust described by team members: “But finally I enjoyed communication with my team because all guys were polite and active.” (A.3/1). Nevertheless, due to the fact that the teams can be seen as short-term project teams, where individuals work together only for some weeks, psychological safety is not as high as in teams with long lasting relationships between the team members.

Task interdependence describes a team in which the “members perceive that their own actions and results are strongly affected by the actions and results of the rest of the team” (Ortega et al., 2010, p. 269). In literature a positive relationship between task interdependence and virtual team learning is presumed, as a shared understanding and collective dependence of team members leads to better conflict solving approaches, efficient knowledge sharing and team learning (Edmondson, 1999; Boon et al., 2013). By contrast, if team members in virtual teams think that they are able to accomplish tasks on their own they would not communicate and interact with other team members and this would diminish team learning behavior (Ortega et al., 2010). It can be concluded from reflective essays that task interdependence played an essential role in all teams. The influence of task interdependence on team work can be seen during the accomplishment of team assignments. For example, team C allocated the team assignment between all team members: “Then, we broke up the assignment into parts so that people could choose the part they voluntarily wanted to do.” (C.4/2) In such a case individuals are dependent on all other team members that they will finish and hand in their assigned task and meet the deadline. As most of individuals got graded on the team assignment they were dependent on the mutual team work and that everyone will accomplish his/her share. In addition, the fact that nobody had to be online during the whole simulation day lead to a rise in task interdependence between team members, as they were dependent on the actions and decisions of other team members. Furthermore, actions of individuals were strongly influenced by the actions of the rest of other team members due to the fact that the simulation just allowed one person to move the mouse. Thus, team members had to coordinate and collaborate in order to ensure an efficient team work, which requires confidence in each other: “Also our team members trusted what we were doing in general as did we when other members operated the mouse.” (A.1/2) Summing up, task interdependence is a highly relevant factor that influences experiences in virtual teams.
Motivation, including both intrinsic and extrinsic incentives, is presumed to influence learning in traditional teams (Olivera and Straus, 2004). By analyzing the reflective essays it reveals that extrinsic rewards (e.g. to win the simulation as the best company, to increase profit, to increase sales etc.) as well as intrinsic incentives (e.g. positive team spirit, individual learning etc.) had a positive impact on experiences and learning in virtual teams: “Some began their shift with a huge load of motivation, really looking forward to collaborate and take part in this game. Others just tried to be online until their 6 hour shift ends.” (B.4/1) This citation shows that not every team member went into the simulation game with high motivation, as some just wanted their claimed time to pass. On that account it can be stated, that the motivation in the team affects the experiences within the team and has consequences on team as well as individual learning.

It is expected that collective efficacy or group potency promotes virtual team members to view themselves as able to handle difficulties and barriers to work and communicate in the virtual context. Thus, in virtual teams with a high level of collective efficacy team members are supposed to talk together about their experiences and to learn together as they believe in an efficient completion of their team tasks. Collective efficacy is therefore assumed to be positively linked to virtual team learning (Ortega et al., 2010). In the reflective essays the presence of group coherence cannot be discerned. This can be ascribed to the short duration of team collaboration, as it is difficult to estimate the team work and to develop high collective efficacy in the very short time frame of some weeks.

Group or social cohesion is the force that keeps a team together and positively influences learning in teams (Boon et al., 2013). The analysis of reflective essays highlights that social cohesion indeed has an influence on the team interaction and experiences within a team: “We had a good team spirit, a flat power structure and we managed to work very well together.” (A.6/1) Furthermore the importance of group cohesion in virtual teams is manifested in some reflections, where the leaving of team members was associated to have a negative impact on team collaboration: “The example of the teammate not entering the game due to technical problems or other people not entering the game at all offered an insight into their way of collaborating. This had negative impacts on the performance of the team as a whole because always doing the work of other persons costs a lot of energy and as a consequence a lot of concentration.” (B.4/2) In such teams social cohesion has to be repaired and strengthened by the remaining team members. On that account it can be inferred that social cohesion has an impact on learning in virtual teams. These outcomes are in contradistinction to Ortega et al. (2010) who does not assume social cohesion as relevant.
for individual learning in virtual teams.

Interestingly, a deeper analysis of reflections demonstrates that individuals sense and experience the extent of social cohesion within a team very differently. Furthermore, individual team members from different cultures need different levels of cohesion in order to feel comfortable. For example, one participant mentions a negative association according to social cohesion: “But it doesn’t fit in high context cultures (like the Spanish one) where the socio-emotional processes (relationship building, cohesion, trust) play a big role.” (C.4/2); “But I need more time in order to have a greater feeling that we are a team and to feel cohesion and trust.” (C.4/2) A reason for the missing cohesion and trust in the member’s point of view can be explained by the fact that team was compounded of members from low-context as well as high-context cultures. Whereas an individual from a high-context culture prefers long and close relationships and reliance on each other, individuals from low-context countries favor many and fewer intimate acquaintances (Hofstede, 2001). Thus, for individuals stemming from lower-context cultures it seems to be more difficult to develop cohesion and trust in short-term virtual teams. Social cohesion therefore plays a crucial role for individual learning in virtual teams.

In literature, task cohesion is seen as a belief about the interpersonal context that influences learning in traditional teams (van den Bosche et al., 2006). However task cohesion is not assumed to influence learning in virtual teams (Ortega et al., 2010). Interestingly, by defining task cohesion as a shared commitment among team members to reach a common goal, several quotes of the reflective essays suggest that task cohesion has an impact on experiences and learning in virtual teams: “Also I guess that we trusted each other, because we were a team with common goal and common desire to win.” (A.3/2); “Everybody tried to work for the same goal.” (D.6/2); Thus, in contrast to Ortega et al. (2010) task cohesion in virtual teams is revealed as a crucial factor that is positively influencing experiences in virtual teams.

Table 4 summarizes the most important social team factors that were identified to have an influence on the individual learning process in virtual teams.
6.3.2 Virtual Team Factors
The second group of factors that are presumed to influence individual learning can be assigned to the virtual context. The analysis of the reflections reveal that the virtual context can positively and negatively affect individual learning: “Virtuality was another challenge for us.” (Team Assignment Team C); “[...] virtuality may affect in a positive way to the communication and listening to the other members.” (Team Assignment Team D) This is in compliance with literature treated in Chapter 2, where challenges and advantages of virtual teams are debated (e.g. Dubé and Robey, 2008; Nydegger and Nydegger, 2010). In the following section contextual factors that have an influence on learning in virtual teams are discussed and examples are provided.

First of all, missing face-to-face contact is ascribed to have a negative effect on communication, trust and relationship building and collaboration within virtual teams. The following quotes demonstrate these influences on experiences of individual team members: “The biggest challenges for me were lack of face-to-face contact.” (A.3/1); “For me, probably due to the cultural differences, it is not easy to build relationships based on ICT, without a face-to-face contact.” (C.4/1) “It can be said that cooperation in a virtual context is always a challenge. The face contact lacks and it makes a huge difference compared to the normal interaction” (Team Assignment Team D). These findings are congruent with the overall meaning in virtual team literature, where missing personal contact between team members is seen as hampering relationship building and trust development in virtual teams (Cascio, 2000; Powell et al., 2004). Therefore, researchers suggest an initial face-to-face meeting for all virtual teams, in order to create a higher bondage and connection to the other team members (e.g. Ebrahim et al., 2009). If this is not possible, video conferences are recommended in order to at least see the other team member’s facial expressions and body language (e.g. Bergiel et al., 2008).

<table>
<thead>
<tr>
<th>SOCIAL TEAM FACTORS THAT INFLUENCE INDIVIDUAL LEARNING</th>
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<tr>
<td>Motivation</td>
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<tr>
<td>Psychological safety</td>
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<tr>
<td>Social cohesion</td>
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<td>Task cohesion</td>
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<td>Task interdependence</td>
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Table 4: Social Team Factors that influence Individual Learning in Virtual Teams (developed by the author)
Time zone differences are presumed to be a further virtual contextual factor influencing experiences in virtual teams. Nobody out of all 31 participants mentioned any positive association or benefit due to different time zones: “But the different time zones didn’t allow us to organize successful decision-making process in the group. It was difficult to offer some new ideas about our strategy because somebody could sleep in that time, somebody could study and so on.” (B.3/2); “[…] but really working together is difficult due to the huge time difference.” (C.5/1) The fact that nobody realizes the positive aspect of team members who are spread in countries all over the world is very astonishing, because literature states that one main advantage of virtual teams is that they can follow the sun and work 24/7 (Berry, 2011). Nevertheless, team members just experienced the negative impact of time zones on their experiences and their individual learning. These findings are in compliance with Bergiel et al. (2008) who emphasized the challenging aspects of different time zones in their study.

Beside time zone differences, virtual teams entail language problems due to different backgrounds and education of team members (Bergiel et al., 2008). Interestingly, a myriad of team members described that there were no problems occurring from language: “Language was once again not an issue because everyone who I was online with spoke very good English.” (B.5/2) This could be explained by the good education of English language skills of team members in the participating countries as well as universities. Thus, language problems did not play a huge role in the four virtual teams that were consisting of young students, due to the fact that a myriad of team members possesses English skills. On that account it can be stated that English skills are necessary to avoid problems and to enable an open and fluent communication in virtual teams.

Virtual communication is described by almost all team members as a factor that has positive as well as negative effects on their experiences within the team. According to literature, asynchronous communication leads to efficient outcomes, because team members are interacting and communicating parallel and not serial (Klein and Kleinhanns, 2003). This advantage is not mentioned in the individual essays. Nevertheless, some other benefits of virtual communication are described in the reflections. “On the other hand virtuality may affect in a positive way to the communication and listening to the other members. Many distractions may disappear and virtual context might forces you to strongly concentrate on the ongoing issue.” (Team Assignment Team D) This citation is in congruence with the literature, where it is presumed that the task focused work environment in virtual teams leads to superior task outcomes and increased team performance (Berry, 2011). In addition, virtual communication is seen as positively influencing decision making, time-saving and flexibility: “So in my opinion virtual communication was to some extent even more efficient in decision-
making process than talking in person, because you can't see the person you are talking with, so you keep your own opinion more easily than when talking in person.” (A.1/2)

Nonetheless, virtual communication entails many challenges and disadvantages (Dubé and Robey, 2008). One team member mentioned the missing nonverbal communication as negatively affecting the experiences within the team: “[I]n Skype communication it is more difficult because we do not have so much nonverbal communication.” (A.2/1) This opinion is represented by Lurey and Raisinghani (2001) who treat the lack of nonverbal cues in virtual communication as one main disadvantage of virtual teams. In addition, virtual communication is described as more impersonal than in traditional teams, which can be ascribed to missing nonverbal cues and missing personal contact. “The cons is that it is still very impersonal compared to having face-to-face meetings. I believe having meet at least in the beginning with your contact in real life creates a much higher bondage and connection was when compared to virtual communication.” (C.7/2)

In virtual teams culture is presumed to have a huge impact on team interaction and communication (Horwitz et al., 2006). By analyzing the description of experiences about culture it can be inferred that different cultural backgrounds play an important role for team members. Although there were many prejudices before the first simulation round, it can be concluded that culture within virtual teams positively influenced communication and collaboration due to different ways of thinking of individuals from various countries. Most of team members were surprised that cultural differences were low and tried to find explanations for it: “In terms of cultural differences no deep differences occurred. For my point of view it was because we are all in a common sub-culture. We are studying more or less all the same and therefore we have the same background.” (A.9/2)

According to literature, trust is more difficult to develop in virtual teams in comparison to traditional teams (Kimble et al., 2000). Nevertheless, analyzing the reflective essays revealed that a myriad of team members described trust as very high within their teams. This can be explained by the emergence of swift trust, which is a special type of trust that occurs in dispersed virtual teams with often very limited life span (Crisp und Jarvenpaa, 2013). Swift trust enables the team members to collaborate and work together from the beginning on and provides a trust base between the team members from the beginning on. In the virtual teams swift trust can be obviously noticed, as team members described experiences with high trust on the first simulation day, where they just knew each other some days: “I must say that the trust was there from the beginning onwards within the team” (C.7/2); “One reason for this is the huge amount of trust all of our members had into each other. Especially during the
second simulation round, the level of trust increased a lot and ended up in telling private stories after the session.” (B.4/2)

Summing up, the virtual context is identified to play a crucial role for individuals participating in virtual teams. On the one hand the virtual context can increase individual learning through experiences, but on the other hand virtuality can entail challenges and disadvantages which can decrease and hamper individual learning (see Table 5).

<table>
<thead>
<tr>
<th>VIRTUAL TEAM FACTORS THAT INFLUENCE INDIVIDUAL LEARNING</th>
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<tr>
<td>Culture</td>
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<tr>
<td>Geographical &amp; time zone differences</td>
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<tr>
<td>Language</td>
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<td>Missing face-to-face contact</td>
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<tr>
<td>Technology</td>
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<tr>
<td>(Swift) Trust</td>
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<td>Virtual communication</td>
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Table 5: Virtual Team Factors that influence Individual Learning in Virtual Teams (developed by the author)

6.3.3 Cognitive Team Factors
In literature, it is assumed that beside social and virtual team factors, the cognitive team context is influencing individual learning. According to van den Bosche et al. (2006) cognitive processes such as construction and co-construction of meaning as well as constructive conflict are playing a huge role for team and individual learning. However, the analysis of individual reflections revealed three cognitive team factors that appear to be highly relevant in virtual teams, namely active feedback, active discussion and active experimenting.

Providing feedback means to prepare honest opinion to others and reflect on their ideas, tasks and actions (Argyris and Schön, 1974). According to Argyris (1995) giving and receiving feedback within a team has a positive effect on individual learning. Furthermore, since feedback from close team members is more efficient and informative than from distant persons, the provision of feedback inside teams and work groups is suspected to positively influence team learning progress (Druskat and Kayes, 2000). The analysis of reflective essays shows accordance with literature, as some team members explicitly pointed out the importance of feedback from other team members: “We have always asked for each other’s
feedback and made every decision together – that’s why there were no conflicts at all.” (A.7/1) Missing feedback, however, leads to conflicts and negative feelings within the teams: “[…] frustration among some members as they did not receive feedback on their suggestions quick enough.” (B.1/2) Individuals who are very insecure in their actions due to a lack of feedback from other team members in the first simulation round state that even negative feedback is more requested than missing feedback. On that account it can be inferred that active feedback is a highly relevant cognitive team behavior in virtual teams.

Another factor which has a huge importance in the team members’ point of view is the discussing with other team members. Discussing problems, issues or future actions is seen as fostering team collaboration within the teams: “I found really beneficial to discuss everything about game before the second session.” (A.3/2) In addition, actively discussing incidents and situations is described as the main way to overcome problems and misunderstandings: “Due to the language issues or misunderstanding of the game process we had some awkward situations but always solved them by discussing and explaining the situation in a more proper way.” (A.7/1) On that account, active discussing of relevant issues and processes is positively influencing experiences within a virtual team. These findings are in congruence with literature, where proactively exploring, discussing and evaluating problems is assumed to enhance knowledge sharing and individual learning (Druskat and Kayes, 2000).

In addition, analysis revealed that active experimenting is a cognitive team behavior that is presumed to have a positive impact on individual learning. The surrounding in ViBu Real Game™, where active experimenting and implementing theoretical knowledge and skills is the main task, is seen as positively influencing individual learning progress: “I enjoy this teaching system and believe that studying subject with participation in the process, games and exercises, sharing personal experiences are the best way to learn any subject.” (A.3/2) The biggest advantages of this cognitive team factor are seen in the opportunity to actively experiment and participate in the game and to test new knowledge and skills in practice: “First of all I would like to underline that this has been the best practical experience I have ever had and I am very thankful that I had the opportunity to participate.” (B.6/1); “In my opinion, one of the best aspects of the simulation game was that for once we were able to try something we had learned in practice.”(A.5/1). On that account it can be stated, that a team context in which all team members are actively experimenting and contributing to team tasks and discussions is positively influencing experiences within the team.

On that account, discussing, feedback giving and receiving as well as active experimentation
and participation are revealed as the most influential cognitive team factors in virtual teams (see Table 6).

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<thead>
<tr>
<th>COGNITIVE TEAM FACTORS THAT INFLUENCE INDIVIDUAL LEARNING</th>
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<tr>
<td>Active discussion</td>
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<tr>
<td>Active experimenting</td>
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<td>Active feedback giving</td>
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Table 6: Cognitive Team Factors that influence Individual Learning in Virtual Teams (developed by the author)

Beside various team factors, individual behavior is assumed to directly influence experiences in a virtual team, as team members who experienced the same team context showed different learning outcomes.

6.3.4 Individual Behavior

The analysis of reflective essays as well as team assignments reveals the huge impact of individual behavior on individual learning in virtual teams. The importance of individual behavior to influence experiences in virtual teams helps to explain why there are high learning individual learners in low and middle learning teams and low learning individuals in high learning teams. Thus, it is necessary to identify individual behavior that alone and in conjunction with the team context fosters individual learning processes. The next paragraphs enumerate several individual behaviors and compares opinions in literature with research findings of this thesis.

Firstly, in literature *concrete experiencing* is described as an individual behavior that fosters and enables individual learning (Kolb, 1984). The analysis of reflective essays confirms the importance of active performance, as individuals who actively experienced situations and problems learned more out of those experiences than individuals who just watched and listened to others: “It was a new experience and usually first touch with anything is troublesome; lots of confusion and learning.” (C.5/2). On that account, it can be inferred that individuals need to witness concrete experiences during the simulation in order to enhance their individual learning. This is in accordance with experiential learning literature, where experiences are seen as crucial predecessor for individual learning (Kolb and Kolb, 2005). Only if individuals undergo situations and handle problems by themselves individual learning is possible.
A further individual behavior that is assumed to positively contribute to individual learning is called *abstract conceptualization* (Manolis et al., 2013). This theoretical concept finds confirmation in the reflective essays. Individuals, who tried to understand, interpret and analyze relationships for issues and processes within the team learned more from their experiences than individuals who did not question or contemplate about their experiences. Interestingly, some team members depict, that they compared their past theoretical knowledge learned in university with new ideas and concepts emerging during and after the simulation: "I think I was able to use the knowledge I have learned during my studies. I almost thought that I have forgotten almost everything I've learned, but in the end I think I was able to perform as well as I did because of my studies in leadership." (A.1/2) Thus, the process of abstract conceptualization is necessary for individual learning to emerge, as it combines theoretical knowledge with practical implementation.

According to experiential learning theory, an individual behavior that is conducive for individual learning to occur is *active experimentation*. During this process individuals try to implement what they have learned in theory into practice (Healy and Jenkins, 2000): "In my opinion, one of the best aspects of the simulation game was that for once we were able to try something we had learned." (A.5/1) In this phase it is important to plan future actions and to ensure that these actions and ideas fit into the relevant context (Mobbs, 2015). Individuals who displayed such a behavior learned more in comparison to individuals who did not actively try new theories, ideas or behaviors. "So I reckon that the Real Game is the only opportunity to practice all your knowledge especially given in such difficult and unusual course like Virtual Organizations. As for me students wouldn't be able to get full imagination about work in modern international companies without practice in the Real Game." (B.3/1)

Individuals who are aware of problems within their team and who are able to identify triggers and reasons for issues and processes positively influence experiences in virtual teams. The following quotation represents an example of a problem aware individual: "In terms of personally identifying the biggest challenges in the game, it could be broadly categorized in the order of team interaction, team coordination, team strategy and the overall competitiveness of the market. These challenges are further compounded by the nature of the virtual environment and its associated difficulties." (D.2/2) This citation shows, that D.2 tried to think about the problems and challenges in his team and moreover clustered them in some categories. This procedure indicates that he really analyzed existing issues in comparison to individuals who just portrayed the team situation without recognizing the problems behind. Thus, it can be stated that individuals who realize problems in the team, are able to improve their experiences and consequently their individual learning in virtual
teams.

In addition, problem awareness in conjunction with solution orientation is revealed as a combination of individual behavior that enhances individual learning. Thus, team members who think about solutions or approaches to solve problems within the team are identified as middle and high learners, compared with individuals who just depict what has happened. An example of a solution oriented individual is presented in the following citation: “I would like to work harder and change some points. Firstly, I want made the game more structured and coordinate all members. I guess it would be better and more effective if each person will clearly understand and perform own special task, for which he or she has a skills.” (A.3/1) Individuals who contribute suggestions and generate new ideas to solve problems and challenges within the team are able to learn more in their virtual teams, because they bother about the team’s future and tried to reach a common goal. These findings are in compliance with learning literature, where the awareness and discussion of problems and the way to find proposals for solution are described as essential for individual and team learning (Druskat and Kayes, 2000).

Furthermore, active participation and contribution during the simulations as well as to the team assignment is an individual behavior that is identified as conducive for individual learning. One quotation of team D clearly named those participants as active during the team assignment, who are identified as high- or middle learners before: “In all such conversations, it was always only myself, [D.6], [D.5] and [D.4] despite the numerous emails that were sent out in regard to the attendance at such meetings by others in the team.” (D.2/2) As categorized in part 6.2.3 “High- vs. Low-Learning Individuals”, D.2, D.4, D.6 are high learners and D.5 a middle-learner, which demonstrates that active participation and contribution to the team assignment is pertinent for individual learning. Thus, people who want to enhance their learning progress need to actively apply themselves in the team tasks and actively collaborate with the other team members.

In addition, individuals who were motivated and interested to participate in the simulation and who had fun during the participation learned more from their experiences in their virtual teams than individuals who described the simulation as boring. For example B.5 and D.5 experienced the simulation as very positive and both of them were identified as high learners before: “However I did not want it to end because I was having so much fun all the time.” (B.5/2); “Regarding the experiences it is quite fun to do this game.” (D.5/1). In addition, all four individuals who made the initiative to start with the team assignment in their team are characterized as high or at least middle learning individuals. An example is presented in the
quotation of A.5, who is identified as high-learner: “Eventually, I was the one to start the actual doing and sent everyone an excel file with my ideas and asked others to add their points.” (A.5/2). This can be explained by the fact that those individuals are more motivated to play the simulation and to interact with their team members, which positively influences individual learning in virtual teams.

On the contrary, individuals who were not motivated and did not have much fun did not take along as much in comparison to middle and high learning individuals: “However, the second session was not as fun and challenging.” (C.2/2); “The colors and the layout of the current virtual system are very boring to look at, and there is nothing exciting about working on it.” (D.7/2) These examples demonstrate the value and importance of motivation for individual learning.

Individual behavior can also be directed and influenced by different cultural backgrounds. Therefore team members from different countries showed various individual behaviors due to their culture. For example one team member described the preferences of high-context cultures (e.g. Indonesia) in comparison to low-context cultures (e.g. Finland) and its effects on team collaboration: “I think the following could be described as "stepping on multicultural toes", and that it was. The Indonesian said one or two things, but as all the others were closer to [the] style of "no unnecessary talk, roles clear, great, let's get the thing up and running", he soon became forgotten.” (D.3/1) Interestingly, some team members even ascribed their own characteristics and working style and due to their cultural backgrounds, as one quotation of an Austrian girl demonstrated: “We from Austria are very straight forward and are trained to meet all deadlines set by someone. As already described some time earlier, the other members of the group started only on Wednesday to think about team assignment. At this time we two Austrians already had a plan “B” if nobody is answering our emails.” (D.1/2) These examples show the impact of culture on individual behavior and working styles. Due to the fact that virtual teams are often composed of individuals with diverse cultural backgrounds culture plays an essential role for individual behavior and their learning progress. Holtbrügge and Mohr (2010) coincide with this assumption and reveal that individual learning styles are influenced by cultural backgrounds.

Summing up, beside the team context, individual behavior is identified to have a huge impact on individual experiences in virtual teams. Individuals who are motivated and interested in a task and who are actively participating and contributing during and between the simulation days enhance their positive experiences. In addition, team members who are aware of problems and who try to find solutions and problem solving approaches are able to indirectly
increase their individual learning in virtual teams. The following table summarizes the main findings about the impact of individual behavior on experiences and individual learning in virtual teams (see Table 7).

<table>
<thead>
<tr>
<th>Abstract conceptualization</th>
<th>Active experimentation</th>
<th>Active participation</th>
<th>Concrete experiencing</th>
<th>Contribution to the team assignment</th>
<th>Interest</th>
<th>Motivation &amp; Fun</th>
<th>Problem awareness</th>
<th>Solution orientation</th>
</tr>
</thead>
</table>

**Table 7:** Individual behavior that influences Individual Learning in Virtual Teams (developed by the author)

In conclusion it can be stated, that both individual behavior as well as team context are influencing experiences in virtual teams. Thus, it can be assumed that individual behavior and team context have an indirect impact on individual learning as they affect the experiences individuals in the virtual teams witness.

Furthermore, it is necessary to mention, that the team context, including social, virtual and cognitive team factors and individual behavior are mutually influencing each other. For example, an individual who has high interest and motivation to actively participate in the simulation is affecting the team context in the way that with his/her positive attitude other team members are positively affected. Consequently, active discussion or team motivation could increase. Another example is an individual who did not contribute to the team assignment. This individual behavior has a negative impact on the team context, as others have to undertake his task. Thus, just one team member is able to decrease social team factors such as task interdependence or task cohesion: “Although the delegation of the tasks seemed fair, I was fairly unsuccessful in trying to work as part of a team with my other Australian team member, who through both lack of motivation and external factors did not have much input into the SWOT analysis, meaning there was an unfair share of workload.” (D.2/2) Furthermore, the impact of individual behavior on the team context can be demonstrated with team C. In this team three de-motivated team members who had no
interest to contribute to team tasks in the second simulation round negatively influenced the whole team collaboration and performance.

In addition, also the team context is able to influence individual behavior of team members. For example, low social cohesion within the team can affect individuals in the sense that their contribution to the team assignment decreases and they had less fun during the simulation. Moreover, the virtual team context which entails problems with technology and virtual communication is able to negatively affect fun and interest of team members: “Some members, including myself, could not get access to Skype, which made it virtually impossible to communicate with the other team members during the game.” (A.4/2). On the contrary high team motivation positively influences individual behavior and contribution: “Other helpful thing is that team members have good motivation for the game, but I think it was because game was so addictive.” (A.2/1).

Nevertheless, not all team factors and not all modes of individual behavior are influencing each other. For example the fact that the virtual team is composed of individuals from different cultures could be irrelevant for influencing individual behavior: “And moreover I didn´t feel any cultural differences between all of us. I guess we just didn’t think about it.” (B.3/1); “In my opinion, cultural differences associated with the respective team members did not have much of a bearing on both the team and business” (D.2/2) On the other hand, the fact that an individual is very problem aware does might not influence the team context, if this individual is very shy and does not communicate and share his/her ideas. On that account, the arrow in Figure 22 between individual behavior and team context is depicted with dashed lines as not each mode of individual behavior is affecting the team context and vice versa.

As discussed before, experiences in virtual teams are governed on the one hand by the team context and on the other hand by individual behavior. For example, the virtual context which entails missing face-to-face contact and lack of non verbal communication can lead to experiences with ostracism and ignorance: “The ostracism (the feeling of isolation, ignorance and exclusion) that I felt in the early times of the first session disappeared.” (C.4/2) This citation demonstrates that in team C the team context changed from the first to the second simulation day and thus it was able to positively affect individual experiences of C.4 (e.g. through higher social cohesion or increased trust within the team). Another example is the influence of culture on experiences with communication or problem solving activities: “I did find one of my team members to be a little blunt when he said that we should all stop working on the project so he could do what he wanted on it for a while, but I understood that he was from Europe, and a lot of Europeans just state things like that differently that I would in my
"culture." (D.7/1) As each factor of the team context is somehow influencing the experiences in virtual teams, the arrow pointing from team context to combination of experiences is depicted with a continuous line (see Figure 22).

Furthermore, also individual behavior influences experiences within a virtual team. An individual who entails interest and active contribution has the chance to experience many situations instead of an individual who did not contribute to the team collaboration. In addition, individuals who are problem aware realize hidden conflicts and critical incidents within their teams and thus witness completely different experiences than other individuals. "However, the actions of [a team member] in forcefully leading the business towards certain directions without consultation of present team-members was a cause for concern." (D.2/1) As each mode of individual behavior is assumed to affect experiences in a virtual team, the arrow depicting from individual behavior to combination of experiences is depicted with a continuous line (see Figure 22).

On that account, it can be stated that team context and individual behavior are affecting each other and both of them are influencing experiences of individuals in virtual teams (see Figure 22).

In the following chapter the role of experiences for individual learning is discussed and analyzed in order to provide an overview of the most important experiences in virtual teams that are influencing individual learning.
6.3.5 Role of Experiences for Individual Learning

"Afterwards I can say that it would have been impossible to have such good feelings if the team had been different. The team itself plays the most important role and how individual members have an aspiration to contribute for the progress of the game. When someone is eager, it seizes on the others as well." (D.4/2)

This citation demonstrates the huge importance of the team and the experiences within the team for individuals and their learning. In order to reveal what experiences and factors are necessary to foster individual learning within teams it is essential to compare teams and look on factors that were available in high-learning teams (D) and missing in low-learning teams (C). Furthermore, analyzing conditions of middle-learning teams (A, B) contributes to detect why those teams did not reach a high-learning status in comparison to team D.

The research outcomes reveal that individuals who experienced specific factors within their team enhanced their individual learning. These factors include an atmosphere of active and intense communication within the team. For example, in high learning team D communication was seen very extensive and active: "It must be noted that one of the main successes of the second session was the way in which communication was both fluent and comprehensive during the course of the game." (D.2/2) In comparison to other teams, team D really fixed it to enhance and improve their communication from the first to the second simulation round and almost all team members actively participated in the discussions. On that account, the experience of active and fluent communication within a team has a positive impact on individual learning. In literature accordance about the importance of active communication between team members can be found (e.g. Boon et al., 2013). Especially in virtual teams, introducing yourself to other team members and discussing non-related issues is of high importance due to missing nonverbal-conversation and missing face-to-face context (Lurey and Raisinghani, 2001). Nevertheless, in the four teams hardly any discussion about non-related topics occurs and the emphasis of communication lies on game and team related issues: “We didn’t spend a minute online on doing something else or too much time talking about things which are not related to the game, I think that we were using the time quite effectively.” (B.6/1) This can be explained by the fact that virtual teams work task-oriented rather than social-oriented, because it is more difficult to develop relationships between team members (Nydegger and Nydegger, 2010). The concentration of topic-related issues is associated with higher performance, as individuals are not diverted from non-relevant discussions (Berry, 2011). Therefore, it can be concluded that active communication between team members about game and team related issues fosters individual learning.
In contrast, weak communication between team members negatively affects individual learning as well as team collaboration. This type of communication is excelled by low or even missing discussions between the team members, by uncoordinated dialogs or by very one-sided communication conversations. Examples for this can be found in Team A and C: “With six people talking on Skype at the same time, it was hard to know who’s turn it was to speak, and I sometimes felt that some were not listening to others and talking while others were talking.” (A.5/2); “The discussion was through email and due to not getting response in time, it was hard to argue or discuss anything and get to a good conclusion.” (C.2/2)

According to Kimble et al. (2000) trust is more difficult to achieve in virtual teams than in traditional teams. In general, in teams where individuals experience an atmosphere of high initial trust and confidence between the team members, individual learning is positively affected. This can be explained by the fact that collaboration is easier in comparison to teams with lower trust level, because individuals confide in and build on each other. In teams with high trust team members can concentrate on the main tasks and do not spend valuable time on solving trust issues. For example, in team D the high trust between team members lead to cohesion and commitment: “We were able to create a common trust between us and we were certain of that, that we could make it together.” (D.4/2) On that account, the experience with high levels of trust within teams can positively influence individual learning outcomes. Low trust, however, has the opposite implication on teams and team members, as missing trust fosters conflict and suspicion between the individuals within the team (Cascio, 2000). In the sequel, this can lead to worse communication and interaction and thus negatively affects individual learning in those teams. Even if there is high initial trust in the beginning, the danger of losing trust to some team members is always present in virtual teams: “Later I noticed how huge impact does ignoring others and delays in replying have in establishing trust. […]. By every hour I waited for their response I felt the trust decrease. With the people who didn’t collaborate with me at that time […] I completely lost all the trust I may have had.” (A.5/2) This citation demonstrates how fast trust between team members can be destroyed and that experiences with trust are able to influence the entire team collaboration.

Experiences in teams with a democratic leader who initiate goal structures are positively related with team and individual learning (Sarin and McDermott, 2003). Interestingly, the analysis of reflections revealed that a myriad of individuals learned more in teams without a leading person than in teams with one or more official or temporary leaders. This can be explained by the fact that in teams without a leader, the power distribution was more equal and fair. Thus, everybody had the chance to perform and contribute to the team tasks. In comparison to that, in teams where a leader appeared some more silent or shyer individuals
were suppressed and did not have the chance to integrate. Furthermore leaders in the teams were mostly those persons who made the decisions, suggested new ideas and strategies and distributed tasks to the other team members. This lead to a decline of reflective thinking of other individuals, as they relied on the leading person that he or she will handle everything and consequently decreases individual learning.

Nevertheless, the wish to have a leader or not seems to have cultural implications. For example one girl from Russia was very dissatisfied due to missing leadership in her team: “During discussion about sharing working time there was some point that we have to choose a leader for our team before the game’s start. We didn’t find it and actually, I consider this is not good idea.” (A.3/1) On the other hand most of European and American team members described the absence of an overall leader as a positive fact, as the following citation affirms: “There was not any really strong leader in team, but I think that we did not need one.” (A.2/2) These different views and opinions of team members about leadership can be ascribed mostly to cultural aspects. For example one girl appropriately described the Russian perception of leadership in her reflection: “[...] from the Russian understanding of leadership, each organization needs a leader for coordinating of performance of tasks and taking final responsibilities. As we told on the lessons of intercultural communications strong hierarchy and feeling of strong leader’s arm, keeping all organization under control are typical for Russia.” (A.3/1) This citation highlights the distinct perspective of leadership from people of different countries and cultures. Whereas European and American team members preferred a more autonomous working style, members from Russia indicated the importance of having someone who inspires the whole team and who has the responsibility for all decisions.

However, from the analysis of the experiences within the teams, it can be inferred that in teams without a leader and with equal power distribution, decision making was divided between all team members. In such teams (e.g. Team D) everybody was able to contribute and have a say in the team decisions. Individuals with own experiences in decision making within their team show higher learning outcome in comparison to individuals who leave the decisions to other team members. These findings are in compliance with literature, where the active contribution to team work and decisions is seen as very important for enhancing individual learning (Manolis et al., 2013).

In literature a further factor which is seen as relevant for enhancing individual learning in teams is that individuals witness concrete experience and contribution to team tasks (Kolb, 1984). This means that the work distribution within the team is of high relevance for individual learning. In teams where each individual applies oneself in the team work and where the
work is fairly and automatically distributed, team members learn more instead of teams where just some members did the whole work alone. In addition, this fair work distribution fosters collaboration, interaction and communication with the team, as individuals have to exchange ideas and work together in order to reach team goals (Boon et al., 2013).

Interestingly, the analysis of reflections made by the students detects that individuals who wrote about their experiences in knowledge sharing and teaching others during the simulation showed higher learning outcomes in comparison to individuals who just worked in their shift and did not communicate and share knowledge with individuals from other shifts or newcomers. These research findings can be explained by the fact that during the process of introducing others in new tasks individuals rethink and reflect about experienced problems and try to pass on tips and suggestions. According Dooly (2008) “students who learn most are those who give and receive elaborated explanations about what they are learning and how they are learning it.” (p.2). On that account, a culture of knowledge sharing where everybody is supporting and explaining tasks to each other enhances individual learning. This experience of knowledge sharing is fostered in teams with a flexible role distribution between team members: “One reason for lack of distribution of tasks was that at least I wanted to learn and also teach all the parts of game to other players. I think that it is good way to start, because all other members can play any role they like and have also good overall picture on game.” (A.2/1) Knowledge sharing within a team is above crucial for team effectiveness, which is seen in the following citation “But most significant value in my opinion was a handover system we created with the team, exactly this system allowed to our team succeed during the all game length.” (C.1/1) Only if a team manages it to pass on all relevant knowledge between team members everybody can learn from the problems, ideas and strategies of others.

According to Berry (2011) a missing overall strategy can lead to a weaker shared understanding of goals and consequently to a negative effect on team and individual performance. The research findings show similar outcomes, as in teams that defined a well-elaborated overall strategy before the simulation days, goal orientation and especially pulling together in the same direction increases. This has a positive influence on team collaboration and communication within those teams. In comparison to that, in teams without a common future strategy, team members sometimes pursued different goals which caused misunderstandings and conflicts within the team. Therefore, discussing and preparing a strategy together raises team learning as well as individual learning, as team members were encouraged to think about problems and to develop ideas together. “This enhanced both the team’s output and its cohesiveness and is as a result of discussed team strategies in the
“prelude to the second session.” (D.2/2)

Teams that are composed of individuals from different cultures and with different backgrounds and skills are positively influencing team collaboration and learning, as these teams are assumed to have a wider range of skills, expertise and perceptions in comparison to homogeneous teams. On the other hand, diversity within teams can create social divisions that lead to deficient social integration, decreased cohesion and negative impacts on the whole team (Mannix and Neale, 2005). The empirical analysis revealed that in the virtual teams different cultural backgrounds of team members have a neutral or positive influence on individual learning progress. Some team members wrote that they had expected cultural issues to appear in their team, and seem pleasantly surprised about the slight meaning of cultural aspects, as the following example shows: “What was really surprising for me was the meaninglessness of the different cultural backgrounds of all teammates. Of course, due to the globalization there are fewer differences than some decades ago but there are a couple of differences left.” (B.4/2) One girl realized in her reflection that although cultural issue are not obvious they always there in multicultural teams: “I found that we all worked well together and even though I am sure there are cultural differences they did not stand out enough for me to notice them.” (B.5/2).

In all teams the experience with different time zones was mentioned negatively, as they lead to difficulties in communication, collaboration and to conflicts due to long waiting for answers or low accessibility of team members. For example one team member of team C mentions this negative impact of time zones on the team interaction: “Because we were all spread throughout different time zones, email communication was painfully slow. It could even take days to get a response to an email.” (A.4/2) In literature, time zone differences are discussed as challenging factors in virtual communication, but they are also seen as chances to work in progress around the clock (Kimble et al., 2000). Nevertheless, different experiences with time zones within a team are identified to indirectly affect individual learning in virtual teams, through communication and interaction problems.

Experiences with technology can have a negative impact on individual learning, as individuals with technological problems or missing technological skills are not able to contribute to the team work in the extent they would have liked. This can lead to demotivation and lower collaboration of individuals and thus can decrease their individual learning. “I am rather dissatisfied with the communication within our team. […] Some members, including myself, could not get access to Skype, which made it virtually impossible to communicate with the other team members during the game.” (A.4/2)
In addition, individuals who experienced ignorance, distinction or ostracism in their team, showed lower learning progress. A reason for that could be that those individuals were excluded from the team collaboration and communication and therefore could not take along the advantages of team work. Furthermore, team members who experienced ostracism and who did not get answers on their comments showed increased demotivation and decline of trust to other team members. According to Fischlmayr (2011) cyberostracism is a huge problem in virtual teams that can lead to decreased trust between team members as well as sunken communication. This is also highlighted in the following quotation: “Later I noticed how huge impact does ignoring others and delays in replying have in establishing trust.” (A.5/2).

Conflicts within the teams were described as negative experiences by all team members. Interestingly, in literature conflicts were often described as very fruitful, constructive and enhancing team as well as individual learning (Druskat, 1996). The research outcomes of this thesis, however, show that conflicts were mainly seen as annoying and disturbing team collaboration. Thus, teams with many conflicts showed decreased team learning, which has a negative impact on individual learning.

The following table summarizes all experiences within a virtual team that influencing individual learning (see Table 8).

<table>
<thead>
<tr>
<th>EXPERIENCES THAT INFLUENCE INDIVIDUAL LEARNING</th>
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</thead>
<tbody>
<tr>
<td>Communication</td>
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<tr>
<td>Conflicts</td>
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<tr>
<td>Culture</td>
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<tr>
<td>Decision Making</td>
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<tr>
<td>Ignorance &amp; Ostracism</td>
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<tr>
<td>Knowledge Sharing</td>
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<tr>
<td>Leadership</td>
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<td>Power Distribution</td>
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<td>Strategy</td>
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<td>Technology</td>
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<td>Time Zones</td>
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<tr>
<td>Trust</td>
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<tr>
<td>Work Distribution</td>
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</tbody>
</table>

Table 8: Experiences that influence Individual Learning in Virtual Teams (developed by the author)
After discussing several experiences in virtual teams, it is necessary to reveal the connection between these experiences and individual learning outcomes and to demonstrate how experiences in virtual teams might lead to individual learning (see Figure 23).

![Diagram](image)

**Figure 23:** How can Experiences lead to Individual Learning? (developed by the author)

Therefore, it is necessary to examine and reveal processes that are occurring between experiences in virtual teams and individual learning outcomes. Based on literature review it can be assumed that reflection could play a specific role in this regard, as there is a huge learning potential cached in experiences (Bolinger and Stanton, 2014). Thus, by reflecting of past events, experiences are challenged and learning processes are caused (e.g. Daudelin, 1996). On that account, the relevance of reflection for individual learning is discussed and analyzed in the following chapter, in order to reveal the significance of reflection processes for individual learning.

### 6.3.6 Role of Reflection for Individual Learning

The way of how people reflect their experiences in virtual teams plays a crucial role for individual learning behavior. As “[in virtual teams, the lack of feedback and information about team processes is a major problem” (Geister et al., 2006, p. 459) it is necessary to foster critical reflection in order to enhance learning behavior of team members.

*Reflective observation* is a process, whereby individuals review their experiences and decisions (Kayes et al., 2005). The essays of team members demonstrate the importance of reflection for individual learning, as the way how people reflected about their experiences lead to different individual learning outcomes. On that account, various forms and ways of reflections can be distinguished.

Firstly, some individuals reflected more team oriented and analyzed team processes whereas others just write about company and game related issues and situations. The
The following citation is an example for an individual who laid an emphasis on company results and who described the attainment of good business results as the main aim of the simulation game: “In conclusion I would like to say that we always achieved our aims, our production cost was low and margin high. We get best result in terms of Result on Sales and Gross Margin.” (C.1/2) Some of these individuals did not or only little reflect about processes within the team and justified issues with the simulation itself: “Within the simulation itself, communication was lacking, but, again, this was more a product of the simulation than our team.” (A.4/2) The outcomes show that individuals who emphasized business and company related issues in their reflection were not able to understand team processes (e.g. knowledge sharing, communication) as much as individuals who reflected about team mechanisms and problems that occurred in the team. This can be explained by the fact that their main point of interest was to win the game and not to interact and collaborate with people from all over the world. Therefore they did not invest much energy in reflecting about the team procedures, but rather tried to find out why the company has for example high production costs in comparison to other companies. The reason for that could lie in the preferred learning styles of such individuals. It can be assumed that individuals who emphasize reflecting about game-related issues rather than about social team processes prefer the converging learning style. Convergers are individuals who favor to solve technical issues rather than dealing with social and interpersonal problems (Geiger, 1992; McCarthy, 2010). As the VIBu Real Game™ emphasizes social experiences and interaction and collaboration with team members over technical tasks it can be supposed that for convergers it is more difficult to learn from the simulation in comparison to other learning types. Furthermore assimilators who are focused on ideas rather than persons (Hayes and Jenkins, 2000) could be influenced in their reflection, as they prefer to write about practical suggestions and improvement proposals instead of personal and social team processes. Those two learning types are more concentrated on the game and the financial outcome of their company, which influences their reflection in the sense that they analyzed business procedures instead of team mechanisms.

On the contrary, individuals whose reflections consist to a high percentage of team related issues and situations, contemplate more about team mechanisms and thus are more able to understand them and learn from them. The following quotation is an example for an individual who reflected about social experiences within the team: “I realized it’s not easy working in team. I mean, you must get in touch with everybody beforehand, make some agreements about time sessions, strategy and overall behavior of the company on the market. More people, more difficulty to reach conclusions.” (C.5/1) The comparison of business- and company-oriented reflections with reflections about team processes reveals
that individuals who emphasized team incidents and experiences have in general a higher learning outcome compared to team members who reflected about game related issues. However, individuals who emphasized company processes and company-related issues in their reflections showed higher learning outcomes in one group of skills, namely in gaining and enhancing business skills.

Furthermore, reflections of individuals differ in the way how people write about their experiences. Some are more descriptive whereas others not just describe experiences but interpret and analyze them. The citation of B.7 is an example for a rather descriptive reflection, as this individual just described the issue and did not try to interpret why the problem occurred: “[A]nother major problem our team has is the price. [A]t the beginning, we did not [know] how is the market going, so we just set our price relatively low compare with other Sub-Producers, our strategy was to attract more customers at the beginning, we thought this may make it easier to trade in the future. However, it did not work eventually. [W]e did not make enough profit to cover our costs [and] we did not notice this until the result out.” (B.7/1) In contrast to that, other individuals analyzed and interpreted the causation of issues and incidents within their team: “It was really challenging to keep pace with everything for example acquiring raw materials, ensuring that they don´t run out too fast or taking into consideration in advance that it takes some time to get raw materials delivered. And that latter point was very crucial to notice, because it forced to close down the production for a while and to wait for the raw material delivery.” (D.4/1)

Beyond, some individuals described that their team should enhance specific processes or that their team should consider developing a strategy, nevertheless those individuals did not write about suggestions or ideas. Thus, they realized that something in the team should be changed but they did not bother about improvement proposals on their own: “I suppose we would need to have one more virtual meeting with the team or we will send opinions buy email to each other as it would be difficult to collect everyone because of time differences, anyway we have to decide what is our strategy for the start.” (C.1/1) In comparison to individuals who presented and discussed concrete ideas to counteract problems, the learning outcome was lower in the former case.

Interestingly, the length of reflection does not influence the learning outcome of individuals. By considering the number of words of each individual it can be concluded that among high learning individuals some had very short reflections (e.g. D.4/1 634 words) and some reflected and analyzed their experiences very extensively (e.g. C.4/2: 2.580 words). In reverse, some low-learning individuals had very long reflections (e.g. A.7/1: 1.111 words)
and some others reflected very shortly (e.g. C.1/2: 548 words). In addition, it does not influence individual learning outcomes if individuals reflected very question oriented or in free-style. An example for question oriented reflection is provided in the following citation: “Were there any conflicts or critical incidents in your team? What were the reasons and how were they solved in the team? Describe the incidents, sources and reasons for them. There were no serious conflicts while I was online, however one point that became a bit of an issue was how to commence the game as well as set the market prices for customers.” (C.6/1). In comparison other individuals wrote their reflections detached from the questions: “In general we communicated on a constant basis. Everybody contribute his ideas and participate equally. There was a lot of respect of the other and interest as well.” (A.9/2)

Consequently, it can be stated, that the way how people reflect about their experiences play a crucial role for individual learning. Individuals who reflected deeper and more critical increased their individual learning, whereas team members who accomplished the reflections rather superficially and who just described what has happened in the teams, did not get the same learning output. This can be explained due to the fact that deep and critical reflection requires thinking about reasons and triggers of experiences in order to understand and learn about them.

In the next chapter individual learning outcomes are discussed in order to provide an overview about what individual can learn in virtual teams.

6.3.7 Individual Learning Outcomes

Individual learning in virtual teams leads to a great number of individual learning outcomes, including virtual skills, business skills, problem solving skills and communication skills. These findings provide new insights in virtual learning literature and reveal which skills individuals can learn and develop in virtual teams.

First of all, an improvement in business skills is one of the main individual learning outcomes in virtual teams. Experiences in the virtual simulation game, such as being responsible for a special department (e.g. production, purchase, sales) or being able to understand business procedures lead to an enhancement in individual business skills: “I am also now more familiar with how to send an invoice and what the requirements are when sending one such as the delivery method, payment time and the cost.” (B.5/2); “I think I learned the intricacies of managing a resource/ production based company, including the different elements that make up the company as a whole.” (C.6/1); In addition, the simulation experience supports individuals to understand mutual relationships and effects of making decisions within a
It was sometimes very surprising how the system reacted to certain decisions." (D.1/1) Thus, individuals learn holistic coherences of economic proceedings and which consequences their actions trail.

In addition, the development and enhancement of so-called “virtual skills” is revealed as a major learning outcome of several team members. Those virtual skills include handling with information and communication technology, social interaction with people from various cultural backgrounds and collaborating and working together without personal contact: “By the finish of these exercises I will have developed new skills (we can refer to them as “virtual skills”) that are extremely important in the global world that nowadays we are living in.” (C.4/1) Furthermore, individuals learn how to cope with the difficulties and challenges of the virtual context, such as missing face-to-face contact and different time zones: “I personally learned that working with other cultures is more complicated than I thought! This is, surprisingly, not because the other team members were very different from myself, but rather because it is so difficult to connect with people who are on different time zones, speaking broken English, and over meeting over weak Internet connections.” (D.7/1) Thus, it can be stated that participation in a virtual simulation can lead to a development and improvement of individual virtual skills. Team members are therefore better prepared for a participation in virtual business teams in companies, as they can use their gained skills and knowledge about the virtual context in the real world.

One of the most important learning experiences in virtual teams is the enhancement of communication skills, which are described as essential for developing trust and autonomy as well as for efficient decision making within a virtual team: “When I think afterwards I learned how important it is to communicate effectively within the team. In that way we could cooperate well together and make the needed decisions.” (D.4/1); “When you communicate with people and get to know them you also build trust at the same time. Communication is the key here, I think.” (D.6/2) These citations illustrate the importance of active and open communication between team members for all other processes within a virtual team. Due to the fact that team members do not have personal contact communication skills are essential in virtual teams (Lurey and Raisinghani, 2001). Especially virtual communication skills, such as discussing issues via Internet and coping with missing body language are developed during the simulation days: “The whole experience has been extremely beneficial in gaining an understanding on business and virtual communication. I have learnt what is difficult about it and what is not so difficult.” (B.5/2) Individuals who gain such virtual communication skills can avoid misunderstandings and conflicts due to lack of mutual understanding or technical challenges in future, as they are trained in this kind of communication and are awake of the
problems it entails.

A further learning outcome in virtual teams are problem solving skills. Individuals who experienced critical incidents and challenging situations and who tried to find solutions for team as well as business problems developed problem solving skills during the simulation. Due to the fact that a simulation is a simplified reflection of the real world, individuals who managed it to reveal and solve issues in the simulation can use these skills also in practice: “My biggest lesson came from the difficulties I had leading up to and during the game.” (A.4/1); “Somehow it just felt more natural put more weight on discussing the problems in this essay, since I think I learned quite a lot out of them.” (A.5/2) As reliance on electronically mediated communication and complicated communication and knowledge sharing in virtual teams increases the potential of conflicts (Dubé and Robey, 2008) problem solving skills are indispensable for individuals working in virtual teams.

In addition, individuals consciously learned about themselves and their own strengths and weaknesses: “I got the opportunity to create new strengths and found some weaknesses which I have to work under.” (B.3/2) The virtual team participation revealed how individuals behave within a group of strangers and which role someone supposes (e.g. leader, operator, negotiator): “It was interesting to see how people work in a group and also how I work in a group.” (D.6/2) Individuals who managed it to learn about their own skills can use these experiences in future jobs and for their career management: “In conclusion I can say that after second session of simulation game I understood that I’m good performer, but not team leader.” (A.3/2) On that account, it can be stated that virtual teams support individuals to recognize and promote their own skills.

Some individuals also extended their leadership skills during the virtual team participation. As those individuals act as coordinators and leaders of their team they learned about how to influence, motivate and direct individuals: “These exercises kind of enforced my way of thinking how to manage a company. My major is leadership and organizing and in a subconscious level I think I was able to use the knowledge I have learned during my studies.” (A.1/2) Thus, individuals who took a leadership position in their team acquired and increased their leadership skills, as they managed to solve team problems, mediate conflicts and instruct individuals to accomplish certain tasks.

Table 9 summarizes the individual learning outcomes in virtual teams that are identified in this empirical study.
6.4 Model Development

The within-case and across-case analyses revealed that team context and individual behavior are influencing experiences in virtual teams. These experiences are reflected in different ways by individuals, whereby the reflection process consequently leads to different individual learning outcomes. These new research findings encourage to the development of a model that demonstrates how experiences can lead to individual learning in virtual teams.

The findings of this empirical study highlight that the team context plays a relevant role for learning in virtual teams. This is because of the fact, that team contextual factors such as psychological safety, task interdependence, task motivation, active feedback giving and fluent discussions are influencing experiences in virtual teams. Furthermore, virtual team factors such as trust, missing face-to-face contact, dependence on technology or cultural issues have a crucial impact on individual experiences. On that account it can be concluded, that the team context is indirectly influencing individual learning in virtual teams through experiences individuals undergo in such teams.

In addition, the research outcomes highlight that individual behavior is highly pertinent for individual learning. Individuals in the virtual teams show great differences in individual behavior, including active vs. passive participation during the simulation, high vs. low motivation, high vs. low contribution to the team assignment, active vs. passive communication etc. This individual behavior affects experiences and reflection processes of all individuals in the team. The results demonstrate that individuals who display a very active behavior during and between the simulations and who reflect very deeply about their experiences, issues and critical incidents learn more than individuals with a contrasting behavior. The crucial role of individual behavior for enhancing individual learning also

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Table 9: Individual Learning Outcomes in Virtual Teams (developed by the author)
explains why there are high-learning individuals in low learning teams (e.g. C.4. in team C) or low learners in high-learning teams (e.g. D.7 in team D). High-learners are therefore presumed to compensate the low learning team context with their individual behavior and their reflection process. Hence, by actively participating and showing interest and motivation to contribute to team collaboration, individuals are able to take along new learning outcomes. In contrast, low-learning individuals do not benefit from a high-learning team context, as with their individual behavior they do not harness the positive learning atmosphere of their high-learning team. Thus, individual behavior has an indirect impact on individual learning through experiences individuals witness in virtual teams and through applied reflection processes.

In the “Individual Learning in Virtual Teams Model” (ILVT-Model) three different reflection processes of experiences can be distinguished (see Figure 24). This differentiation is based on the concept of single-, double- and triple-loop learning by Argyris et al. (1985). Individuals are therefore able to scrutinize and reflect their experiences with the support of three questions: what, how and why.

In the “low reflection process” individuals ponder upon what they experienced in the virtual teams. Those reflections are very descriptive, superficial and often business and company oriented, as individuals do not question how and why team processes and situations are happening. By asking themselves what experiences they witnessed in the teams, individuals do not question underlying approaches or relationships for certain proceedings. In addition, individuals applying this reflection processes do not contemplate about changing ways or procedures to achieve their goals, rather they describe that they would do the things in the same way as last time. This kind of reflection leads to low learning outcomes (LLO) as individuals do not deeply contemplate and reflect about their experiences. Thus, they do not realize relations between team processes and consequences.

Individuals deploying the “middle reflection process” can be identified by their questioning and analyzing of team problems, relationships and coherences. Experiences and situations are not just described but additionally individuals discuss how they could have emerged. This type of reflection can be matched with the so-called “normal reflection”, which is defined as an evaluation of how a person has noticed, thought and acted (Hoyrup, 2004). The main process of this form of reflection is to review an experience, to analyze the causes and to draw conclusions for future events (Reynolds, 1998). In this middle reflection process, approaches and ways to reach goals are questioned: “The strategy that our company and team had come up with could not be implemented effectively as the game parameters had changed.” (C.6/2) The reflection about what experiences are occurring in the team and how
these experiences and team proceedings are emerging leads to middle learning outcomes (MLO), because individuals contemplate about team processes and their causes, but do not scrutinize underlying goals and values.

The highest kind of reflection is a very deep and critical reflection about team procedures, situations and experiences. In literature this type of reflection is called “critical reflection” or “critical self-reflection” and focuses on questioning taken-for-granted assumptions and contextual aspects (Brookfield, 2000). Individuals applying this reflection process ponder about coherences, triggers and consequences within their team. They describe what and how something is happening and beyond why situations or conflicts are emerging. According to Gray (2007) critical reflection bridges experiences with learning by involving both feelings and cognition. Furthermore, the reasons why individuals act or think in a specific way are figured out and the goals of the company and the team are often scrutinized: “So, we changed more or less the whole company values, goals, strategy.” (D.1/1) By reflecting about why something is intended and why there should be a transformation to new goals individuals reach a very deep and critical phase of reflection: “So in addition to the strategy we had before the start of the second session, the fact that we lacked members online forced us to rethink the sources of staying competitive during the game as well.” (B.2/2)
interesting example of this type of reflection is demonstrated in the following quotation: “For the next round I am going to question my team if it is our goal to win the game or should we change the system? This is from my point of view even more interesting.” (C.3/1) In this citation the individual completely questions the whole aim of the team and the company, which is a good example for the third type of reflection. These findings are in accordance with Bulpitt and Martin (2005) who revealed that if the team context is approached in a different way as without the reflection an individual has learned something new. In addition, the process of critical self-reflection, which includes reassessing the approaches how individuals constitute problems and question their orientation to appreciate, think and act, belongs to the third type of reflection (Mezirow, 1990). By critical self-reflection, self-identity, goals and personal values are scrutinized (Reynolds, 1998) as demonstrated with the following example: “Some of my previous assumptions have been changed. For example, now I think that leadership doesn’t mean an authoritarian leader whose rules have to be obeyed. Teams can be more effective if everyone has the opportunity to talk and express his/her ideas.” (C.4/2) Individuals who are in this deepest phase of reflection realize hidden processes, coherences and causes and thus their learning outcome is extremely high (HLO). This is confirmed by Hoyrup (2004) who validated that critical reflection causes deeper level learning and a transformation of psychological mechanisms that establish the interpretations of individuals.

These three types of reflection processes are partly influenced by individual behavior. For example individuals who tend to be very problem aware, handed in reflective essays in which problems are recognized and analyzed very deeply. Furthermore, individuals who showed high interest and motivation to participate in the virtual teams display more critical and deep reflections about team processes. Nevertheless, some individual behavior does not directly impact reflection of individuals, such as active participation or abstract conceptualization. These individual modes of behavior are only indirectly affecting reflection processes through experiences. On that account, in the “ILVT-Model” the arrow depicting from individual behavior to reflection is dashed, as only a part of individual behavior is directly influencing reflection processes.

The sum of learning outcomes of an individual is composed of each single learning outcome of this individual. This implies that an individual can have low-, middle- and high-learning outcomes from different experiences. For example, an individual who has three independent experiences in a team can reflect about each of these experiences in a different way. If an individual experiences conflicts within the team and his mode of behavior is that he is rather problem aware than solution oriented, the reflection of his experience would be not very
deep. Thus, the learning outcome from his experience would be rather low. Another experience with the business strategy of the company is reflected by the same individual deeper due to the fact that he has for instance a good understanding of business processes from his educational background. Therefore, the individual has a middle-learning outcome as he really questions the way (e.g. low production costs) how to achieve a certain goal of the company (e.g. profit) and contemplates about a change of this approach (e.g. high quality products). Furthermore, the same individual can scrutinize the goal of the team (e.g. to win the game) and through the process of deeply analyzing and reflecting team processes a high learning outcome could be the consequence. On that account, it can be concluded that an individual is able to deploy different reflection processes for different experiences that lead to distinct learning outcomes. The reflection process itself is directly affected by individual behavior and experiences and indirectly influenced by the team context.

Based on these new findings it can be inferred that high learning individuals can have low learning outcomes, if their reflection process is superficial and descriptive. On the contrary, low learning individuals can reflect some experiences very deeply which can consequently lead to high learning outcomes. Nevertheless, the sum of learning outcomes reveals if an individual is a high-, middle- or low-learning individual in general. Hence, the role of reflection is crucial for individual learning in virtual teams as it constitutes the process that affects learning outcomes.

The sum of individual learning outcomes has in further consequence a direct impact on individual behavior. For example an individual who gains communication and virtual skills (LO) during his team participation, consequently change his/her individual behavior in future: “And now that everything has finished […] I think I have learnt a set of new skills […] that are going to help me to cope, not only in my future work but also in my daily life.” (C.4/2) Another example demonstrates a change in individual behavior as a cause of gained skills in problem solving during the virtual team participation. “My biggest lesson came from the difficulties I had leading up to and during the game. […] We should expect the unexpected. […] Next session, and in future real-world situations in general, I will always consider what difficulties and issues could possibly arise in any given situation ahead of time and at least think about what I should do to solve them.” (A.4/1) These citations highlight that learning outcomes directly affect individual behavior in future, as due to obtained skills and knowledge the approaches and ways of individuals to handle situations, problems and incidents change. A further quote reveals that learning outcomes can even lead to a new orientation and clarity about what to work in future: “Also, I had an opportunity to try my skills in a field I had never had a chance before […] so it made me feel more secure in myself and convinced in what I
want to work in the future, maybe revealed me some roots of my future profession" (B.6/1) In addition, individual learning about own strengths and weaknesses leads to a shift in individual behavior: “During the games I realized that by nature I am not the boss. I don't have special power to organize people and inspire them to do anything. As for me personally, just performing the job under the guidance of someone else I can bring more advantages to the team.” (A.3/2). As demonstrated with this citation the modification in individual behavior (e.g. from a leader to an operator) can bring along benefits for the whole team. Individuals, who are aware of the things they are good at, can positively influence team collaboration. Thus, this example also highlights the indirect impact of learning outcomes on team context through a change of individual behavior.

7. CONCLUSION

Based on the theoretical background the process of individual learning in virtual teams is examined, discussed and analyzed in this thesis. The implementation of the empirical research study contributed to the development of the “ILVT-Model” in which the influence of experiences on individual learning is demonstrated.

The ILVT-Model shows that the experiences in virtual teams are on the one hand influenced by the team context, consisting of social, virtual and cognitive team factors. In addition, experiences in virtual teams are affected by individual behavior, such as active participation, motivation and interest. Beyond, individual behavior and team context are mutually influencing each other, as team processes can impact individual modes of behavior and vice versa.

The experiences in virtual teams are reflected by individuals in different ways, whereby the reflection processes are again influenced by individual behavior, such as problem awareness, solution orientation or motivation. Three different types of reflection can be distinguished, depending on three main intentions individuals attempt to answer. Thereby individuals question what, how and why situations, problems and processes emerge. These different reflection processes lead to three distinct learning outcomes, namely to low- (LLO), middle- (MLO) or high-learning outcomes (HLO). Individual learning outcomes include the acquisition and enhancement of communication skills, virtual skills, problem solving skills as well as a better estimation of own strengths and weaknesses. The sum of these individual learning outcomes consequently influences and changes individual behavior and indirectly affects the team context, whereby an iterative process of learning might be established.

To summarize, the outcomes of this thesis reveal that individual learning is influenced by
experiences in virtual teams through the process of reflection. Thus, the way how people reflect experiences has a crucial impact on individual learning.

8. LIMITATIONS AND FUTURE RESEARCH

Due to the fact that literature focusing on individual learning in virtual teams does not go much into depth, this study aims at giving further insights in this research field. In addition, this thesis provides new findings about the impact of reflection on individual learning outcomes. This study offers novel information and can serve as a basis for future research.

Even though this study demonstrates interesting outcomes to the area of virtual learning, it should be noticed that the research is also subject to some limitations.

First of all, as the nature of the theoretical and empirical study is a master thesis, its scope is rather limited, since it is subject to restrictions in time, volume and sample size. Consequently, it should be mentioned that neither the theoretical part dealing with the review of literature nor the empirical research claim for completeness.

Besides, only four teams with a total number of 31 participants build the sample of the empirical part. All those 31 participants are students. Thus, it is necessary to mention that employees working in companies might witness different situations in their virtual business teams and reflect in a different way about team processes and experiences. On that account, future research including employees in the sample would contribute to new findings in the field of learning in virtual teams.

Another limitation of this master thesis is that the period of consideration of the virtual teams is very short, as there is only one week between the first and the second simulation day. Thus, long-term consequences and learning outcomes could not be detected from the reflective essays and team assignments.

In addition, the qualitative research study is subject to several limitations, as for example students were just coming from five different universities. Hence, it would be interesting for future research to include nationals from other universities, companies and cultures to verify and enrich the qualitative results. In addition, the study is a context specific study and the results are only to a limited degree generalizable. Thus, more research with a control group setting is needed.

In addition, demographic factors were not taken into consideration in the data collection, due
to the limited scope of time and sample size. Thus, this empirical study does not include the influences of gender, age and country of origin on individual learning in virtual teams. Hence, it is suggested that future research should clarify the role of demographic impact on the research focus of this thesis. Another interesting aspect for future research would be to take a quantitative look on the topic of individual learning in virtual teams.

Although some limitations are figured out, the findings of this study contribute valuable knowledge to the field of learning in virtual teams. Nevertheless, it is important to state that research outcomes cannot be generalized to each individual participating in a virtual team.

The outcomes of this study should predominantly provide a better understanding of the individual learning processes in virtual teams and the important role of reflection for individual learning. Furthermore, the findings of the study should serve as a basis for future research in this special field of team research.
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