

Preprint: <https://psyarxiv.com/md93x>

Helplessness Among University Students: An Empirical Study Based on a Modified Framework of Implicit Personality Theories

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Abstract

Due to the COVID-19 pandemic, and within a very short period of time, teaching in the 2020 summer term changed from predominantly on-site to online instruction. Students suddenly faced having to adapt their learning process to new demands for which they may have had both insufficient digital skills and a lack of learning resources. Such a situation carries the risk that a substantial number of students become helpless. The aim of our empirical study was to test a hybrid framework of helplessness that includes both objective causes of helplessness and students' subjective interpretations of them. Before lectures or courses began, students of a full-scale university were invited to participate in an online survey. The final sample consists of 1,690 students. Results indicate that objective factors as well as their subjective interpretations contribute to the formation of helplessness.

Keywords: higher education, digital learning, COVID-19 pandemic, helplessness, implicit theories of personality

Introduction

Within the first months of 2020, governments around the world responded to the COVID-19 pandemic with a variety of different measures, including travel restrictions, curfews, and the closing of educational institutions (Bozkurt et al. 2020; Cheng, Barceló, Hartnett, Kubinec and Messerschmidt 2020). By the 20th of March, the Federal State of Bavaria announced far-reaching measures to curb the COVID-19 pandemic. Bavarian universities – where our research takes place – completely switched to online courses.

Research has shown that the use of modern technologies in learning can have multiple positive effects on students (Bond et al. 2020; Bull and Keengwe 2019; Dyson et al. 2015; Hung and Yuen 2010; Zhang 2015). Nonetheless, there are several reasons to assume that this rapid shift to online learning amidst a catastrophic event may have triggered the perception of helplessness in a significant cohort of university students (Bavel, Baicker, Boggio et al. 2020). A recent dependence on digital learning coupled with potential instances of helplessness among students is an opportunity to test theoretical assumptions about antecedents of helplessness in higher education. In this work, we will focus on the role of individual skills, learning resources, and implicit personality theories on the modifiability and stability of abilities. Our focus on these three factors is both theoretically grounded and based on pedagogical considerations.

Theoretical Background

Exposure to uncontrollable outcomes can bring about the phenomenon of learned helplessness, a state in which a person fails to take advantage of control, although the situation is objectively controllable (Hiroto and Seligman 1975; Maier and Watkins 2000; Peterson, Maier and Seligman 1995; Seligman 1972). Myers (2004) defined helplessness as “hopelessness and resignation learned when a human or an animal perceives no control over repeated bad events” (p. 56).

It is assumed that helplessness results in behavioral, motivational, emotional, and cognitive deficits (Wu and Tu 2019). Indeed, research has repeatedly shown that the perception of own helplessness is associated with numerous behavioral, personal, and social problems such as greater test anxiety (Cassady 2004; Fincham, Hokoda and Sanders 1989; Raufelder, Regner and Wood 2018); negative emotions such as boredom (Sharp, Sharp and Young 2020); maladaptive behavior types such as internalizing (e.g. withdrawal, depression) and externalizing problems (e.g. delinquent and aggressive behavior) (Klein and Seligman 1976; Klein, Fencil-Morse and Seligman 1976; Sorrenti et al. 2019); perceiving tasks that

require persistence as beyond one's reach (Abramson et al. 1989; Ames 1990); lower achievements (Johnston-Wilder, Goodall and Almehr 2018; Valas 2001a, 2001b); and burnout (Maslach and Jackson 1982).

The scientific explanation of helplessness and its (negative) consequences is still not conclusive. This is in part, due to the fact that the term is not used uniformly. Overmier and Molet (2017), for example, point out that scholars sometimes make reference to the phenomenon of helplessness itself, to the theory of helplessness, or to both constructs. However, there is another notable discrepancy in the use of the term, which is expressed, for example, in the definition of helplessness by Nuvvula (2016, p. 426): „Helplessness is a state in which nothing a person opts to do affects what is happening. It is the quitting or the give up response that follows the conviction that whatever a person does doesn't matter.” A notable aspect of this definition is that it distinguishes an objective and a subjective side of helplessness. In the first sentence, an objective state is assumed and in the second sentence, a subjective reaction to it. The focus on the objective side dominated the initial phase of helplessness research, which investigated helpless behavior in animals. As its shortcomings became increasingly apparent, research interest shifted markedly to the subjective side of interpreting objective conditions (Maier and Seligman 2016). From an educational point of view, however, we consider both aspects equally important, as we will explain below.

Objective and Subjective Factors in the Explanation of Helplessness

The original explanation for helplessness was that persons perceive outcomes independent of their behavior (Hiroto and Seligman 1975; Maier and Seligman 2016). However, the phenomenon of helplessness comprises more than the inability to produce certain outcomes (but see Lieder, Goodman and Huys 2013). Many researchers noted problems with such a sparse explanation (Beevers et al. 2003; Hiver 2014; Miller and Norman 1972). For example, some people, far from becoming helpless, increased their efforts and improved their performance (e.g., Roth and Bootzin 1974; Roth and Kubal 1975; Tennen and Eller 1977). The central issue became then the individual interpretation of the bad, uncontrollable event (Abramson, Seligman and Teasdale 1978; Dweck and Wortman 1982; Feist and Feist 2002; Mohanty, Pradhan and Jena, 2015; Wortman and Dintzer 1978). In the “attributional reformulation” of learned helplessness, it was claimed that inescapability and the perception of non-contingency were not sufficient to produce helplessness. Rather, the explanations that subjects for the causes of the non-contingency predicted the extent of helplessness (Abramson et al. 1978; Alloy, Peterson, Abramson and Seligman 1984).

Various studies have found a correlation between helplessness and the aforementioned attribution style (Klein, Fencil-Morse and Seligman 1976; Miller and Norman 1986; Zemore and Johansen 1980). According to Weiner (1982), situations that favor external (causes by situational or external factors), global (across different contexts), and stable (consistent over time) attributions can cause helplessness. It seems quite likely that the COVID-19 pandemic and the associated switch to digital learning could encourage such a helpless attribution pattern. The switch to digital instruction is due to the COVID-19 crisis (external); is not limited to a single session or class; and at the same time, affects all classes (global) over the entire semester and probably beyond (stable).

However, the attributional reformulation was also criticized early on (Frankel and Snyder 1978; Wortman and Dintzer 1978). For example, it has been questioned whether the dimensions of attributions selected are really the most significant ones in causing helplessness. One line of development in the field of helplessness research literature sought to uncover further antecedents of helplessness, not least with the aim of better understanding interindividual differences. Indeed, many antecedents of helplessness are identifiable, including negative social expectations (Pi and Yan 2010), motivational orientations (Diener and Dweck 1980), self-efficacy (Putwain and Symes 2014; Sorrenti, Filippello, Costa and Buzzai 2015), maladaptive perfectionism (Filippello et al. 2017), and frustration intolerance (Filippello, Harrington, Costa, Buzzai and Sorrenti 2018). But these findings on antecedents did not change the basic pattern of explanation, according to which there must be mediating factors between the experience of non-contingency, inescapability, and helplessness. These mediating factors were supposed to give a person a sense of control. In fact, these antecedents are usually not understood as the mediators, but as antecedents to these mediators. For example, Tubre and Collins (2000) argued that high self-esteem should result in less susceptibility to helplessness, because high self-esteem tends to increase the tendency to attribute success to internal and stable factors and failure to external and unstable factors. However, there were also some exceptions to localize the effect of an antecedent only after the effect of the mediating factor, which allows for the control conviction. For example, Filippello et al. (2017) studied the mediating role of maladaptive perfectionism in the association between psychological control and learned helplessness. Another line of development focused on the mediators themselves (e.g., Carlson and Kacmar 1994; Dweck 2006; Dweck and Yeager 2019; Lieder, Goodman and Huys 2013; Martinko and Gardner 1982; Teodorescu and Erev 2014; Thomas 2016). For example, Martinko and Gardner (1982), and later Carlson and Kacmar (1994) are strongly rooted in the attributional tradition, where

the interpretation of an event seems even more important than the event itself. In contrast, Lieder, Goodman, and Huys (2013) followed by Teodorescu and Erev (2014) present approaches where the objective structure of events is important, but must be learned—either in the form of Bayesian learning, by way of generalizations about controllability (Lieder et al. 2013), or via the reward prevalence (Teodorescu and Erev 2014). The theoretical approach pursued in this work takes a middle position with regard to helplessness, in that both the subjective interpretation of events and objective aspects of reality are ascribed important roles. In addition, we recognize the importance of other antecedents that may influence the objective probability or the subjective assessment of producing an outcome.

We present our own approach not as a model of helplessness, as in our view, the complexity of helplessness with its various antecedents is still beyond the theoretical and methodological scope of introducing a model. However, we assert that an important step toward such a useful model to higher education is possible by developing a framework in the sense of a “network of linked concepts” (Jabareen 2009, p. 49).

A Hybrid Framework of Helplessness

The helplessness framework presented in this work can be considered a hybrid because it encompasses objective and subjective factors of helplessness. The objective factors refer to whether a person would in principle be able to achieve an outcome. It is assumed that two main factors are important for this: one's own competencies, as well as the resources that can be used to bring about an outcome.

By competence we mean the individual ability of a person to produce an outcome (Alqurashi 2016; Chang 2015; Cheung and Vogel 2013; Sawang, Newton and Jamieson 2013; Taipjutorus 2014; Tang and Tseng 2013). However, a person who cannot produce an outcome is not yet necessarily helpless. In fact, he or she might ask other people for help or decide to acquire the missing competences through learning. To assess the objective side of helplessness, therefore, it is important to know whether a person can activate further resources to produce the effect in the absence of own competences (Heckhausen and Heckhausen 2018). These resources can be very diverse. Their absence can be interpreted as barriers to successful digital learning (Ali, Uppal and Gulliver 2018; Muilenburg and Berge 2005).

On the subjective side, following the work of Ziegler and Stoeger (Ziegler and Stoeger 2010; Ziegler et al. 2010) we propose an extended variant of Dweck's implicit personality theory of the origin of helpless reactions. Dweck (1995, 1999, 2006) postulated that helpless reactions in the face of (repeated) failure are predominantly demonstrated by persons who

subscribe to an entity theory as opposed to an incremental personality theory. Persons, who subscribe to an entity theory view individual abilities as stable, whereas persons who subscribe to an incremental theory see them as malleable.

Dweck has provided a lot of evidence that incremental theorists react more adaptively when facing failure (Blackwell, Trzesniewski and Dweck 2007; Dweck and Leggett 1988; Dweck and Grant 2008; Dweck and Master 2008; Molden and Dweck 2006). However, building on Ziegler and Stoeger's (2010) work, we believe that the focus on the modifiability of deficits and on change is insufficient. There are many well-established psychological constructs and theories that also assign a positive role to stability. For example, self-affirmation theory maintains that individuals are motivated to keep up an image of oneself that is able to control important and adaptive outcomes in life (Cohen and Sherman 2014; Sherman 2013; Sherman and Cohen 2006). They engage in "identity-protective reasoning" (Branscombe, Ellemers, Spears and Doosje 1999; Kahan 2017a, 2017b) and actively seek verification of self-views that they consider to be important and central to the self (Chen, Chen and Shaw 2004; Swann, Rentfrow and Guinn, 2003). This tendency to stabilize positive aspects of personality may point to the existence of an explicit theoretical component that functions within many influential constructs such as self-esteem (Brown 1993; Brown and Mankowski 1993; Harter 1993), self-concept (Baumeister 1986), self-regard (Rogers 1977, 1980), and self-definition (Wicklund and Gollwitzer 1982). Even in self-presentation, individuals seek to maintain positive impressions of the self in view of others (Schlenker 2003). In line with these approaches, Ziegler and Stoeger (2010) concluded that the focus on the modifiability of deficits is insufficient. They assumed that it is also important for individuals to believe that their own ability to produce outcomes remains stable and will not change with circumstances.

The hybrid framework of helplessness in educational settings was developed primarily under pedagogical considerations and is summarized in Figure 1. A distinction is made between objective factors (i.e., competencies and resources), their subjective interpretation (implicit theories of modifiability and stability), and different antecedents of objective and subjective factors.

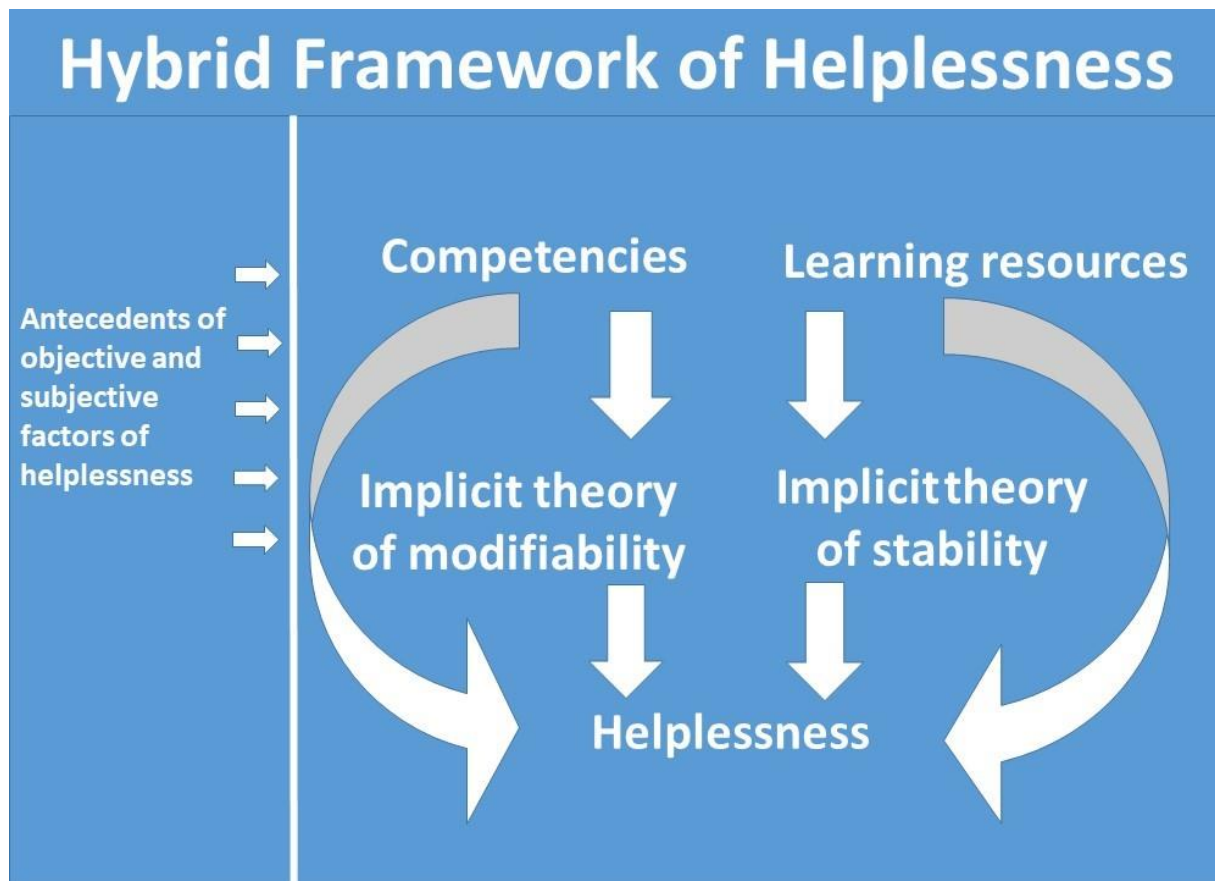


Fig. 1 The hybrid framework of helplessness

It is assumed that two objective factors can cause helplessness: a lack of competences and a lack of resources to produce desired outcomes in educational settings. In contrast to the original concept of the phenomenon of learned helplessness, *actual* helplessness is when an actually objectively existing control is not exercised (Hiroto and Seligman 1975; Maier and Seligman 2016). As a result, this objective understanding of helplessness puts more emphasis on the need for help in pedagogical settings (see also Nuvvula 2016): the helpless are persons who, under normal learning conditions, are unable to produce objectively or subjectively (or both) required outcomes in pedagogical settings.

For pedagogical reasons, we consider the inclusion of the two objective factors in the hybrid framework to be useful. From an educator's point of view, it is important to know whether someone can achieve the outcome required in an educational setting by their own efforts, and with the available resources. If not, from the perspective of the educator, the person is helpless and needs active help to achieve the outcome. Therefore, helplessness in this hybrid framework is, above all, an educational construct that indicates the need for prevention or intervention.

Our hybrid framework of helplessness considers two subjective interpretations of objective circumstances: Stability of existing possibilities to produce an outcome as well as modifiability of yet non-existing possibilities to produce an outcome.

Finally, antecedents beyond the four core concepts of competencies, learning resources, and implicit theories of modifiability and stability were added to the hybrid framework of helplessness. There are three reasons for this. Firstly, it simply reflects the state of current research that a multitude of different antecedents of helplessness have been discovered in research studies (Diener and Dweck 1980; Filippello et al. 2017; Filippello et al. 2018; Pi and Yan 2010; Putwain and Symes 2014; Sorrenti et al. 2015). Secondly, that the objective and subjective factors postulated in the hybrid framework have numerous causes is also true. For example, an almost unmanageable abundance of antecedents of competencies has been found in research. These first two reasons taken together indicate that the causal network, at the end of which lies helplessness, is far too complex to be reduced to a handful of factors in a framework or model. For an institution of higher education, however, a framework is important whether or not it allows reality to be represented in all its complexity. A framework must also be pedagogically useful. Therefore, we consider it a pragmatically justifiable decision to limit the number of factors in a framework, but at the same time to enable flexibility. This flexibility makes room for antecedents in the hybrid framework. The situation that arose in academia as a result of the COVID-19 pandemic is a prime example of the usefulness of this approach.

The sudden switch to online teaching modified the entire teaching structure and teaching organization (Marinoni, van't Land and Jensen 2020). Thus, it presents a significant modified antecedent condition with presumed effects on the objective factors of the model and their subjective interpretation. Presumably, this sudden switch influenced the role of student competences because digital skills are growing in importance alongside subject-related skills. At the same time, learning resources such as didactic educational capital shifted (Ziegler and Baker 2013). The limited experience of many lecturers with online teaching may have made it difficult for many students to achieve their learning goals. This is because their teaching often resembled more "emergency remote teaching" than thoroughly prepared online instruction (Hodges, Moore, Lockee, Trust and Bond, 2020).

Moreover, antecedents that potentially led to a change in the objective factors of the hybrid framework may subsequently lead to new subjective assessments. For example, in the face of this uncertain and makeshift online teaching, students may not have known for certain whether their - from their perspective - available competences and resources for online

learning are sufficient in the context of this new situation or how well they can compensate for existing deficits in competences and resources for digital learning.

Emotional factors as another antecedent may have also influenced the assessments of the objective factors (Dweck 1999). At the time of our study during the COVID-19 pandemic, 56% of Germans between the ages of 18-29 years perceived their situation as stressful, and in the overall population 69% reported that the Corona virus was rather or even more frightening for them (COSMO 2020).

In summary, the concept of antecedents allows for a flexible consideration of whether the objective and subjective factors included in the hybrid framework of helplessness could be influenced in a way that would finally end in actual helplessness. Furthermore, from a pedagogical point of view, the antecedents can also be regarded as potential early indicators of helplessness. The identification of antecedents may signal an occasion to look for signs of emerging helplessness on the basis of the objective and subjective factors mentioned above and, if necessary, to intervene or take preventive measures.

The Current Research

During the lockdown caused by the COVID-19 pandemic, and just before the beginning of the 2020 summer semester, we conducted a study with students enrolled in a German university. Natural disasters and macro-crises can result in the feeling of helplessness (Bohannon, Clapsaddle and McCollum 2019; Fritsche et al. 2017; Heitkamp 2019), especially when the situation is perceived as challenging (McKean 1994) and personal autonomy is threatened (Ashford 1989; Ashford and Saks 2000). In other words, students cannot simply escape the COVID-19 pandemic. Fear and stress about COVID-19 can cause strong emotional reactions which might eventually result in worsening chronic and mental health problems (Ahorso et al. 2020; National Center for Immunization and Respiratory Disease, 2020; Zhang and Ma 2020). In this situation, the switch to digital learning at universities is another circumstance from which students cannot escape, and that represents another risk factor for the development of helplessness. According to Arieli and Ataria (2018), “helplessness arises when, despite the functioning of the cognitive system and awareness of circumstances and feelings, an individual is unable to access practical knowledge. As a result, the subject becomes a victim of one’s own inability to perform, or act, in the real world” (p. 948). With regard to the COVID-19 pandemic and the associated shift to digital learning, this indicates an increased sense of helplessness among various groups of students. Students may now lack the ability to achieve their learning goals. The ability to achieve their learning goals is particularly

limited in the case of students with a low academic achievement level and students with low digital skills. This leads to the first two hypotheses regarding the helplessness of the students in our study:

Hypothesis 1: Students with a lower academic achievement level have a higher risk of developing helplessness.

Hypothesis 2: Students with lower digital skills have a higher risk of developing helplessness.

However, according to the hybrid framework, there is at least one other significant objective risk factor: lack of digital learning resources. Roth and Bootzin (1974) found that non-contingency due to a lack of ability to produce an effect alone does not cause helplessness. Similarly, lack of digital skills should not necessarily trigger helplessness. It also depends on what resources a person has available and can activate in order to be able to transform non-contingency into contingency (Costello 1978).

The idea that scholars should distinguish among internal and external resources goes back to the integrated model of Martinko and Gardner (1982). For example, the authors categorize work-related factors such as task difficulty and structure as internal environment simulators, whereas technology, social values, economic and political-legal conditions were listed as external environment simulators. Since then, a wide range of resources have been identified; for example Palmer, Dunford and Akin (2019) name economic, organizational, working conditions, and motivation among others. In this paper we will use the Ziegler and Baker (2013) educational and learning capital model to capture learning resources, as it was developed specifically to capture endogenous and exogenous learning resources.

Hypothesis 3: Students with fewer endogenous and exogenous digital learning resources have an increased risk of developing helplessness.

Besides objective factors, their subjective interpretation is postulated as a possible risk factor for the development of helplessness. Regarding the special situation of digital learning, the implicit theories of the modifiability and stability of the digital skills and resources necessary for learning success play a central role. This leads to a total of four hypotheses on the meditative effect of the implicit theories.

Hypothesis 4: The influence of digital skills on the development of helplessness is mediated by the implicit theory of the stability of abilities.

Hypothesis 5: The influence of digital resources on the development of helplessness is mediated by the implicit theory of the stability of abilities.

Hypothesis 6: The influence of digital skills on the development of helplessness is mediated by the implicit theory of the modifiability of abilities.

Hypothesis 7: The influence of digital resources on the development of helplessness is mediated by the implicit theory of the modifiability of abilities.

Method

The study reports on the first of three measurements within an ongoing longitudinal study of the 2020 summer semester. It took place as an online survey to which all students at a full university were invited. Participation in the study was voluntary and compliance with data protection was assured.

Procedure

In the week before the start of the official lecture period, all students enrolled at the university were invited via an e-mail correspondence from the Vice President of Education to take part in a survey on the general conditions of digital teaching (via survey access link). Participation in the survey took place via the Questback platform and was activated for 10 days. To reduce questionnaire length in the study, a simple form of a multi-matrix design was implemented (cf. Smits and Vorst 2007). As the first step, all students provided personal details and answered questions about previous academic achievement and digital literacy. In a second step, they were randomly assigned to three groups, each of which was presented with a further block of questionnaire scales. Here, we report the results of the group that filled out the helplessness questionnaire.

Instruments

The students were asked about their gender and age. Regarding university variables, study semester and faculty enrollment were also assessed.

Academic achievement level was assessed by the current average grade. Please note that in Germany higher scores indicate lower achievements.

To assess the four core concepts of competencies, learning resources, and implicit theories of modifiability and stability, established questionnaire scales were used and adapted to the current semester of digital learning. The individual items were answered on a six-level Likert scale ranging from 1 ‘not at all correct’ to 6 ‘completely correct.’

Digital skills were measured with eight items of two subscales from the Digital Readiness for Academic Engagement questionnaire (DRAE; Hong and Kim 2018). The items

focused on the application of digital tools (sample item: "I can use software or apps on a computer or mobile device") as well as on information-sharing behavior (sample item: "I can interact with fellow students using real-time communication media, e.g. video conferencing tools or messenger services").

Digital learning resources were assessed with a shortened version of the Questionnaire of Educational and Learning Capital (QELC; Vladut, Liu, Leana-Tascilar, Vialle and Ziegler 2013), which was adapted to the field of digital learning. While the original questionnaire contained 50 items, the short version contained 20 items. Systematic research had shown that even shortened and domain-specific scales have good reliability (Reutlinger, Pfeiffer, Stoeger, Vialle and Ziegler, submitted; Ziegler, Debatin and Stoeger 2019). A sample item for the original QELC cultural educational resources reads, "In my social environment, learning is considered to be very important." The reformulated item read, "In my social environment, digital learning is considered to be very important."

Stability beliefs were measured with a shortened, four item version of a scale developed by Ziegler and Stoeger (2010). A sample item reads, "After I have learned something, I don't forget how to apply it." Higher scores on this scale indicate more pronounced stability beliefs.

Modifiability beliefs were measured with a shortened, four item version of a scale developed by Ziegler and Stoeger (2010). A sample item is: "I can improve my skills." Higher scores on this scale indicate more pronounced modifiability beliefs.

The degree of *helplessness* was measured with a modified version of the helplessness scale by Ziegler, Dresel, Schober and Stoeger (2005). The scale comprises six items with which helplessness is primarily operationalized in terms of an experienced loss of control. All items that were originally related to academic learning in general have been reformulated for the specific learning situation of the upcoming summer semester. The original item, "Even if I try hard, I will not succeed," was changed to "Even if I try hard, I will not succeed in the coming summer semester."

Sample

Of about 38,500 students enrolled at the university, 5,563 students (which corresponds to 15% of all students) took part in the survey, of which 1,690 students filled out the helplessness questionnaire. In order to obtain an inventory that was as uninfluenced as possible, students who took part in the survey after the start of the official lecture period and who stated that they had already attended digital courses in the current semester were

excluded from the data analysis (less than 1% of the respondents). In the current sample, 52% of the respondents were female, 33% male, 0.4% non-binary; 15% did not provide any information on gender. The participating students were on average 23.4 years old ($SD = 4.9$) and were enrolled in their 4.8 semester ($SD = 2.8$).

Table 1 shows the absolute and relative frequencies in the surveyed sample, as well as the respective share of the total university student population for classification purposes. The table indicates that students participated in the survey across all five faculties and that the participation distribution corresponds approximately with the distribution within the university (e.g. 13.5% of the participating students are enrolled at the Faculty of Sciences; 14.0% of the students of the full-scale university are enrolled in this faculty). Regarding desired degree, the proportions are also comparable to the distribution within the total number of students.

Table 1. Sample separately reported by faculty and desired degree

	Frequency	% of participating students	Relative amount of students per faculty of all students
Faculty			
Faculty of Humanities, Social Sciences, and Theology	525	31.1	24.6
Faculty of Sciences	228	13.5	14.0
Faculty of Business, Economics, and Law	317	18.8	25.1
Faculty of Engineering	410	24.3	26.0
Faculty of Medicine	207	12.2	10.3
Expected degree			
Bachelor	665	39.3	39.6
Master	420	24.9	24.4
State exam	550	32.5	30.1
Doctoral exam	24	1.4	3.9
Others	16	0.9	-

Data Analysis

Descriptive statistics are reported. Hypotheses 1-7 were analyzed by means of structural equation modeling, using the *Mplus 7* (Muthén and Muthén 1998–2012). First, we tested a model representing the hypothesized relations between students' achievement level, students' digital skills, students' digital learning resources, students' implicit theories of stability and modifiability, and students' perceived helplessness. Given an acceptable overall fit of the initial model, we specified and estimated a final model in which we omitted non-significant paths of the initial model.

Figure 2 displays the model with expected signs of the postulated relations. Student helplessness was modeled to depend on students' achievement level, students' digital skills, students' digital learning resources, as well as students' implicit theories of stability and modifiability. In addition, students' implicit theories of stability and modifiability were modeled to depend on students' digital skills and students' digital learning resources. The residuals of students' achievement level, students' digital skills, and students' digital learning resources could covary freely, which was also true for students' implicit theories of stability and modifiability.

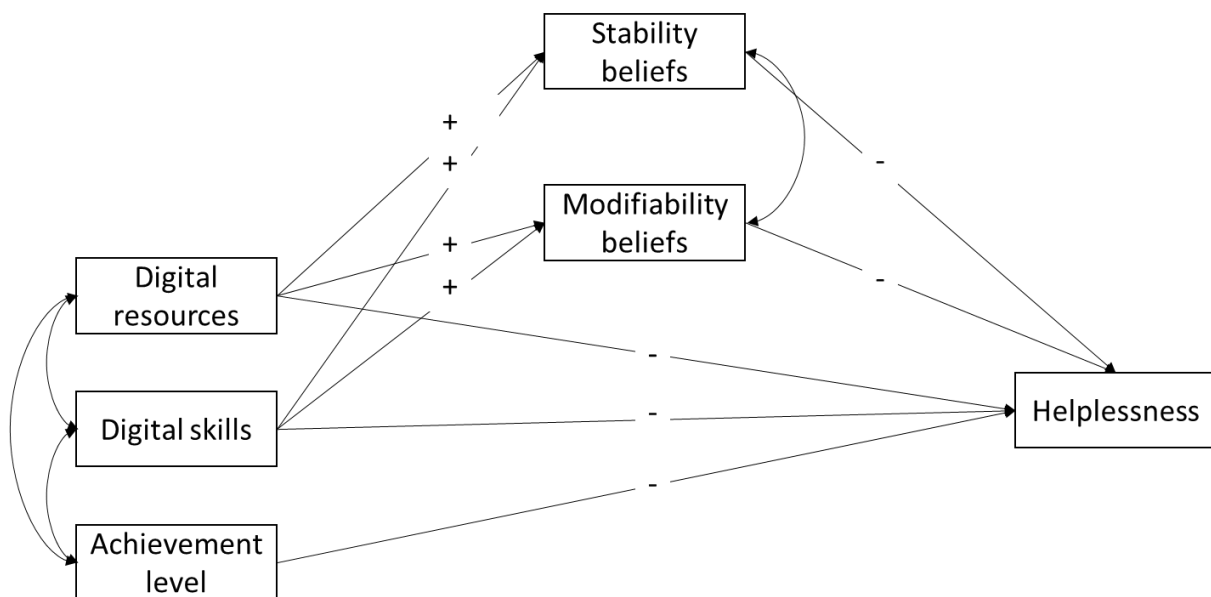


Figure 2. Theoretical model. Plus signs indicate to-be-expected positive path coefficients; minus signs indicate to-be-expected negative path coefficients.

The model fit was evaluated using the Comparative Fit Index (CFI), the root mean square error of approximation (RMSEA), and the standardized root mean squared residual (SRMR). A good (acceptable, respectively) model fit was inferred if the following cutoff values were met: $CFI \geq .95$, $RMSEA \leq .06$, $SRMR \leq .08$ (cf. Hu and Bentler 1999). Finally,

we evaluated the fit of the final model in comparison to the fit of the initial model via a χ^2 test comparing the two nested models.

Results

Table 1 provides descriptive statistics and correlations of the investigated variables. All scales were of sufficient internal consistency (Cronbach's α s $\geq .81$). All mean scores could range from 1 to 6. Furthermore, substantial correlations among stability and modifiability with the assumed predictor variables were detected. Hence, their interrelationship was further tested via a mediation model.

Table 1.

Internal Consistency, Descriptive Statistics and Correlations of all Variables

Variable	α	M	SD	2	3	4	5	6
1 Digital resources	.90	3.85	0.69	.31	.08	.29	.45	-.41
2 Digital skills	.85	4.86	0.82		.05	.15	.30	-.19
3 Achievement level	-	2.18	0.68			.03	.10	.41
4 Stability beliefs	.88	3.68	0.92				.28	-.23
5 Modifiability beliefs	.81	5.00	0.65					-.43
6 Helplessness	.92	2.15	0.87					

Note. $|r| \geq .05$: $p \leq .05$; $|r| \geq .08$: $p \leq .001$.

The overall model fit of the initial model was good, $\chi^2(2) = 7.63$, CFI = .995, RMSEA = .041, SRMR = .013. All path coefficients except the path of digital skills on helplessness were significant and in the hypothesized direction, all $|\beta|$ s $\geq .07$, $ps \leq .01$. Thus, this path was removed from the initial model.

The final model also fitted the data well, $\chi^2(3) = 7.91$, CFI = .996, RMSEA = .030, SRMR = .013. Fig. 2 shows the estimated coefficients of the final model, which did not fit the data significantly worse than the initial model, Satorra-Bentler scaled chi-square difference test: $\Delta\chi^2(1) = 0.13$, $p = .71$.

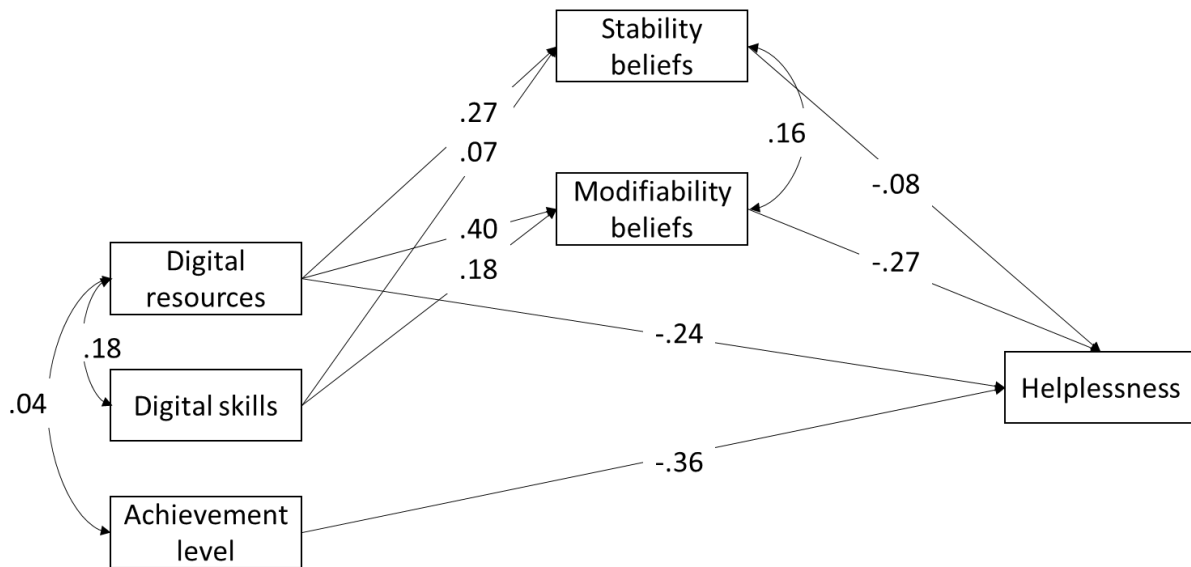


Figure 3. Standardized estimated coefficients of the final model. All coefficients are significant with $ps \leq .001$.

Direct effects on helplessness could be detected for digital learning resources as well as for student achievement level. The more endogenous and exogenous resources to which students can refer, the less helpless they feel. Similarly, students with higher grades feel less helpless. These results confirm Hypotheses 1 and 2, whereas Hypothesis 3 could not be confirmed; there was no significant direct path from digital skills to helplessness.

Furthermore, significant direct and indirect effects were found (cf., Table 2), and the meditation hypotheses (hypotheses 4-7) were confirmed. In detail, both digital skills as well as digital learning resources positively influenced implicit theories of stability and modifiability, which, in turn, were related negatively to helplessness. Strongest effects were found for the effect of digital learning resources on helplessness, mediated via students' modifiability beliefs (see Figure 3).

Table 2.

Standardized Estimates for the Direct and Indirect Effects of Digital Skills as well as Digital Learning Resources on Helplessness, Mediated via Students' Implicit Theories of Stability and Modifiability

	Estimate	SE
Digital skills -> Helplessness		
Total	-0.05	0.01
Total indirect	-0.05	0.01

Digital skills -> Stability -> Helplessness	-0.01	0.00
Digital skills -> Modifiability -> Helplessness	-0.05	0.01
Digital learning resources -> Helplessness		
Total	-0.37	0.02
Total indirect	-0.13	0.01
Digital learning resources -> Stability -> Helplessness	-0.02	0.01
Digital learning resources -> Modifiability -> Helplessness	-0.11	0.01
Direct	-0.24	0.03

Discussion

The starting point of our empirical study was a unique opportunity to investigate helplessness that arose as a result of the COVID-19 pandemic. Due to the closure of universities, a switch to digital instruction was necessary. This suddenly required special digital skills and resources from students for successful digital learning. These are objectively available in varying degrees, whereby the extent to which they are personally available is presumably assessed differently by the students. We have described these as the objective and subjective factors of the causes of helplessness.

The proposed hybrid framework of helplessness is based on a broader understanding of helplessness: individuals are helpless if they cannot produce an outcome or if they *believe* that they cannot produce an outcome (Nuvvula 2016). In our view, such an approach offers both conceptual advantages and practical benefits in the diagnosis and treatment of helplessness in natural, especially university settings.

The hybrid framework of helplessness focuses on two objective factors for academic success at university: first, the upcoming summer semester curriculum that now features competencies that include specific skills for digital learning; and second, the resources necessary for successful digital learning, such as IT equipment, bandwidth, social support, well-planned courses, etc. (Palmer et al. 2019). In the path analysis, evidence was found that these objective factors are important, as two out of three direct postulated paths to helplessness were statistically significant.

In the hybrid framework of helplessness, we further assumed that the subjective interpretation of objective factors can also play an important role in the development of helplessness. We assumed that implicit theories of the modifiability of deficits, but also of the stability of strengths, play a key role (Ziegler and Stoeger 2010; Ziegler et al. 2010). Indeed,

path analysis showed that both implicit theories mediate the effects of digital skills and the effects of digital learning resources on helplessness.

Although a total of six out of seven postulated hypotheses could be confirmed in our study, it is not easy to draw a conclusion. Since the hybrid framework of helplessness includes elements of other models, the results of our study also confirm individual aspects of each of them. With objective models of helplessness (Lieder et al. 2013; Teodorescu and Erev 2014), the hybrid framework has in common the assumption that the objective probability of success predicts helplessness. This was the case for two of the three antecedents examined: academic achievement level and digital learning resources. In contrast, the results of the mediator analyses are consistent with the reformulated model assumption that subjective interpretation is important (Abramson et al. 1978; Alloy et al. 1984). Our results support Dweck's approach (Dweck 1995, 1999, 2006) in that the strongest paths in the path model were mediated by the modifiability beliefs. Results also support Ziegler and Stoeger's (2010; Ziegler et al. 2010) postulate that the stability theory is indicative of a mediator. In addition to these numerous findings that are compatible with individual segments of established models, however, it is important to note that no model, including the hybrid framework of helplessness, could be fully confirmed.

Thus, one can cautiously conclude that more eclectic approaches should be tested in the future. This observation is all the more valid since even the hybrid framework of helplessness which contains both objective and subjective factors almost certainly do not cover the complexity of the emergence of helplessness. For example, many known risk factors of helplessness such as negative social expectations (Pi and Yan 2010), motivational orientations (Diener and Dweck 1980), self-efficacy (Putwain and Symes 2014; Sorrenti et al. 2015), maladaptive perfectionism (Filippello et al. 2017), and frustration intolerance (Filippello et al. 2018) are only mentioned vaguely as antecedents. So what could our results mean for higher education in particular?

We would like the hybrid framework of helplessness to be understood as a pedagogical-pragmatic approach of higher education. Of course, it also claims to represent reality. However, it was developed in the awareness that helplessness is a complex phenomenon which, in our opinion, cannot be broken down to a few variables. A full understanding of all antecedents, boundary conditions, and processes is perhaps even beyond scientific reach. But helplessness is a very serious problem that is not just a performance impairment. It also carries significant consequences for mental health (Maier and Seligman 2016). Therefore, in designing our hybrid framework of helplessness, we have essentially

focused on what an institution like the university can contribute to prevent or reduce helplessness. We think that tenets of higher education need to be vigilant in three respects: Objective and subjective factors of helplessness, as well as risk factors of helplessness-termed as antecedents in the hybrid frame of helplessness.

Firstly, many risk factors for the development of helplessness are well-known and quite intuitive like low self-efficacy (Putwain and Symes 2014; Sorrenti et al. 2015) or frustration intolerance (Filippello et al. 2018). Other risk factors are quite obvious including suddenly altering learning requirements, as prescribed by the changes that occurred in response to the COVID 19 pandemic. Should universities see risk potential, they may wish to examine the objective and subjective factors contained in the hybrid framework.

Secondly, higher education institutions should always check for the possibility of students achieving learning success through their own efforts, whether by competences, learning resources, and the absence of learning barriers. Here, a first alarm signal for lecturers is certainly poor student performance.

Thirdly, implicit theories can be a risk factor if either the stability of one's own ability to produce certain outcomes is doubted or the modifiability of one's own deficits is questioned. They should always be given attention, when general risk factors and performance deficits are present. They can be examined in discussions with students or short questionnaires, for example. Such information may eventually lead to the taking of steps to stop the downward spiral triggered by helplessness in time.

Limitations

Our study examined a hybrid framework of helplessness. Certainly not all potential causes of helplessness were covered. Other contributing causes could be, for example, the fear associated with the pandemic (COSMO 2000) or the sensational coverage in the media, where metaphors surrounding keywords like 'war' and 'fight' were often employed. However, we suggested that such further causes can be flexibly integrated in a hybrid framework as antecedents.

For reasons of limited survey time, it was not possible to distinguish completely between subject-related and digital skills, and learning resources in the study. Although this was not exactly necessary in order to explore the hybrid framework of helplessness with regard to the transition to digital teaching, taking this distinction into account would have contributed to a more comprehensive examination of the framework as a whole.

At first glance, it may appear contradictory that objective factors of the causes of helplessness (digital skills and digital learning resources) were measured from the subjective perspective of the participants. However, the developers of the measuring instruments do claim to measure objective factors (Hong and Kim 2018; Vladut et al. 2013). Moreover, at the time of the imposition of a curfew, it was hardly possible to collect data other than subjective data.

Finally, the parallel process structural equation modeling lack appropriate temporal sequencing for a stronger evaluation of our mediation assumptions. Therefore, any causal statements in general and assumptions of mediation can only be used alongside theoretical considerations as well as the pattern of correlations that is consistent with the hypotheses. Future studies should aim for such temporal sequencing and ideally, for multiple assessments during the course of the semester.

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