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To leave or not to leave? Critical factors for university dropout among first-generation students

Abstract

Researchers who study university dropout have identified personal and organizational factors as crucial. The question is whether these factors affect first-generation students (FG) in the same way as they affect others (non-FG). Our sample consisted of 286 non-FGs and 250 FGs from three German universities, who responded to an online survey. For both groups, the quality of information before studying had a direct effect on the probability of student dropout. For FGs, the quality of information in the first semester increased self-efficacy and decreased the probability of student dropout. For non-FGs, both self-efficacy and the quality of information in the first semester decreased the perceived organizational constraints and hence the probability of student dropout. Recommendations for universities are discussed.

Keywords

First-generation, university dropout, self-efficacy, structural equation model

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Soll ich bleiben oder gehen? Eine Analyse von Abbruchgründen des Studiums bei der First-Generation

Zusammenfassung

Studienabbrüche werden durch personale und organisationale Faktoren erklärt. Die Frage ist, ob für Studierende der First-Generation (FG) dieselben Zusammenhänge wie für andere Studierende (non-FGs) gelten. Den Online-Fragebogen füllten 250 FGs und 286 non-FGs von deutschen Universitäten aus. Bei beiden Gruppen besteht ein direkter Zusammenhang zwischen der Qualität der Informationen vor Studienbeginn und der Abbruchwahrscheinlichkeit. Für FGs erhöht die Qualität der Informationen während des ersten Semesters die Selbstwirksamkeit und senkt dadurch die Abbruchwahrscheinlichkeit. Bei der non-FG senken die Selbstwirksamkeit und die Qualität der Informationen im ersten Semester die wahrgenommenen Barrieren und dadurch die Abbruchwahrscheinlichkeit. Handlungsempfehlungen für Universitäten werden diskutiert.

Schlüsselwörter

First-Generation, Studienabbruch, Selbstwirksamkeit, Strukturgleichungsmodell

1 Introduction

Although it is one of the wealthiest countries in the world, Germany remains a country of strong societal stratification, particularly in the domain of education (EL-MAFAALANI, 2015). In addressing social differences, the current study compares two specific subgroups of beginning students, FG students and non-FG students, to explore crucial factors for student dropout. FGs are defined as students whose parents did not study within a university setting (JEHANGIR, 2010). As part of the uneducated class, FGs are a group most at risk of dropout, although they account for 50 % of the total student population (MIDDENDORF, APOLINAR-SKI, POSKOWSKY, KANDULLA & NETZ, 2013). Given that FG dropout is

higher than non-FG rates (MIDDENDORF et al., 2013), the question remains whether the same mechanisms for predicting university dropout apply to both groups. Therefore, we focused on (1) the quality of information before studying and (2) information received in the first semester, as universities can easily influence such information (e.g., via a well-structured homepage). Additionally, we included self-efficacy and organizational constraints as mediators. While both have been identified as important for academic success, prior research has found that FGs have weaker self-efficacy than non-FGs (RAMOS-SANCHEZ & NICHOLS, 2007).

Our study contributes to the research on university dropout in several ways. First, contrary to previous studies addressing personal factors (e.g., HORN & NUÑEZ, 2000), we have focused on organizational factors (e.g., quality of information) that universities can influence, comparing the relation between information and university dropout for FGs and non-FGs. Second, we show that due to weaker self-efficacy, FG students begin their studies under more difficult circumstances. Universities may apply the results to develop more efficient programs to decrease dropouts of both FGs and non-FGs. Finally, we have established structural equation models for FGs and non-FGs to demonstrate the relations between the aforementioned variables.

2 Theoretical Background

Whereas some studies have found no link between parental education and study time or academic success (ALARCON & EDWARDS, 2013; SCHLECHTER & MILEVSKY, 2010), or between parental education and adaptation to university life (RAMOS-SANCHEZ & NICHOLS, 2007), an increasing number of studies have emphasized the connection between university dropout and FGs. FGs are three times less likely to begin coursework toward a degree (77 % vs. 33 % among non-FGs), and one in five FGs either changes his/her subject major (MIDDENDORF et al., 2013) or drops out (CINGANO & CIPOLLONE, 2003; DELL'MOUR & LANDLER, 2007; MARTINEZ, SHER, KRULL & WOOD, 2009).

Studies asserting a correlation have identified different reasons for FG academic underperformance, including the influence of parental education on the ability to cope with the demands of university life (ADDINGTON, 2005); lack of support in preparation for academia (HORN & NUÑEZ, 2000); and less familiarity with the varieties of learning strategies (STEPHENS et al., 2012). These studies have highlighted differences in personal factors between FGs and non-FGs. However, university dropout research generally has distinguished between personal and organizational factors (e.g., BLÜTHMANN, 2014). In our study, we have concentrated on organizational factors, such as the special role of information, which universities can influence (Fig. 1).
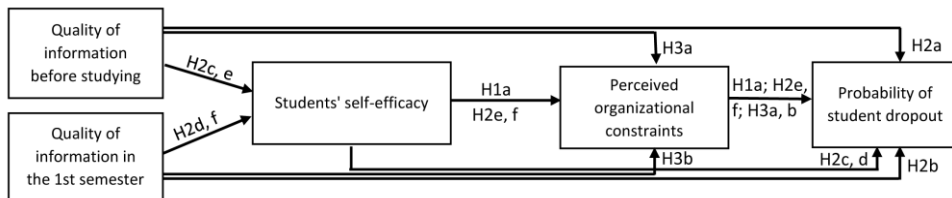
Fig. 1: Model of Hypotheses

One important factor in explaining university dropout is self-efficacy because it controls cognitive, motivational, affective, and decision-relevant processes (BANDURA, 1997). It is defined as people's confidence in their ability to perform an act or exercise successfully (BANDURA & CERVONE, 1983). Not surprisingly, people with greater self-efficacy develop better information-seeking effectiveness (BROWN, GANESAN & CHALLAGALLA, 2001); exhibit higher motivation, better performance, and more tenacity; and have more academic success (CARAWAY et al., 2003). Similarly, experiences with setting and reaching goals increase students' readiness to set further goals and to pursue them, even in the face of obstacles (CARAWAY et al., 2003; RICHARDSON, CHARLES & BOND, 2012). Hence, people with high self-efficacy cope with organizational constraints (e.g., unclear structure of the study program) easier than people with weaker self-efficacy. Since it is known that perceived constraints lead to an increased risk of

student dropout (BLÜTHMANN, 2014), we assume that organizational constraints mediate the relation between self-efficacy and the probability of student dropout.

H1a: Self-efficacy affects the probability of student dropout via organizational constraints.

Additionally, FGs show lower levels of self-efficacy than non-FGs (RAMOS-SANCHEZ & NICHOLS, 2007). It seems probable that parents with university experience serve as role models for their children, who are more likely to expect success within the university.

H1b: FGs' self-efficacy is weaker than non-FGs' self-efficacy.

To avoid university dropout, it is important to determine exactly what strengthens self-efficacy beliefs. We assume that the quality of information about the study program (especially on pre-study program requirements), the transition between bachelor and master studies, and career perspectives influence students' self-efficacy and are therefore important organizational factors for explaining university dropout (BLÜTHMANN, 2014). These variables mediate students' judgment of study requirements and their likelihood of dropping out (BLÜTHMANN, 2014). Similarly, studies found a correlation between the accuracy of students' expectations for their studies and the subsequent satisfaction with their studies (cf. SCHMIDT-ATZERT, 2005; VOSS, 2006). Information about studying likely reduces the gap between expectations and reality, which consequently decreases the probability of university dropout (e.g., GAWRILOW, SEVINCER & OETTINGEN, 2009; OETTINGEN & GOLLWITZER, 2002). Furthermore, realistic expectations about the content and demands have been found to increase satisfaction with the study program (HASENBERG & SCHMIDT-ATZERT, 2013), the lack of which can result in a change of university, a change of subject, or university dropout (BRANDSTÄTTER, GRILLICH & FARTHOFER, 2006; SUHRE, JANSEN & HARSKAMP, 2007).

The present study distinguished between information acquired independently by the student before studying (quality of information before studying) and infor-

mation the university provided directly as part of the first-semester orientation (quality of information in the first semester). In our models, we focused on quality over quantity, as the sheer amount of information is no indicator of whether students consider themselves well-informed (KELLER & STAELIN, 1987).

In line with previous studies (GAWRILOW ET AL., 2009; OETTINGEN & GOLLWITZER, 2002), we assume:

H2a: High quality of information before studying decreases the probability of student dropout.

H2b: High quality of information in the first semester decreases the probability of student dropout.

Assuming that information reduces the level of uncertainty and strengthens students' confidence (MUNRO & HANLEY, 2001), we hypothesized that the quality of information decreases the probability of student dropout, mediated via both self-efficacy and a combination of self-efficacy and organizational constraints.

Hypothesis 2c: The quality of information before studying reduces the probability of student dropout mediated via self-efficacy.

Hypothesis 2d: The quality of information in the first semester reduces the probability of student dropout mediated via self-efficacy.

Hypothesis 2e: The quality of information before studying has an indirect effect on the probability of student dropout via self-efficacy and perceived organizational constraints.

Hypothesis 2f: The quality of information in the first semester has an indirect effect on the probability of student dropout via self-efficacy and perceived organizational constraints.

Additionally, high-quality information about studying skills facilitates student preparation. Pre-announced constraints will not be perceived as such.

H3a: Perceived organizational constraints mediate the relation between the quality of information before studying and the probability of student dropout.

H3a: Perceived organizational constraints mediate the relation between the quality of information in the first semester and the probability of student dropout.

3 Method

3.1 Sample

The data were collected by means of online questionnaires administered both prior to university entry and during the first semester. The first questionnaire was filled in by second- (or later) semester bachelor students, while the second questionnaire was completed by university dropouts. There were 536 respondents from three German universities. No significant differences were found between the students who completed the questionnaire and those who did not. The parental education information was gathered using two questions. First, "Does your mother/your father hold a university or technical college degree?", to which students could answer *yes*, *no*, or *I do not know*. We labeled a student as 1 (*First-Generation*) if neither parent held a post-secondary degree, and as 2 (*non-First-Generation*) if either one or both parents held a post-secondary degree. If the student marked one or both questions with *I do not know*, we recoded it as missing. This happened 14 times (2.6 %). In all, 250 students (46.6 %) were FGs, of which 140 (56 %) were women, whereas there were 276 non-FGs, with 167 women (58.4 %). We gathered data on school grades with an open question: "What was your secondary degree grade point average (GPA)?" The students indicated their GPA on a scale from 1.0 to 4.0, whereby 1.0 is the highest achievable grade, and 4.0 is the lowest possible grade to pass within the German school system. Among FGs, 232 students (92.8 %) gained access to university through a general higher education entrance qualification (German *Abitur*), which they completed with a GPA of 2.35 ($SD = 0.61$). Among non-FGs, 276 students (96.5 %) gained access to university through a general high-

er education entrance qualification (German *Abitur*), which they completed with a GPA of 2.25 (*SD* = 0.64).

3.2   Variables

Probability of student dropout. Based on the Transtheoretical Model (GRANT & FRANKLIN, 2007; KLONEK, ISIDOR & KAUFFELD, 2014), the students were asked to choose from several statements and to indicate which most closely resembled their university status (e.g., "I decided to drop out of university"). Later, the category *university dropout* was added in the second online questionnaire. Afterwards, we combined the categories and used a dichotomous outcome variable. In all, 468 students (87.3 %) indicated that they had ruled out a university dropout, whereas 68 students (12.7 %) indicated that they had had doubts about their studies or discontinued them.

Perceived organizational constraints. To measure perceived organizational constraints, we used a modified scale from SCHERFER (2013). Our scale included seven items: "The structure of the study program is unclear"; "It is not possible to fulfill the study requirements in the time allotted for this purpose"; "I find it difficult to raise professional enthusiasm for my studies"; "The requirements in foundational subjects are too high"; "I do not have enough time to prepare course work"; "Teaching methods in university courses do not reflect my learning style"; and "I find the mentoring of lecturers' insufficient." The internal consistency value for organizational constraints was acceptable (Cronbach's α = .75). The students indicated their responses on a 5-point scale, from 1 (*completely disagree*) to 5 (*completely agree*).

Self-efficacy. GRANT and FRANKLIN (2007) adapted the self-efficacy scale from BANDURA (1977) to the context of students. The respondents classified their confidence in relation to four core areas of academic success on a 10-point scale, from 0 (*no confidence*) to 10 (*fully confident*). An example is: "How confident are you that you can improve your GPA by the end of this semester?" Our German translation of the scale was validated by two simultaneous translations and a back-

translation. The coefficient alpha for the self-efficacy measure was good (Cronbach's $\alpha = .76$).

Quantity of information before studying. The quantity of information was assessed by asking the question: "Which information did you use?" Students could choose between the university homepage, the university Facebook presence, the university's online self-assessments, an "Open House Day," stands at trade fairs, information brochures, and centralized and decentralized advisory services. The total number of choices indicated were added together.

Quality of information before studying. The information was rated on a 5-point scale from 1 (*not at all helpful*) to 5 (*very helpful*). All ratings were first added together and then divided by the quantity of information before studying.

Quantity of information in the 1st semester. To collect the number of events attended during the first semester, the students were asked: "Which of the following events did you attend?" They were asked to select from: introductory course, mentoring program, offers of a student organization associated with a faculty, pre- and gap courses, tutorials, learning strategy courses, freshmen orientation week, and other advisory services. These are typical offers at German universities. The response format was 1 (*did not know*), 2 (*did not participate*), and 3 (*did participate*). The first two answer possibilities were labelled as 0 (*did not participate*), and the third one as 1 (*participate*). Thus, it was possible to present the quantity of information in the first semester. Subsequently, the number was added together.

Quality of information in the 1st semester. The students rated the events attended on a 5-point scale from 1 (*not at all helpful*) to 5 (*very helpful*). All ratings were first added together and then divided by the quantity of information in the first semester.

4 Data Analysis

To test the comparative hypotheses (H1b), we executed t-tests. The remaining hypotheses were modulated with Mplus 7.3 using a weighted least squares (WLS) estimation. For model evaluation, we applied normed χ^2, RMSEA, CFI, and TLI with the respective cut-off values, as proposed by SCHWEIZER (2010). We calculated two separate structural equation models, one for FGs and one for non-FGs, because a single model with a moderation variable incorporating all variables would be very complex and confusing. As we cannot assume that the product of several regression coefficients within indirect effects is normally distributed, both models were bootstrapped (GEISER, 2010).

5 Results

Table 1 summarizes the means, standard deviations, and bivariate correlations of variables. The probability of student dropout related positively to perceived organizational constraints (H1a) and negatively to self-efficacy (H1a), quality of information before studying (H2a), and quality of information in the first semester (H2b). However, it was unrelated to parental education. These findings confirmed our hypotheses. Moreover, we suspected that FGs had weaker self-efficacy than non-FGs. A t-test confirmed this hypothesis 1b ($t(1) = 2.50$, $p < .05$).

Next, we tested our hypothesized models for the non-FG (see Figure 2) and the FG (see Figure 3). These models fit well. They were controlled for sex and grade point average. Additionally, both qualities of information were controlled for the variable quantity of information, in order to relativize the quantity and the quality. The FG model explained 64.9 % of the variance and the non-FG model explained 63.4 % of the variance.

We expected all hypotheses to be applicable to both groups to the same extent. Hypothesis 1a predicted that perceived organizational constraints mediated the relation between self-efficacy and probability of student dropout. This could only

be shown for non-FGs (ß = -.101, p < .01 [CI: -.196, -.007]). For FGs, no indirect effects were significant. Thus, we confirmed hypothesis 1a for non-FGs.

For both groups, the quality of information before studying had a significant, direct correlation with the probability of student dropout. The quality of information in the first semester was found to be insignificant in both groups. For both groups, we therefore confirmed hypothesis 2a and rejected hypothesis 2b. Hypotheses 2c and 2d assumed indirect effects from both qualities of information to the probability of student dropout via self-efficacy. For FGs, self-efficacy mediated the relation between the quality of information in the first semester and the probability of student dropout (ß = -.149, p < .05 [CI: -.269, -.028]). Hypotheses 2e and 2f assumed indirect effects from both qualities of information to the probability of student dropout via self-efficacy and perceived organizational constraints. As we found a mediation effect of self-efficacy, we confirmed hypothesis H2d for the FG and rejected hypotheses H2c, H2e, and H2f for both groups.

Next, we supposed that perceived organizational constraints mediated the relation between the quality of information and the probability of student dropout. For non-FGs, the mediation effect with the quality of information in the first semester applied (ß = -.054, p < .05 [CI: -.103, -.006]). Thus, H3a was rejected and H3b confirmed for non-FGs.

Table 1: Cronbach's Alpha, Means, Standard Deviations, and Bivariate Pearson Correlations for Probability of Student Dropout, Self-Efficacy, Information, Constraints, Sex, First Matriculation, and Grade Point Average.

Measures	MFG	SDFG	Mnon_FG	SDnon-FG	1[A]	2	3	4	5	6	7	8	9
1. Probability of student dropout[A]	1.14	0.35	1.09	0.28	-	.269***	-.243***	-.077	-.158**	.070	-.175**	-.189**	.111+
2. Organizational constraints	2.56	0.73	2.49	0.75	.351***	(.752)	-.398***	.007	-.264***	-.063	-.309***	-.165**	.166**
3. Self-efficacy	7.59	1.71	7.94	1.49	-.405***	-.556***	(.777)	.033	.155**	.103+	.259***	.053	.232***
4. Quantity of information before studying	3.12	1.65	3.12	1.55	-.004	-.077	.041	-	-.121*	.126*	.129*	.027	.034
5. Quality of information before studying	3.81	0.75	3.83	0.74	-.208**	-.406***	.288***	-.094	-	.103+	.280***	.041	-.018
6. Quantity of information in the 1st semester	4.54	1.17	4.49	1.20	-.060	-.204**	.120+	.159*	.046	-	.146*	-.062	-.084
7. Quality of information in the 1st semester	3.89	0.75	3.92	0.73	-.180**	-.408***	.401***	.184**	.473***	.166**	-	-097	-.130*
8. Sex	1.44	0.50	1.41	0.49	.028	.024	-.094	.003	.070	-.164**	-.066	-	-.131*
9. Grade point average	2.35	0.61	2.25	0.64	.087	.122+	-.190**	-.110+	-.125*	-.098	-.203**	-.113+	-

Notes: The values for the non-FG are above the diagonal; the values for the FG are below the diagonal; Cronbach's alpha is in the diagonal.
[A]: Using Spearman's roh
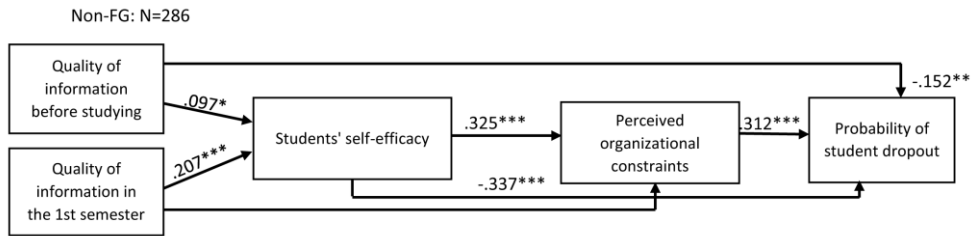+p <. 10 (two-tailed). *p < .05 (two-tailed). **p < .01 (two-tailed). ***p < .000 (two-tailed).

Fig. 2: Model for the non-first-generation students controlled by sex, GPA and quantity of information.
Chi^2 = 17.34; df = 10; CFI = 0.98; TLI = 0.93; RMSEA = 0.03, p > .05.
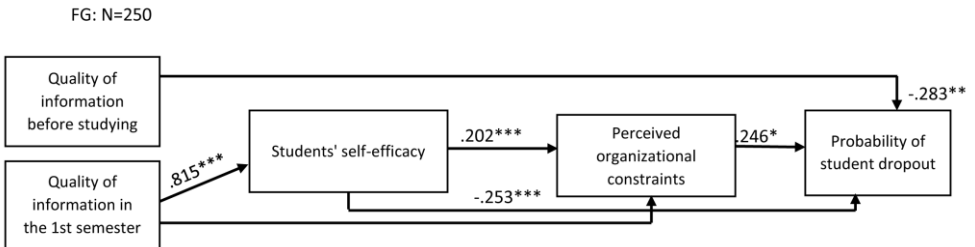*p < .05 (two-tailed). **p < .01 (two-tailed). ***p < .000 (two-tailed).

Fig. 3: Model for the first-generation students controlled by sex, GPA and quantity of information.
Chi^2 = 15.18; df = 8; CFI = 0.98; TLI = 0.93; RMSEA = 0.00, p > .05.
*p < .05 (two-tailed). **p < .01 (two-tailed). ***p < .000 (two-tailed)

6 Discussion

The aim of our study was to analyze how information influences the probability of student dropout for FGs and non-FGs. We predicted that due to weaker self-efficacy of the FG, the relation of the variables would differ significantly between

the two groups. Furthermore, we focused on the quality of information as an organizational factor that universities can easily influence; thus, universities can apply our results when developing more efficient programs to decrease dropout numbers.

In line with the literature, we were able to show that the probability of student dropout is predictable for both FGs and non-FGs based on the quality of information (GAWRILOW ET AL., 2009; OETTINGEN & GOLLWITZER, 2002). Contrary to BLÜTHMANN (2014), we identified direct relations of information on the probability of student dropout for both groups. Our data showed that realistic expectations about study content influence the probability of student dropout (BRANDSTÄTTER ET AL., 2006; SUHRE ET AL., 2007). One explanation for this discrepancy could be the difference in samples: BLÜTHMANN's (2014) sample was restricted to students, whereas we also included dropouts.

Additionally, we found indirect effects for FGs, which demonstrated the special role of self-efficacy. We replicated the finding that self-efficacy is weaker for FGs than for non-FGs (e.g., RAMOS-SANCHEZ & NICHOLS, 2007). Self-efficacy can be enhanced by providing high-quality information in the first semester, in order to decrease the probability of student dropout. A possible explanation is that information can compensate for the lack of parents' ability to advise their children. Nonetheless, neither self-efficacy nor information can decrease the perceived constraints.

For non-FGs, both their higher self-efficacy and the high-quality of information given to them during the first semester decrease the perception of constraints and therefore lower the probability of student dropout. The results highlighted the importance of differentiated analyses for specific groups of students.

Similar to most empirical studies, this study is also limited in several ways, which are addressed in this paragraph. The present study has a cross-sectional design. To predict directional relationships, we included the quantity and quality of information as retrospective questions. The validation of answers to retrospective questions depends on the time-lag and the kind of event. "Accuracy of recall usually decreases as the length of time since the event increases" (BRANDBURN, RIPS,

& SHEVELL, 1987, In: LUCAS & BAIRD, 2006). Events that represent a turning point in one's life, such as the choice of a study program, are remembered reliably (HÖPFINGER, 2010). However, a longitudinal study can reproduce the thinking more accurately. Additionally, the quality of Cronbach's alpha needs to be considered. In general, the literature about how high Cronbach's alpha should be is diverse. Whereas BORTZ and DÖRING (2006) find that an acceptable value is α = .08, SCHMITT (1996) proposed α = .07. All scales used here have a Cronbach's alpha above .70 and are therefore acceptable, according to SCHMITT (1996). Furthermore, to examine whether Cronbach's alpha measures reliability and dimensionality at all, we conducted a Confirmatory Factor Analysis (CFA) with Mplus for scales of both self-efficacy and the perceived organizational constraints (BENTLER, 2009). The method is independent of the number of items. It showed an acceptable fit for self-efficacy (Chi^2 = 14.52; df = 2; CFI = 0.99; TLI = 0.98; RMSEA = 0.00, p > .05). For the perceived organizational constraints, the fit is not that good for a 1-factor model (Chi^2 = 220.22; df = 14; CFI = 0.85; TLI = 0.77; RMSEA = 0.101, p < .05). A 2-factor model would be a better option (Chi^2 = 80.72; df = 13; CFI = 0.95; TLI = 0.92; RMSEA = 0.54, p < .05). The first factor would include "The structure of the study program is unclear"; "I do not have enough time to prepare course work"; "Teaching methods in university courses do not reflect my learning style"; and "I find the mentoring of lecturers' insufficient." The second factor would include "It is not possible to fulfill the study requirements in the time allotted for this purpose"; "I find it difficult to raise professional enthusiasm for my studies"; "The requirements in foundational subjects are too high."

In summary, our findings assert the crucial importance of providing aspiring students with high-quality information prior to their studies (BLÜTHMANN, 2014; HASENBERG & SCHMIDT-ATZERT, 2013; MORGAN, 2005). Universities need to make information on study programs more easily accessible to potential students (e.g., by providing a well-structured homepage or online self-assessments). To help the FG, a concept for a good introduction to the study program is needed. More research is needed to explore which information is necessary at the beginning of a study program. The consequence would be an increase in self-

efficacy for both FGs and non-FGs, a decrease in perceived constraints, and, in turn, a decrease in the probability of student dropout.

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