Personality as a Determinant of Customer Experience Quality and Value-in-Use in a Public Crisis Situation – The Case of E-Learning

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Abstract

This thesis was designed to investigate whether differences exist between students' personalities regarding their perceived Customer Experience Quality and their perceived Value-in-Use, for the case of e-learning. In particular, the personality dimension Introversion-Extraversion was investigated. Furthermore, it was examined whether students' Fear of the Coronavirus Disease 2019 moderates the relationship between Introversion-Extraversion and the perceived Customer Experience Quality as well as the relationship between Introversion-Extraversion and the perceived Value-in-Use. Using survey data on asynchronous e-learning as well as survey data on synchronous e-learning, multiple two-way ANOVAs were conducted. It was found that no significant differences for either asynchronous e-learning or synchronous e-learning regarding the Customer Experience Quality and the Value-in-Use exist between introverted and extraverted students. Furthermore, no significant interaction effect on the perceived Customer Experience Quality and Value-in-Use was found for introverted and extraverted students with either low or high Fear of the Coronavirus Disease 2019.

Keywords: COVID-19; e-learning; introversion-extraversion; customer experience quality; value-in-use; two-way ANOVA.

1. Introduction

University lectures are usually characterized by large numbers of participants and a predominantly frontal teaching approach. Students follow presentations in real time, take notes and use additional online materials only for preparation or follow-up of teaching content. The central tasks of the lecturer involve preparing and presenting his[1] lecture content, communicating with students and organizing his courses (Freie Universität Berlin, 2020a). In 2017, around 90 percent of university lecturers stated that they would supplement their teaching with digital elements, such as the use of learning management platforms. However, only 42 percent of lecturers actually used blended learning formats, i.e. communication consisting of classroom teaching combined with e-learning, frequently or occasionally. On the student side, 61 percent of the students surveyed were in favor of blended learning formats. Nevertheless, a preference

for pure e-learning formats did not appear to exist since 68 percent of the students surveyed continued to find classic teaching tools, such as blackboards and books, motivating (Schmid, Goertz, Radomski, Thom, & Behrens, 2017).

Until the Coronavirus Disease 2019 (COVID-19), e-learning services at Freie Universität Berlin were also only used as an addition to classroom teaching. However, as a result of the risk posed by COVID-19, in 2020 the university was forced to conduct the entire summer semester digitally, with possibly more semesters with a large proportion of online courses to follow (Freie Universität Berlin, 2020e). For universities, such as Freie Universität Berlin, which offer teaching services, it is therefore important to know the factors that influence students' perception of the quality of their e-learning experiences and ultimately their perceived value through e-learning.

Since personality traits of individuals are relatively stable over time (Ashton, 2013; Johnson, 1997), individuals' personality could be a crucial factor in this respect. In particular, the fact whether a person is intro- or extraverted might influence the perception of their e-learning experience as Introversion-Extraversion influences how information is pro-

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[1] Words used herein, regardless of the number and gender specifically used, shall be deemed and construed to include any other number, singular or plural, and any other gender, masculine, feminine or neuter, as the context requires.

cessed by individuals and which communication and learning settings are preferred (Capretz & Ahmed, 2010; Felder & Silverman, 1988). Due to the fact that e-learning fundamentally changed used teaching and communication tools, this thesis will investigate the research question of whether significant differences between introverted and extraverted students regarding their perceived Customer Experience Quality and their perceived Value-in-Use exist, for the case of e-learning at Freie Universität Berlin. In doing so, synchronous and asynchronous e-learning services are compared with each other.

Given that the outbreak of COVID-19 was the reason for the digital summer semester 2020, this thesis will also investigate how students' perception of COVID-19 influences their Customer Experience Quality and Value-in-Use regarding e-learning. For instance, de Keyser, Verleye, Lemon, Keiningham, and Klaus (2020) already argued for the need for research on the impact of the COVID-19 pandemic on Customer Experiences. It was found that the fear of diseases triggers uncertainty and irrational behavior and can thus influence the way individuals think and behave (Pappas, Kiriaze, Giannakis, & Falagas, 2009). It was also found that COVID-19 can cause fear in people (Ahorsu et al., 2020). The mass media, social isolation, the fear of losing loved ones or the insecurity of losing one's job are only a few reasons for this (Pappas et al., 2009). In particular, introverted personalities are attributed a higher level of anxiety, compared to extraverted personalities (Dewaele & Furnham, 1999; Eysenck, 1965). Therefore, this thesis will investigate the research question of whether there is a significant interaction effect of Introversion-Extraversion and Fear of COVID-19 on students' Customer Experience Quality and Value-in-Use.

The second section of this thesis provides an overview of the theoretical background of the research topic under investigation. As part of this, an overview of the e-learning services of Freie Universität Berlin is given and the theoretical constructs of Value-in-Use, Customer Experience Quality, Introversion-Extraversion as well as of Fear of COVID-19 are introduced. In the third section, the hypotheses to be tested are derived on the basis of the reviewed literature and past study results which result in the research model of this thesis. After an overview of the quantitative method approach in the fourth section, in the fifth section the results are presented and interpreted with respect to the research questions. The thesis ends with the discussion part in the sixth section, including practical implications as well as an outlook for possible future research.

2. Theoretical Background

2.1. E-Learning

2.1.1. Distance Education and E-Learning

Although there is no general agreement about the definition of "Learning", many researchers define it as a permanent change in behavior resulting from practice or experience (Baron, 2001; Logan, 1970; Myers, 2014). Lachmann (1997) established a less absolute definition of learning and defines it as a process rather than a permanent change of behavior, whereby experiences can contribute to learning processes:

> *"Learning is the process by which a relatively stable modification in stimulus-response relations is developed as a consequence of functional environmental interaction via the senses"* (Lachmann, 1997, p. 477).

In recent decades, the use of information and communication technologies has provided new opportunities for learning services which also enabled the physical separation of teachers and students in higher education, for instance. These distance education systems deliver education at a distance by video, interactive audio or computers, while simultaneously meeting the needs of individuals (Zigerell, 1984). According to Guri-Rosenblit (2005), although "Distance Education" and "E-Learning" are not interchangeable terms, e-learning can be used for distance educational purposes. In literature, e-learning is often considered as a new generation of distance education and definitions from different perspectives exist. Emphasizing the technological aspects of e-learning, it refers to *"the use of electronic media for a variety of learning purposes that range from add-on functions in conventional classrooms to full substitution for the face-to-face meetings by online encounter."* (Guri-Rosenblit, 2005, p. 469). Thus, e-learning is a form of e-service whose delivery depends on information technologies (Rowley, 2006).

Ebner et al. (2013) take a closer look at the interaction aspects of e-learning. Although students have to sit alone in front of a technical device, they do not necessarily have to learn in isolation. Rather, there is an opportunity for exchange via digital communication channels. In this context, teachers act as e-moderators who control and structure the communication and exchange of learning groups in a targeted manner (Ebner et al., 2013). As parameters for forms of e-learning communication, Ebner et al. (2013) introduce three parameters: "Supervision", "Time Dimension" and "Relationship of the Participants", i.e. who communicates with whom. Teachers can provide supervision or offer courses without additional supervision. Regarding time, e-learning models can be synchronous, asynchronous, or a mix of the two. If communication with and between students takes place in real time, this is referred to as "synchronous" communication, which is the case with live lectures or live chats, for instance. On the other hand, communication can also take place "asynchronously", that is time-delayed, which is the case with e-mail exchanges or recorded video lectures, for instance. With regard to the relationship of participants, a distinction can be made between direct one-to-one exchange (1:1), the exchange of individual teachers with several students (1:n) and the exchange of a large number of participants on one platform (n:n) (Ebner et al., 2013).

2.1.2. E-Learning at Freie Universität Berlin

Freie Universität Berlin (FUB) defines e-moderation and the supervision of students, parallel to the provision of digital

teaching materials, as central success factors for digital teaching and mainly relies on Blackboard (BB) for asynchronous e-learning purposes and on real-time meetings via Cisco Webex (Webex) for synchronous e-learning purposes (Freie Universität Berlin, 2020c).

BB is the central learning management system at FUB and has been used to support teaching at the university since 2004 by organizing and structuring learning content. The platform is provided by an external firm and can be accessed from the computer as well as from mobile devices, for which a corresponding app can be downloaded. In the summer semester 2020, for instance, 1,738 lecturers and 22,255 students were enrolled in the 2,467 actively used BB courses during the semester (Freie Universität Berlin, 2020d). In BB, each student has a personal profile and the opportunity to access attended courses and the associated teaching material, such as recorded lectures, video tutorials, lecture slides or literature. The platform is frequently used for organizational purposes, such as the announcement of dates or other relevant announcements (Freie Universität Berlin, 2019). Furthermore, BB provides some communication networks for asynchronous communication forms. For instance, it is possible for teachers to set up working groups for students. In addition, wikis, discussion forums or office hours blogs can be created as a forum for collaboration and course participants have the possibility to send messages to teachers or to other students (Freie Universität Berlin, 2019). BB is therefore suitable for asynchronous 1:1 communication as well as for asynchronous 1:n or n:n communication (Ebner et al., 2013).

In addition to the resources provided and the time-shifted communication possibilities on BB, online lectures can be held in real time using software, such as Webex. Within the program, lecturers and students meet in a virtual room and are connected via video and audio transmission. The synchronous communication is particularly suitable for holding live lectures and live office hours, but also for student learning in the context of smaller group work. In addition to the possibilities of audio and video sharing, Webex offers the possibility of screen transmission and interaction within a live chat (Freie Universität Berlin, 2020a). Therefore, it is suitable for synchronous 1:1 communication as well as for synchronous 1:n and n:n communication (Ebner et al., 2013).

2.2. Value-in-Use

2.2.1. Service Dominant Logic

In order to capture the construct "Value" with regard to the research purpose of this thesis and make statements about how it is generated, different perspectives can be taken. The "Goods Dominant Logic", for instance, takes a supply-side perspective and focuses on tangible goods and their embedded value, which means that a supplier can determine the value of a good by embedding it in the goods it produces (Vargo & Lusch, 2004). The ultimate value a supplier receives in exchange for these tangible goods is called "Value-in-Exchange" (Sandström, Edvardsson, Kristensson,

& Magnusson, 2008). However, especially for services that require the involvement of customers (Gabler, 2020), this perspective seems inadequate which is why Vargo and Lusch (2004) propose a shift in perspective towards a "Service Dominant Logic" (SDL). Its origins can be traced back to Carl Menger in the 19th century, who already regarded value as subjective and argued that a good must be able to be used in order to satisfy needs. Otherwise, it is useless and no longer a good (Menger, 1968).

SDL adopts a customer-centric and relational perspective and shifts its focus from the product exchanged and physical resources to the process of exchange as well as to knowledge and skills as primary resources. From the perspective of SDL, the "Value-in-Use" (ViU) of a customer can be defined as the extent to which the customer's goals have been achieved through the use of a service, at which the role of the provider is to formulate value propositions (MacDonald, Wilson, Martinez, & Toossi, 2011; Payne, Storbacka, & Frow, 2008). Customer goals determine the relative salience of service features so that customers are aware of them and attach meaning to them (Puccinelli et al., 2009; Woodruff & Flint, 2006). As an active co-creator, the customer defines his individual ViU by integrating knowledge and skills within the framework of his usage processes (Vargo & Lusch, 2004). This co-creation interaction between supplier and customer implies that exchange is a relational construct from the SDL perspective (Vargo & Lusch, 2004). The case of e-learning illustrates this as students and instructors need to interact on electronic engagement platforms in order to exchange knowledge and skills (Kleinaltenkamp, Storck, Gumprecht, & Li, 2018).

2.2.2. Dimensions of Value-in-Use

In the literature, various approaches exist to conceptualize "Value". Zeithaml (1988), for instance, offers a one-dimensional model approach and conceptualizes value as the customer's overall assessment of the utility of a product based on what is given and what is received. In contrast, there are multidimensional model approaches that define value as a multidimensional construct and consider various value components (Sheth, Newman, & Gross, 1991; Sweeney & Soutar, 2001). Sweeney and Soutar (2001), for instance, developed the "Perceived Value (PERVAL) Model", distinguishing between a "Functional", "Emotional" and "Relational" value dimension which together make up the value of an offer. The functional value of an offer is made up of the two subcomponents "Price" and "Quality", whereby the utilitarian benefit results from the perceived performance of an offer and the perceived price-performance ratio. The emotional value refers to the hedonistic value of an offer, which results from the feelings or affective states that an offer generates (Sweeney & Soutar, 2001). The social or relational value involves the role of other actors, whose behavior, motivation and support can also be crucial in generating value for customers in terms of their personal status or recognition by others (Lemke, Clark, & Wilson, 2011; Sweeney & Soutar, 2001). Although Sweeney and Soutar's (2001) PER-

VAL model can be used as a starting point for the development of value measurement tools, it focusses on the assessment of value before usage. This is reflected, for instance, in the relational value dimension where the actual interaction between users is not taken into account, but only the recognition by others.

Following the SDL, other research focuses instead on customer value in terms of ViU and transfers the multidimensional understanding of value to customer usage processes (Bruns & Jacob, 2014, 2016; Kleinaltenkamp, Storck, et al., 2018). Referring to the concrete case of e-learning, Kleinaltenkamp, Storck, et al. (2018) conducted a qualitative study at a German university and identified the individual ViU dimensions of students and lecturers for the case of asynchronous e-learning[2]:

- *Task Simplification*

- *Pressure Reduction*

- *Flexibility*

- *Cost Decrease*

- *Hedonistic Benefit*

- *Motivation*

- *Personal Self-Fulfillment*

- *Proficiency*

- *Self-Portrayal*

- *Uncertainty Reduction*

- *Perceived Control*

As already stated, according to Sweeney and Soutar (2001), the value of an offer is made up of a functional, an emotional and a relational value dimension. The eleven ViU dimensions identified by Kleinaltenkamp, Storck, et al. (2018) contain more functional goals, such as "Task Simplification" through time savings and reduction of effort through the use of e-learning, "Proficiency", "Cost Decrease" as well as "Flexibility" regarding time and space. In addition, Kleinaltenkamp, Storck, et al. (2018) identified a "Hedonistic Benefit" dimension for the case of e-learning. Furthermore, they found that individuals felt affective benefits in the perceived control over processes and resources that affected their own work and also perceived an uncertainty reduction due to less misinformation and communication. Because of e-learning, students achieved a reduction in stress (Pressure Reduction) during their daily tasks as well as pleasure and interest in fulfilling their tasks (Motivation). On a personal level, e-learning contributed to the fulfilment of personal ambitions and interests (Personal Self-Fulfillment) and offered the opportunity to demonstrate abilities and achievements

during one's own work (Self-Portrayal) (Kleinaltenkamp, Storck, et al., 2018).

Other actors' behavior, motivation and support might also lead to a perceived "Relational Value" regarding e-learning (Lemke et al., 2011; Sweeney & Soutar, 2001). Since both asynchronous and synchronous forms of e-learning are investigated in the context of this thesis, an additional relational ViU dimension is considered. Compared to asynchronous e-learning settings, particularly synchronous e-learning settings offer additional interaction possibilities so that students and lecturers are able to exchange knowledge in real time (Freie Universität Berlin, 2020a; Sandström et al., 2008).

2.3. Customer Experience Quality

Already in the late 1930s, Keynes (1936) argued that customers buy products to satisfy their desire for experiences. Researchers like Holbrook and Hirschmann (1982) were among the first to study experiential aspects of consumption and according to Holbrook (1999), the experiences that customers make create value. Furthermore, Pine and Gilmore (1998) coined the term "Experience Economy" and stated that experiences should be treated as an economic offering and that merely providing services is no longer sufficient. Becker and Jaakkola (2020) provide a definition for the construct of "Customer Experience" (CE) and define it as *"non-deliberate, spontaneous responses and reactions to particular stimuli"* (p. 637), deriving from various touchpoints with the provider. Those responses include the customer's subjective cognitive, affective, emotional, social and physical responses over the time of the customer journey (Verhoef et al., 2009).

CEs can vary in terms of the nature of the touchpoint, as it can be human, physical, digital or a combination thereof and depend on the specific stage of the customer journey in which they take place - pre-purchase, purchase or post-purchase. Furthermore, the individual context, that is the transitory personal state of the customer as well as the social context - emerging from social groups - and the environmental context - composed of natural, economic, public or political externalities - can be determining factors of CEs (de Keyser et al., 2020). With regard to the SDL, CEs are influenced both by elements that the provider can control and by elements over which the provider has no control which is why value is co-created and the provider's role is to deliver value propositions (Lemke et al., 2011; Vargo & Lusch, 2004; Verhoef et al., 2009). The "Customer Experience Quality" (CEQ) finally comprises the perceived superiority or excellence of the CE and is judged individually with respect to its contribution to ViU, i.e. abstract goals (Edvardsson, 2005; Lemke et al., 2011; Sandström et al., 2008). According to Lemke et al. (2011), with reference to Payne et al. (2008), the perceived CEQ is composed of different dimensions and *"goes beyond the notion of service quality"* (p. 859). These dimensions can be assigned to three encounters: the "Service Encounter", the "Communication Encounter" and the "Usage Encounter" (Lemke et al., 2011).

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[2]See Table 2 for further details.

Service Encounter:

The Service Encounter includes categories regarding the quality of the service, for instance in terms of the quality of the offer itself or the accessibility and reliability of the service personnel. In order to measure the perceived Service Quality (SQ), Parasuraman, Zeithaml, and Berry (1988) developed the "SERVQUAL Scale" consisting of 22 items, which cover the following aspects (Parasuraman et al., 1988, p. 23):

1. *Tangibles,* which includes items regarding physical facilities, equipment and appearance of personnel.
2. *Reliability,* which contains items regarding the ability to perform the promised service dependably and accurately.
3. *Responsiveness,* which refers to the willingness to help customers and provide prompt service.
4. *Assurance,* which relates to the knowledge and courtesy of employees and their ability to inspire trust and confidence.
5. *Empathy,* which refers to caring, individualized attention the firm provides its customers.

With the increasing use of the Internet, the focus of service research has shifted from the investigation of offline CEs and offline CEQ to the investigation of e-CE and e-CEQ (Elsharnouby & Mahrous, 2015; Parasuraman, Zeithaml, & Malhorta, 2005; Zeithaml, Parasuraman, & Malhorta, 2002). Compared to offline communication, the specifics of online communication lie above all in the interactivity and multimedia, the lower degree of personal contact, the speed and range of information dissemination as well as the heterogeneity of users (Frohne, 2020; Rose, Hair, & Clark, 2011). Santos (2003) defines "E-SQ" as the *"customers' overall evaluation and judgment regarding the excellence and quality of e-service delivery in the virtual market place"* (p. 235). E-SQ can be assessed through measurement scales that include both the evaluation of system attributes, such as the ease of use or design, as well as the evaluation of service attributes, such as the availability of the service personnel (Elsharnouby & Mahrous, 2015; Gera, 2011; Parasuraman et al., 2005). For the special case of asynchronous e-learning, Udo, Bagchi, and Kirs (2011) modified the SERVQUAL scale in order to assess the SQ of e-learning. In particular, the authors renamed the "Tangibles" dimension to "Web Content" since online settings have fewer physical attributes and are more multimedia in nature.

Communication Encounter:

According to Lemke et al. (2011), the construct of CEQ not only includes the perceived SQ, but also the perceived quality of the relationship with the provider which can be assigned to the "Communication Encounter". In the context of this thesis, from the students' perspective, the provider is the course instructor. The perceived "Relationship Quality" (RQ) with a provider results from the overall assessment by the customer of the quality of the interaction and the strength of the relationship with the provider (de Wulf, Odekerken-Schröder, & Dawn, 2001; Gummesson, 1987). RQ is a multidimensional construct for which several conceptualization approaches exist (de Canniere, de Pelsmacker, & Geuens, 2009; de Wulf et al., 2001). Keating, Rugimbana, and Quazi (2003), for instance, adapted Page's (2000) conceptualization of RQ for the online retail context. The findings of their study show that trust in the provider, the perceived amount of effort a provider makes as well as how a provider values its customers, understands and communicates with them form the RQ construct. For the context of e-learning, the findings of Swan (2002) as well as of Kuo, Walker, Belland, and Schroeder (2013) illustrate the importance of interaction with course instructors as it contributed significantly to students' satisfaction with e-learning and learning from online courses in general.

Usage Encounter:

The e-learning services offered by FUB are delivered in settings where many students are present at the same time. Therefore, in the context of value co-creation, relational experiences with peer students also play a role for the overall CEQ (Schouten, McAlexander, & Koenig, 2007; Verleye, 2015). Lemke et al. (2011) summarize the RQ with other customers under the "Usage Encounter", with peer customers and their identities being involved in value creation. Several studies found that other customers' behavior influences CEs and can influence the satisfaction with a service as well as the emotional and behavioral responses toward a service significantly (Grove & Fisk, 1997; Hui & Bateson, 1991; Martin & Pranter, 1989; Thakor, Suri, & Saleh, 2008). With regard to e-learning, Swan (2002) discovered that student-student interaction influenced students' satisfaction as well as their perception of learning from an online course. Gomez-Rey, Barbera, and Fernandez-Navarro (2016) found that students considered interaction with other students among the most important variables when evaluating the quality of their e-learning experience.

2.4. Personality and Introversion-Extraversion

Customers' evaluation of their CE and their perceived ViU is subjective and is influenced by customer specifics, such as demographic characteristics or personality traits (Becker & Jaakkola, 2020; Holbrook & Hirschmann, 1982; Sandström et al., 2008; Verhoef et al., 2009), which can act as individual filters that include *"everything connected to the individual user"* (Sandström et al., 2008, p. 116). Focusing on the impact of "Personality" in this thesis, Allport (1937) was among the first researchers who shaped the field of personality psychology and defined an individual's personality as *"the dynamic organization within the individual of those psychophysical systems that determine his characteristic behavior"* (Allport, 1961, p. 28). He and other researchers stated that the construct of Personality is composed of several lesser elements, that is a unique pattern of personality traits, which cause individual differences between people (Baughman & Welsh, 1962; Guilford, 1959). According to Ashton (2013),

personality traits refer to *"differences among individuals in a typical tendency to behave, think, or feel in some conceptually related ways, across a variety of relevant situations and across some fairly long period of time."* (p. 27). Therefore, personality traits show up over a longer period of time and represent structures or habits within a person that imply similar reactions in similar situations (Allport, 1937, 1961; Johnson, 1997). Individuals even tend to look for situations and circumstances that enable trait expression, such as extraverted individuals like to spend time on events and parties that promote their gregariousness (Snyder, 1983).

One of the purposes of this thesis is to measure the "Introversion-Extraversion" (I-E) of students as part of their personality. One of the first researchers who introduced the concept of I-E in the early 1920's was Carl Gustav Jung, who considered I-E as differing orientations toward the world. According to him, extraverted people are more outward focused and oriented toward external, objective experiences. They are perceived as sociable and outgoing by others. Introverted people, in contrast, are more inward focused and oriented toward internal, subjective experiences. They tend to focus on their own thoughts and feelings which is why they are perceived by others as quiet and reserved (Jung, 1971).

Extraverted and introverted personalities also differ in the way they process information. Since extraverts are better in processing sensory information, compared to introverts, their brains search for external stimuli. Introverts, in contrast, show more brain activity in areas where problem-solving, introspection and complex thinking are carried out (Laney, 2005). Consequently, extraverted personalities learn best through active experimentation and communication, while introverted personalities learn primarily through introspective information processing and preferably alone (Felder & Silverman, 1988).

In order to measure individuals' personalities, according to McAdams (1997), it was Bernreuter (1931) who developed the first multi-trait personality inventory, which contained multiple scales to assess the six trait dimensions of "Neuroticism", "I-E", "Dominance-Submission", "Self-Sufficiency", "Confidence" and "Sociability". Over the following years, further personality inventories were developed differing in the number and nature of personality dimensions distinguished. However, almost every conceptualization contained I-E as a central personality dimension (Costa & Mccrae, 1989; Eysenck & Eysenck, 1975; Eysenck & Wilson, 1991; John, Donauhue, & Kentle, 1991).

Over time, the differentiation of five basic personality dimensions, known as the "Big Five", became established in literature (Tellegen, 1991). First mentioned by Goldberg (1981) and evidenced through research by Cattell (1946); Norman (1963); Tupes and Christal (1961) as well as by Wiggins (1968), the Big Five reduce the scope of trait dimensions to five basic bipolar dimensions: "Extraversion", "Agreeableness", "Conscientiousness", "Neuroticism" and "Openness" (McCrae, Costa, & Busch, 1986). Regarding the single dimensions, several conceptualizations have been developed

over time, which partly differ regarding their associated traits (Eysenck & Eysenck, 1975; Hogan, 1983; Tellegen, 1985). In the context of this thesis, the focus is on I-E and it is referred to John and Srivastava (1999), Costa and Mccrae (1985, 1992) as well as to McCrae and Costa (1987), who consider gregariousness, assertiveness, activity, excitement-seeking, positive emotions and warmth as traits of Extraversion. Introverted personalities, in contrast, are characterized by more negative emotions as well as passive, quiet, reserved and aloof traits. Research has shown that these traits are common across different countries and cultures (McCrae & Terracciano, 2005; Schmitt, Allik, McCrae, & Benet-Martinez, 2007).

2.5. Public Crisis Situations

2.5.1. The COVID-19 Pandemic

How customers experience services and judge their experiences can be influenced not only by personality traits, but also by individually perceived contextual conditions (Chandler & Vargo, 2011). "Context" is defined as *"the relevant aspects of a situation, which are relevant for the resource-integrating activities"* (Löbler & Hahn, 2013, p. 259) and is usually only partly within the control of the provider (Chandler & Vargo, 2011; Löbler & Hahn, 2013; Lemon & Verhoef, 2016). External environments provide contextual conditions, which are dynamic and subject to continuous change (Chandler & Vargo, 2011; de Keyser et al., 2020; Lemon & Verhoef, 2016). Therefore, an *"extreme crisis can have a strong, negative, and enduring effect on the customer experience"* (Lemon & Verhoef, 2016, p. 79) and thus, on the CEQ. Extreme public crises are undesirable, unexpected phases of disorder that threaten societies and shatter their orders. According to Boin, Hart, Stern, and Sundelius (2017), the importance of the endangered values and structures determines how deeply a crisis situation is sensed by the public. The more important the endangered values and structures are, the stronger a crisis is perceived.

Pandemics are transboundary crises that threaten human health and are marked by uncertain developments regarding numerous areas of life (Boin et al., 2017). By the end of 2019, numerous cases of pneumonia with unknown cause were registered in the Chinese city of Wuhan. A short time later, a novel type of coronavirus was identified as the cause, called "COVID-19". After the virus had spread to most countries in the world within a few months and had been characterized by high infection rates as well as relatively high mortality rates, it was declared a pandemic by the World Health Organization (WHO) on March 11, 2020 (WHO, 2020a). On August 26, 2020, the WHO already reported about four million confirmed cases of COVID-19 for Europe alone (WHO, 2020b). Since the virus has developed into a pandemic that challenged fundamental social structures and values and also led to an international economic crisis, which is accompanied by a period of decline in business profitability and economic strength, it is considered an "Extreme Public Crisis" in the context of this thesis (Boin et al., 2017; Lemon & Verhoef,

2016; McKinsey & Company, 2020). Since both public and private organizations had to respond to the crisis in order to bring outbreaks of diseases under control (Boin et al., 2017), the context in which services are delivered and experienced rapidly changed with COVID-19. All countries affected by the pandemic 19 have taken social distancing measures to stop its spread, including shutting down schools and universities offering e-learning services (Berliner Vewaltung, 2020).

2.5.2. Psychological Consequences of COVID-19

Besides physical consequences for peoples' health, COVID-19 has also led to a personal crisis for many people, characterized by a period of emotional turmoil and illness (Boin et al., 2017). The psychological consequences are, for instance, reflected in emotions of fear of COVID-19 (Ahorsu et al., 2020). "Fear" is considered an adaptive, negative emotion which *"represents the reactive removal of oneself from a position of immediate risk"* (Harper, Satchell, Fido, & Latzmann, 2020, Implications of Results section). The fear of diseases results from both medical and social factors and is predominantly rooted in the past. People used to be afraid of infectious diseases as they are transmissible, imminent and invisible. The memories of former infectious diseases have led to an automatic response in human subconscious of a fear of infection (Pappas et al., 2009). Inconsistent health policies, isolation procedures, the fact that many people lose their jobs as well as the lack of opportunities for childcare and social contacts increase the fear of diseases (Manderson & Levine, 2020; Pappas et al., 2009). Nowadays, the easier import of exotic diseases into metropolitan regions, as a result of globalization, as well as the mass media are additional factors which shape the fear responses of people (ibd.).

On the one hand, the fear of an infectious disease prepares people both physically and mentally for an acute response to possible harm (Pappas et al., 2009). Furthermore, Harper et al. (2020) found that fear of COVID-19 is a predictor of positive behavior change towards more social distancing and has a protective effect during the pandemic. On the other hand, "Fear of COVID-19" was shown to increase anxiety, depression and stress as well as to decrease life satisfaction among people from different countries (Ahorsu et al., 2020; Reznik, Gritsenko, Konstantinov, Khamenka, & Isarlowitz, 2020; Satici, Gocet-Tekin, Deniz, & Satici, 2020; Soraci et al., 2020). People report fear of coming into contact with people who may be infected with COVID-19 and are afraid of infecting themselves (Lin, 2020). With high levels of fear, which is reflected, for instance, in sleep disorders, clammy hands or palpitations, Ahorsu et al. (2020) suspect individuals might not think clearly and rationally when they react to COVID-19. Thus, "Fear of COVID-19" can be a trigger for uncertainty, anxiety or irrational behavior (Pappas et al., 2009).

3. Derivation of Hypotheses and Research Model

In the following section, the presented theoretical constructs of ViU, CEQ, I-E and Fear of COVID-19 are linked to each other and hypotheses are formulated regarding their relationships in the context of e-learning at FUB. Based on the hypotheses, the research model underlying this thesis is developed.

Personality influences the perception of the external world, the decisions individuals make as well as their behavior (Allport, 1937; Ashton, 2013). Several studies also investigated learning style differences between different personality types, including the I-E dimension (Ahmed, Campbell, Jaffar, & Alkobaisi, 2010; Raju & Venugopal, 2014). It was found that introverted and extraverted individuals differ in how they process information which leads to different cognitive processes as well as to different preferred learning settings (Felder & Silverman, 1988; Raju & Venugopal, 2014). Since extraverted personalities are characterized as being outgoing, communicative and active, they are considered "Active Learners", who like to learn through experimentation and prefer working and discussing information in groups (Capretz & Ahmed, 2010; Felder & Silverman, 1988). Active learners tend to learn less in passive learning situations, such as lectures, and longer periods of solitude or a lack of interaction could lead to exhaustion for them (Felder & Silverman, 1988; Kroeger & Thuesen, 1988). Introverted personalities, in contrast, prefer reflection over action and receive energy from introspection which is why they are considered "Reflective Learners". Reflective learners need time to think about information and prefer working by themselves over working in groups. For them, constant interaction with others could lead to exhaustion (Capretz & Ahmed, 2010; Felder & Silverman, 1988; Kroeger & Thuesen, 1988).

I-E and CEQ:
With regard to how individuals experience e-learning, the results of a study with nursing students by Malloy (2007) confirmed that introverted students prefer an independent learning style, while extraverted students prefer an interactive one. According to Livingood (1995), extraverts are too impatient for e-learning and get frustrated not talking to others. Introverts, in contrast, get frustrated in traditional face-to-face learning settings as they prefer working alone and perceive that extraverted students dominate conversations. The results of a study by Ellsworth (1995) correspond to this and reveal that introverts even perceive the communication with course instructors as facilitated using computer-mediated communication.

The perceptual differences between the e-learning experience of introverts and extraverts found in these studies, lead to the first hypothesis (H_{1a}-H_{1c}) of this thesis, which is that introverted students evaluate their CEQ regarding e-learning differently compared to extraverted students, i.e. there are group differences between introverted and extraverted students.

H_{1a}: *Introverted and extraverted students differ significantly with regard to their perceived SQ.*

H_{1b}: *Introverted and extraverted students differ*

significantly with regard to their perceived RQ with peer students.

H_{1c}: Introverted and extraverted students differ significantly with regard to their perceived RQ with the course instructor.

I-E and ViU:
The fact that individuals tend to look for situations and circumstances that enable trait expression (Snyder, 1983), explains why introverted and extraverted personalities strive for different goals in life and thus also prefer different learning styles and settings. A long-term study with Canadian college students by Little, Lecci, and Watkinson (1992), for instance, showed that different manifestations of the Big Five personality dimensions are accompanied by different goals or "personal projects" that individuals pursue. They found that a significant correlation between "Extraversion" and "Project Visibility" exists. The more extraverted students were, the more they looked for contexts, situations or projects that contained a strong interpersonal component and whose results were visible to others. That individuals with a high degree of Extraversion are more likely to have relational intentions was also confirmed by Al-Hawari (2015), who investigated customers' perception of retail banking. Overall, these study results correspond with the proposition that extraverts are active learners, who strive for active experimentation and group discussions (Felder & Silverman, 1988).

For introverted personalities, Bishop-Clark, Dietz-Uhler, and FIsher (2007) discovered that introverted students reported more often than extraverted students about completing their tasks at their own pace when using e-learning services. Ellis (2003) came to a similar result and found that introverted students valued having enough time to think about ideas when using e-learning services - particularly in the case of asynchronous e-learning. These results also correspond with the results of Felder and Silverman (1988), who found that introverts are reflective learners, who strive for working by themselves and having enough time to reflect. Therefore, the second hypothesis (H_{2a}-H_{2q}) of this thesis is that:

H_{2a-q}: Introverted and extraverted students differ significantly in their perceived ViU (with regard to all ViU dimensions).

I-E and Fear of COVID-19:
COVID-19 is associated with several psychological stressors including the health threat to oneself and loved ones, the disruption of daily routines, the possible separation from family and friends, social isolation as well as financial losses. Although society as a whole is confronted with these difficulties, individuals differ according to their personality in how strongly they feel fear and react to a pandemic (Taylor, 2019). With regard to I-E, studies found that introverted and extraverted personalities possess different levels of arousal,

which leads to different responses to certain situations (Dewaele & Furnham, 1999; Eysenck, 1965). Due to neurobiological differences, extraverted personalities tend to be generally under-aroused, while introverted personalities tend to be generally over-aroused. As a result, introverted personalities have a lower stress resistance compared to extraverted personalities and show stronger fear reactions across a range of situations (Dewaele & Furnham, 1999; Eysenck, 1965; Gange, Geen, & Harkins, 1979). In over-arousing situations, Eysenck (1981) states that *"introverts take longer to access information (...) from long-term memory or permanent storage"* (p. 203).

Mowen, Harris, and Bone (2004), for example, were able to prove the relationship between "Introversion" and "Fear" for the case of advertisements. Introverted personalities responded with higher fear to certain advertisements than extraverted personalities did. Shapiro and Alexanders (1969) investigated the particular relationship between "I-E", "Affiliation" (i.e. gregariousness) and "Anxiety" and found that in a high-anxiety condition, introverted students had less desire to affiliate than did either anxious extraverted students or non-anxious introverted students. In order to reduce anxiety, they found that anxious introverted students preferred solitude, while anxious extraverted students preferred the company of others. Several other studies also confirmed the relationship between Introversion and Fear and showed the higher likelihood of introverted personalities to notice threatening stimuli and their higher susceptibility to stress (Eysenck, 1981; Gray, 1970; Ragozzino & Kelly, 2011). Furthermore, it was found by various studies that introverted personalities in reaction try to avoid situations which they perceive as over-arousing and also prefer low-arousing conditions in learning settings (Dewaele & Furnham, 1999; Socan & Bucik, 1998).

E-learning gives students the possibility to study alone and at their own pace which should be especially suitable for introverted students with high fear of COVID-19 since they try to avoid over-arousing situations. The perceived CEQ and ViU of other groups might be lower in comparison. Therefore, it is hypothesized that:

H_{3a}: Student I-E and Fear of COVID-19 interact such that introverted students with high Fear of COVID-19 perceive a significantly higher SQ than introverted students with low Fear of COVID-19 as well as extraverted students with low and with high Fear of COVID-19.

H_{3b}: Student I-E and Fear of COVID-19 interact such that introverted students with high Fear of COVID-19 perceive a significantly higher RQ with peer students than introverted students with low Fear of COVID-19 as well as extra-verted students with low and with high Fear of COVID-19.

H_{3c}: Student I-E and Fear of COVID-19 interact such that introverted students with high Fear of COVID-19 perceive a significantly higher RQ with

the course instructor than introverted students with low Fear of COVID-19 as well as extraverted students with low and with high Fear of COVID-19.

H_{4a-q}: *Student I-E and Fear of COVID-19 interact such that introverted students with high Fear of COVID-19 perceive a significantly higher ViU with regard to all ViU dimensions than introverted students with low Fear of COVID-19 as well as extraverted students with low and with high Fear of COVID-19.*

Research Model:

Based on the reviewed literature and the formulated hypotheses, a conceptual research model was developed for the purpose of this thesis. The model proposed here represents the hypothesized relationships between I-E, Fear of COVID-19, CEQ and ViU (see Figure 1). In the further course of this thesis, the formulated hypotheses are tested. It is investigated whether there are group differences between introverted and extraverted students regarding their perceived CEQ and ViU. Furthermore, it is analyzed whether an interaction effect of I-E and Fear of COVID-19 on both CEQ and ViU exists.

4. Method

4.1. Choice of Method and Data Collection

Choice of Method:

In order to test the formulated hypotheses, a quantitative research approach was chosen employing Analysis of Variance (ANOVA). Quantitative data not only allowed for summary information on a variety of constructs and was suitable for testing hypotheses, but also allowed for a larger sample compared to most qualitative methods (Hair, Page, & Brunsveld, 2019). In concrete, a self-administered online survey was conducted with students of FUB. This method enabled a rapid data collection at relatively low cost and a large number of students could be surveyed simultaneously and from any location (ibd.). In addition, no personal contact with participants was necessary which was also favorable considering the pandemic situation prevailing at the time of data collection.

Choice of Case:

The case of FUB was chosen since the university concentrated solely on e-learning during the summer semester 2020, using both asynchronous and synchronous forms of e-learning. With about 34,000 students and a total of 16 different faculties and 150 different study programs, FUB is furthermore one of the largest German universities (Berlin.de, 2020; Freie Universität Berlin, 2020f). Since literature recommends conducting surveys only with people who have experience using the service of interest, FUB with its digital summer semester

was also suitable as the case to be investigated (Marshall, 1996).

Pretest:

Before the actual data collection phase started, a pretest was conducted between August 10 and August 15, 2020 in order to ensure that all items in the questionnaire are as reliable and valid as can be determined (Anderson & Gerbing, 1991). Sheatsley (1983) states that 12 participants are enough to uncover major difficulties and weaknesses when pretesting a questionnaire. Therefore, seven business students, two law students and three communication science students - all from FUB - were asked for written feedback[3] regarding the questionnaire design, the instructions for completing the questions as well as difficulties in understanding and responding to the items. Since they were familiar with the e-learning context and all students of FUB, they reflected the target group of the actual questionnaire (Ferketich, Phillips, & Verran, 1993). Based on their feedback, some items were slightly reworded in order to improve both their reliability and validity. Overall, the students found the questionnaire to be well structured and had no difficulties in understanding it.

Data Collection:

The actual data collection phase started on September 10, 2020 and ended on October 18, 2020. For the data collection, a convenience sampling was used. This sampling method generally promises a high response rate, but at the price of a lower generalizability of the results compared to probability sampling methods (Hair et al., 2019). Nevertheless, due to the limited time and financial resources, it was considered an appropriate method for the purpose of this thesis.

Efforts were made to obtain the most representative sample of the student body possible. For this purpose, all 12 departments of FUB were contacted by e-mail and were informed about the research purpose of the thesis. Furthermore, they were asked for support by disseminating the questionnaire link via BB or mailing lists. With a few exceptions, every department offered their support and disseminated the link. In addition, the link was posted to various Facebook groups of faculties and of FUB as a whole. In order to maximize the response rate and to motivate students to participate, ten Amazon vouchers, worth € 20 each, were raffled and ten cents per completed questionnaire were donated to the "Deutsches Kinderhilfswerk", an NGO that is committed to equal educational opportunities for children as well as to combating child poverty in Germany (Deutsches Kinderhilfswerk, 2020).

Respondents were given equal opportunity to participate in the survey, as long as they fulfilled the criterion of the first screening question. Altogether, 470 usable questionnaires were returned - 229 questionnaires of the BB-questionnaire

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[3]Due to COVID-19, the students were asked for written feedback instead of a face-to-face meeting.
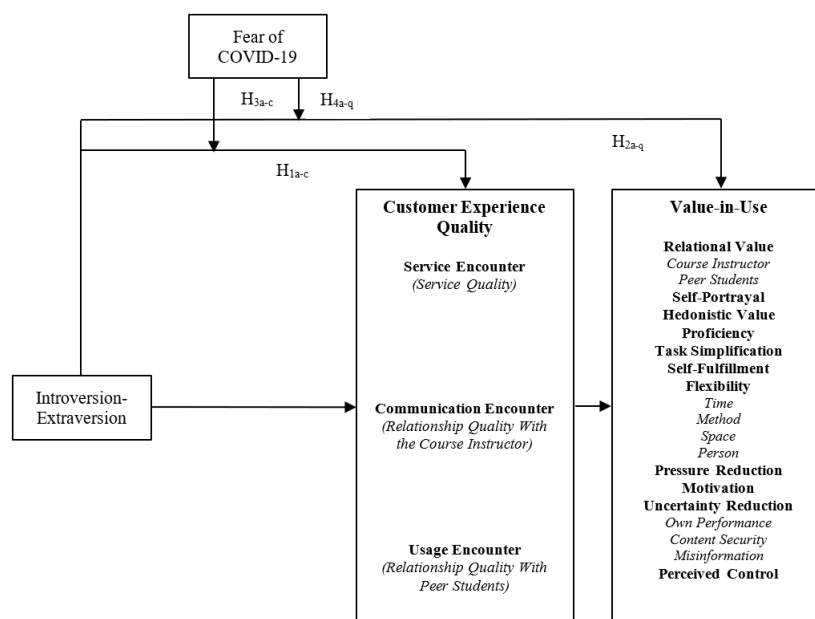
Figure 1: Research Model

version and 241 questionnaires of the Webex-questionnaire version.

4.2. Conception of the Questionnaire

The questionnaire was created and later completed by the students on "Unipark" - the academic program of "Questback" - which provides a standardized platform for creating online questionnaires. It started with a short introduction that contained a brief description of the questionnaire purpose and provided information about contact possibilities and data protection regulations. In addition, respondents were informed about the donation and the possibility of participating in the raffle.[4]

Due to the fact that the e-learning services of FUB include both asynchronous and synchronous offerings, two questionnaire versions were designed: one BB questionnaire version and one Webex questionnaire version. Although they referred to either BB or Webex in their instructions, both questionnaire versions contained the exact same questions and items so that comparisons could be made afterwards. Also, the instructions and layouts were identical in order to eliminate any kind of biases. The order of the questionnaires was structured by topic sections. Each section began with a couple of introductory instructions to prepare the respondent for the upcoming section. The questions asked related only to teaching and not to examination forms or situations since these are associated with particular emotions and coping strategies (Zeidner, 1995), which are not investigated in the context of this thesis. All theoretical constructs were measured by multi-item scales, with each construct being measured by at least three items in order to achieve an acceptable reliability (Hair et al., 2019). In addition, established scales were used to ensure the validity and reliability of each item (Schrauf & Navarro, 2005). Where it was necessary, items were slightly adjusted in their wording in order to adapt them to the research context of this thesis. Excluding the demographic questions and screening questions, the two questionnaire versions consisted of 125 items each, which were rated on either seven-point Likert scales (1 = "Strongly Disagree", 7 = "Strongly Agree") or five-point Likert scales (1 = "Strongly Disagree", 5 = "Strongly Agree"). A detailed overview of the measured theoretical constructs and the scales used can be found in Table 2 in the appendix.

Screening Questions:
As suggested by Sheatsley (1983), the survey started with two screening questions before the respondents were forwarded to the respective questionnaire version. The screening questions were easy to answer and did not yet contain any emotional components (ibd.). The first screening question asked whether the student participated in at least one online course at FUB during the summer semester 2020. This should ensure that only students of FUB, who already had experience with e-learning, were included in the final sample. Through the second screening question, an attempt was made to distribute the respondents as equally as possible to the two questionnaire versions. It was asked, whether the student's age is an even or an odd number. Students with an even age number received the BB questionnaire version, while those with an odd age number received the Webex questionnaire version.

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[4]The questionnaire can be found in Appendix 2.

Customer Experience Quality:
The first topic section of both questionnaires contained items on the perceived CEQ regarding BB or Webex. As mentioned above, in order to measure the perceived SQ, the SERVQUAL scale is a suitable instrument since it has already been validated across various industries (Lemon & Verhoef, 2016). Udo et al. (2011) modified the SERVQUAL scale for the case of asynchronous e-learning which is why the items used here were taken from their study. Nevertheless, the wording of the 21 items was slightly adapted to be suitable for both synchronous and asynchronous forms of e-learning as investigated here. Since Santos (2003) identifies "Ease-of-Use" as a further dimension of e-SQ, four additional items for Ease-of-Use were adopted from Venkatesh (2000) and were added to the SQ dimension. In order to measure the RQ with peer students, seven items were taken from a study on students' experiences with e-learning by Paechter, Maier, and Macher (2010). The 11 items on the RQ with the course instructor were taken from a study by Keating et al. (2003) on RQ in the online retail context. Both the items on the RQ with the course instructor and on the RQ with peer students were slightly adapted in their wording.

Value-in-Use:
The second topic section of the questionnaires contained items on the ViU that resulted from the usage of e-learning services on BB or Webex. Since Kleinaltenkamp, Storck, et al. (2018) already conducted a qualitative study at a German university on ViU dimensions regarding e-learning, their identified dimensions were also considered to be appropriate for the context of this thesis. Due to the fact that the study was a qualitative study, suitable established scales were looked for in other literature. In addition, established scales for measuring a relational value dimension of e-learning were sought. The items for four constructs[5] were taken over from Bruns and Jacob (2016), who detected several ViU dimensions for the context of fitness apps. Since fitness apps are online applications as well, the items were considered appropriate for the research purpose of this thesis. The construct of "Self-Portrayal" was measured using three items from a study by Pura (2005) on the use of mobile services. The items on "Flexibility" were adopted from a study on the measurement of work autonomy by Breaugh (1985) as well as from a study on task interdependence and job design by Kiggundu (1983). The three items on "Flexibility Regarding Space" were developed in the style of Breaugh (1985) and were merely adapted in their wording to refer to the space instead of the method. The four items for the measurement of "Task Simplification" were adopted from a study on online shopping by Mathwick, Malhorta, and Rigdon (2001) as well as from a study by Bruns and Jacob (2016). In order to develop items for the construct of "Pressure Reduction", the "Perceived Stress Scale" by Cohen, Kamarck, and Mermelstein (1993) was used, which is the most widely

psychological tool for measuring perceived stress. Four of the questions contained in the scale were reformulated into statements that correspond to the context of e-learning. From a study on factors influencing student's perception of e-learning by Tarhini, Al-Busaidi, Mohammed, and Magableh (2017), the three items on "Cost Decrease" were taken. In order to measure intrinsic motivation in field and laboratory settings, Guay, Vallerand, and Blanchard (2000) developed the "Situational Motivation Scale". Two of the three items on "Motivation" were taken from this scale. Since Kleinaltenkamp, Storck, et al. (2018) also consider the ease with which tasks are fulfilled as a value aspect of one's motivation, a third item regarding the perceived ease of studying was formulated and added to the "Motivation" scale. The construct of "Uncertainty Reduction" was measured by ten items, which were taken from different sources. The three items referring to the "Uncertainty Regarding One's Own Performance" were taken from the "Incompetence of Fear Scale" by Vollmeyer and Rheinberg (2000). The three items referring to the "Uncertainty Regarding Content Security" were adopted again from Tarhini et al. (2017). Since Kleinaltenkamp, Storck, et al. (2018) also consider the reduction of misinformation as a central value aspect of "Uncertainty Reduction", four items referring to the "Uncertainty Regarding Misinformation" were also included in the questionnaire, which were adapted from a study on behavioral intention to reuse e-learning systems in rural China by Li, Duan, and Alford (2012). The final three items of the ViU section were on "Perceived Control" and were taken from a study by Fu, Su, and Yu (2009), who intended to measure the perceived control of learners over e-learning games.

The wording of all items used in the ViU section was adapted to the context of this thesis, except the items for "Task Simplification" that were adopted exactly. In addition to the items measuring theoretical constructs, in the middle of the ViU section, the respondents' attention was tested by including an attention check statement to which respondents should respond with "Strongly Disagree".

For both the CEQ and ViU sections, respondents were asked to refer to the online course they found to be the best in the summer semester 2020 since emotional fluctuations in the answers should be minimized and the results should be comparable.

Introversion-Extraversion:
The third part of the questionnaire contained items on the construct of I-E. For the measurement of I-E several different approaches exist, even though no consensus has yet been reached in literature (McCrae & John, 1992). In the context of this thesis, the items on I-E of the "Big Five Inventory" (BFI) were used. The BFI is with only 44 items in total a brief multidimensional personality inventory whose short phrases enable above all time savings (John et al., 1991). Its eight items on I-E already proved to be valid in previous research (John, Naumann, & Soto, 2008) and were adopted without any adjustments in their wording.

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[5]"Relational Value", "Hedonistic Benefit", "Proficiency", "Personal Self-Fulfillment".

Fear of COVID-19:
The penultimate section of the questionnaire was intended to measure "Fear of COVID-19" using "The Fear of COVID-19 Scale" (FCV-19S) by Ahorsu et al. (2020). The seven-item scale was developed through literature reviews, expert panels as well as interviews with pilot participants. Several studies, including Italian, Turkish and Eastern European samples, already proved that the scale is valid and reliable for assessing Fear of COVID-19 (Reznik et al., 2020; Satici et al., 2020; Soraci et al., 2020). The scale was adopted completely for this thesis, without any changes to the wording of the items. To not risk a breakoff or false response, both the I-E Scale and the FCV-19S were placed towards the end of the questionnaire since they both address more sensitive topics.

Demographic Questions:
As people's attitudes and behavior are affected by demographic variables and in order to be able to check the representativeness of the sample later, demographic questions formed the final section of the questionnaire (Sheatsley, 1983). Respondents were asked to provide information on their age, gender, program of study and income level. Placing the demographic questions at the end of the questionnaire was considered to be appropriate as those questions can be quite personal to some people who first need to build trust during the course of the questionnaire (Hair et al., 2019; Sheatsley, 1983).

4.3. Sample

Since the case under investigation of this thesis is FUB, the target population comprised the students of FUB. A non-randomized convenience sampling was carried out with an additional snowball procedure, where students of FUB forwarded the questionnaire link to other students of FUB (Ferber, 1977; Goodman, 1961). Of the BB sample, the majority of students was female (77 percent), enrolled in a Bachelor program (65 percent) and in the age groups between 18-20 (32 percent) and 21-30 (58 percent). The demographic characteristics of the Webex sample were similar: 71 percent of students were female and 59 percent were enrolled in a Bachelor program. Most students were in age groups 18-20 (12 percent) and 21-30 (76 percent). In both samples, the students were spread in roughly equal numbers across different academic fields. Table 1 provides an overview of most of the demographic variables surveyed. The high percentage of women in both samples does not compromise representativeness since the proportion of female students at FUB was 60.4 percent in the summer semester 2020 (Freie Universität Berlin, 2020b).

4.4. Data Analysis

Data Preparation:
Before both data sets were analyzed, they were prepared accordingly. 19 respondents in the BB data set and 15 respondents in the Webex data set failed the integrated attention check item. Since their concentration can be doubted when answering the items, they were excluded from the data sets. Additionally, in the BB data set a further response was excluded because all questions regarding one contruct were unanswered. In order to identify additional unengaged responses, the time each respondent took to complete the survey was examined more closely. In doing so, three respondents from the Webex data set and one respondent from the BB data set were excluded since their response time was more than three standard deviations above the mean response time (Mean$_{BB}$ = 805.65, SD$_{BB}$ = 369.15; Mean$_{Webex}$ = 868.48, SD$_{Webex}$ = 414.19)[6] (Anscombe, 1960). The final two samples consisted of 228 (BB data set) and 238 (Webex data set) units in total.

Reliability and Validity:
In order to evaluate the reliability and validity of the reflective measurement model, three criteria were considered: internal consistency reliability, convergent validity and discriminant validity (see Tables 3 and 4 in the appendix).[7]

For internal consistency reliability, Cronbach's alphas (CA) and composite reliabilities (CR) were examined. CA should be above the threshold of 0.7 (Nunnally, 1978). For all constructs, except the Cost Decrease construct in both data sets, CA values were satisfactory, ranging from 0.79 to 0.94 (BB data set) and from 0.78 to 0.95 (Webex data set). However, six items in each data set were dropped because their exclusion increased the CA of the respective construct (see Table 5). For those scales in the BB data set[8] and in the Webex data set[9] which consisted of only three items in total, no item was excluded to increase the CA of the respective construct. The CA values of these scales nevertheless exceeded 0.7.[10] To further meet the criteria of internal consistency reliability, the CR of each construct should exceed 0.6 (Bagozzi & Yi, 1988). All constructs in both data sets fulfilled this criterion.

Subsequently, convergent validity was examined. While some research considers a threshold of 0.5 for factor loadings (Bagozzi & Yi, 1988; Terho, Eggert, & Haas, 2015), other research considers a threshold of 0.6 (Kleinaltenkamp, Löbler, & Fennert, 2018). Therefore, in the context of this work, a threshold of 0.55 was used. All items which loaded less on the respective factor were excluded. In addition, it was checked whether the Average Variance Extracted (AVE) of each construct exceeded the threshold of 0.5 (Bagozzi & Yi,

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[6]A value of 100 equals one minute.

[7]The statistical consulting service fu-stat of FUB was contacted in case of questions.

[8]Time Flexibility, Method Flexibility, Motivation, Uncertainty Reduction Regarding Own Performance, Uncertainty Reduction Regarding Content, Perceived Control.

[9]Time Flexibility, Method Flexibility, Space Flexibility, Motivation, Uncertainty Reduction Regarding Own Performance, Uncertainty Reduction Regarding Content.

[10]The Cost Decrease construct was excluded from both data sets due to low CA values as well as low factor loadings. One of three items in both data sets loaded with less than 0.3 on the factor Cost Decrease. As a consequence, the construct was removed from the research model.

Table 1: Demographic Data of Respondents

Sample Characteristics	BB Sample ($n = 228$)		Webex Sample ($n = 238$)	
	n	%	n	%
Female	173	76.55%	170	71.43%
Male	52	23%	65	27.31%
Diverse	1	0.44%	3	1.26%
18-20	73	32.30%	28	11.77%
21-30	130	57.52%	181	76.05%
Bachelor Program	147	65.04%	140	58.82%
Master Program	61	26.99%	75	31.51%
1.-2.	98	43.36%	90	37.82%
3.-4.	68	30.09%	77	32.35%
Medical Sciences	9	3.98%	13	5.46%
Natural Sciences/Mathematics	32	14.16%	42	17.65%
Humanities	36	15.93%	48	20.17%
Economic/Social Sciences	59	26.11%	60	25.21%
Education	46	20.35%	40	16.81%
Psychology	10	4.43%	5	2.10%
Other field of study	34	15.04%	30	12.61%
Part-Time (< 40 hours a week)	105	46.67%	129	54.43%
Unemployed (not looking for work)	29	12.89%	25	10.55%
Unemployed (looking for work)	56	24.89%	53	22.36%

1988). In both data sets, all constructs exhibited an AVE above 0.5, except the Fear of COVID-19 construct in both data sets ($AVE_{BB} = 0.49$, $AVE_{Webex} = 0.45$). Therefore, for the BB data set, the item with the lowest factor loading (Fear_Unconf: 0.63) was excluded which increased the AVE to 0.51. For the Webex data set, even if several items had been excluded, the AVE would not have increased to 0.5 which is why no item was excluded. Nevertheless, the construct was used for further analysis since all other quality criteria were met (Zerres, 2010), and the scale also achieved a sufficient AVE in the study by Ahorsu et al. (2020), who developed the scale.

In order to assess discriminant validity, in a next step the Fornell and Larcker (1981) criterion was used. Tables 6 and 7 show the square roots of the AVE for all constructs and the construct correlations. In the BB data set, the correlation (0.76) of the two constructs SQ and RQ (With The Course Instructor) exceeded the square root of the AVE. The reason for this might be that several items of the SQ scale also referred to the course instructor. As a consequence, three items (SQ Needs, SQ Concern, SQ Encourages) of the SQ scale, which cross-loaded with values between 0.66 and 0.72 on the RQ scale, were excluded. In the Webex data set, the correlation (0.73) of the two constructs SQ and RQ (With The Course Instructor) also exceeded the square root of the AVE. Therefore, two items (SQ Needs, SQ Helps) of the SQ scale, which both also cross-loaded with values of 0.74 on the RQ construct, were excluded. After the exclusions, the square roots of the AVE for each construct exceeded the construct correlations

indicating a satisfactory degree of discriminant validity.[11]

For the further statistical analyses, the remaining items were used to calculate mean values for the respective constructs. In addition, a median split was carried out for the constructs of I-E and Fear of COVID-19 to achieve nominal measurement levels for both constructs that are suitable for conducting variance analyses.

5. Results

Using JMP Pro 15, multiple two-way ANOVAs were performed to explore the hypothesized group differences between introverted and extraverted students as well as the hypothesized interaction effects.

Prior to conducting the two-way ANOVAs, the assumption of homogeneity of variances was checked using Levene's Test for Homogeneity of Variance. For the Webex data set, the assumption of homogeneity of variances was satisfied across all dependent variables ($p > .05$). For the BB data set, the p-value of Levene's Test was significant ($p < .05$) for the dependent variables of Relational Value (Peer Students) and Space Flexibility indicating variance heterogeneity. Nevertheless, ANOVAs rather than non-parametric tests were conducted since group sizes were relatively equal and greater than 12, making the ANOVA robust to the assumption violation (Kohr & Games, 1974).

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[11]Due to the item exclusions, the AVE of the SQ construct in the Webex data set dropped to 0.49. However, since the threshold value of 0.5 was only slightly undercut and all other quality criteria were fulfilled, no further items were excluded.

Furthermore, the assumption of normality was tested for both samples using the Anderson-Darling Test. For both data sets, the p-value of the Anderson-Darling Test was significant ($p < .05$) across all dependent variables indicating a violation of the normality assumption. Since the ANOVA is robust to violations of normality, the data analysis was continued as planned (Blanca, Alarcon, Arnau, Bono, & Bendayan, 2017).

For the BB data set, 20 two-way ANOVAs were conducted. The results showed that differences in mean values between introverted and extraverted students as well as between introverted students with high fear of COVID-19, introverted students with low fear of COVID-19, extraverted students with high fear of COVID-19 and extraverted students with low fear of COVID-19 exist. Nevertheless, these differences were minor and non-significant for all CEQ encounters and all ViU dimensions as indicated by the F-tests of the ANOVAs ($p > .05$). Tables 8 and 9 provide a detailed overview of the results. Regarding the CEQ, introverted students on average reported a more positive SQ ($M_{SQ} = 5.68$), RQ with peer students ($M_{RQPS} = 3.25$) and RQ with the course instructor ($M_{RQCI} = 4.74$) than extraverted students did ($M_{SQ} = 5.52$, $M_{RQPS} = 3.15$, $M_{RQCI} = 4.72$). Regarding 12 out of 17 ViU dimensions, introverted students on average also reported a higher ViU than extraverted students did. Looking at I-E and Fear of COVID-19 in interaction, introverted students with low fear of COVID-19 on average reported the most positive CEQ ($M_{SQ} = 5.81$, $M_{RQPS} = 3.41$, $M_{RQCI} = 4.8$). Regarding eight out of 17 ViU dimensions, introverted students with high fear of COVID-19 on average also reported the highest ViU. Nevertheless, all formulated hypotheses (H_{1a-c}, H_{3a-c}, H_{2a-q}, H_{4a-q}) had to be rejected as the two-way ANOVAs were non-significant ($p > .05$).

20 two-way ANOVAs were also conducted for the Webex data set. The differences in the mean values were also only minor and non-significant for all CEQ encounters and all ViU dimensions as indicated by the F-tests of the ANOVAs ($p > .05$). Tables 10 and 11 provide a detailed overview of the results. Regarding the CEQ, introverted students reported a more positive SQ ($M_{SQ}=5.66$), RQ with peer students ($M_{RQPS}=3.13$) and RQ with the course instructor ($M_{RQCI}=4.89$) than extraverted students did ($M_{SQ}=5.63$, $M_{RQPS}=2.94$, $M_{RQCI}=4.74$). Regarding nine out of 17 ViU dimensions, introverted students on average reported a higher ViU than extraverted students did. Looking at I-E and Fear of COVID-19 in interaction, introverted students with low fear of COVID-19 on average reported the most positive SQ ($M_{SQ}=5.68$). Introverted students with high fear on average reported the most positive RQ with peer students ($M_{RQPS}=3.28$) and RQ with the course instructor ($M_{RQCI}=4.99$). Regarding 11 out of 17 ViU dimensions, extraverted students with low fear of COVID-19 on average reported the highest ViU. Nevertheless, all formulated hypotheses (H_{1a-c}, H_{3a-c}, H_{2a-q}, H_{4a-q}) had to be rejected for the Webex data set as well since the two-way ANOVAs were non-significant ($p > .05$).

Since no significant group differences regarding the perceived CEQ and the perceived ViU were found for the inde-pendent variables of I-E and Fear of COVID-19, an additional look was taken at the demographic variables of "Gender" and "Academic Field". For both data sets, no significant gender differences between female and male students were found regarding their perceived CEQ and ViU (see Tables 17 to 19). For Academic Field, for the BB data set, the only significant pairwise difference was found between humanities students and economic and social sciences students regarding their perceived RQ with the course instructor (see Tables 12 and 13). Humanities students reported a slightly significantly ($p=.04$) higher RQ ($M_{RQCI}=5.29$) than economics and social sciences students did ($M_{RQCI}=4.48$). For the Webex data set, significant pairwise differences were found between humanities students and economic and social sciences students as well as between humanities students and medical students regarding their perceived RQ with the course instructor (see Tables 14 to 16). Humanities students reported a significantly ($p=.01$) higher RQ ($M_{RQCI}=5.48$) than economics and social sciences students did ($M_{RQCI}=4.57$). They also reported a significantly ($p=.008$) higher RQ than medical students did ($M_{RQCI}=3.94$). In addition, a significant pairwise difference was found between medical students and economic and social sciences students regarding the ViU dimension of Self-Fulfillment. Medical students reported a slightly significantly ($p=.046$) higher Self-Fulfillment ($M_{SF}=4.52$) than economic and social sciences students did ($M_{SF}=3.08$).

6. Discussion

6.1. General Discussion

This thesis was designed to investigate whether differences exist between students' personalities regarding their perceived CEQ and their perceived ViU for the case of e-learning. In particular, the personality dimension I-E was investigated. Furthermore, it was examined whether students' Fear of COVID-19 constitutes a moderating variable that affects the relationship between I-E and CEQ as well as the relationship between I-E and ViU.

6.1.1. Interpretation of Results

Although the differences were not significant, regarding asynchronous e-learning introverted students on average perceived both a more positive CEQ regarding all three encounters as well as a higher ViU regarding most dimensions. This result is consistent in its tendency with the results of past studies (Bishop-Clark et al., 2007; Ellis, 2003; Felder & Silverman, 1988), which found that introverts, as reflective learners, prefer sufficient time for reflection as well as self-study. In particular, with respect to the Proficiency dimension, which reflects the perceived learning success, but also with respect to the Flexibility dimensions and the Motivation dimension, introverted students on average reported a higher ViU than extraverted students did.

Although not significant either, the interaction of I-E and Fear of COVID-19 regarding most ViU dimensions pointed in the direction of the formulated interaction hypotheses and introverted students with high of Fear of COVID-19 on average

perceived a higher ViU regarding most ViU dimensions than the other investigated groups did. Presumably, introverted students with high Fear of COVID-19 had the strongest desire for withdrawal out of all four groups. Therefore, they were able to achieve their goals regarding e-learning the most out of all four groups through time-shifted communication and independent study of course materials posted online.

In contrast, regarding the previously evaluated CEQ, introverted students with low Fear of COVID-19 on average rated their CEQ the most positive out of all four groups. Thus, high Fear of COVID-19 particularly seems to play a role for introverted students in their goal achievement - for instance as an opportunity for uninterrupted learning - and less in their evaluation of their CE. Qualitative studies need to be conducted to find out the underlying reasons for this finding.

For synchronous e-learning, also no significant group differences were found between introverted and extraverted students regarding their perceived CEQ and ViU. For synchronous e-learning, introverted students on average reported a more positive CEQ with regard to all three encounters than extraverted students did. However, for only about half of the ViU dimensions they on average perceived a higher ViU than extraverted students did. This could be due to the fact that synchronous e-learning, compared to asynchronous e-learning, addresses more strongly the needs of extraverted students, who prefer active communication. It allows for participation in lectures, face-to-face communication via video and audio communication and therefore, shows parallels to face-to-face teaching.

Although not significant either, the interaction of I-E and Fear of COVID-19 regarding most ViU dimensions surprisingly pointed in the opposite direction of the formulated interaction hypotheses. Extraverted students with low Fear of COVID-19 on average perceived a higher ViU regarding most ViU dimensions than the other three groups did. The combination of Extraversion and low Fear of COVID-19 may have resulted in a higher openness to direct social contacts and a stronger desire for active interaction. Especially live lectures and live chats via Webex provide an opportunity to satisfy this need.

In contrast, regarding the CEQ, introverted students with low Fear of COVID-19 on average rated the highest SQ and introverted students with high Fear of COVID-19 on average rated the highest RQ with peer students and the highest RQ with the course instructor. It appears that extraverted students with low Fear of COVID-19 are most likely to achieve their goals regarding e-learning, but do not evaluate the quality of their CE more positively than the other groups. Again, qualitative studies are needed here that additionally could investigate the relationship of the constructs of CEQ and ViU.

A descriptive comparison of the results for asynchronous and synchronous e-learning shows that in both cases there are only minor and non-significant differences regarding the CEQ and the ViU across groups. With regard to the CEQ, the SQ on average was rated most positively across groups, for both asynchronous and synchronous e-learning. This indicates the perception of the e-learning services of FUB as

reliable and the accessibility and helpfulness of the course instructors. The rating of the perceived RQ with the course instructor on average was also positive across groups in both data sets. Nevertheless, the relational value indicated by the students surveyed in both data sets as well as the social acceptance by others (Self-Portrayal) were among the ViU dimensions with the lowest rating. Across groups, the mean values for these constructs were in the lower half of the rating scale and ANOVA results showed no significant group differences. Consequently, although students felt that course instructors were available when needed, a strong relationship could not be established with them and acquired knowledge could not be adequately demonstrated. It appears to make no difference here whether students are introverted or extraverted, whether they have low or high Fear of COVID-19 and whether it is asynchronous or synchronous e-learning. A reason for this might be that the transition to e-learning happened quite suddenly and completely eliminated any kind of face-to-face teaching or real-life contact opportunities for students. It is possible that all students - including the introverted - felt overwhelmed by this complete transition to self-study and the sudden removal of any direct communication opportunities with course instructors and peer students. Perhaps it was not just about a lack of simple communication, but rather about comprehension or organizational problems that occurred across personalities.

In contrast, the groups in both data sets reported a comparatively high ViU with regard to Space Flexibility indicating a perceived benefit in being able to pursue their learning activities regardless of location. Furthermore, students of both data sets were able to achieve Proficiency and thus learning progress through e-learning and e-learning was able to reduce their uncertainty of obtaining misinformation (Uncertainty Reduction Regarding Misinformation). Consequently, it can be concluded that students perceived the quality of the taught course contents as relatively high in both asynchronous and synchronous e-learning.

6.1.2. Substantive Explanations

Overall, it was found that no significant group differences existed in terms of reported CEQ and perceived ViU between introverted and extraverted students with either high or low fear of COVID-19. Furthermore, the students surveyed evaluated their CEQ only in the upper-middle range and also perceived only a moderately high ViU with respect to most dimensions (see Tables 9 and 11).

One possible explanation for this result, as mentioned earlier, is that all students surveyed experienced comprehension problems or organizational problems due to the complete transition to e-learning. Across personalities, students may have felt overwhelmed with the self-study associated with e-learning and experienced information overload. The mid-range ratings of both the CEQ and the perceived ViU suggest a need for improvement of the e-learning services of FUB. Reconstructive qualitative research methods, e.g. interviews, could help to specify this need and identify the exact

reasons for the mid-range ratings of the CEQ and the perceived ViU.

Furthermore, differences in the evaluation of the CEQ and the perceived ViU could depend on factors other than I-E and Fear of COVID-19, such as the topic of the evaluated course, examination requirements, the personality of the course instructor or other personality dimensions of the Big Five Model.

Examination requirements, for instance, could have an impact on achieving goals, such as the flexibility of time and methods, students' motivation as well as the perceived pressure reduction. Students with assignments due weekly may achieve these goals to a lesser degree than students with only one assignment due at the end of a course.

The personality of the course instructor could also lead to differences regarding the evaluation of e-learning services. The results of the one-way ANOVAs for the independent variable of Academic Field showed, with regard to both asynchronous and synchronous e-learning, that Humanities students perceived a significantly higher RQ with their course instructors, compared to students of some other academic fields. This could be an indication that the personality of the course instructor and his course design have an impact on the evaluation of the RQ by students. It may be that course instructors from the department of Humanities resort to particular methods to strengthen their RQ with students. Future studies could try to find this out with the help of qualitative interviews.

This thesis has limited itself to the assessment of one particular personality dimension. However, personality traits other than students' I-E might influence the perceived CEQ and ViU regarding e-learning. For instance, it could be possible that students who score high on the Big Five personality dimension of "Openness to Experience" are more open to new teaching methods and value trying new things more than students who score low on this personality dimension. Since high openness is characterized by intellectual curiosity and a preference for diversity, it is possible that the sudden transition to digital teaching formats and the required self-study are perceived more positively by open students than by less open students, who try to avoid change (McCrae et al., 1986).

Another reason for differences regarding the perceived CEQ and ViU might be the housing situation of students. Many students, especially in Berlin, live in shared apartments which is why introverted students with high Fear of COVID-19, for instance, might not have perceived e-learning as quiet self-study with a lot of time to reflect at all. Living with others might have interfered with their learning and also might not have contributed to their avoidance of social contacts. Extraverted students, on the other hand, possibly perceived a shared apartment and the social contacts associated with it as compensation for not having social contacts at university. Therefore, their CEQ was not significantly more negative and their perceived ViU was not significantly lower than that of introverted students.

The digital summer semester of 2020 and the transition to e-learning served as a protective measure to contain the pandemic and to prevent new infections. Although Harper et al. (2020) state that negative emotions protect against further spread of COVID-19 and lead to more social distancing, which in turn should contribute to an appreciation of e-learning, it may be possible - in light of the results of this thesis - that high Fear of COVID-19 had little effect on the need for protection among students. The age group in which most students in both samples are located does not belong to the COVID-19 risk group, which is generally above 50 to 60 years of age (Rober Koch Institut, 2020). Therefore, even introverted students with high Fear of COVID-19 may not have felt themselves to be at high risk and therefore may not have developed a strong need for protection. Whether the perceived need for protection acts as a mediator between Fear of COVID-19 and the CEQ or the ViU regarding e-learning, could be investigated using a more age-diverse sample that also includes COVID-19 risk groups. E-learning courses offered by larger companies, for instance, would be a suitable case for such a research project.

6.1.3. Statistical Explanations

One statistical explanation for the results of this thesis could be the loss of information that may have occurred due to the two median splits that were performed. The median splits performed on the constructs of I-E and Fear of COVID-19 did not account for mid-range scores and students who located themselves in the middle of the five-point scale of I-E, for instance, were assigned to one of the two extremes. Future studies could alternatively divide their samples into three groups so that moderately introverted or extraverted personalities are included in the analysis.

In addition, although all students surveyed were instructed to refer to what they considered to be the best course in the digital summer semester 2020, all students surveyed here nonetheless referred to different courses that varied in terms of size, course contents, exam requirements and course instructors. Although both samples exhibited a high degree of representativeness, the comparability of the information provided by individual students nevertheless suffered as a result. For instance, some students may have participated in the survey prior to receiving exam results, while others may have already received negative feedback and participated in the survey with that in mind. As a result, the survey could be repeated with students from the same course, controlling for the influence of several other possible influencing variables.

Following the last point mentioned, the internal validity of the results of this thesis might have suffered from self-selection bias (Woolridge, 2002). According to Sen and Lerman (2007), the goal of utilitarian consumption is to maximize utility which is why negative experiences, especially in utilitarian consumption, are weighted more heavily than positive ones. Due to this, perhaps only those students who evaluated their CEQ regarding e-learning as negative or moderate and whose level of goal attainment was only moderate as well participated in the survey.

Besides the results of this thesis, the results and external validity of the results of past studies of the subject area are also not free from criticism. A comparison with past studies, which were used to develop the hypotheses of this thesis, shows that some of them worked with much smaller sample sizes. In two studies, the sample size was even n<30 (Bishop-Clark et al., 2007; Ellis, 2003). Furthermore, in two studies either no demographic variables were surveyed (Raju & Venugopal, 2014), or no demographic information about the sample was provided in the report of study results (Bishop-Clark et al., 2007).

6.2. Theoretical Contributions

Although all of the hypotheses formulated in this thesis had to be rejected, the thesis nevertheless makes an important theoretical contribution to service research. Not only in the context of the COVID-19 crisis, but also in the context of increasing globalization and technologization, e-learning services play an increasingly important role for companies as well as for universities and change the co-creation interaction between universities and students. Therefore, there is not only interest in finding out how customers or students perceive and evaluate e-learning services, but also in finding out which factors influence these evaluations. This thesis investigated both of these questions and examined the influence of the personality dimension I-E on both the perceived CEQ and the perceived ViU regarding e-learning services.

In addition, perceptions of e-learning services were examined in light of the COVID-19 pandemic, which constitutes a public crisis situation. The pandemic represents an external condition over whose development service providers have little, if any, influence and whose exact impact on various service sectors remains unexplored. The results of this thesis show that introverted and extraverted personalities with either high or low fear of COVID-19 do not differ significantly in their perceptions regarding e-learning services. Even introverted personalities with high fear of COVID-19 did not perceive e-learning services significantly more positively than the other investigated groups. Unlike past studies that do not consider fear and the need for protection from COVID-19 as separate constructs (Harper et al., 2020), this thesis provides indication that the need for protection mediates between different personalities' perceptions of fear and their perceptions of services.

Furthermore, this thesis serves as a basis for investigations of the influence of other personality dimensions of the Big Five Model on the perception of e-learning services and encourages the multidimensional assessment of personalities.

Finally, this thesis worked with relatively large sample sizes of n_{BB}=228 and n_{Webex}=238 which contributes to the reliability of the results. Also, unlike previous studies that focused primarily on asynchronous e-learning (Bishop-Clark et al., 2007; Ellis, 2003), this thesis made descriptive comparisons between asynchronous and synchronous e-learning and tested the formulated hypotheses for both forms of e-learning. Although none of the hypotheses could be confirmed, a comparison of the group mean values nevertheless showed different tendencies between the two forms of e-learning.

6.3. Practical Implications

Against the background of the rapid required transition from face-to-face teaching to full e-learning starting with the summer semester 2020 and the fact that this survey was already conducted after the completion of the first digital semester, the CEQ rated in the upper middle range and the mid-range perceived ViU of the students should not be equated with a negative judgment about e-learning in general, but may rather be due to the sudden transition for both students and course instructors. Therefore, the information provided by university students in the survey should be considered as both an incentive and an opportunity for improvement of e-learning services.

First, it can be stated that, based on the results, it is not advisable to make an abrupt and complete transition of learning settings and that, in general, a blended learning approach could combine the advantages of face-to-face teaching, such as building relationships with peer students and course instructors, and the advantages of e-learning, such as not being tied to a specific location when studying or reducing the uncertainty of getting wrong information. However, due to the fact that universities have virtually no control over the development of the COVID-19 pandemic, these recommendations are currently more forward-looking. Immediate resumption of face-to-face teaching or blended learning formats are still not possible at the time of writing this thesis.

Second, under the given conditions, course instructors should acquire sufficient knowledge of the e-learning services offered and actively encourage a lot of exchange and discussion via Webex consultations, written communication, or group work in order to increase the perceived relational value of students and to offer support in organizing self-study. As part of this, efforts could also be made to allow individual students to choose to speak in Webex lectures or to allow them to create wikis in order to provide opportunities for self-presentation of acquired knowledge (Self-Portrayal).

Third, course instructors should introduce students, regardless of their personalities and preferred learning settings, to the proper use of the information provided online in order to prevent information overload or even overwhelm with e-learning. Especially in light of the fact that the end of the pandemic is not yet foreseeable at the time of this thesis, an effective and efficient design of self-study is essential to prevent a deterioration of academic performance in possible further digital semesters.

Finally, course instructors should not only conduct evaluations after online courses have been completed, but should also ask about expectations and desires before courses begin in order to identify determinants for the perception and evaluation of e-learning services and to address students' desires accordingly. In this regard, this thesis suggest that the focus should not be on the I-E personality dimension. Also, Fear of

COVID-19 does not lead to significant differences regarding students' perception of their CEQ and their ViU.

6.4. Limitations and Further Research

In addition to the suggestions for future research that can be derived from the interpretation of results, other future research opportunities arise from the findings of this thesis.

First, only the case of FUB was investigated in this thesis, so the results may not be generalizable. Future studies, in addition to e-learning in corporate contexts, could examine other national contexts with different education systems and different policies to address the COVID-19 crisis. For instance, the CEQ and the perceived ViU regarding e-learning could differ between countries such as the U.S., with relatively high tuition fees, and countries such as Germany, with comparatively low tuition fees. Furthermore, it could be investigated how students living in countries with few restrictions due to COVID-19 experience e-learning compared to students living in countries with many restrictions due to COVID-19.

Second, due to the fact that only quantitative methods were used in this thesis, deeper insight into personal reasons for certain students' perceptions of e-learning cannot be provided. Future research could overcome this by conducting in-depth interviews with students regarding their experiences with e-learning services.

Third, students here were only surveyed at one point in time. Since no one yet knows how long the COVID-19 crisis will last, long-term studies should be initiated to examine how students' perceptions of their e-learning experience change over the period of the crisis. Future studies could also comparatively examine, based on previous teaching evaluations, whether or not the perceived CEQ and ViU differ between face-to-face teaching, before the onset of the COVID-19 crisis, and e-learning, after the onset of the COVID-19 crisis. For instance, has the CEQ for extraverted students worsened since the full transition to e-learning? Could it be that introverted students, even if they only reported scores in the upper-middle range here, perceived even less value regarding face-to-face teaching? A combination of qualitative and quantitative methods seems promising here to identify factors that influence students' perceptions of e-learning and to help universities develop appropriate strategies to improve their e-learning services.

6.5. Conclusion

The impact of the perception of the COVID-19 crisis on different service sectors of the economy is an unexplored topic to date. The pandemic forced universities to suddenly make a complete transition to offering e-learning services which has not been necessary yet in this form in the past and changed the co-creation interaction between universities and students.

The purpose of this thesis was to investigate, for the case of e-learning services at FUB, whether students evaluate their CEQ differently depending on their personality and whether

they perceive a different ViU. Specifically, the personality dimension I-E was considered and ANOVAs found that introverted and extraverted students do neither significantly differ with respect to their perceived CEQ, nor significantly differ with respect to their perceived ViU. In addition, the thesis investigated whether Fear of COVID-19 forms a moderator between students' I-E and their CEQ as well as their ViU. No significant interaction effects were found between I-E and Fear of COVID-19 on the three CEQ encounters, nor on the individual ViU dimensions. Due to this, all research questions posed in this thesis had to be negated and all formulated hypotheses had to be rejected.

One reason for the results of this thesis could be that other factors than I-E and Fear of COVID-19 are responsible for differences in the evaluation of both the CEQ and the ViU regarding e-learning, such as the topic of the respective course, examination requirements, the personality of the course instructor, the housing situation of students or other personality dimensions of the Big Five Model. Also, additional mediator variables could exist between Fear of COVID-19 and the perceived CEQ or between Fear of COVID-19 and the perceived ViU.

The thesis contributes to the service domain of e-learning and sheds light on the impact of the COVID-19 crisis on e-learning services, which is a novel area of research. It proposes that whether a person is introverted or extraverted and whether a person has high or low Fear of COVID-19 makes no significant difference to the evaluation of e-learning services.

Future research could use qualitative methods to help identify other influencing factors and explore other national and corporate contexts for the purpose of generalizability. In addition, long-term studies would offer the opportunity to compare students' perceptions of e-learning during and after the pandemic.

Overall, the students surveyed rated their CEQ in the upper-middle range and perceived a moderately high ViU with respect to most ViU dimensions. Course instructors should therefore, in this novel situation, acquire sufficient knowledge about e-learning themselves and encourage mutual support as well as teach students to independently use the provided course materials so that there is no overload with e-learning. In addition, students' expectations and wishes should already be asked before online courses start in order to identify possible influencing factors for final evaluations. Not only for the further course of the pandemic, but also afterwards, regarding e-learning an approach should be pursued that takes into account the interests of the students without neglecting the available resources of the universities as service providers as well as external framework conditions, such as political regulations. Thus, there is a chance that universities and students can continue to benefit from the advantages of e-learning even after overcoming the COVID-19 crisis.

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