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# The Impact of Obligatory Online Education on Business Students: A Comparative Study

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## Abstract

Due to the Covid-19 crisis, higher education was forced to offer online alternatives to their courses. This change drastically increased the number of students partaking in online education. However, the effects of obligatory online education could potentially be harmful and are not yet sufficiently explored. This research analyses the impact of obligatory online education on business students' social life, well-being and academic performance. The study used a phenomenological and a comparative approach to assess and compare students' personal experiences in Germany and the Netherlands. A total number of 30 semi-structured interviews were conducted with students in the mentioned countries. Results show, that students' academic performance decreased due to a lack of student identity, study life balance, motivation and technological issues during e-learning. Furthermore, mixed findings were recorded about the impact on social life. Finally, a slight drop in students' well-being caused by a decline in physical and mental health was observed. Findings of this study are significant in a sense that they can provide crucial information for policymakers, educators and managers in higher education which enable them to make more informed decisions when delivering online education in crucial times and enhance students' experience. This will consequently create a more positive impact for students' well-being, social life and academic performance.

**Keywords:** academic performance, Covid-19, E-learning, higher education, social life, well-being

# 1. Introduction

Online education is an alternative to presence-based studies at educational institutions. In the United States online education has become increasingly popular (Statista, 2019) and has already been the topic of existing studies. Research by Shachar and Neumann (2010) suggests an increase in academic performance amongst American students that took online education classes voluntarily. Simultaneously, Fish and Snodgrass (2015) show that the preference for online education in American business students is affected by having had previous experience with this form of studying. In other regions such as Europe, however, there were fewer options and less academic interest in studying online. Due to the Covid-19 crisis, educational institutions globally were forced to switch to online alternatives. This change has drastically increased the number of students partaking in online education. Especially in Europe, where online degrees are less common (Goglio, 2019), the sudden switch changed how lectures were held. Obligatory online education was expected to affect students' well-being, social life and academic performance. The unexpected introduction of online classes changed academic assessments and led to study delays, which harmed students' academic performance (Crabbendam & Goes, 2020). Next to that, online classes limited students' ability to socialize with classmates, which harmed their mental health and well-being (Sahu, 2020). The lack of social contact with classmates increased their loneliness which caused psychological pain and suffering (De Oliveira Araujo et al., 2020). Switching to compulsory online education also severely impacted students' daily routine and social life (Chaturvedi et al., 2020).

Nevertheless, the amount of data on the effects of mandatory online education is insufficient. Especially well-being, academic performance and social life have only been researched to a small extent, even though they could have large consequences if not addressed properly. Online education could lead to knowledge gaps and other deficiencies which might injure a considerable part of the future workforce. With 22 percent business students take up the largest share of tertiary students in Europe (Eurostat, 2018). This means that a large part of the future workforce will consist of business students, and setbacks in their education could seriously impact the future labor force. On the other hand, well-functioning online education can positively affect students' academic performance (Shachar & Neumann, 2010). By lacking knowledge about online studying, educational institutions might harm the future workforce and fail to implement a beneficial and effective study method. Furthermore, studies regarding the positive impacts of studying online are mainly US-focused (Shachar & Neumann, 2010) (Fish & Snodgrass, 2015). As online education was less common in Europe prior to the global pandemic (Goglio, 2019), it has also been studied less. Moreover, the lack of online options offered in Europe potentially made the sudden switch much more drastic than in the United States. Thus, there exists a lack of research focusing on compulsory online education in Europe. Compulsory online education further concerns stakeholders such as lecturers, employers and policymakers. E-learning has a major impact on how lecturers teach since they encounter technological and communication issues (Lestiyanawati & Widyantoro). Due to a potential lack of skills and credentials caused by obligatory e-learning, employers might consider online education inferior to face-to-face learning (Shersad & Salam, 2020). Furthermore, policymakers such as accreditation bodies, risk the credibility and validity of their study

programs due to compulsory online education (Shersad & Salam, 2020). Only little research has been conducted on how to resolve stakeholder concerns.

All in all, there is not enough information and research available about the effects mandatory online education has on business students. Therefore, this study mainly focuses on discovering and analyzing the perceived values and disadvantages of online education and how they influence business students' well-being, social life and academic performance. Furthermore, due to the lack of research in Europe on this topic, the current study concentrates on business students from Germany and the Netherlands. These countries were selected because they align in their approaches to face compulsory online education by following social distancing rules and protecting their students and staff by enforcing studying online (Government of the Netherlands, 2021) (Storsberg, 2020). In addition to this, they show cultural similarities (Hofstede Insights, 2021) while being situated in geographical proximity. Finally, this study contributes to theory by aiming to close the gap and deepen the knowledge on the topic of compulsory online education. The contribution for involved stakeholders is also significant as the current study follows the objective to address and resolve stakeholders concerns regarding compulsory online education.

## 2. Theoretical background

### 2.1 E-learning

According to Alonso et al. (2005, p. 218) ‘E-learning is the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services, as well as remote exchange and collaboration.’

Studying online offers both benefits and disadvantages (Shachar & Neumann, 2010) (Sahu, 2020), which is why a method that analyzes the value perception of e-learning is necessary. Toufaily et al.’s (2018) theory on e-learning and perceived value evaluates students' different perceived values of e-learning. The theory analyzes different aspects of perceived value, namely functional, conditional, epistemic, social, belonging, emotional, and personal value. The described values are to be analyzed in a dynamic approach, thus before, during, and after an e-learning experience to avoid misrepresentation due to assuming a static view. After dividing perceived values into the aforementioned categories, Toufaily et al. (2018) further divide the values into ‘gives’ and ‘gets.’ ‘Gets’ stand for the positively perceived values by students, while ‘gives’ signify the sacrifices to be made (Kumar & Reinartz, 2016) (Toufaily, et al., 2018). Similar to Toufaily et al. (2018), Hassanzadeh et al.’s theory for measuring e-learning success in universities (2012) focuses on the values perceived from e-learning. The value-adding or deriving components used in their theory are technical system quality, content and information quality, educational system quality, service quality, user satisfaction, intention to use, use of system, goal achievement, benefits, and system loyalty. Related to this, Navimipour and Zareie’s theory (2015) assesses the impact e-learning has on employees’ satisfaction, indicating what aspects of e-learning employees consider as valuable or not valuable. Their theory on the impact of e-learning on employee satisfaction (Navimipour & Zareie, 2015) states four variables, sub-divided into seventeen dimensions.

Toufaily et al.'s theory on e-learning and perceived value (2018) is most suitable for the current paper due to its focus on e-learning in an academic environment, which is the same as the current study's environment. Next to that, it investigates the perceived values of e-learning, which can be negative or positive; due to the values directly being linked to the advantages and disadvantages of studying online, they can be directly linked to the three dependent variables of this study namely academic performance, social life and well-being. Compared to the other theoretical perspectives on e-learning, Toufaily et al.'s theory (2018) appears more concise and focused on these three variables. The theory, for example, focuses on the belonging and social aspect, which directly relate to well-being, academic performance and social life.

### 2.1.1 The impact of e-learning on academic performance

Phang et al.'s (2013) expanded theory on goal efficacy attempts to prove that academic ability, goal orientation, self-efficacy, and self-regulated strategy contribute positively to students' academic performance. Phang et al. (2013) used a variety of tools to assess these variables: Marsh and O'Neill's self-description questionnaire III (1984) to assess students' perceived academic ability; Solberg et al.'s college self-efficacy instrument (1993) to assess students' self-efficacy; Pintrich et al.'s (1993) motivated strategies for learning questionnaire to evaluate goal orientation; and Gredler and Garavalia's (2000) self-efficacy for a self-regulated learning tool to assess students' learning strategies' frequency and effectiveness. Similar to Phang et al.'s (2013) theory, Elger's theory of performance (2007) concentrates on the components that increase performance. These six components are level of identity, level of skills, level of knowledge, context of performance, personal factors, and fixed factors. Next to that, the theory states seven attributes of high performance. The seven attributes linked to improved performance are an increase in quality, a decrease in cost, an increase in capability, an increase in capacity, an increase in knowledge, an increase in skills, and an increase in identity and motivation (Elger, 2007).

For the current study Elger's theory of performance (2007) is deemed most suitable to assess the influence of e-learning on academic performance due to its application in the academic environment. Besides that, the theoretical perspective shows a multi-dimensional approach to evaluate performance. Viewing performance from multiple perspectives can enable a more detailed data collection to determine whether students' academic performance decreases or increases during obligatory e-learning. The use of Phang et al.'s theory (2013) would have been too complicated since their hypothesis that learning strategies mediate between self-efficacy, academic ability, and academic performance has been disproven.

The impact obligatory online learning has on students' academic performance has barely been explored due to its recent introduction. Prior to e-learning being mandatory, Shachar and Neumann (2010) proved a positive correlation between studying online and academic performance. Most research predicted a negative impact on students' grades caused by the enforcement of e-learning (Crabbendam & Goes, 2020). Haider and Al-Salman (2020) found that the majority of students believe that e-learning tools were responsible for their lower academic performance. Gonzales et al.'s research (2020), however, showed opposing results and concluded that enforced online education during the pandemic led to higher academic performance among students than face-to-face education. Given the conflicting research

regarding the impact of e-learning on academic performance, further research is necessary to form clear conclusions.

### 2.1.2 The impact of e-learning on social life

Wenger's social theory of learning (1998) describes the process of learning through social participation, in other words, learning through actively participating in the practice of communities and creating an identity related to these communities. The four components of social learning are, meaning, practice, community, and identity. These four components and learning are interconnected and can be mutually exchanged for each other. Compared to Wenger's social theory of learning (1998), Fine's five dimensions of time theory (1996) approaches social life from a temporal perspective. Fine's theory offers an analytical approach to dividing an individual's daily life into five dimensions, namely: Periodicity, tempo, timing, duration, and sequence. Fine created the dimensions of time to analyze the temporal division in a hospitality environment, but Southerton (2006) proved that Fine's theory could also be applied to an individual's daily activities. Southerton (2006) also created plotting practices for the five dimensions that visually represent Fine's theory.

The theoretical perspective chosen to assess business students' social life is Fine's five dimensions of time theory (1996). Southerton applied Fine's theory (1996) in the context of daily life, of which social life is an aspect (Southerton, 2006); thus, the theory should also apply to social life. Since compulsory online education changes students' daily routines and social lives (Chaturvedi et al., 2020), the temporal aspect will change as well. That is why using Fine's five dimensions of time theory (1996) can give useful insights in the current study.

There is currently little research available on the influence obligatory e-learning has on students' social lives. Chaturvedi et al. (2020) stated that the switch to e-learning greatly influences students' daily routine and social life. Further research regarding the impact on social life shows contradictory results. Research conducted by Fried et al. (2020) recorded that questioned students declared no significant changes in their social activities and that their only behavior change was avoiding large social gatherings. This led to an increase in meaningful interactions in smaller groups; hence, a decrease in loneliness among students during the pandemic and e-learning (Fried et al., 2020). Research by Elmer et al. (2020), on the other hand, came to an opposite conclusion. Their data showed that the frequency of social interactions between students decreased during online education. At the same time, students' friendships remained stable, and they received more emotional support from their peers when compared to before the global pandemic. Nevertheless, the number of socially isolated students rose compared to the number of face-to-face education students (Elmer et al., 2020). Since current studies about the effects of compulsory online education on students' social lives are contradictory, further research needs to be conducted.

### 2.1.3 The impact of e-learning on well-being

To begin with, Naidoo's multi-dimensional individual well-being theory (2019) measures individual well-being based on the fulfilment of six dimensions and their specific sub-dimensions. The six dimensions are economic stability, physical health, mental health, personal relationships, community and social participation, and neighborhood environment, and have

been developed based on existing literature. Next to that, Naidoo (2019) provides Likert-scales to collect data for the six dimensions of well-being. Similar to Naidoo's multi-dimensional individual well-being theory (2019), Seligman's well-being theory (2011) assesses well-being depending on the fulfilment of specific factors. These factors are positive emotions, engagement, relationships, achievement, and meaning. Peplau and Perlman's social psychological theory of loneliness (1979) states four causes that directly lead to loneliness and predispositions that increase the risk for it. Besides that, Peplau and Perlman used the UCLA scale, which assesses the level of loneliness, to gather data for their theory (Russel et al., 1978). According to Peplau and Perlman (1979), loneliness results either from predispositions or can be caused by four factors: the ending of an emotionally close relationship, physical separation from family and friends, significant changes such as retirement and unemployment, or a lack of quality in the relationships with family and friends.

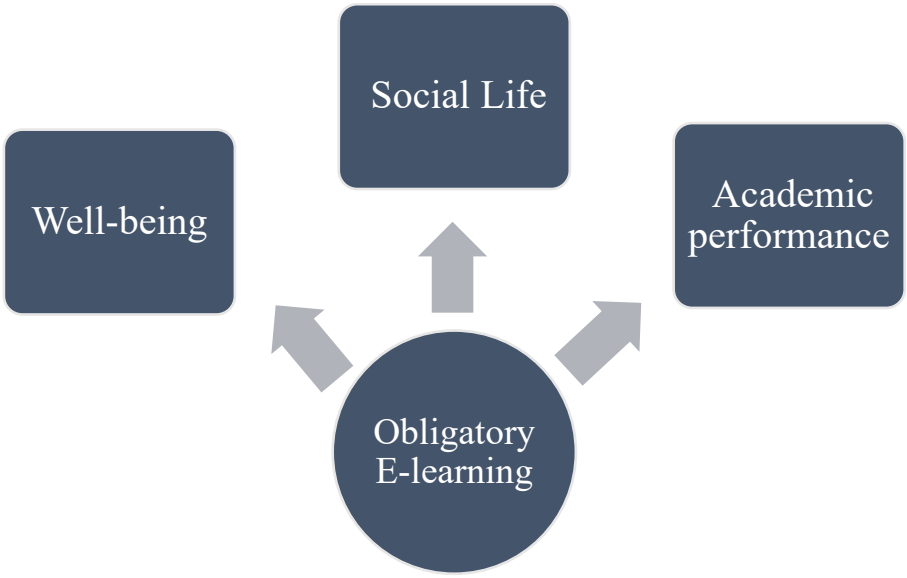
Naidoo's multi-dimensional individual well-being theory (2019) was selected as the theoretical perspective evaluating business students' well-being and social life. First of all, Naidoo (2019) offers an extensive and multi-dimensional framework on well-being; by analyzing more aspects of the variable, more relevant information can be collected. Next to that, the theory provides operationalized dimensions and tools in the form of Likert-scales that can gather data. Unlike the other presented theoretical perspectives, Naidoo's theory (2019) covers both positive and negative aspects of well-being and is universally applicable. Naidoo's theory (2019) also applies to the variable social life, as it analyzes personal relationships and community participation, which are relevant sub-variables of social life. Therefore, Naidoo's well-being theory was utilized to analyze both well-being and social life.

The relationship between certain aspects of well-being and online education has been investigated and findings are presented in recent literature. Sahu (2020) determined that studying online influences students' ability to socialize with their peers, which might have a negative impact on their mental health. De Oliveira Araujo et al. (2020) also concluded that the loneliness linked to e-learning could lead to psychological pain and suffering. Haider and Al-Salman (2020) found that the majority of questioned students have encountered negative mental health issues. Besides that, more than half of the students indicated that the prolonged use of e-learning tools led to boredom, nervousness, and tension. The majority of the interviewed students also considered e-learning as socially and psychologically unhealthy. According to Elmer et al. (2020), students felt socially isolated and more concerned about their future careers during obligatory e-learning due to Covid-19. Their research also indicated that students were more depressed, anxious, stressed, and lonelier during studying online and the global pandemic; therefore, it can be concluded that students' mental health has been affected by online education. However, the current study aims to analyze the impact of e-learning on students' well-being, and mental health is only one aspect of this variable (Naidoo, 2019). Therefore, further research is needed to better understand the effects of studying online on other dimensions of well-being.

### 2.1.4 Theory implications and conceptual framework

As indicated in the literature review, obligatory e-learning seems to affect well-being, social life, and academic performance, but the available research about the exact effects is either contradictory or incomplete. Studies about the impact on academic performance and social life are conflicting (Fried et al., 2020) (Elmer et al., 2020) (Gonzales, et al., 2020) (Haider & Al-Salman, 2020); therefore, the exact impact of e-learning on the dependent variables cannot be established yet. In addition to that, the studies available focus on mental health rather than on well-being. Since mental health is only one dimension of well-being (Naidoo, 2019), no clear conclusions on how e-learning affects well-being can be formed at this point. The presented literature neither focuses on business students nor the specified countries for this research, except for Crabbendam and Goes (2020) and Fried et al. (2020), who focused on Dutch students. That is why the current study investigates the influence obligatory e-learning has on the well-being, social life, and academic performance of Dutch and German business students. Figure 1 shows the conceptual model of the study.

*Figure 1: Conceptual model*




## 3. Methods

This study used a phenomenological qualitative approach; thus, the research focused on gathering primary data from participants' lived experiences and basing further conclusions upon these findings. This method was chosen due to the explorative intentions of this study. The impact of mandatory online education on business students is relatively unknown, and using a phenomenological method enabled this study to make relevant discoveries and create a better understanding of the topic. This study is comparative in nature as the findings from the Netherlands and Germany are compared to find similarities and differences.

Moreover, quota and convenience sampling were used in this study. Quota sampling was necessary to adequately represent the business student population in the target countries. Business-students were selected convenience-based through the researcher’s personal network, student forums, or social media. Snowball sampling ensured faster and simplified research and

was most suitable due to time constraints (Saunders et al., 2007). The sample size was determined by the number of business schools per country. There are 138 business schools in Germany and 43 in the Netherlands (Studyportals B.V., 2021). This study interviewed 30 students in total: 23 students studying in Germany and seven studying in the Netherlands. The division of the participants was based on the following calculation:

Germany = 138 universities; Netherlands = 43 universities
138 u + 43 u = 181 u
181 u= 100 % | /100
1.81 u = 1% | /1.81
1 u = 0.552486 % | x 138 |x 43 |
138u = 76.2%
43u= 23.76%
30 participants = 100% | / 100
0.30 p = 1% |x76.2% |x23.76 %
23 p = 76.2%
7 p = 23.76%

Semi-structured interviews were selected since they enable researchers to follow a script but at the same time allow them to adapt the interview to the actual conversation. The content of the interviews was based on the literature review and the operationalized variables. The interviews were conducted via Zoom during March and April 2021 and recorded with the consent of the participants. Due to the insufficient English level of multiple German participants, 15 interviews were conducted in German and later translated to English. The remaining interviews were conducted in English and the recorded conversations were roughly transcribed with the transcription software otter.ai (English) and sonix.ai (German).

After the successful collection and transcription of all narrative data, a thematic analysis was conducted. The hallmarks of thematic analysis are its flexibility and its applicability to the phenomenological approach (Clarke & Braun, 2014), which made this type of analysis suitable for the current study. The collected data was coded with Atlas.ti to analyze e-learning, well-being, social life, and academic performance. Additional themes revealed through the analysis were assessed on their relationship with the main variables.

Regarding potential ethical concerns, adequate steps were taken. First, the research's intention was clarified to the participants, and they were informed about the outcome of this study. Besides that, the collected data was treated confidentially, and the anonymity of the interviewees was guaranteed. Participants were informed about their right to forgo sensitive questions and to withdraw their participation at any time.

## 4. Results

The findings of this study revealed relevant insights into the effects of compulsory online education on students' academic performance, social life and well-being. The results are presented under three main themes namely: academic performance, social life and well-being.

Furthermore, participants' general perception of the impact of e-learning as well as differences between Germany and the Netherlands are presented.

### 4.1 Academic performance

Elger's theory of performance allowed the assessment of students' academic performance during compulsory online education on multiple levels. To begin with, students' identity was negatively influenced by e-learning. One German student, for example, said 'I didn't get a student feeling at all, unlike when you are sitting in a lecture hall and you have students around you who also have the lecture'. Next to that, students saw a decline in their context of performance, due to reasons such as difficulties with studying online, technical and communication issues, tedious classes and the attitude of lecturers. A student studying in the Netherlands, for instance, mentioned that 'it's harder to interact with people and to ask questions' and a German student complained that 'you [they] have to get everything on your [their] own which is frustrating if you [they] don't understand it'. Another sub-variable that was negatively influenced by e-learning was personal factors. The main concern for students was the lack of study-life balance. A Dutch participant proclaimed that 'there's never an end of my [their] work time period or my [their] study time period'. Many students also complained about having 'a lot more distractions' at home during e-learning. Moreover, students felt limited in their capability to complete difficult assignments during compulsory online education due to the lack of social contact with other students and the decrease in their context of performance, including the exam environment. 'We actually used scan programs to take a picture of our exam and then we have to send them to our teacher immediately' and 'you only have 15 minutes and some students uploaded their file incorrectly', said one student from a German university. Another German participant noticed that exams were 'even harder now because some teachers are expecting students to cheat'. The variable subject to most negative influence during e-learning was motivation because of the missing peer pressure and surveillance, tedious classes and the increased need for discipline and the lack of social contact. A German participant indicated that they would have been 'more motivated if I [they] are surrounded by students that are ambitious and motivated and studying, compared to being in my [their] room where I [they] have many distractions'. A participant from the Netherlands described e-learning as 'boring',' not interesting' and 'not interactive', and confirmed that it greatly affected their motivation. On the other hand, students' capacity to complete more assignments increased during e-learning due to the time-efficiency and flexibility associated with online education. A participant from Germany explained that 'e-learning really gave me [them] more time to do my [their] tasks'. Some students considered the acquired flexibility and time-efficiency a benefit. This benefit also caused an improvement in the grades of some students. One German student's grades rose 'because of all the time saving' and because they 'had more time to coordinate and to study'. On the other hand, a student from a German university thought that their grades decreased 'due to less focus, less concentration and less feeling obligated to really pay attention all the time'. Finally, the results regarding perceived skills and knowledge varied significantly. Some students acquired additional skills through e-learning, such as discipline, independence and technological knowledge. A German participant described that the flexibility of e-learning gave them 'more freedom to develop myself

[themselves]'. However, students felt that online education limited their soft-skills and networking development. A participant from Germany believed that e-learning negatively affected their 'soft skills' and 'networking skills', which they 'otherwise would have developed'.

The components identity, personal factors, context of performance, capability and motivation were negatively affected; mixed results were noted for skills and knowledge, costs and grades and students' capacity was positively influenced by online education. When assessing all the components of performance according to Elger's theory (2007) it can be concluded that students' academic performance has diminished due to obligatory e-learning.

### 4.2 Social life

The combination of Fine's five dimensions of time (1996) under Southerton's application (2006) and Naidoo's theory of well-being (2019) allowed the collection of data about multiple aspects of students' social lives. Relevant information about temporality, personal relationships and social participation was collected. To begin with, the periodicity and duration of interactions with other students declined significantly. One German student stated that 'social activities before e-learning were definitely more frequent and longer in terms of duration than they were during e-learning'. On the other hand, social activities with friends or family were positively affected. A participant from a German university indicated that 'because of e-learning, you [they] can listen to the lecture anytime and anywhere and this also means that you [they] have more time for your [their] friends, family and partners'. For one Dutch student, the lack of social interactions resulted in 'meeting some friends every week' or having 'a fixed footballing session'. Students' relationships with other students also significantly decreased during compulsory online education. A German participant described that 'they [interactions with other students] were completely gone'. On the other hand, students' opinions regarding their relationships with friends and family were divided. Some students considered the increased amount of time spent together as a source of conflict with family members and roommates. A German student explained this as follows: 'The situation can become tense every now and then because you just hang on top of each other all day'. The opposite, however, was also frequently the case. One German participant realized that they 'actually became better friends with my [their] roommates, because we [they] spent a lot more time together'. Finally, students also noticed that their relationships with lecturers were impacted. A German respondent preferred 'going to the professor after the event and asking them questions instead of staying in the online lecture and asking a question online'. The findings of the current study also show that students' social participation was not really affected by compulsory online education. Most students were not part of communities or associations or were able to interact with them online. A German student indicated that they 'tried my [their] best to be part of a university association here, that was really, really busy. And we [they] did a lot'. Besides that, students were less lonely because they lived with their family or regularly saw their friends. A German participant had 'a big family and since I [they] still see my [their] friends here, I [they] wouldn't say that I'm [they are] feeling lonely'. Some students seemed to be immune to loneliness due to their introverted personality. A student from a German university described themselves as 'someone who withdraws from other people' and does not 'interact that much

with others'. Other students even indicated that they would not be lonely if it were not for the pandemic. A German participant stated that 'loneliness would not exist because e-learning does not mean that you are trapped at home. You can still do something with others'. Nevertheless, students on average still felt lonelier than prior to online education. A Dutch participant, for example, rated their loneliness a 'seven or eight' on a scale from one to ten and a student from Germany believed that 'everything that has to do with university tasks and e-learning are very lonely activities'.

The application of Fine's theory (1996) and Naidoo's theory (2019) shows that the effects of compulsory online education on students' social life highly depends on several factors as explained above. The frequency, duration of interactions and relationships with students and lecturers clearly decreased, while the frequency and duration of interactions with family and friends rose. Students' loneliness was on average less affected than anticipated.

### 4.3 Well-being

Naidoo's theory of well-being (2019) enabled the analysis of students' well-being based on multiple variables. The findings of the current study show that multiple variables of well-being were not significantly affected by compulsory online education; the respective variables are social participation, economic stability and neighborhood. Most students did not consider their social participation and neighborhood affected by e-learning at all. Regarding economic stability, the majority of students noticed no or only small differences. A German student noticed that they had less expenses for 'transportation' and 'stuff to eat'. Contradictory data for the variable personal relationships was gathered as students' relationships with lecturers and other students decreased but were mixed for family and friends. However, both variables mental health and physical health decreased during compulsory online education. A German participant considered e-learning as 'mentally stressful', because 'there is simply no physical contact with people'. Besides that, the missing study-life balance seemed to impact students' mental health. A Dutch participant stated that 'there's never an end of my [their] work time period or my [their] study time period' and felt trapped in a 'vicious cycle of always, always, always having to do something'. Furthermore, a few German students complained about 'boredom' and e-learning being 'mentally a bit more tiring'. Nevertheless, students explained that the mentioned mental health concerns due to online education were relatively minor. This was also the case for physical health. Students did not move as much during e-learning as during face-to-face education, which negatively influenced their physical health and sometimes led to a decline in students' mental health. 'With e-learning, you always sit in front of your computer and you become more inactive. And the more inactive you get, the worse you feel physically and that also affects your mental health. You feel weak and tired and you get into a negative spiral', explained a German participant. Although physical complaints were somewhat present, students actively tried to compensate for their lack of movement. A student from a German university ' try [tried] to keep this balance' by 'taking my [their] e-learning classes and then I walk [walking] around the block'.

To summarize the analysis through Naidoo's theory of well-being (2019) it should be mentioned that compulsory online education affects students' well-being slightly negatively.

Multiple variables such as social participation, economic stability, neighborhood and personal relationships proved to be not affected or mixed results were recorded. Students' mental and physical health, however, decreased during online education.

### 4.4 General perception of online education and its impact

Toufaily et al.'s theory on e-learning and perceived value (2018) was applied in the current study and the semi-structured interview with questions about students' opinion on online education before the pandemic and in the future, made it possible to gather relevant data about students' general perception. To begin with, students had mixed opinions on e-learning prior to Covid-19. A German student indicated that they would have had 'many doubts about it [e-learning], because you have no contact with your professor at all'. Another participant from Germany was open-minded towards e-learning because they 'considered it useful to make more use of new technologies'. On average, students wanted to keep e-learning integrated in their future education to a certain extent; e-learning should be used partially or be optional. One German student would like to have the flexibility to 'do hybrid education, just however you're feeling that day'. Nevertheless, many students shared the belief that e-learning 'definitely doesn't replace normal studying' and should be an addition rather than a replacement. Students agreed that online education delivers functional value, due to its flexibility, digitalization and time-efficiency. A German participant explained that 'you can simply arrange them [classes] in a way that works for you, in comparison with the very strict schedule of in-person classes'. On the other hand, students noticed a negative impact on their social value. They felt that during compulsory online education they had difficulties forming their own or perceiving other students' image. A participant from a German university believed that 'as a result of e-learning, they [other students] generally notice me less'. Another negative effect of e-learning was that it affected employers' image of online students. A Dutch student voiced concerns about employers 'prefer[ing] someone who actually did traditional education' and a German participant believed that employers consider online education as 'a worse degree'. Varying results were observed for students' skills and knowledge and personal relationships. The variables epistemic value, emotional value and conditional value were not specifically questioned during the current study but some data was gathered regardless. The epistemic value of e-learning was relatively high as students enjoyed the usage of novel technologies during compulsory online education. A participant from a Dutch university shared that 'there are plenty of websites and tools like Skillshare and Squarespace' that are 'super useful regarding university'. The findings about students' emotional value were mixed; most students were satisfied with their universities' actions but the attitudes of lecturers varied and could either add or subtract emotional value. One German student noticed that some lecturers 'display an attitude in the sense of eat or die', another one believed that lecturers 'try so much harder and really try to motivate people'. Only a few students commented on the conditional value of compulsory online education. According to one German participant, students 'can be glad that we [they] can continue our [their] study and that e-learning made the whole thing easier for us [them]'.

The assessment of students' general perceptions of compulsory online education through Toufaily et al.'s theory (2018) revealed mixed results. The number of positively perceived values equals the number of negatively perceived values.

### 4.5 Differences Germany and Netherlands

Due to the comparative nature of the current study, valuable insights from Germany and the Netherlands could be gathered and compared. The main difference noticed was that German universities preferred the usage of recorded lectures and the prevalence of live online lectures in the Netherlands. This difference could potentially be the reason for more complaints about image, status, motivation or developing soft-skills among students in Germany. On the other hand, recorded lectures might also be the cause for German students' increase in capacity. Dutch students voiced more concerns about the transferability of skills and knowledge of e-learning, and their motivation was more affected by the tediousness of online classes. The average grades of students in the Netherlands were also higher than those of German students. Another significant difference were the higher levels of loneliness among students in Germany. A possible reason for this could be the lack of first-year students among the Dutch sample.

## 5. Discussion

Overall, the current study revealed that compulsory online education affected all of the three main variables to a certain extent. Students' academic performance diminished due to reasons such as the lack of student identity and study-life balance, communication issues, boredom and lack of motivation. The influence of e-learning on students' social life is highly dependant: while social interactions with other students and lecturers significantly dropped, this was not the case for friends and family. Students also felt less lonely than expected. Compulsory online education most likely led to a decrease in students' well-being due to the decline in their mental and physical health. Students' overall perceptions of e-learning were both negative and positive and multiple differences between both countries were noticed.

The findings of the current study both contradict and confirm existing research regarding e-learning. Besides that, the unique framework of this study enabled the researchers to collect relevant and novel data contributing to the academic field. To begin with, this research contradicts Haider and Al-Salman's findings (2020), in which 70% of the research participants confirmed a decrease in their grades. The current study refutes this since the same number of students noticed a decrease and an increase in their grades. Furthermore, unlike Gonzales et al.'s study findings (2020), the findings of this study show that students did not become more motivated due to e-learning; the contrary was the case. Demotivation caused by the missing peer pressure and surveillance was a major contributor to students' decrease in performance in the current study. It is crucial that academic institutions and lecturers combat the decrease in performance caused by demotivation. Online study rooms could be established to counteract the lack of peer pressure and lecturers are urged to make online classes more interactive. Tools such as gamification are suggested. In contrast to Gonzales et al. 's findings (2020), the current study could not link an increase in students' grades to a change in study behavior. Students' grades were equally positively and negatively affected and higher grades were mostly the result

of an increase in time-efficiency, better study material and a more comfortable exam environment. Some students even suggested that lecturers were more lenient in their grading. It is recommended for lecturers to select an exam structure that neither hinders nor aids students too much or permits cheating. During the pandemic, tools such as Proctorio should be utilized to guarantee a fair exam environment. Afterwards, it is advised that examination returns to pre-pandemic standards. Due to Elger's theory (2007) consisting of multiple variables, the current study was able to collect novel data on aspects of academic performance besides grading. Remarkable results were noted for students' identity and capacity: students did not feel like real students during compulsory online education but because they were more flexible, their capacity improved. The current study also suggests that students' learned skills and knowledge are not significantly influenced by online education. However, students' subjective perception might not reliably represent the actual transferability of skills and knowledge during online education; further research is necessary. Nevertheless, it is important for employers to know that online students can possess additional skills, such as discipline, independence and technological knowledge, which distinguishes them from conventional students. Students also mentioned that persisting technical issues or the lack of technical knowledge influenced their academic performance. Therefore, academic institutions should act by investing in training for students and lecturers, so that both parties fully comprehend the functionality of e-learning tools.

The findings of the current study stand in agreement with Chaturvedi et al.'s results (2020) as students' daily routine and social life have been heavily impacted by compulsory online education. During traditional education students could frequently interact with other students or lecturers, which was replaced by little to no social interaction during online education. This contrasts Fried, Papanikolaou and Epskamp's findings (2020), whose participants did not notice any significant differences. As already mentioned it is crucial that academic institutions enhance students' ability to interact with each other during e-learning. Regular opportunities for students to interact with each other and bond online should be offered. The current study's results are aligned with Elmer, Mepham and Stadtfeld's findings (2020): Interactions with peers decreased but students spent more time with family and friends. Furthermore, the current findings about loneliness contradict both Elmer et al.'s (2020) and Fried et al.'s (2020) findings. Students felt less lonely than Elmer et al.'s participants (2020), but they did not feel less lonely than before obligatory e-learning, unlike Fried et al.'s (2020) participants. The conceptual framework which combines Fine's (1996) and Naidoo's theory (2019) made it possible to retrieve novel findings for the academic field. Firstly, online education seemingly did not impact students' social participation. Besides that, multiple students indicated that without the pandemic online education's impact on their social life would have been minimal. Finally, introverted students' social lives were affected less.

The current research found that the lack of social interaction somewhat affected students' mental health which agrees with Sahu's findings (2020). Similar to Elmer et al.'s (2020) and Haider and Al-Salman's findings (2020), some students felt more depressed, stressed, lonelier and bored during online education. However, it needs to be noted that many students in the current study indicated that the influence on their mental health was minimal, which contrasts De Oliveira Araujo et al. (2020) and Haider and Al-Salman's data (2020). Both found that the

loneliness caused by compulsory online education significantly impacted students' mental health and led them to suffer and feel psychological pain. The participants of the current study were less impacted by loneliness, which might have been the case due to the small sample size of the current study. Further research should be conducted to conclude how much obligatory e-learning actually impacts students' mental health. An aspect that significantly contributed to the decrease in mental health and was not yet recorded in existing studies is the lack of study-life balance. The participants felt strongly influenced by spending their free time and study time at the same place. Academic institutions should attempt to address this by offering guidelines for successfully balancing study and life during online education. Furthermore, if possible, students should be allowed to use university facilities, such as libraries.

Existing literature mainly focuses on the aspect of mental health to assess students' well-being. However, Naidoo's theory (2019) allowed the analysis of a broader spectrum of well-being. Variables such as economic stability, social participation and neighborhood have not been affected at all. The results for personal relationships were mixed but students' physical and mental health slightly decreased. This shows that, on average, students' well-being was negatively impacted but not as strongly as students' mental health, if taking existing studies into account.

The findings regarding students' general perception of e-learning were highly useful for stakeholders. Students seem to have a positive view on e-learning in the future, especially hybrid education, but consider online education as an addition not a replacement. Academic institutions should aim to implement e-learning in the future, while keeping guest lectures, debates and practical classes offline. The current study could be replicated with a focus on hybrid learning after the pandemic and could present further perspectives on hybrid learning. The flexibility and time-efficiency of e-learning also makes tertiary education more accessible for a new target group: People who do not have time to follow traditional education. Students praised the functional value of e-learning, which includes the digitalization of course materials. This preference indicates that lecturers should aim to digitize their materials after the pandemic as well. Moreover, students indicated that their status among employers was negatively impacted, which should concern policy makers. On the one hand, it is advised that employers do not discriminate against e-learning students during the pandemic as every student during this time period was subject to it. On the other hand, policymakers should aim to guarantee the transferability of knowledge and skills during e-learning compared to traditional education. It is suggested that policymakers create standardized policies and guidelines for online education to improve its validity and reliability. Further research on the transferability of skills in e-learning should be conducted.

The most noticeable difference between Germany and the Netherlands was the choice in e-learning methods; German universities opted for recorded lectures, and Dutch universities for live online lectures. Compared to live online lectures, recorded lectures improve students' capacity but they limit the creation of an image, status or soft-skills and decrease motivation. It was not the intention of this study to compare different e-learning methods, therefore, further research on this topic is necessary.

## 6. Limitations

The current study was severely limited by time-constraints and the adaptations made to suit the time-frame. Firstly, the choice of convenience sampling made it possible to interview the targeted number of participants but on the other hand, it led to a lack of diversity. The Dutch sample is almost entirely composed of students from the same university and study, which limits its representativeness. Due to the time-constraints the number of participants was also relatively small. A larger sample size could have more accurately represented the population and led to more contrasting results. Besides that, students kept confusing the effects of compulsory online education with the effects of the pandemic. Additional probing questions mostly omitted the mix-up but it cannot be entirely guaranteed; thus, it may have introduced bias to the findings of this study. Finally, the subjectiveness of certain results, for example skills and knowledge, limits the reliability of the research. Students might not perceive the skills learned during e-learning in an objective manner and actual objective research on this topic could lead to different results.

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