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Abstract

We examine the mechanisms explaining the dropout intentions of students with disabilities by integrating Tinto's model of student integration, the student attrition model, the composite persistence model, and insights from social stratification research. The resulting theoretical model posits that not only students' academic and social integration, but also their private resources (financial, home learning, and personal resources) are crucial for academic success. Analysing data from a 2020 Germany-wide student survey, we find that students with disabilities are substantially more likely to intend to drop out of higher education than students without disabilities. Linear regressions and Kitagawa-Oaxaca-Blinder decompositions show that their lower academic integration and fewer personal resources are most relevant for explaining this difference, while their lower social integration, home learning, and financial resources play subordinate roles. Further analyses reveal that dropout intent is highest among students with psychic disabilities, followed by students with learning disabilities and students with physical disabilities. Regarding all three disability groups, less academic integration and fewer personal resources are most relevant for explaining their higher dropout intent (compared to students without disabilities). However, the disability groups differ regarding the importance of the different explanatory factors. Overall, our results highlight the importance of considering both students' integration into higher education and their private resources for understanding student-group-specific dropout intent.

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Introduction

Higher education dropout can create substantial costs for the affected students and the society they live in (Berlingieri et al., 2021; Sarcletti & Müller, 2011). Therefore, reducing student dropout is a key political objective in many countries (Belloc et al., 2010; Larsen et al., 2013; Wissenschaftsrat, 2015). Attaining this objective requires an in-depth understanding of the mechanisms leading to student dropout. Enlightening these mechanisms is, therefore, at the heart of a large literature examining the causes of higher education dropout (e.g., Heublein et al., 2017; Ishitani, 2006; Neugebauer et al., 2019; Pascarella & Terenzini, 1980; Stinebrickner & Stinebrickner, 2014).

Interestingly, this literature hardly considers students with disabilities[1]—although both the scientific and political discourses about inclusion in education have come to pay more attention to this student group over the past decades (Kutscher & Tuckwiller, 2019). Including this student group in the dropout discourse is important to meet egalitarian political goals calling for equality in access to and within higher education (see e.g. the UN Convention on the Rights of Persons with Disabilities, United Nations, 2006).

Notably, students with disabilities are not a marginal group. In Germany, 24% of all students reported impairments in 2021, more than half of whom (nearly 16% of all students) stated that their impairments impeded their studies and thus constituted disabilities (Kroher et al., 2023). Crucially, students with disabilities face a higher risk of dropping out of higher education (Kerst, 2016), which has further increased in the wake of the Covid-19 pandemic (Koopmann et al., 2023; Rußmann et al., 2023). Thus, there is a need to profoundly understand the dropout intentions of students with disabilities.

Existing studies on higher education dropout of students with disabilities mostly come from the USA. They suggest that students with disabilities are more likely to (intend to) drop out because of their lower grade point average (Herbert et al., 2014; Mamiseishvili & Koch, 2011), their lower social integration (DaDeppo, 2009; Stanic, 2022), difficulties in disclosing their disability as a prerequisite for getting academic assistance (Kranke et al., 2013; Thompson-Ebanks, 2014), and insufficient accommodations[2] (Kim & Lee, 2016; Skinner, 2004).

Importantly, most studies examining the influence of disabilities on student dropout have severe limitations (for overviews, see Madaus et al., 2021, Matesic, 2020, and Römhild & Hollederer, 2023). First, they tend to use data from single universities and are thus not nationally representative. Second, many previous studies have no comparison group of students without disabilities, which severely limits the robustness of their results. Third, many studies examine only one type of disability. Hence, they do not reflect the range of disabilities and the specific challenges related to certain disabilities. Fourth, most studies concentrate on the role of one or a few specific factors explaining disability-related

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[1] According to the social model of disability, people are not necessarily disabled because of an impairment but because of the barriers they face in society related to their impairment (Oliver, 2013). Therefore, we only consider impairments disabilities if students themselves indicated that they impede their studies. Among German students, the most common types of disabilities are psychic disabilities, followed by physical disabilities, and learning disabilities (Poskowsky et al., 2018). In our sample, 65% of all students with disabilities report a psychic disability, 31% report a physical disability, and 7% report a learning disability (multiple answers possible).

[2] Accommodations are measures to relieve students with disabilities. They "include extended time on exams, tutors, testing in alternative locations, classroom note takers, help with study strategies, and other classroom technologies or aids" (Murray et al., 2013, p. 280).

differences in dropout intent, and thus cannot quantify the relative importance of different influencing factors. In summary, we lack nationwide studies using controlled designs, which consider different types of disabilities and elucidate the relative importance of the multitudinous factors influencing dropout intentions.

We narrow this research gap by explaining the dropout intentions of students with disabilities in Germany during the summer semester 2020. We draw on Tinto's (1975) student integration model, which posits that academic and social integration are most relevant for predicting dropout. While previous research substantiates the relevance of academic and social integration for student dropout (e.g., Pascarella & Chapmann, 1983; Piepenburg & Beckmann, 2021), Tinto's model has also been criticised as being insufficient for explaining the dropout intentions of specific student groups. For example, Bean and Metzner (1985) argue that private living conditions may be more important than social integration into higher education for non-traditional student groups. Moreover, Rovai (2003) points out that Tinto's model has limited ability to explain the dropout of students who participate in online learning. Considering their strong reliance on private support from family and friends (Poskowsky et al., 2018), these arguments should be particularly relevant for students with disabilities—and especially so in the wake of the Covid-19 pandemic, which has forced students to (temporarily) study online in their private facilities.

Against this background, the following section illustrates the need to theoretically extend Tinto's model to include students with disabilities into the dropout literature. We achieve this extension by integrating insights from Tinto's student integration model, the student attrition model (Bean & Metzner, 1985), the composite persistence model (Rovai, 2003), and social stratification research (e.g., Boudon, 1974; Bourdieu, 1986; Breen & Goldthorpe, 1997). These models and approaches stress that students' private resources strongly influence educational decision-making. In line with this view, recent empirical studies suggest that students' private resources, such as their financial, home learning, and personal resources notably influence their dropout intent—and that these resources may have become even more relevant during the Covid-19 pandemic (Zhang et al., 2021; Zimmer et al., 2021).[3]

We also strive to advance research on student dropout in methodological and empirical terms. Using data from a 2020 Germany-wide student survey, we test our hypotheses by estimating linear regressions and Kitagawa-Oaxaca-Blinder decompositions. Thereby, we can approximate the relative importance of the different theoretical components for explaining differences in dropout intent between students with and without disabilities.

State of research and theoretical considerations

Following Tinto's (1975) student integration model, Bean and Metzner's (1985) student attrition model, Rovai's (2003) composite persistence model, and insights from research on social stratification (e.g., Boudon, 1974; Bourdieu, 1986; Breen & Goldthorpe, 1997), we consider five theoretical components to be most relevant for predicting student dropout. These are students' (1) academic and (2) social integration, as well as their (3) financial, (4) home learning, and (5) personal resources. In the following, we discuss the relevance of these theoretical components for understanding disability-related differences in dropout intent.

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[3] Students with disabilities must not necessarily have fewer resources than students without disabilities, but they are likely to need more resources on average to successfully complete their studies because of their disabilities.

Integration into higher education

Tinto (1975) stresses that students enter higher education with a range of background characteristics (individual characteristics, family background, and pre-university education) that influence their higher education experience. According to Tinto, these characteristics influence students' ability to integrate into the academic and the social system of the university. Following his model, the less students are integrated academically and socially into their higher education institution, the higher should be their risk of dropping out.

Academic integration

Academic integration comprises students' adaptation to the performance standards of higher education and their cognitive development. According to Tinto (1975), these concepts can be measured by students' grades and intellectual development during their studies. In line with Tinto's model, previous research shows that a lower academic performance is strongly positively associated with higher education dropout (Belloc et al., 2010; Heublein et al., 2017; Larsen et al., 2013; Voelkle & Sander, 2008).

Concerning the academic performance of students with disabilities, previous studies show mixed results: While some studies do not find any differences in grades between students with and without disabilities (Israel: Hen & Goroshit, 2014; Canada: Jorgensen et al., 2005), others indicate that students with disabilities receive lower grades (USA: Eisenberg et al., 2009; Canada: Parsons et al., 2021). In Germany, students with disabilities more often report difficulties in coping with exams (Kerst, 2016). In particular, they mention problems with the density of examinations, the duration of examinations, lacking options to repeat or postpone examinations, and submission deadlines for assignments (Poskowsky et al., 2018).

Furthermore, students with disabilities take longer to complete their studies (Canada: Jorgensen et al., 2005; Germany: Kerst, 2016). In Germany, this may result from the above-mentioned difficulties with exams and/or from changes of the degree programme or higher education institution (Poskowsky et al., 2018). Studies from other countries show that students with disabilities need more time to acquire grades they consider satisfactory (USA: Denhart, 2008; Canada: Duquette, 2000). Notably, students' workload has tended to increase in many countries during the Covid-19 pandemic with the shift to online education (Aristovnik et al., 2020). This may have made academic integration even more difficult.

In summary, despite partially contrasting evidence (albeit not for Germany), existing research tends to show that students with disabilities have more difficulties in fulfilling academic requirements. Therefore, we hypothesise that students with disabilities are more likely to intend to drop out because they feel less academically integrated (**H1**).

Social integration

Social integration manifests in contact to faculty and close relationships with fellow students. Such ties create a supportive social environment and a sense of belonging to higher education. Faculty members mainly offer professional advice and implicitly convey academic norms. Fellow students, on their part, can provide emotionally supportive friendship networks (Klein et al., 2019).

Crucially, the relationship with faculty can be more important for students with disabilities than for students without disabilities (Matesic, 2020). For example, if faculty have negative attitudes and perceptions of students with disabilities, this may deteriorate their higher educational experience (USA: Denhart, 2008; Hong, 2015). Students with disabilities may feel that the faculty do not understand them or rather their disability (Matesic, 2020). As a consequence, they may hesitate to disclose their disability and thus not get the support they need (USA: Denhart, 2008; Kranke et al., 2013).

Regarding their relationship with fellow students, students with visible disabilities may face social barriers due to negative attitudes of students without disabilities (Liasidou, 2014). Students with non-visible disabilities often worry about what their peers would think about them if they knew about their disability. Therefore, they sometimes do not disclose their disability because they fear stigmatisation (USA: Koch et al., 2018; Kranke et al., 2013).

Backing the above-mentioned evidence, students with disabilities in Germany report difficulties in dealing with faculty (Bartz, 2020; Kerst, 2016) and in establishing and maintaining contact with fellow students (Kerst, 2016; Poskowsky et al., 2018). Their social integration may have become even more challenging during the Covid-19 pandemic, as social contacts were impeded by contact restrictions.

Following these arguments, we hypothesise that students with disabilities are more likely to intend to drop out because they feel less socially integrated into higher education (**H2**).

Private resources

Several authors criticised Tinto's student integration model for focusing on the higher education environment, thereby neglecting private resources. Among other arguments, this criticism has motivated the development of Bean and Metzner's (1985) student attrition model and Rovai's (2003) composite persistence model. The importance of private resources for educational decisions is also well-established in social stratification research (e.g., Boudon, 1974; Bourdieu, 1986; Breen & Goldthorpe, 1997). Dropping out of higher education can be considered a socially stratified educational decision. Hence, we argue that besides academic and social integration, students' private resources should be considered in a comprehensive student dropout model. Following the above-mentioned literature on the relevance of private resources during the Covid-19 pandemic, we focus on students' financial, home learning, and personal resources.

Financial resources

In line with rational choice approaches stressing the relevance of cost considerations for educational decisions (Boudon, 1974; Breen & Goldthorpe, 1997), previous research from Germany indicates that financial difficulties are an important reason for dropping out of higher education (Heublein et al., 2017). Students often compensate financial difficulties with more paid work, which further reduces their time and energy left for studying (Heublein et al., 2017; Sarcletti & Müller, 2011).

In Germany, almost two-thirds of students with disabilities have additional costs of living and studying because of their disability (Poskowsky et al., 2018). Accordingly, students with disabilities more often report difficulties in financing their living expenses than students without disabilities (Middendorff et al., 2017).

For students with disabilities in Germany, family contributions and earned income are the two most common sources of funding (Poskowsky et al., 2018). Both sources of funding were strongly negatively affected by the Covid-19 pandemic. For example, many students lost their jobs (Aristovnik et al., 2020), and sometimes, their parents' income decreased due to short-time work (Lörz & Becker, 2022). Crucially, more students with disabilities reported concerns about personal and family income losses due to the Covid-19 pandemic than students without disabilities (Zhang et al., 2021).

Overall, students with disabilities tend to be particularly affected by financial insecurities. Therefore, we hypothesise that students with disabilities are more likely to intend to drop out because they consider their financial situation to be less secure (**H3**).

Home learning resources

We define home learning resources to include both private support from significant others and technical equipment. Various studies show that private social support plays an important role for completing the studies (Mishra, 2020). Moreover, we assume that poorer technical equipment could increase dropout intent, especially during online semesters.

For students with disabilities, social support from the private environment is very important, particularly parental support (Poskowsky et al., 2018). According to Troiano (2003), parental support helps students with requesting accommodations. Importantly, the Covid-19-related contact restrictions have negatively affected family support structures (Zimmer et al., 2021), arguably making it more difficult for students with disabilities to get the support they need.

Moreover, the pandemic has induced shifts towards online learning. This might have relieved some students with disabilities from physical restrictions at higher education facilities (Zhang et al., 2021). Yet, recent research shows that students with disabilities in Germany are less likely to consider their living situation suitable for online learning, likely because their disability-specific learning requirements are not always met in their private facilities (Zimmer et al., 2021).

Consequently, we assume that students with disabilities are more likely to intend to drop out because they are more likely to consider their home learning resources less suitable for online learning (**H4**).

Personal resources

Previous research highlights the importance of personal resources for dropout—or rather for retention. As already highlighted by Tinto (1975), students' personality characteristics may influence college retention. Recent research substantiates that a high self-efficacy[4], in particular, positively influences retention (Baier et al., 2016). Students with higher self-efficacy beliefs are more motivated, set more ambitious goals, and pursue them with greater perseverance, which should decrease their dropout risk (Sarcletti & Müller, 2011). It is relevant to recall that the Covid-19 pandemic has increased stress for students (Germany: Ehrentreich et al., 2022; USA: Son et al., 2020). Self-efficacy is crucial for buffering such environmental stressors (Saracoglu et al., 1989).

Moreover, recent research examining the role of the big-five personality traits reports negative correlations of greater conscientiousness with dropout (intent) (Isphording &

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[4] Self-efficacy is the belief "in one's capabilities to organize and execute courses of action required to produce given attainments" (Bandura, 1997, p. 3).
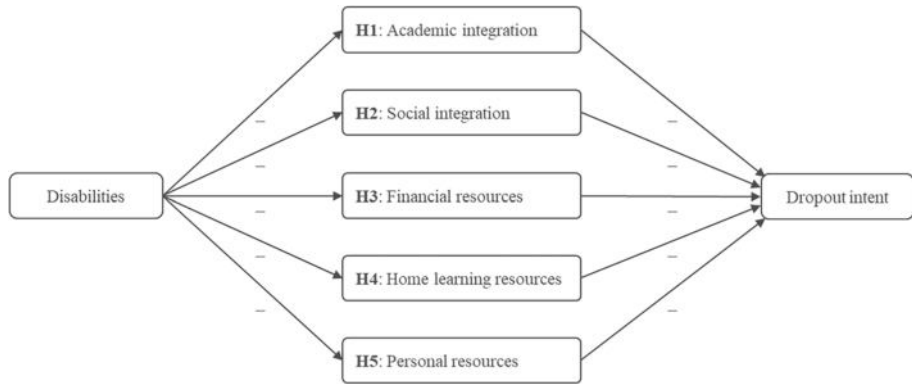
Fig. 1 A model explaining the dropout intent of students with disabilities

Wozny, 2018; Lounsbury et al., 2004; Van Bragt et al., 2011). Regarding other personality traits, previous research shows mixed results: Lounsbury et al. (2004) find that dropout intent correlates significantly negatively with extraversion and agreeableness and significantly positively with neuroticism. Van Bragt et al. (2011) report similar findings regarding extraversion and neuroticism, but their estimations are not significant. Concerning openness, Isphording and Wozny (2018) find a significantly positive correlation with dropout, while Lounsbury et al. (2004) find an insignificant negative correlation with dropout intent. Thus, the reported effect directions point in the same direction regarding conscientiousness and extraversion (negative) as well as neuroticism (positive).

To our knowledge, research on the dropout (intent) of students with disabilities has so far not empirically examined the possible mediating role of self-efficacy and the big-five personality traits. However, considering that prior experiences strongly shape students' self-efficacy beliefs and that students with disabilities tend to be less integrated academically and socially into higher education, they may also feel less self-efficacious.

Following these thoughts, we assume that students with disabilities are more likely to intend to drop out of higher education because of their fewer personal resources (**H5**).[5]

Figure 1 summarises the model resulting from our five hypotheses. Regarding all five explanatory components (**H1** to **H5**), we expect the same effect directions for all types of disabilities. Based on the available literature (Madaus et al., 2021), however, we consider it plausible that the relative importance of the different explanatory components differs depending on whether students have psychic, physical, or learning disabilities.

Data and sample restrictions

We test our hypotheses using data from the Germany-wide student survey "Studying in Corona Times" (https://doi.org/10.21249/DZHW:sitco2020:1.0.0). These data allow us to examine the relevance of both academic and social integration as well as the discussed types of private resources for (disability-specific) dropout intent.

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[5] While previous research allows us to hypothesise that students with disabilities are less self-efficacious than students without disabilities, it does not readily yield directed hypotheses regarding their big-five personality traits.

The data were collected in the summer semester 2020 by the German Centre for Higher Education Research and Science Studies (DZHW) and the Research Group on Higher Education at the University of Konstanz. Data sampling was carried out in two stages: A systematic selection of 23 universities according to their distribution across federal states, size, subject structure, and type (university versus university of applied sciences) was followed by a random selection of students within these institutions. The total response rate was about 15% (28,623 cases).

To avoid systematic bias, we use post-stratification weights. These were constructed considering students' gender, semester, subject, and type of higher education institution. Furthermore, we restrict the sample to students below 40 years of age because dropout has entirely different meanings and consequences for younger than for older people. Younger people are more likely to depend on successful studies for their career. We also concentrate on students in bachelor, master, state examination, or diploma degrees, meaning that we exclude students pursuing other degrees, PhD students, and students not striving for a degree. These restrictions reduce the overall sample size to 24,997 cases.

Of these cases, 9.371 respondents (37%) have missing information on at least one variable. Therefore, we multiply impute missing values using chained equations (MICE). Running 20 imputations, we employ all variables included in the main and the additional analyses. The results based on multiply imputed data (presented below) are very similar to results based on listwise deletion (not presented).

Variables and descriptive results

We operationalise *dropout intent* using students' answer to the question "To what extent are you currently considering giving up studying altogether?", which was captured on a five-point scale ranging from 1 "not at all" to 5 "very often".

To identify *students with disabilities*, we use an item battery capturing different kinds of impairments, including psychic impairments (mental illness), physical impairments (impaired mobility and movement, deafness, blindness, speech impediment, long-term/chronic physical ailment), learning impairments, and other impairments. Importantly, we only consider impairments disabilities if students' themselves indicated them to impede their studies. We compare students with disabilities to students without disabilities, whom we define as students reporting either no impairment or an impairment not impeding their studies.

Descriptive results show that students with disabilities are more likely to intend to drop out of higher education than students without disabilities (Table 1). Students with psychic disabilities represent the largest group of students with disabilities, followed by students with physical disabilities, and students with learning disabilities. Dropout intent is highest among students with psychic disabilities, followed by students with learning disabilities and students with physical disabilities.

We explain the observed disability-related differences in dropout intent considering the possible mediating role of students' academic integration (**H1**), social integration (**H2**), financial resources (**H3**), home learning resources (**H4**), and personal resources (**H5**). First, we focus on explaining the difference in dropout intent between all students with disabilities and students without disabilities (see the section "Explaining the disability gap in dropout intent"). To take account of the heterogeneity of students with disabilities, we then examine the dropout intent of students with psychic, physical, and learning disabilities,

Table 1 Dropout intent of students with (different types of) disabilities

	Means	**(SD)**	**n**	**%**
Students without disabilities	1.37	(0.93)	20,180	85.39
Students with disabilities	1.91	(1.35)	3,452	14.61
thereof with psychic disabilities	2.02	(1.41)	2,244	65.01
thereof with physical disabilities	1.80	(1.30)	1,087	31.49
thereof with learning disabilities	1.88	(1.28)	231	6.69

Notes: The sum of the shares of students with different types of disabilities is larger than the share of students with disabilities as some students reported multiple disabilities.

Data source: DZHW survey "Studying in Corona Times" (2020)

each time comparing them to students without disabilities (see the section "Explaining dropout intent of different disability groups").[6]

We capture students' *academic integration* based on their satisfaction with their academic achievements and with their acquired knowledge and skills, which were measured on five-point-scales ranging from 1 "not at all satisfied" to 5 "very satisfied" (see Table 2 for information on the wording of all scales, correlations of all explanatory variables with dropout intent, and mean values for students without and with disabilities). In line with **H1**, less satisfaction with these aspects significantly positively correlates with dropout intent. Moreover, students with disabilities are significantly less satisfied with these aspects than students without disabilities.

To operationalise students' *social integration*, we first consider their satisfaction with the supervision and guidance by teachers (1 "not at all satisfied" to 5 "very satisfied"). Furthermore, we consider the frequency of contact with fellow students (1 "never" to 5 "very often") and whether students think that they generally support each other (1 "not at all" to 5 "corresponds exactly"). Supporting **H2**, a lower value on these measures of social integration significantly positively correlates with dropout intent. Also, students with disabilities are significantly less socially integrated according to all three measures.

We capture students' *financial resources* based on their answers to the statements "the financing of my subsistence during my studies is secured" and "my parents are able to support me financially only to a limited extent". Both indicators were measured on five-point-scales ranging from 1 "not at all" to 5 "absolutely correct". We reversed the second item for an easier interpretation (Table 2 contains the new formulation). Supporting **H3**, financial security is significantly negatively correlated with dropout intent. Moreover, students with disabilities have significantly fewer financial resources according to both indicators.

Mirroring the original items for an easier interpretation, we take account of students' *home learning resources* through their assessment of whether their living situation and computer are suitable for digital learning and whether forms of digital learning are usable for them (1 "not at all" to 5 "absolutely correct"). Additionally, we consider whether students have someone who checks their academic work (1 "very unlikely" to 5 "very likely"). Supporting **H4**, fewer home learning resources correlate significantly positively with dropout intent. Also, students with disabilities are significantly less likely to rate their living situation as suitable for digital learning and to know someone who would check their work.

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[6] For students with different types of disabilities, we only report detailed multivariate results. Detailed descriptive results on these groups are available upon request.

Table 2 Description of explanatory independent variables

	Variable	Correlation		Means and (SD)				
		No disability	Disability	No disability		Disability		Sig.
Academic integration	Satisfaction with academic achievements (1 *not at all satisfied* to 5 *very satisfied*)	-0.30 ***	-0.37 ***	3.14	(1.10)	2.71	(1.18)	***
	Satisfaction with acquired knowledge and skills (1 *not at all satisfied* to 5 *very satisfied*)	-0.27 ***	-0.32 ***	3.16	(1.07)	2.83	(1.13)	***
Social integration	Satisfaction with supervision and guidance by teachers (1 *not at all satisfied* to 5 *very satisfied*)	-0.20 ***	-0.22 ***	3.15	(1.16)	2.88	(1.21)	***
	Frequency of contact with fellow students outside of classes (1 *never* to 5 *very often*)	-0.11 ***	-0.11 ***	2.95	(1.22)	2.66	(1.22)	***
	Perception that students generally support each other (1 *not at all* to 5 *corresponds exactly*)	-0.13 ***	-0.13 ***	3.66	(1.10)	3.42	(1.18)	***
Financial resources	Perception that financing of subsistence is secured (1 *not at all* to 5 *absolutely correct*)	-0.16 ***	-0.17 ***	4.22	(1.05)	3.78	(1.23)	***
	Perception that parents are able to support me financially (1 *not at all* to 5 *absolutely correct*)	-0.10 ***	-0.10 ***	3.57	(1.47)	2.99	(1.60)	***
Home learning resources	Perception that living situation is suitable for digital learning (1 *not at all* to 5 *absolutely correct*)	-0.14 ***	-0.14 ***	3.91	(1.20)	3.60	(1.34)	***
	Perception that computer is suitable for digital learning (1 *not at all* to 5 *absolutely correct*)	-0.12 ***	-0.13 ***	4.23	(1.05)	3.97	(1.22)	***
	Perception that forms of digital learning are usable for me (1 *not at all* to 5 *absolutely correct*)	-0.16 ***	-0.19 ***	4.48	(0.85)	4.25	(1.00)	***
	Likelihood that friend/acquaintance will check academic work (1 *very unlikely* to 5 *very likely*)	-0.13 ***	-0.15 ***	4.07	(1.26)	3.77	(1.41)	***
Personal resources	Self-efficacy	-0.15 ***	-0.25 ***	3.99	(0.65)	3.60	(0.81)	***
	Conscientiousness	-0.11 ***	-0.13 ***	3.54	(0.86)	3.38	(0.90)	***
	Neuroticism	0.08 ***	0.08 ***	3.06	(0.95)	3.72	(0.95)	***
	Openness	0.01	0.00	3.46	(1.05)	3.85	(1.01)	***
	Agreeableness	-0.03 **	-0.03	3.23	(0.80)	3.12	(0.85)	***
	Extraversion	-0.03 ***	-0.07 ***	3.12	(1.05)	2.87	(1.09)	***
Control variables	Gender	-0.02 **	-0.01	0.57	(0.49)	0.69	(0.46)	***
	At least one parent with a higher education degree	-0.03 **	0.00	1.56	(0.49)	1.55	(0.49)	
	Semester	-0.05 ***	-0.02	6.42	(4.07)	7.49	(4.77)	***
n		20,180	3,452	20,180		3,452		

Notes: The columns entitled Correlation show Pearson's correlations of the explanatory independent variables with the intention to dropout of higher education. The columns entitled Means and (SD) show the means and standard deviations (in parentheses) of students with (Disability) and without disabilities (No disability). The last column indicates whether the mean differences are statistically significant.

Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Data source: DZHW survey "Studying in Corona Times" (2020)

We capture students' *personal resources* based on their self-assessed self-efficacy and big-five personality traits. We operationalise self-efficacy using the short scale of general self-efficacy (Beierlein et al., 2013), which measures self-efficacy with three items on five-point scales ranging from 1 "not at all" to 5 "absolutely correct". We combined all three items in one index (Cronbach's alpha = 0.83). We capture personality traits using the Big Five Inventory (BFI-10, Rammstedt et al., 2013). As commonly done, we reversed the negatively formulated items and combined two items for each personality trait in one index for measuring conscientiousness (Cronbach's alpha = 0.56), neuroticism (Cronbach's alpha = 0.64), openness (Cronbach's alpha = 0.66), agreeableness (Cronbach's alpha = 0.22), and extraversion (Cronbach's alpha = 0.82).[7] Supporting **H5**, a higher self-efficacy significantly negatively correlates with dropout intent. Furthermore, less conscientiousness and extraversion and more neuroticism correlate significantly positively with dropout intent. More agreeableness significantly negatively correlates with dropout intent only among students without disabilities, and openness does not significantly correlate with dropout intent at all. Importantly, students with disabilities consider their self-efficacy

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[7] The low alpha values result from the development of the BFI-10. Its items were chosen to cover each personality dimension as comprehensively as possible, leading to low item correlations (Rammstedt et al., 2013).

to be significantly lower. Furthermore, they score significantly lower on conscientiousness, agreeableness and extraversion and score significantly higher on neuroticism and openness.

To ensure that our results are robust across students' gender, parents' education, and semester, we control for these variables in all models. Interestingly, these variables are only significantly negatively correlated with dropout intent in the group of students without disabilities.

Multivariate methods

To corroborate our descriptive findings, we estimate linear regressions of students' dropout intent, thereby gradually considering the previously discussed measures of the hypothetical explanatory mechanisms. The regression coefficients indicate scale point changes in the dependent variable associated with one-unit changes in the independent variables, holding all other variables constant (see Wooldridge, 2015, for methodological details on linear regressions).[8]

Additionally, we estimate linear Kitagawa-Oaxaca-Blinder decompositions using the Stata commands developed by Jann (2008). A Kitagawa-Oaxaca-Blinder decomposition quantifies the extent to which a group difference—in our case the difference in dropout intent between students with and without disabilities—is attributable to group differences in the distribution of other, explanatory independent variables. On the one hand, we indicate the percentage share of the disability-related difference in dropout intent explained by all variables included in a respective model—see the last line of Table 3, entitled D_{total} (%). On the other hand, we report the percentage share of the disability-related difference explained by each variable in the fully specified model—see the last column of Table 3, entitled D_{var} (%).

Multivariate results

Explaining the disability gap in dropout intent

Our first regression model reveals that students with disabilities are more likely to intend to drop out of higher education than students without disabilities even when including our control variables (M0 in Table 3). To explain this disability-related difference, we consecutively add our measures of academic integration (M1), social integration (M2), financial resources (M3), home learning resources (M4), and personal resources (M5).

When introducing our two measures of academic integration into the regression (M1), the disability-related difference in dropout intent declines from 0.55 to 0.42 scale points. As hypothesised (**H1**), a better academic integration has a significant negative effect on dropout intent (Table 3). Moreover, as shown in Table 2, students with disabilities are less well-integrated academically. Accordingly, the Kitagawa-Oaxaca-Blinder decomposition shows that the lower academic integration of students with disabilities significantly explains their higher dropout intent (by about 16%). This is the largest share that a single theoretical component explains of the observed disability gap.

In M2, we additionally consider students' social integration, which decreases the disability-related difference to 0.40 scale points. Consistent with **H2**, our measures of social

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[8] To test for multicollinearity, we estimate variance inflation factors (VIFs) including all variables of the fully specified main model (Table 3). With the highest VIF amounting to 2.05, each VIF lies substantially below the frequently used threshold value of 10 (O'Brien, 2007).

Table 3 Linear regressions of dropout intent and Kitagawa-Oaxaca-Blinder decompositions (students with disabilities versus students without disabilities)

	M0	M1	M2	M3	M4	M5	D_var (%)	
Disability								
Disability *(ref. no disability)*	0.55 ***	0.42 ***	0.40 ***	0.38 ***	0.37 ***	0.31 ***		
Academic integration								
Satisfaction with academic achievements		-0.19 ***	-0.17 ***	-0.16 ***	-0.15 ***	-0.14 ***	*11.19 ****	} 15.97 ***
Satisfaction with acquired knowledge and skills		-0.12 ***	-0.10 ***	-0.09 ***	-0.09 ***	-0.08 ***	*4.78 ****	
Social integration								
Satisfaction with supervision and guidance by teachers			-0.05 ***	-0.05 ***	-0.04 ***	-0.05 ***	*2.30 ****	} 5.09 ***
Frequency of contact with fellow students outside of classes			-0.04 ***	-0.03 ***	-0.03 ***	-0.02 ***	*1.36 ****	
Perception that students generally support each other			-0.05 ***	-0.04 ***	-0.03 ***	-0.03 ***	*1.44 ****	
Financial resources								
Perception that financing of subsistence is secured				-0.06 ***	-0.05 ***	-0.05 ***	*3.80 ****	} 4.77 ***
Perception that parents are able to support me financially				-0.01 *	-0.01	-0.01	*0.97*	
Home learning resources								
Perception that living situation is suitable for digital learning					-0.01	-0.01	*0.52*	} 4.81 ***
Perception that computer is suitable for digital learning					0.00	0.00	*0.15*	
Perception that forms of digital learning are usable for me					-0.06 ***	-0.06 ***	*2.74 ****	
Likelihood that friend/acquaintance will check academic work					-0.03 ***	-0.02 **	*1.40 ***	
Personal resources								
Self-efficacy						-0.11 ***	*7.80 ****	} 13.41 ***
Conscientiousness						-0.04 ***	*1.04 ***	
Neuroticism						0.02	*2.22 **	
Openess						0.02 *	*1.36 **	
Agreeableness						-0.01 *	*0.26 **	
Extraversion						-0.02 *	*0.74 **	
Control variables								
Gender *(ref. male)*	-0.05 **	-0.06 ***	-0.05 **	-0.04 **	-0.04 **	-0.06 **	*-1.18 ***	} -2.12 ***
At least one parent with a higher education degree *(ref. none)*	-0.04	-0.03	-0.02	0.01	0.01	0.01	*-0.04*	
Semester	-0.01 **	0.00	0.00	-0.01 *	-0.01 *	0.00	*-0.90*	
n with disabilities	3,452	3,452	3,452	3,452	3,452	3,452		
n without disabilities	20,180	20,180	20,180	20,180	20,180	20,180		
R²	0.04	0.13	0.14	0.15	0.15	0.16		
D_total (%)	-2.87 ***	20.91 ***	24.63 ***	29.22 ***	30.85 ***	41.93 ***	41.93 ***	

M0 to M5 = Results of linear regression models with cluster-robust standard errors (clusters = higher education institutions)

D_{var} (%) = Percentage share of disability difference explained by different variable sets

D_{total} (%) = Percentage share of disability difference explained by all variables in a respective model

Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Data source: DZHW survey "Studying in Corona Times"(2020)

integration have significant negative effects on dropout intent (Table 3) and students with disabilities are less socially integrated (Table 2).

Adding financial resources (M3) reduces the disability-related difference in dropout intent to 0.38 scale points. Supporting **H3**, both measures of financial resources have significant negative effects on dropout intent. Furthermore, students with disabilities have fewer financial resources (Table 2).

Regarding home learning resources (M4), three measures have negative effects on dropout intent, which backs **H4**. However, they only slightly decrease the disability difference (0.37). Also, only the coefficients for the last two variables are significant. Yet, students with disabilities have fewer home learning resources than students without disabilities according to all four variables (Table 2).

As the decomposition shows, differences in social integration, financial resources, and home learning resources explain relevant but smaller parts of the difference in dropout intent between students with and without disabilities (each around 5%).

Finally, we consider students' personal resources (M5), which substantially decreases the disability difference (0.31). Supporting **H5**, self-efficacy has a significant negative effect on dropout intent. Moreover, conscientiousness, agreeableness, and extraversion have significant negative effects on dropout intent, while openness has a significant positive effect. Neuroticism does not have a significant effect. Overall, differences in personal resources explain the second largest share of the difference in dropout intent between students with and without disabilities (around 13%).

The final model explains about 42% of the difference in dropout intent between students with and without disabilities. While each theoretical component significantly contributes to explaining the greater dropout intent of students with disabilities, their lower academic integration and fewer personal resources explain the largest shares. While we consider the explanatory power of our models satisfactory, we must also acknowledge that a significant share of the disability-related difference in dropout intent remains unexplained.

As a sensitivity check, we rerun our models without clustered standard errors but including dummies for students' higher education institution. Although we observe significant variations in students' dropout intentions across different higher education institutions, they do not explain the disability gap.

To test for further disability-related differences in dropout intent, we also re-estimate our fully specified main model (re-including the clustered standard errors) additionally controlling for students' type of higher education institution (university versus university of applied sciences), mode of study (studies in presence versus other mode), type of degree (bachelor versus other degree), and subject.[9] These additional variables explain only very small parts of the disability-related difference in dropout intent.

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[9] The type of higher education institution does not significantly affect dropout intent. Studying in an "other mode" has a significant negative effect on dropout intent compared to studying in presence. Moreover, students are more likely to intend to drop out in bachelor programmes than in other degree programmes. Regarding the subject, we observe that studying sport or medicine has a significant negative impact on dropout intent, while studying agricultural studies has a significant positive impact on dropout intent compared to studying law (reference category).

We also include students' grades as an additional objective measure of academic integration. For this sensitivity analysis, we excluded students who indicated that they had not received grades yet. The results show that worse grades have a substantial positive effect on dropout intent. However, differences in grades between students with and without disabilities only explain 0.12% of the disability-related differences in dropout intent. The results of all sensitivity analyses are available upon request.

Explaining dropout intent of different disability groups

Figure 2 shows that dropout intent is highest among students with psychic disabilities (difference of 0.66 scale points on a scale from 1 to 5 compared to students without disabilities), followed by students with learning disabilities (0.52) and with physical disabilities (0.45).

Regarding all disability groups, academic integration is most relevant for explaining the disability-related difference in dropout intent. Social integration is more important among students with learning disabilities than among students with physical and psychic disabilities, while financial resources are more important among students with physical disabilities than among students with psychic and learning disabilities. Home learning resources are most important among students with learning disabilities, followed by students with physical and psychic disabilities, while personal resources are most important among students with psychic disabilities, followed by students with learning and physical disabilities.

In summary, these additional analyses uncover notable heterogeneity across disability groups regarding the likelihood of intending to drop out and the reasons explaining their greater dropout intent. Overall, the proposed theoretical model can explain around 47% (learning disabilities), 40% (psychic disabilities), and 36% (physical disabilities) of the respective difference in dropout intentions compared to students without disabilities. While the model fits best for students with learning disabilities, it explains the dropout intentions of all considered disability groups reasonably well.

Fig. 2 Shares of the disability-related differences in dropout intent explained by different components (separate decomposition models for different disability groups)
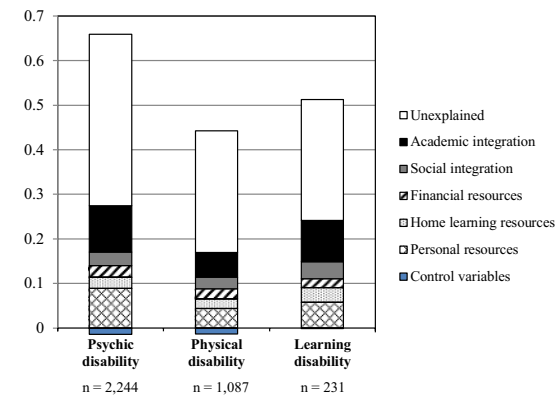
Notes: Results of Kitagawa-Oaxaca-Blinder decompositions with cluster-robust standard errors (clusters = higher education institutions). The explained shares are indicated in scale points. Tables 4 to 6 in the appendix show the full regression and decomposition results.
Data source: DZHW survey "Studying in Corona Times" (2020)

Discussion and conclusion

Main findings and contributions

Students with disabilities had thus far hardly been considered in the dropout literature. Intending to close this research gap, we explored the mechanisms explaining the greater dropout intent of students with disabilities in German higher education. To this end, we combined Tinto's (1975) model of student integration, the student attrition model (Bean & Metzner, 1985), the composite persistence model (Rovai, 2003), and insights from social stratification research (e.g., Boudon, 1974; Bourdieu, 1986; Breen & Goldthorpe, 1997). The resulting model posits that not only students' academic and social integration into higher education but also their financial, home learning, and personal resources influence dropout intent and explain the observed disability-related differences. To test our hypotheses, we used data from a 2020 Germany-wide student survey. Estimating linear regressions and Kitagawa-Oaxaca-Blinder decompositions, we approximated the relative importance of the discussed theoretical components for explaining disability-related differences in dropout intent.

In line with previous research from Germany (Kerst, 2016; Koopmann et al., 2023; Rußmann et al., 2023), we found that students with disabilities are substantially more likely to intend to drop out than students without disabilities. Dropout intent is highest among students with psychic disabilities, followed by students with learning disabilities and students with physical disabilities. This pattern differs from findings from Australia (Kilpatrick et al., 2017) and the USA (Mamiseishvili & Koch, 2011), where students with learning disabilities seem to be more likely to persist in higher education than students with physical disabilities. However, it aligns with the finding that U.S. students with physical disabilities are more likely to successfully complete their studies than students with learning and psychic disabilities (Matesic, 2020; Pingry O'Neill et al., 2012).

The results of our Kitagawa-Oaxaca-Blinder decomposition showed (both generally and for students with different types of disabilities) that less academic integration and fewer personal resources (especially less self-efficacy) are most important for explaining the above-mentioned disability-related differences in dropout intent. Lower social integration, fewer home learning, and fewer financial resources also explain part of the disability-related difference in dropout intent—albeit to a smaller extent. In this regard, it is difficult to compare our findings to previous studies because the latter frequently lack a comparison group of students without disabilities. What stands out in studies from the USA is that a high social integration proves to be more important than a high academic integration for the retention of students with disabilities (DaDeppo, 2009; Mamiseishvili & Koch, 2011; Stanic, 2022). We find the opposite pattern (see our descriptive results). These diverging findings could result from different measurements of academic and social integration. They could also result from differences in the amount and nature of support that students with disabilities receive in Germany and the USA. For instance, services for students with learning disabilities have been massively expanded in the USA after the Americans with Disabilities Act in 1990 (Fisseler, 2016).

Regarding academic integration, some studies find that students with disabilities receive worse grades than students without disabilities (USA: Eisenberg et al., 2009; Canada: Parsons et al., 2021), while others do not find any grade differences (Israel: Hen & Goroshit, 2014; Canada: Jorgensen et al., 2005). For Germany, we did not find grade differences between students with and without disabilities. Accordingly, grades

explained only 0.12% of the disability-related difference in dropout intent. However, the subjectively assessed measures of academic integration explain a considerable part of the difference in dropout intentions between students with and without disabilities. This highlights the importance of considering subjective measures of academic integration in future research.

Additionally, our analyses highlight the importance of self-efficacy for explaining differences in dropout intent between students with and without disabilities. To our knowledge, research on the dropout (intent) of students with disabilities had so far not empirically examined the possible mediating role of self-efficacy. Our findings suggest, however, that the role of self-efficacy should be explored in more depth in future research—regardless of the considered type of disability.

Overall, our results back Tinto's student integration model, especially concerning the relevance of academic integration. In line with our theoretical arguments, however, we also found that private resources (especially personal resources) are important for explaining (disability-related differences in) dropout intent. Therefore, we conclude that the integration of Tinto's model, the student attrition model, the composite persistence model, and insights from social stratification research eases comprehensive explanations of the greater dropout intent of historically underrepresented and disadvantaged student groups, including not only students with disabilities but also other groups of non-traditional students (Bean & Metzner, 1985; Dahm et al., 2018; Müller & Klein, 2023).

Limitations and further research

Our study could not fully explain the observed disability-related differences in dropout intent. This results from several data limitations. For instance, some of our theoretical constructs could be operationalised differently or by using additional measurements. Concerning home learning resources, for instance, we could only measure private social support by asking whether friends or acquaintances would check their academic work. More variables to capture private social support, especially parental support, would be beneficial. From both scientific and political points of view, it would also be relevant to better distinguish private social support from the support students receive in their higher education environment.

Moreover, we have focused on subjective measures of our theoretical components. While our analyses underscore the relevance of students' subjective perceptions for explaining dropout intent, future research could assess whether the use of objective measures leads to different results than ours. Where applicable, it could also examine the reasons for the differences in results depending on whether objective or subjective measures are used. For example, our sensitivity analyses indicate that (objective) grades hardly explain disability-specific dropout intent, while the (subjective) satisfaction with the own academic performance is highly relevant in this regard. To better understand this discrepancy, it could also be instructive to consider (ideally objectively measured) competencies in addition to students' grades and satisfaction.

Furthermore, there seem to be mechanisms influencing dropout intent of students with disabilities that our data did not allow us to consider at all. For example, our data did not offer information on the availability of disability services and disadvantage compensation, which, however, previous research suggests are factors influencing the study success of students with disabilities (Fisseler, 2016). This is especially important considering the potential initial lack of online information for students with disabilities during the Covid-19 pandemic (Meleo-Erwin et al., 2021).

Besides the specific type of disability, its visibility to other people and its official recognition can notably influence study success (Fisseler, 2016). Unfortunately, we did not have information on the visibility and recognition of students' disabilities. While we could broadly differentiate psychic, physical, and learning disabilities, case numbers did not enable robust analyses of specific subtypes of these disabilities. Such analyses are highly relevant because students' needs and resources likely differ depending on their specific disability—and so might their dropout intentions.

Future research could also examine whether the reasons for disability-related differences in dropout intent vary by subjects. In our analyses, the subject explained only small differences of the overall disability-related differences in dropout intent. We consider it plausible, however, that the factors explaining disability-related differences in dropout intent differ across subjects.

Future research is needed also from a methodological point of view. Our cross-sectional decomposition analyses could only approximate the relevance of specific factors for explaining the greater dropout intent of students with disabilities. To better quantify the relative importance of the discussed (and further) explanatory factors, we would need longitudinal data enabling panel data analyses.

The development of dropout intent and the explanation of disability-related differences could also be examined before, during, and after the Covid-19 pandemic. Potentially, there were strong initial effects of the pandemic on students' (disability-specific) dropout intentions, which were then followed by adjustment to the circumstances and thus re-declining dropout intent.[10]

Furthermore, research still has to examine the link between dropout intent and actual dropout (Neugebauer et al., 2019). Future research could apply and extend the proposed theoretical framework to disability-related differences in actual dropout of higher education.

Finally, future research could better acknowledge that student dropout is inherently linked to sample selection and attrition. Crucially, selection and attrition processes are likely to depend on characteristics such as students' disability status. Regarding sample selection, it is noteworthy that the share of students with disabilities entering higher education has increased substantially over the past decades (Madaus et al., 2021), suggesting that students with disabilities in higher education are nowadays likely to be a less selective and more heterogeneous group than in the past (changing sample selection). Therefore, we consider it plausible that the relevance of the examined explanatory components has changed over time. Regarding sample attrition, it should be considered that the timing of dropout might differ between students with and without disabilities (selective sample attrition). Thus, the relevance of the examined explanatory components might differ depending on the semester in which students are examined. This possibility underscores the value of examining both dropout intent (ideally in various stages of the studies) in addition to actual dropout. Exploring these thoughts in more detail might further advance research on dropout (intent)—not only concerning the role of disabilities, but also concerning other student characteristics.

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[10] We had no information on when a disability occurred. Especially considering that the Covid-19 pandemic severely increased mental illnesses (World Health Organization, 2022), we assume that students could adapt more easily to the new circumstances if they have had their disability already for a longer period of time.

Practical implications

Despite the discussed limitations, our analysis suggests several practical implications. First, faculty could be better sensitised to the specific needs of students with disabilities. Relatedly, they could be better informed about available relief and support measures. This would be important because faculty are in a good position to ease the integration of students with disabilities through knowledge about compensating measures.

Second, policymakers and higher education administrators could evaluate the necessity of redesigning study and counselling structures to address the lower academic integration and self-efficacy beliefs of students with disabilities. For example, they could promote that different types of exams are offered by default. This would eliminate the need to disclose disabilities as a prerequisite for receiving academic support. Such measures could prevent stigmatisation and reduce the likelihood of students with disabilities failing exams because of unsuitable formats. Considering the large number of students with disabilities suffering from mental illnesses, a further expansion and professionalisation of psychological counselling services also promises to reduce dropout.

In summary, policymakers, higher education administrators, and faculty could better ensure that students with disabilities can participate in different learning settings—especially considering the ongoing digitisation and proliferation of new modes of study. Still, university-level measures to reduce disability-specific dropout (intent) will likely remain limited in their impact. It might overburden higher education institutions to expect them alone to prevent student-group-specific dropout. For ensuring academic success of students with disabilities, a broader societal commitment is needed, including more easily accessible psychological and medical support as well as financial and social assistance. Not least, a strong commitment of the enrolling students is necessary. Finally, research can play its part. For example, intervention studies could assess which measures inside and outside higher education institutions contribute most to reducing inequalities between students with and without disabilities.

Appendix

Table 4 Linear regressions of dropout intent and Kitagawa-Oaxaca-Blinder decompositions (students with psychic disabilities versus students without disabilities)

	M0	M1	M2	M3	M4	M5	D_var (%)	
Disability								
Psychic disability *(ref. no disability)*	0.66 ***	0.51 ***	0.49 ***	0.47 ***	0.46 ***	0.38 ***		
Academic integration								
Satisfaction with academic achievements		-0.19 ***	-0.16 ***	-0.16 ***	-0.15 ***	-0.14 ***	*11.27 ****	16.30 ***
Satisfaction with acquired knowledge and skills		-0.12 ***	-0.09 ***	-0.09 ***	-0.08 ***	-0.07 ***	*5.03 ****	
Social integration								
Satisfaction with supervision and guidance by teachers			-0.05 ***	-0.05 ***	-0.04 ***	-0.04 ***	*1.98 ****	4.62 ***
Frequency of contact with fellow students outside of classes			-0.04 ***	-0.03 ***	-0.03 ***	-0.02 **	*1.38 ****	
Perception that students generally support each other			-0.05 ***	-0.04 ***	-0.04 ***	-0.03 ***	*1.27 ****	
Financial resources								
Perception that financing of subsistence is secured				-0.06 ***	-0.05 ***	-0.04 ***	*3.13 ****	4.06 ***
Perception that parents are able to support me financially				-0.01 *	-0.01	-0.01	*0.93*	
Home learning resources								
Perception that living situation is suitable for digital learning					-0.01	-0.01	*0.41*	3.86 ***
Perception that computer is suitable for digital learning					0.00	0.00	*0.19*	
Perception that forms of digital learning are usable for me					-0.06 ***	-0.06 ***	*1.96 ****	
Likelihood that friend/acquaintance will check academic work					-0.03 **	-0.02 **	*1.30 ***	
Personal resources								
Self-efficacy						-0.10 ***	*7.98 ****	13.69 ***
Conscientiousness						-0.04 **	*1.27 ***	
Neuroticism						0.02	*2.22*	
Openness						0.02	*1.05 **	
Agreeableness						-0.01	*0.26*	
Extraversion						-0.02	*0.90 **	
Control variables								
Gender *(ref. male)*	-0.05 **	-0.06 ***	-0.05 **	-0.05 **	-0.05 **	-0.06 **	*-1.29 ***	-2.17 ***
At least one parent with a higher education degree *(ref. none)*	-0.04 *	-0.02	-0.02	0.01	0.01	0.01	*-0.05*	
Semester	-0.01 **	0.00	-0.01 *	-0.01 *	-0.01 *	-0.01 *	*-0.84 **	
n with psychic disabilities	2,244	2,244	2,244	2,244	2,244	2,244		
n without disabilities	20,180	20,180	20,180	20,180	20,180	20,180		
R²	0.04	0.13	0.14	0.15	0.15	0.16		
D_{total} (%)	-2.75 ***	21.15 ***	24.15 ***	27.12 ***	28.88 ***	40.36 ***	40.36 ***	

M0 to M5 = Results of linear regression models with cluster-robust standard errors (clusters = higher education institutions)

D_{var} (%) = Percentage share of disability difference explained by different variable sets

D_{total} (%) = Percentage share of disability difference explained by all variables in a respective model

Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Data source: DZHW survey "Studying in Corona Times" (2020)

Table 5 Linear regressions of dropout intent and Kitagawa-Oaxaca-Blinder decompositions (students with physical disabilities versus students without disabilities)

	M0	M1	M2	M3	M4	M5	D_var (%)	
Disability								
Physical disability (*ref. no disability*)	0.45 ***	0.36 ***	0.34 ***	0.32 ***	0.31 ***	0.27 ***		
Academic integration								
Satisfaction with academic achievements		-0.18 ***	-0.16 ***	-0.15 ***	-0.14 ***	-0.13 ***	9.09 ***	13.01 ***
Satisfaction with acquired knowledge and skills		-0.11 ***	-0.09 ***	-0.09 ***	-0.08 ***	-0.07 ***	3.92 ***	
Social integration								
Satisfaction with supervision and guidance by teachers			-0.05 ***	-0.04 ***	-0.04 ***	-0.04 ***	2.36 ***	5.98 ***
Frequency of contact with fellow students outside of classes			-0.04 ***	-0.04 ***	-0.03 ***	-0.03 ***	1.87 ***	
Perception that students generally support each other			-0.04 ***	-0.04 ***	-0.03 ***	-0.03 ***	1.76 ***	
Financial resources								
Perception that financing of subsistence is secured				-0.06 ***	-0.04 ***	-0.04 ***	4.27 ***	5.34 ***
Perception that parents are able to support me financially				-0.01 *	-0.01	-0.01	1.07	
Home learning resources								
Perception that living situation is suitable for digital learning					-0.01	-0.01	0.86	5.13 ***
Perception that computer is suitable for digital learning					0.00	0.01	0.26	
Perception that forms of digital learning are usable for me					-0.05 **	-0.05 ***	2.85 ***	
Likelihood that friend/acquaintance will check academic work					-0.03 ***	-0.02 **	1.16 **	
Personal resources								
Self-efficacy						-0.08 ***	4.39 ***	10.03 ***
Conscientiousness						-0.04 ***	0.48 *	
Neuroticism						0.02 *	2.50 **	
Openess						0.02 *	1.66 *	
Agreeableness						-0.01	0.34	
Extraversion						-0.01	0.67	
Control variables								
Gender (*ref. male*)	-0.05 *	-0.06 **	-0.05 **	-0.05 **	-0.05 **	-0.06 **	-1.33 *	-3.13 ***
At least one parent with a higher education degree (*ref. none*)	-0.04 *	-0.03	-0.03	0.00	0.01	0.00	-0.03	
Semester	-0.01 **	0.00	-0.01 *	-0.01 **	-0.01 *	-0.01 *	-1.77 *	
n with physical disabilities	1,087	1,087	1,087	1,087	1,087	1,087		
n without disabilities	20,180	20,180	20,180	20,180	20,180	20,180		
R²	0.01	0.11	0.12	0.12	0.13	0.13		
D_total (%)	-3.93 ***	15.78 ***	21.11 ***	26.60 ***	28.17 ***	36.37 ***	36.37 ***	

M0 to M5 = Results of linear regression models with cluster-robust standard errors (clusters = higher education institutions)

D_{var}(%) = Percentage share of disability difference explained by different variable sets

D_{total}(%) = Percentage share of disability difference explained by all variables in a respective model

Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Data source: DZHW survey "Studying in Corona Times"(2020)

Table 6 Linear regressions of dropout intent and Kitagawa-Oaxaca-Blinder decompositions (students with learning disabilities versus students without disabilities)

	M0	M1	M2	M3	M4	M5	D_var (%)	
Disability								
Learning disability (*ref. no disability*)	0.52 ***					0.27 **		
Academic integration								
Satisfaction with academic achievements		-0.17 ***	-0.15 ***	-0.14 ***	-0.13 ***	-0.12 ***	*13.16 ****	} 18.44 ***
Satisfaction with acquired knowledge and skills		-0.11 ***	-0.09 ***	-0.08 ***	-0.08 ***	-0.07 ***	*5.27 ***	
Social integration								
Satisfaction with supervision and guidance by teachers			-0.05 ***	-0.05 ***	-0.04 ***	-0.04 ***	*4.26 ****	} 7.51 ***
Frequency of contact with fellow students outside of classes			-0.04 ***	-0.03 ***	-0.03 **	-0.03 **	*1.13 **	
Perception that students generally support each other			-0.05 ***	-0.04 ***	-0.04 ***	-0.03 ***	*2.12 **	
Financial resources								
Perception that financing of subsistence is secured				-0.06 ***	-0.05 ***	-0.04 ***	*3.24 ***	} 4.00 **
Perception that parents are able to support me financially				-0.01 *	-0.01	-0.01	*0.76*	
Home learning resources								
Perception that living situation is suitable for digital learning					-0.01	-0.01	*0.83*	} 6.31 ***
Perception that computer is suitable for digital learning					0.00	0.00	*0.23*	
Perception that forms of digital learning are usable for me					-0.06 ***	-0.06 ***	*4.32 ***	
Likelihood that friend/acquaintance will check academic work					-0.03 **	-0.02 **	*0.93*	
Personal resources								
Self-efficacy						-0.08 ***	*5.69 ****	} 11.26 ***
Conscientiousness						-0.03 **	*1.87 ***	
Neuroticism						0.03 **	*2.27 **	
Openness						0.02 *	*1.19 **	
Agreeableness						-0.01	*0.18*	
Extraversion						-0.01	*0.05*	
Control variables								
Gender (*ref. male*)	-0.05 **	-0.06 **	-0.05 **	-0.05 **	-0.05 **	-0.06 ***	*0.51*	} -0.25
At least one parent with a higher education degree (*ref. none*)	-0.05 *	-0.03 *	-0.03	0.00	0.00	0.00	*0.02*	
Semester	-0.01 **	0.00	-0.01 *	-0.01 *	-0.01 *	-0.01 *	*-0.77*	
n with learning disabilities	231	231	231	231	231	231		
n without disabilities	20,180	20,180	20,180	20,180	20,180	20,180		
R²	0.01	0.10	0.11	0.11	0.12	0.13		
D_total (%)	-1.35	26.12 ***	31.51 ***	33.49 ***	37.84 ***	47.27 ***	47.27 ***	

M0 to M5 = Results of linear regression models with cluster-robust standard errors (clusters = higher education institutions)

D_{var}(%) = Percentage share of disability difference explained by different variable sets

D_{total}(%) = Percentage share of disability difference explained by all variables in a respective model

Significance levels: * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$

Data source: DZHW survey "Studying in Corona Times"(2020)

Declarations

Ethics approval Our results do not allow for deductive disclosure of the survey participants' identities. Participation in the survey was voluntary, and participants' confidentiality was protected.

Conflict of interest The authors declare that they have no competing interests.

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