

Article

The Effects of a University's Self-Presentation and Applicants' Regulatory Focus on Emotional, Behavioral, and Cognitive Student Engagement

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Abstract: A university's presentation of its programs to the public should provide potential students with information about what they can expect as students at that university. However, it is largely unclear what kind of self-presentation affects different applicants and their commitment. In a laboratory experiment with $N = 116$ participants, we examined the emotional, behavioral and cognitive impact of a university's self-presentation (either emphasizing chances for students or emphasizing their obligations) on student engagement. We also measured the participants' regulatory focus (promotion and prevention focus). We found interaction effects of the university's self-presentation and participants' promotion and prevention focus on student engagement. There was a regulatory fit for promotion focus in the chances condition for emotions and behavior. There was also a regulatory fit for prevention focus in the obligations condition for cognitive processes. We conclude that universities should dedicate time and effort to creating a clear presentation of their offerings in the implementation of digital learning environments.

Keywords: academic performance; academic motivation; academic goals; motivational strategies

1. Introduction

At the time of transition to a higher education institution, students have to make many decisions in order to choose a university and a study program that fit their individual career needs [1–4]. In such situations, students act with uncertainty, not being fully aware of the universities' community or culture [5]. Briggs [1], for example, reported students' difficulties in trying to imagine their upcoming studies. Universities, in turn, present information about their programs and characteristics in digital environments, such as websites or social media. This information implicitly promotes a university's vision of its students' way of life and learning at that institution. However, it is unclear how students perceive such presentations of universities. It also remains unknown whether students' perceptions influence their motivation and, as a consequence, their decisions, well-being, and their commitment as students.

1.1. Universities' Self-Presentation in Digital Environments

Sustainable digitalization plays an increasingly important role in academic teaching [6]. In addition to the successful implementation of academic teaching in digital learning environments, there are social and economic aspects of sustainability. Graham [7] pointed out that a university's culture provides structural and, at the same time, social alignment for lecturers and students. Students and lecturers increasingly collaborate at universities with the help of digital learning tools [8,9]. Lewison

and Hawes [10] reported the necessity of marketing plans to attract future students, recommending a marketing approach that requires universities to emphasize relevant foci. It is important to understand how universities can present themselves clearly in digital environments.

For some universities, it may be more important to support the development of social identity [11–14], whereas others have a vision of structuring students' futures [15,16], or others wish to invest in public relations and comparative evaluations with other universities [17]. Overall, it is not clear how these particular foci of interest are experienced by student applicants from outside the university and how this affects their (future) student commitment and engagement.

1.2. Student Engagement

An engaged student displays a positive, work-focused psychological state [18] that is characterized by vigor, dedication, and absorption [19]. From a psychological point of view, student engagement is a learner's motivational state of well-being that is represented by educationally productive activities [19,20]. Such activities reflect the student's commitment to their own studies [21] as well as how intense the experiences of learning activities, lecturer support or feedback are for that student [22]. The National Survey of Student Engagement (NSSE) [23] provides four factors that reflect student engagement: academic challenge, learning with peers, experiences with faculty, and campus environment. Mandernach [24] used similar indicators: level of academic challenge, student/faculty interaction, active and collaborative learning, and enriching educational experiences. Educationally productive activities can be, for example, motivation to work on projects together with other students, actively seeking feedback from tutors and lecturers, making self-created learning scripts available for other students, putting a concerted effort into their studies, not wasting time on things that are not relevant to their studies, or even finding out more about their professors' research interests. The NSSE provided benchmarks for assessing student engagement [25]. These were higher-order learning, reflective and integrative learning, learning strategies, quantitative reasoning, collaborative learning, discussions with diverse others, student–faculty interaction, effective teaching practices, quality of interactions, and a supportive environment. As part of the work presented here, we transferred these benchmarks of student engagement to the challenges of digital learning environments. The description provided by Bempechat and Schernoff [26], stating that student engagement can be seen “as the quality of temporal interactions with the learning activity, task, social companions, and other components of the proximal environment” (p. 318), is helpful for describing student engagement in digital learning environments. However, more empirical research is needed to investigate student engagement in this context.

Previous research has shown that student engagement functions as a prerequisite for learning success [27–30] and is therefore an indicator of the performance of learners [31,32]. Student engagement also seems to depend on situational context and what role a learner plays in the higher education context [33–36]. Fredricks [34,37] viewed student engagement as an antidote to low achievement, high levels of boredom, and high drop-out rates. To sum up, student engagement should provide learners in higher education with a high level of energy and strong identification [19] to support their learning in these environments.

Research studies have emphasized different influences when distinguishing among the various dimensions of student engagement. Carini, Kuh, and Klein [38] measured significant correlations between student engagement and Grade Point Average (GPA) measures for active and collaborative learning, student–faculty interaction, supportive campus climate, and student–faculty interaction concerning coursework. Appleton, Christenson, Kim, Dongjin, and Reschly [39] emphasized the importance of cognitive and psychological dimensions beneath more conventional academic and behavioral dimensions. Gray [40] demonstrated the effects of learner interaction and instructor presence on student engagement. Handelsmann et al. [29] used a four-factor structure (skills engagement, participation/interaction engagement, emotional engagement, and performance engagement) to predict student engagement.

In the work presented here, we refer to studies [28,31,41] that suggested measuring affect, cognition, and behavior as indicators of momentary student engagement in a situational context. Kahu [31] reported a lack of clarity in the selection and relationship of these three dimensions, so we aimed to address this research gap. In line with Kahu [31], we set out to measure student engagement with regards to emotion, behavior, and cognition. As explained above, we defined student engagement as vigor, dedication, and absorption. We assumed that vigor, dedication, and absorption would provide learners in higher education with a high level of power, energy, and strong identification [19,20,42,43]. In addition, pro-active engagement requires considerable expenditure of effort, energy, and resources [44,45] and also predicts performance [46].

In addition to investigating situational contexts that could affect student engagement [34,47], we also took an individual approach [48]. We assumed that students with a sense of psychological fulfillment and personal significance, combined with a willingness to invest, would demonstrate a high level of student engagement. In the following section, we provide the theoretical background on regulatory focus theory [49,50], which predicts individual effects on student engagement.

1.3. Regulatory Focus Theory

People tend to seek particular psychosocial experiences and feel pleasure when they have these experiences [51]. According to regulatory focus theory [49,50], there are two distinct and independent self-regulatory orientations for seeking these experiences: a promotion focus is driven by the need for growth, and a prevention focus is driven by the need for security. The theory suggests that performance and goal achievement are either driven by a motivational tendency to approach success or to avoid failure. A person with a promotion focus, for example, focuses more strongly on information about gain or no-gain while pursuing their goal to approach success. In contrast, a person with a prevention orientation [52] processes information on loss or non-loss while pursuing the goal of avoiding failure. Both promotion and prevention focuses affect attention and perception [52–54].

We transferred this approach into the context of universities' self-presentation and assumed that students' exploration of a course of study for a sustainable career would be triggered by people's regulatory focus. As Sun et al. [41] have found that self-regulation affected student engagement, we hypothesized the effects of self-regulation strategies (i.e., promotion or prevention focus) on student engagement. Students with a promotion focus would primarily be influenced by information about a course of study that implied gain or no-gain for their career progression. In comparison, students with a prevention focus would mainly be influenced by information that emphasized loss or non-loss for their career. The following section provides more detail on the interplay of regulatory focus and a university's self-presentation.

1.4. Regulatory Fit with a University's Self-Presentation

Higher education faculties should sustainably foster the learning of students and ensure that their students belong to the community of a faculty: a community that supports growth, challenges students' viewpoints, builds long lasting relationships and well-being, and focuses on academic as well as personal success [16,55,56]. Hassanzadeh, Kanaani, and Elahi [57] transferred these considerations into a digital learning environment. They demonstrated the effects of content and information quality on students' satisfaction and behavioral intention. In the research presented here, we hypothesized that a university's self-presentation has an impact on regulatory fit [58], which in turn should affect students' emotional responses [59,60], behavior [61–64], and cognitive performance [65].

A university's self-presentation—on a website, for example—that emphasizes eagerness or self-realization should fit the promotion focus of students who wish to pursue achievement and success. Such self-presentation would make these students feel a sense of significance, combined with the willingness to invest effort to achieve their hopes and aspirations. In other words, this regulatory fit of a university's self-presentation would in turn lead students to express higher levels of student engagement.

On the other hand, for regulatory fit with students with prevention focus, pursuing non-loss and avoiding mistakes or failure, a university's self-presentation should describe possible vigilance behavior, or behavior fostering certainty—by following the rules, for example. Students with this regulatory fit should also feel a sense of significance combined with willingness to invest effort to fulfill their responsibilities, so these students would also show a boost of student engagement.

1.5. Research Question and Hypotheses

The research question here was whether there is an effect on student engagement in the interplay between a university's self-presentation and people's regulatory focus. This experiment was pre-registered on the pre-registration platform aspredicted.org (pre-registration number #24702). We hypothesized that there would be an interaction effect between a university's self-presentation (chances vs. obligations) and participants' promotion and prevention focus on student engagement. In particular, we hypothesized that there would be higher student engagement scores for participants with a promotion focus in the chances condition and higher engagement scores for participants with a prevention focus in the obligations condition. We hypothesized that this interaction effect would occur on (a) emotional, (b) behavioral, and (c) cognitive levels.

2. Material & Methods

We tested the interaction hypothesis in a laboratory study. Participants put themselves in the role of a university applicant. We examined the impact of (1) the university's self-presentation in emphasizing chances for students vs. emphasizing obligations and (2) participants' regulatory focus score on student engagement. We manipulated the university's self-presentation by presenting two different descriptions of its programs and character. We also measured the participants' regulatory focus by capturing promotion and prevention focus independently [66]. The dependent variable was student engagement, as measured on three levels: (1) emotion, (2) behavior, and (3) cognition. In order to develop valid material and reliable measures of behavioral student engagement, we conducted a pre-study.

2.1. Pre-Study

We recruited $N = 56$ participants (44 females, 12 males, zero third gender) aged from 19 to 65 years old ($M = 25.21$, $SD = 8.40$) for this pre-study. The objective was to validate (1) the manipulation of a university's self-presentation and (2) the items to measure behavioral student engagement.

2.1.1. Validation of Self-Presentation

We utilized two self-presentations of a university in a within-design. To analyze the suitability of the self-presentation texts, we conducted a randomized study with participants' perception of the two types of self-presentation (chances vs. obligations) as dependent variables. Participants were to imagine that they had applied to a university and been accepted. After reading the university's self-presentation, participants rated the description of the study program at that university. They rated six statements on a 7-point Likert scale (1 = does not apply at all to 7 = applies completely). There were three items in each case, each representing either an emphasis on chances (1) or an emphasis on obligations (2).

The chances-related items specified that the study program provided students with a lot of freedom for learning experiences, offered graduates many professional opportunities, and aimed to ensure that their students were among the best. The obligations-related items referred to a rigid structure of how students should learn, represented a clear vision of how the course of study should proceed, and aimed to ensure that their students were monitored and accompanied.

The results revealed an interaction effect, $F_{(3,664)} = 44.38, p < 0.001, \eta^2 = 0.063$ (Table 1; Figure 1), indicating that our texts were valid operationalizations for the self-presentation of chances vs. obligations.

Table 1. Pretest self-presentation.

Statement/Condition	Chances Mean (SD)	Obligations Mean (SD)
Chances	5.58 (1.58)	3.67 (2.03)
Obligations	4.89 (1.84)	5.10 (1.90)

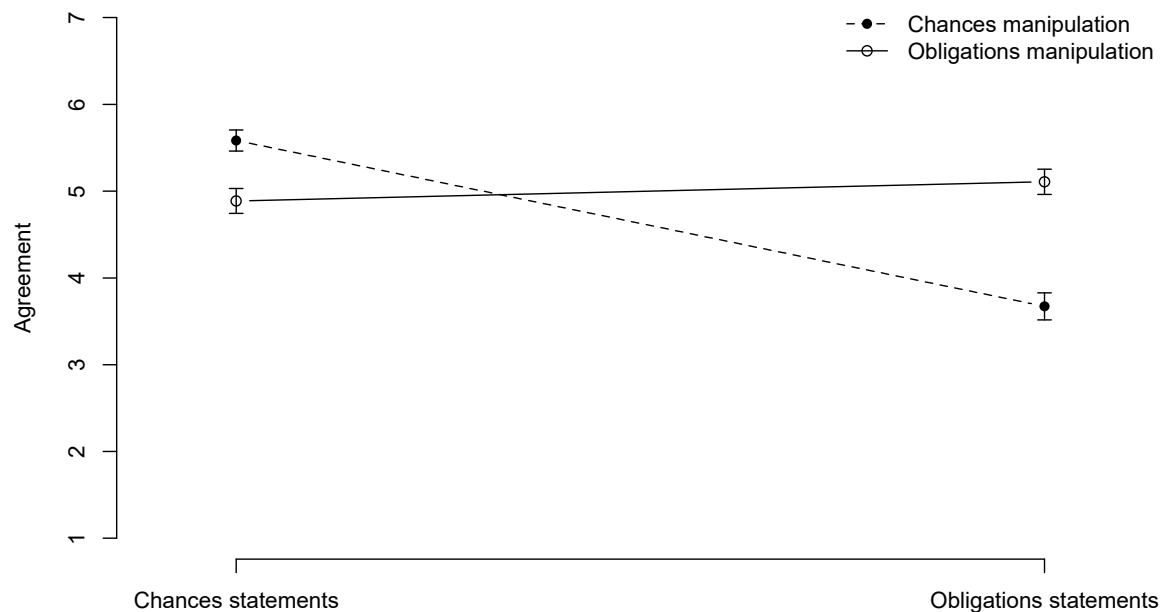


Figure 1. Evaluation of two types of a university's self-presentation (chances vs. obligations). Error bars indicate standard errors.

2.1.2. Validation of the Behavioral Student Engagement Measurement

We also examined 45 items to measure behavioral student engagement in this pre-study. Participants were asked what they would do next and to what extent they would find themselves carrying out the behavior described in these items. We used a 7-point Likert scale (1 = does not apply at all to 7 = applies completely). The participants rated the items twice (Cronbach $\alpha = 0.90$, Cronbach $\alpha = 0.93$) in the context of the within-design. They first rated all of the items after reading one self-presentation and a second time after reading the other self-presentation. For our main study, we aimed to obtain items with mean values between 3 and 5, so that our items would be informative with respect to a representative and sensitive middle field, without outliers (Figure 2). This procedure resulted in 31 items for the measurement of behavioral student engagement.

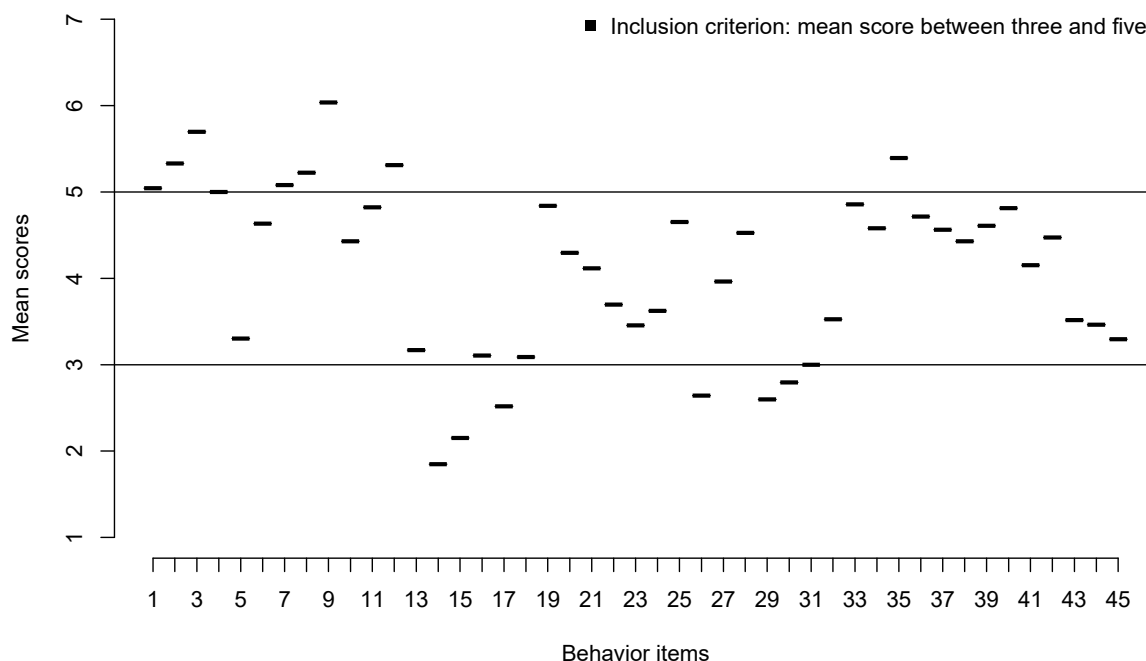


Figure 2. Items to measure behavioral student engagement: 31 items with a mean score between three and five were selected for the main study.

2.2. Procedure

For the main study, we recruited adult participants through the Online Recruitment System for Economic Experiments (ORSEE) to take part in a laboratory experiment with a duration of 45 min. Participants were welcomed, and after they had signed the declaration of consent, they started the study on a laptop. The survey ran on the XM Platform™ Version October 2019 of Qualtrics (Copyright © 2020 Qualtrics, Provo, UT, USA. <https://www.qualtrics.com>), and participants received compensation of six Euros.

Participants answered demographic questions about their age, gender, and whether they were university students. Then, we presented a questionnaire to determine the individual promotion focus and individual prevention focus of each participant and continued with a manipulation of the university's self-presentation. Participants were instructed to imagine that they were applicants for a Master's program. They were randomly assigned to one of two experimental conditions (chances vs. obligations), in which they read one of the university's self-presentations (see below). After reading the text, we presented three chances statements and three obligations statements with the same procedure as in the pre-study as a manipulation check. Then, participants filled in the emotional student engagement questionnaire. After this, participants rated their behavioral intentions in terms of what they would do next. Finally, they were asked to write an essay about the personal relevance of the self-presentation of this university (cognitive student engagement).

2.3. University's Self-Presentation

The independent variable was self-presentation, with the conditions of chances vs. obligations, as validated in the pre-study. We manipulated descriptions of student life at the university with reference to the goals, tasks, and professional fields of a fictitious Master's degree program in Bioeconomy. We provided two different self-presentations of a university and that particular degree program. One self-presentation emphasized independence and individual choices, whereas the other self-presentation described a rigid structure with predefined choices.

The text of the chances condition suggested a high level of freedom, allowing students to use their own learning styles and choose their preferred learning environments. This assumed that students

wanted to decide on their own in a responsible manner and receive support or information in order to find their own way. In the chances version of the university's self-presentation, we used the following wording, for example: "Our students are partners in our learning community and choose their own learning groups . . . Students can choose seminars in which they can realize themselves and which are interesting to them." Such a presentation would establish a regulatory fit with promotion focus by pointing out potential gains and opportunities for a student's future career.

The university's self-presentation in the obligations condition emphasized a rigid structure for students, with clear norms, demands, and predefined courses and learning groups. Participants in this condition read about a clearly defined and structured way of studying with a lot of supervision. In the obligations condition the text emphasized obligations with wording like: "The university organizes learning groups that prevent our students from feeling left alone . . . Students are assigned to seminars that are adapted to their course content." A regulatory fit with prevention focus would occur with such a self-presentation that emphasized security and non-loss.

2.4. Measures

2.4.1. Regulatory Focus

We used a questionnaire with two subscales to determine each participant's individual promotion focus and prevention focus (Appendix A.1). Participants answered 12 items to assess promotion focus ("If I really want to achieve a goal, I'll find a way.") and ten items to assess prevention focus ("For me, safety is an important criterion when making important decisions."). They rated the extent to which the items applied to them on a 7-point Likert scale from 1 = does not apply at all to 7 = applies completely.

2.4.2. Emotions

We used eight subscales with a total of 24 items (adjectives) to assess the participants' affective states [59,67,68]. Sassenberg et al. [59] reported that with a particular regulatory focus, individuals experience specific predominant emotions. We therefore integrated items to evaluate positive and negative emotions with respect to promotion and prevention focuses. In addition, we integrated four subscales from the Positive and Negative Affect Schedule (PANAS) [67] to provide a comprehensive spectrum of an individual's affective states. The eight subscales integrated were positive promotion, negative promotion, positive prevention, negative prevention, hope, threat, fear, and anxiety. The emotions involved in student engagement were based on these subscales, with higher scores representing greater student emotional commitment (see Appendix A.2). Participants were to imagine that they were considering taking part in the Master's program at the university and to indicate which adjectives described what they felt (7-point Likert scale: 1 = does not apply at all to 7 = applies completely).

2.4.3. Behavior

Student engagement on a behavioral level included concrete behavioral intentions. The 31 items identified in the pre-study represented concrete behavioral intentions on three subscales: personal initiative (8 items), digital networking (11 items), and goal-orientated learning activities (12 items; see Appendix A.3). Participants were asked to what extent these concrete behavioral intentions matched their own current intentions, with higher scores representing greater student behavioral engagement (7-point Likert scale: 1 = does not apply at all to 7 = applies completely).

Personal initiative is supposed to be beneficial for individual learning. The personal initiative subscale was represented by pro-active participation in a learning setting. The following items are examples of personal initiative: "I would like to start my studies immediately" and "I don't intend to waste time on things that are not relevant to my studies."

The digital networking subscale referred to active usage of digital tools [8]. This facet of behavior focused in particular on the social aspects of networking in a digital environment. Pro-active behavior in this subscale was therefore represented by active contributions to a corresponding digital environment.

We used the following items, for example: “I am motivated to look for new peers in my existing social networks” and “I am motivated to register in existing social media groups in order to establish contact with other students at the university.”

Goal-orientated learning activities represented self-regulatory aspects of learning in digital learning environments. This implied cognitive processing, selection, evaluation, cooperation, and reflection. We described these activities with items like “I am highly motivated to differentiate between important and unimportant study sessions” and “I am motivated to create my own learning scripts”.

2.4.4. Cognition

Participants had to write an essay to answer this question: “Which statements from the description of the university were personally relevant to you with regard to your studies, university, or future professional life?” There were no restrictions regarding the length of the participants’ texts. We analyzed the texts with Linguistic Inquiry and Word Count (LIWC) 2015 software [69] in the German Version DE-LIWC2015. Output variables of the psychological dimension drives from the software’s dictionary [69,70] were used. The drives dimension in LIWC2015 includes achievement, power, risk, and reward. These variables fit our theoretical definition of student engagement and regulatory focus theory and include thinking about power in the form of passion and perseverance [71]. Asking participants for a statement about their own studies, the university, and their future made them reflect on relevant goals, on self-assessment, and on self-regulatory strategies. In addition, writing an essay made them think about their willingness to dedicate time and effort.

2.5. Statistical Analysis

We examined the impact of the university’s self-presentation (emphasizing chances for students vs. emphasizing obligations of students) and participants’ regulatory focus on student engagement. To accomplish this, we designed a multiple linear regression model with the three predictors university’s self-presentation, participants’ promotion focus, and participants’ prevention focus. We then regressed the predictors to each level and each subscale of student engagement (linear regression model (dependent variable $\sim$ self-presentation $\times$ promotion $\times$ prevention), $\alpha = 0.05$). We conducted a manipulation check at participant level and overall. We used the same statements as in the pre-study. Participants rated six statements on a 7-point Likert scale (1 = does not apply at all to 7 = applies completely), with three statements each representing an emphasis on chances or an emphasis on obligations. For the individual manipulation check, we calculated the mean differences of each participant. In the chances condition, agreement was supposed to result in a positive difference score, whereas the obligations condition was supposed to result in a negative score. Participants who rated the statements in the “wrong” direction were not included in the analysis. For the overall manipulation check, we conducted an analysis of variance (ANOVA) that was supposed to result in an interaction effect of a university’s self-presentation in the chances vs. obligations conditions.

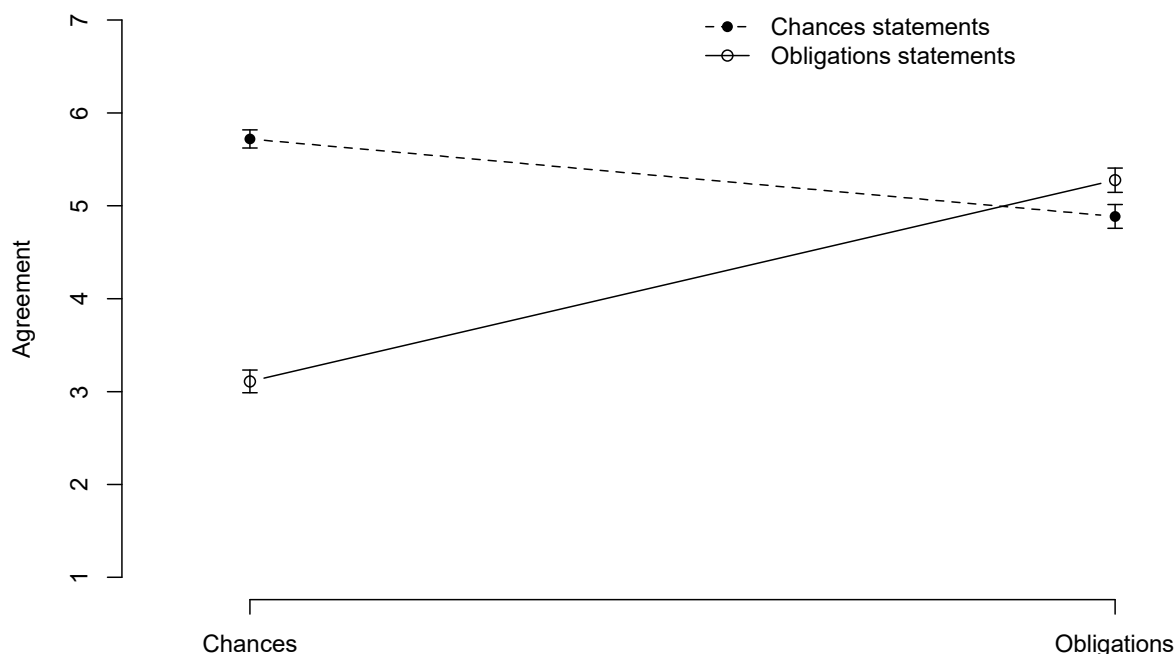
3. Results

We obtained 124 complete datasets and had to exclude five participants who were non-native speakers and three participants who did not pass the participant manipulation check. The remaining $N = 116$ participants (85 females, 31 males, and zero third gender participants) were aged from 18 to 73 years old ($M = 26.25$, $SD = 9.67$) and were assigned in equal numbers to the conditions (58 participants each).

The ANOVA for the overall manipulation check showed a significant interaction effect of condition (chances vs. obligations) and statements (chances vs. obligations), $F_{(1,114)} = 93.22$, $p < 0.001$, $\eta^2 = 0.45$. Participants in the chances condition scored higher on the chances statements than on the obligations statements and vice versa (Table 2, Figure 3).

Table 2. Manipulation check of the university's self-presentation.

Statements/Condition	Chances Mean (SD)	Obligations Mean (SD)
Chances	5.72 (1.28)	3.11 (1.63)
Obligations	4.89 (1.70)	5.28 (1.72)

**Figure 3.** Manipulation check: interaction effect indicating successful manipulation of the university's self-presentation, with error bars indicating standard errors.

3.1. Individual Regulatory Focus

The internal consistencies of both of the subscales, promotion and prevention focus, were acceptable: promotion-focus subscale, Cronbach $\alpha = 0.78$, $M = 4.89$, $SD = 0.74$; prevention-focus subscale, Cronbach $\alpha = 0.70$, $M = 4.68$, $SD = 0.75$ (Table 3). The assessment of participants' promotion focus and prevention focus revealed a significant difference, $t_{(115)} = 2.34$, $p = 0.021$. In line with regulatory focus theory, our results indicated two independent self-regulatory orientations.

Table 3. Promotion and prevention focus.

Regulatory Focus	Mean (SD)
Promotion	4.89 (0.74)
Prevention	4.68 (0.75)

3.2. Emotions

The reliability of emotion measurement was excellent overall, Cronbach $\alpha = 0.97$. The linear regression model (emotions ~ self-presentation * promotion * prevention) resulted in a three-way interaction effect for the positive promotion emotion subscale ($\beta = 0.96$, $SE = 0.48$, $p = 0.048$, $R^2 = 0.165$, $F_{(7,108)} = 3.04$, $p = 0.006$) and for the hope subscale ($\beta = 0.94$, $SE = 0.46$, $p = 0.044$, $R^2 = 0.167$, $F_{(7,108)} = 3.10$, $p = 0.005$; Table 4). As hypothesized, there was an interaction effect between the condition and promotion focuses for positive promotion emotion. That is, the university's self-presentation had an impact on participants' positive promotion emotion, depending upon their regulatory focus: the higher participants' promotion focus was, the higher they rated their positive promotion emotions in the chances condition (Figure 4). The same applied to the emotion hope. The higher participants'

promotion focus was, the higher they rated their sense of hope about their studies in the chances condition (Figure 5). The subscales negative promotion emotion, positive and negative prevention emotion, threat, fear, and anxiety did not show any effects.

Table 4. Emotional student engagement.

Emotion	β	SE	T	p
Positive promotion emotion ¹				
Intercept Chances	−1.63	7.47	−0.22	0.828
Condition	19.01	10.60	1.79	0.076
Promotion	1.05	1.44	0.73	0.469
Prevention	1.05	1.64	0.64	0.525
Condition × promotion	−4.45	2.16	−2.05	0.042 *
Condition × prevention	−4.26	2.36	−1.80	0.074
Promotion × prevention	−0.15	0.31	−0.49	0.627
Condition × promotion × prevention	0.96	0.48	2.00	0.048 *
Hope ²				
Intercept Chances	4.23	7.18	0.59	0.557
Condition	17.75	10.20	1.74	0.085
Promotion	−0.005	1.38	−0.004	0.997
Prevention	−0.042	1.58	−0.03	0.979
Condition × promotion	−4.39	2.08	−2.11	0.037 *
Condition × prevention	−3.93	2.27	−1.73	0.086
Promotion × prevention	0.05	0.30	0.17	0.868
Condition × promotion × prevention	0.94	0.46	2.04	0.044 *

* $p < 0.05$; ¹ Regression model: $F_{(7,108)} = 3.04, p = 0.006, R^2 = 0.165$; ² Regression model: $F_{(7,108)} = 3.10, p = 0.005, R^2 = 0.167$.

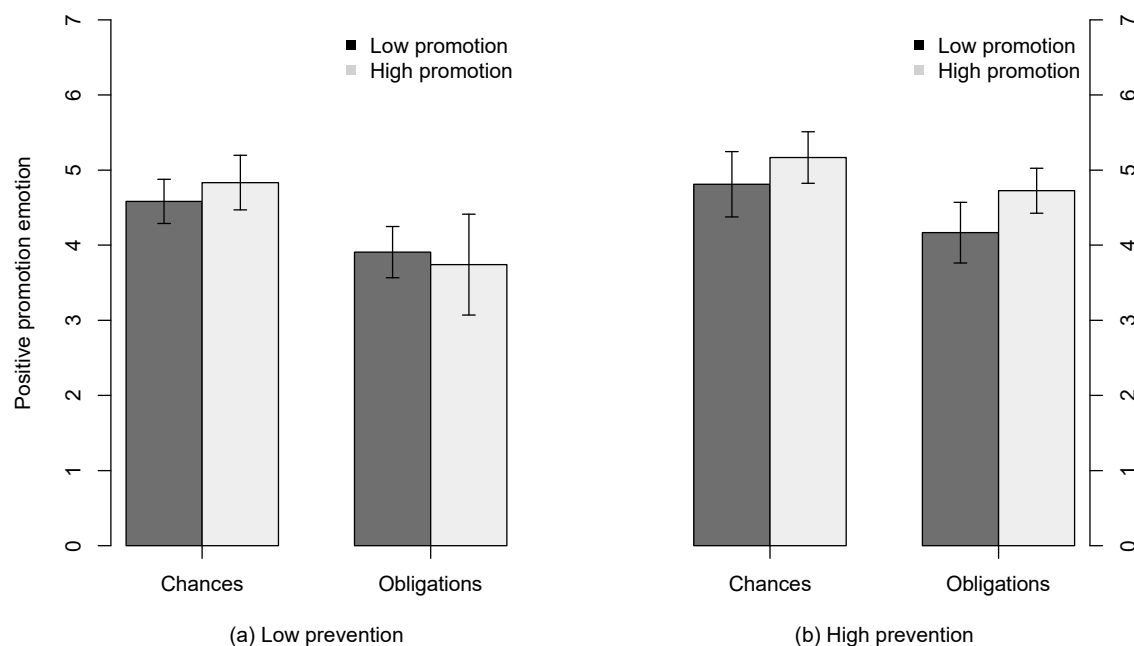


Figure 4. Interaction effect of a university's self-presentation (chances vs. obligations), promotion focus, and prevention focus on positive promotion emotions.

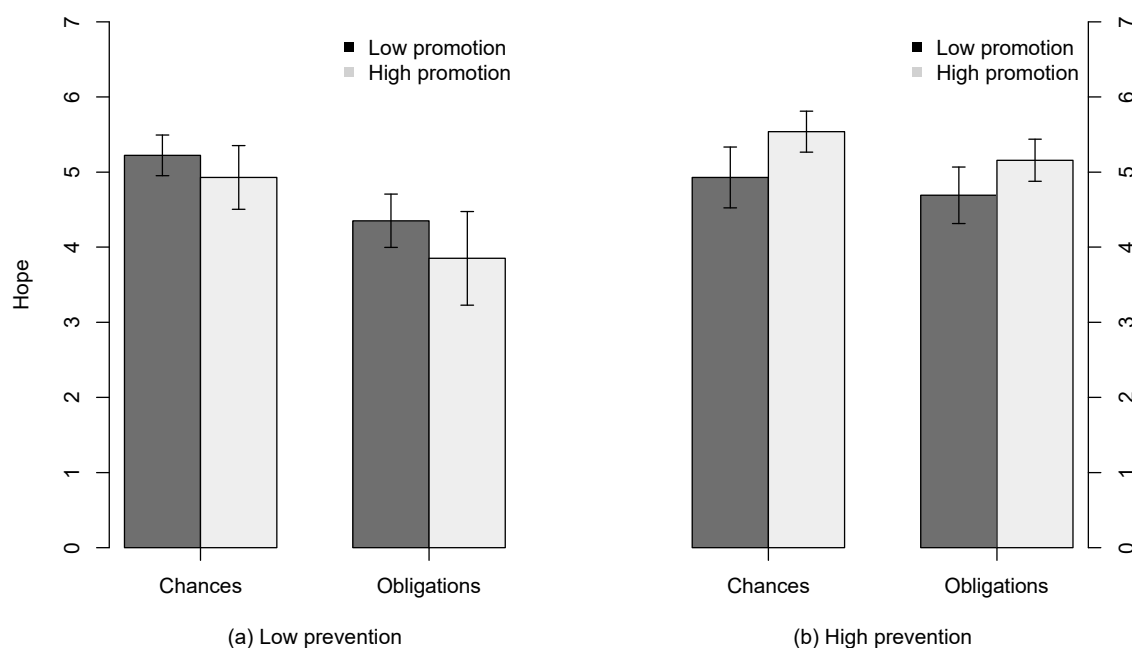


Figure 5. Interaction effect of a university's self-presentation (chances vs. obligations), promotion focus, and prevention focus on hope.

3.3. Behavior

The reliability of the behavior measurement was good (Cronbach $\alpha = 0.82$). The linear regression model (behavior $\sim$ self-presentation $\times$ promotion $\times$ prevention) resulted in a three-way interaction effect for the subscale personal initiative ($\beta = 0.80$, $SE = 0.24$, $p = 0.001$ *, $R^2 = 0.260$, $F_{(7,108)} = 5.43$, $p < 0.001$; Table 5). As hypothesized, a university's self-presentation had an impact on the behavioral level of student engagement depending on participants' promotion and prevention focus. The higher participants' promotion focus was, the higher they rated their personal initiative for their university studies, in particular in the chances condition. Participants indicated the highest personal initiative in the chances condition with a high promotion focus and the lowest in the obligations condition with a low promotion focus (Figure 6). The subscales digital networking and goal-orientated learning activities did not show any effects.

Table 5. Student engagement on a behavioral level.

Behavior	β	SE	t	p
Personal initiative ¹				
Intercept Chances	−7.09	3.68	−1.93	0.057
Condition	18.95	5.23	3.63	0.0004 ***
Promotion	1.95	0.71	2.76	0.007 **
Prevention	2.24	0.81	2.77	0.007 **
Condition $\times$ promotion	−3.78	1.07	−3.54	0.0006 ***
Condition $\times$ prevention	−4.11	1.16	−3.54	0.001 ***
Promotion $\times$ prevention	−0.37	0.15	−2.39	0.018 *
Condition $\times$ promotion $\times$ prevention	0.80	0.24	3.40	0.0009 ***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$; ¹ Regression model: $F_{(7,108)} = 5.34$, $p < 0.001$, $R^2 = 0.261$.

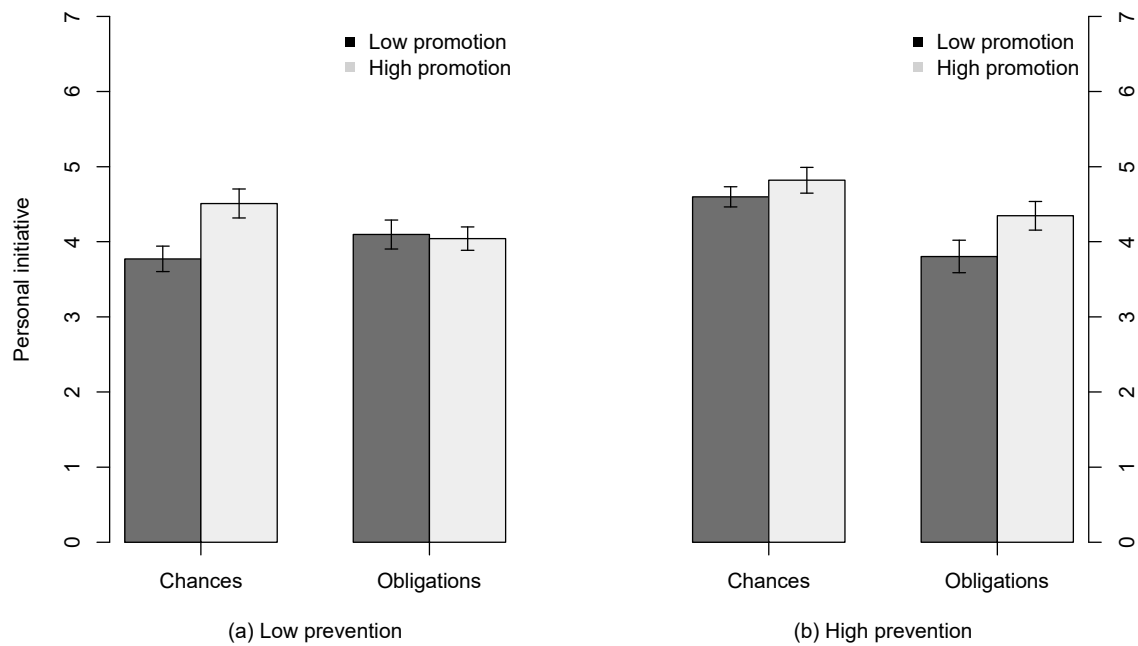


Figure 6. Interaction effect of a university's self-presentation (chances vs. obligations), promotion focus, and prevention focus on personal initiative.

3.4. Cognition

We measured the cognitive level of student engagement based on participants' essays. On average, the essays consisted of $M = 144.96$ words ($SD = 73.05$). The linear regression model (cognition ~ self-presentation * promotion * prevention) resulted in a three-way interaction effect for the LIWC category power ($\beta = 1.19$, $SE = 0.42$, $p = 0.005^*$, $R^2 = 0.109$, $F_{(7,108)} = 1.891$, $p = 0.078$; Table 6). As hypothesized, a university's self-presentation had an impact on the cognitive level of student engagement, depending on the participants' promotion and prevention focus. The higher the participants' promotion focus, the lower the number of words in participants' essays that represented power in the obligations condition. The same applied to prevention focus: the higher the participants' prevention focus, the lower the number of words in participants' essays that represented power in the obligations condition (Figure 7).

Table 6. Student engagement on a cognitive level.

Cognition	β	SE	t	p
LIWC Word category power ¹				
Intercept Chances	−40.68	14.60	−2.79	0.006 **
Condition	28.07	9.25	3.03	0.003 **
Promotion	8.53	2.88	2.96	0.004 **
Prevention	9.11	3.22	2.82	0.006 **
Condition × promotion	−5.64	1.89	−2.99	0.004 **
Condition × prevention	−5.91	2.06	−2.88	0.005 **
Promotion × prevention	−1.83	0.63	−2.90	0.005 **
Condition × promotion × prevention	1.19	0.42	2.85	0.005 **

** $p < 0.01$; ¹ Regression model: $F_{(7,108)} = 1.89$, $p = 0.078$, $R^2 = 0.109$.

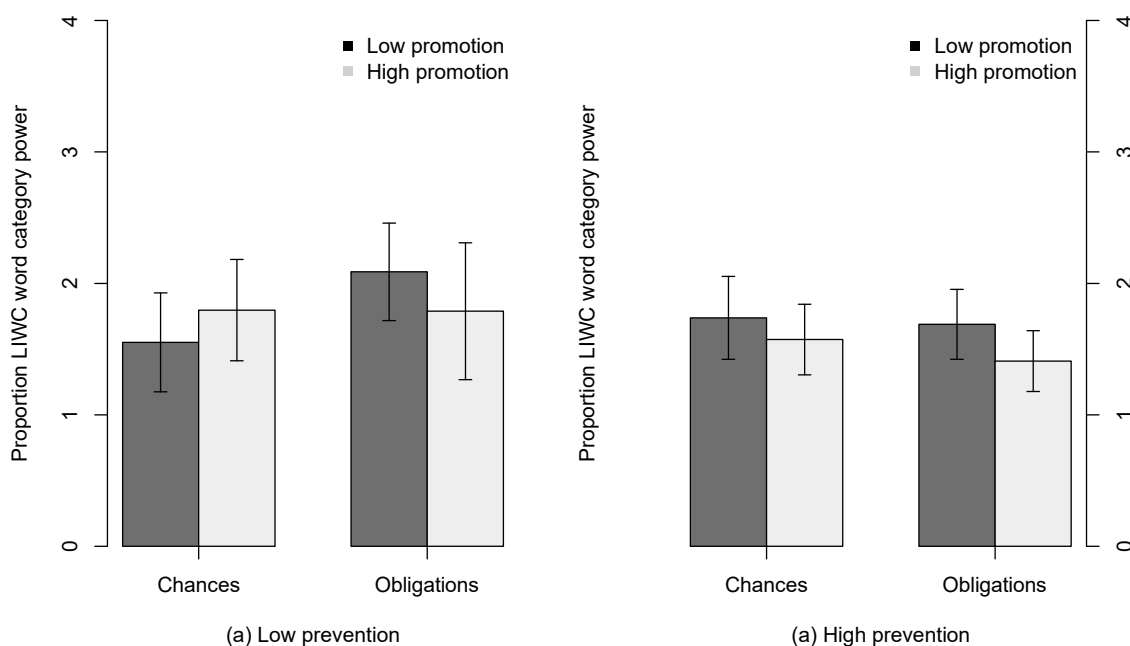


Figure 7. Interaction effect of a university's self-presentation (chances vs. obligations), promotion focus, and prevention focus on the Linguistic Inquiry and Word Count (LIWC) category power.

4. Discussion

In trying to assess what influences student engagement, we found interaction effects indicating a regulatory fit between a university's self-presentation and participants' regulatory focus for emotion, behavior, and cognition. This applied to the subscales of positive promotion emotions, hope, personal initiative, and power words. In particular, we found the regulatory fit we had hypothesized for promotion focus in the chances condition. The self-presentation of a university that focused on chances resulted in a bigger boost of positive promotion emotion, hope, and personal initiative compared to the self-presentation of a university that focused on obligations for people with a high promotion focus. As hypothesized, we also found a regulatory fit for prevention focus in the obligations condition on the use of power words.

The low scores in the obligations condition for participants with a high promotion focus fit our assumption that a rigid structure does not encourage student engagement for those people. However, for the university's self-presentation that emphasized obligations, we had expected higher scores of student engagement for people with a high prevention focus. The obligations condition was supposed to trigger security aspects and strategies to succeed, which in turn should have activated hope for people with a high prevention focus. In this study, no negative emotions, such as feelings of threat, fear, or anxiety were triggered. It is possible that the topic of our cover story was connotated positively [72] so that it did not induce any stress [73] or negative feelings.

What is also interesting is the comparison of the two conditions regarding personal initiative. Restrictions and obligations emphasized in the obligations condition led to lower personal initiative than in the chances condition. Participants in the obligations condition might have been more dispassionate. Participants in the chances condition may have experienced support and opportunities, resulting in initiative for their future studies. Being dispassionate, in contrast, would be considered a bad starting point to achieve high performance [74–76]. Being hopeful or expecting a good course of study, however, may support personality development and a stable future for applicants. Hope is known to provide positive expectations, dedication, and energy. So, our results are in line with the approach of Maroco [28], who found that student engagement is a prerequisite to learning success. If a university wants to support their students in developing positive emotions and hope with regards to their studies, it should present itself as providing many chances and opportunities.

We had similar findings for student engagement on a behavioral level. As expected, applicants with a stronger promotion focus indicated higher personal initiative in the chances condition than in the obligations condition. Participants with low prevention focus showed more personal initiative after reading the university's self-presentation in the obligations condition. A stronger prevention focus, however, led to less personal initiative in the obligations condition. High prevention focus and chances-oriented self-presentation led to higher expressions of personal initiative than in the obligations-oriented self-presentation. The effects on student engagement measured as personal initiative were multifaceted and worth investigating. We used concrete behavioral intentions to describe personal initiative in a digital learning context. However, there are also other approaches to describe such personal initiatives, like pro-activity or grit [44,71], that could be transferred into the context of learning at the university. Interestingly, there is little research that has implemented personal initiative as a variable, although personal initiative is a core characteristic for initiating interaction with digital media [8]. The subscales digital networking and goal-orientated learning activities did not reveal any effect. Maybe the shift to explicitly using digital technologies is obvious and independent of situational student engagement and individual regulatory focus.

We found significant results for student engagement on a cognitive level in the category power that were not entirely straightforward. Essays included more power words with a prevention focus in the obligations condition. It was the self-presentation of the university that led to a regulatory fit on a cognitive level of student engagement depending on a low promotion focus. We assume that with a low promotion or prevention focus, participants were not engaged very much at all in the chances condition. Even a high promotion and prevention focus did not lead to high scores for student engagement. Maybe writing an essay was not an optimal measure for cognitive effort. For further studies, we recommend focusing more strongly on meta-cognitive learning skills, attitude, and values in concrete cognitive tasks [22]. Another idea for further studies is to add writing an essay in a real application situation so that applicants' statements are more meaningful.

Limitations

We limited our work to positive student engagement to elaborate on empirical evidence for the three dimensions of student engagement. On an emotional level, we could compensate this by measuring negative emotions as well. Our results supported this theory testing and revealed that student engagement addressed momentary aspects (affects) as well as intentions (behavior) and writing skills (cognition). Accordingly, future research could monitor student engagement in a multidisciplinary approach. An aspect that we did not follow was considering student engagement as a potential mediator. We decided to investigate student engagement as an outcome variable and have broken it down into small research units. We are aware that the self-presentation of a university in digital learning environments includes more than just reading texts. The website of a university also includes pictures, videos, hyperlinks, or reports from peers and alumni. However, as a first step, it was useful to exclude such aspects of processing information to explore distinctive results.

Another limitation is that people's regulatory focus was the only individual difference factor that we addressed in this study. It is conceivable that a number of other aspects, such as interest, social value orientation [77], and social comparison orientation [78], and also demographic factors, such as age or educational background, may play a role in student engagement. In addition, it may be problematic that we have used a large number of varied measures, which are not necessarily on the same level and therefore may have very different variances, which are not always easy to interpret. We must also note that the scenario used here was rather artificial. It involved the profiles of fictional universities, which meant that the research setting lacked authenticity. Finally, it must be noted that the generalizability of the findings is limited due to the lack of representativeness of the sample.

5. Conclusions

There was empirical evidence for the impact of a regulatory fit on all three levels of student engagement, which supports our approach of measuring student engagement on emotional, behavioral, and cognitive levels. This supports the approach of Kahu [31]. We also found that the results were not generalizable or additive over these levels: emotional, behavioral, and cognitive student engagement seemed to be rather different aspects of student engagement that should be investigated separately.

We investigated whether the situational context of a university's self-presentation could possibly influence student engagement, depending on the regulatory focus of the participants. Our results revealed a situational influence on student engagement that supported the approach of Bempechat and Shernoff [26] and Kahu [31], but results may vary under real conditions [72,73]. For all three levels, individual regulatory focus was considered as well. We found an effect in the interplay of a university's self-presentation with people's regulatory focus on student engagement. In support of regulatory focus theory, we found the hypothesized regulatory fit for a university's self-presentation for single subscales. However, regulatory focus theory does not explain all of our results. Especially in combination with regulatory focus, we found different effects on student engagement. Further research is needed in order to arrive at a more accurate picture of this interplay.

We measured emotions at one point in time, and it is possible that situational effects on an emotional level were not long-lasting, as affects tend to fade away quickly. Further research on universities' self-presentation that focuses on positive emotions, like hope and positive promotion emotions, and on personal initiative seems to be promising. In our opinion, experience sampling studies could describe emotional student engagement more sustainably. We found that digital networking and goal-orientated learning activities did not lead to any differences in student engagement. Maybe these behavioral intentions represent common practice among students.

We conclude that a university that focuses on predefined ways of learning and on concrete conceptions of their students' professional careers will prevent the development of student engagement. Our recommendation for universities is to provide support, ideas for chances, and opportunities for applicants and students. This is important because, currently, universities often rely on predefined curricula. Universities should be willing to dedicate time and effort to designing a clear idea of their self-presentation in a digital context and to implement digital learning environments and online universities.

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Appendix A

Appendix A.1. Regulatory Focus Questionnaire

Items to measure participants' promotion and prevention focus

- Promotion focus

My motto is “nothing ventured, nothing gained”.

I want to achieve a great deal.

I am very productive.

If I really want to achieve a goal, I will find a way.

The big picture is more important to me than the details.

I am striving for success in live.

I am guided by my ideals.
 At times I am fanatic about achieving my goals.
 I like trying out new things.
 I am ready to take risks.
 I am striving for progress.
 I wholeheartedly go for my goals.

- Prevention focus

Success sets me at ease.
 I am literally always following rules and regulations.
 If I do not reach my goal, I am becoming nervous.
 Every now and then I violate rules and regulations, to reach my goals. *
 I am not a cautious person. *
 In case of important decision security is a core criterion I care for.
 In my studies, thoroughness is important to me.
 I take care to carry out my duties.
 My Motto is “slow and steady wins the race”.
 My Motto is “cobbler, stick to your last”.

* inversed item

Appendix A.2. Emotion Items

Items to measure student engagement on an emotional level
 When I think about the degree program at the universit

- Promotion positive

I am excited.
 I am enthusiastic.
 I am optimistic.

- promotion negative

I am disappointed.
 I am sad.
 I am depressed.

- prevention positive

I am cool.
 I am calm.
 I am relaxed.

- prevention negative

I am nervous.
 I am worried.
 I am concerned.

- hope

I am hopeful.
 I am in good spirit.
 I am confident.

- threat

I am helpless.
 I feel I have no control.
 I feel threatened.

- anxiety
 - I am scared
 - I am frightened
 - I am afraid
- anger
 - I am hostile.
 - I am annoyed.
 - I am angry.

Appendix A.3. Behavior Items

Items to measure student engagement on a behavioral level

- Personal initiative
 - I would like to start my studies immediately.
 - I don't intend to waste time on things that are not relevant to my studies.
 - I am motivated to study in small groups.
 - I have decided to read the examination regulations for the course of study carefully.
 - I am motivated to read the module manual for the study program carefully.
 - I have the intention to take my time for my studies, as I do not need to reach the degree quickly. *
 - I get myself assigned to seminars when the time comes. *
 - I'm only interested in module contents in the semester in which a module takes place *.
- Digital networking
 - I am motivated to look for new peers in my existing social networks.
 - I am motivated to register in existing social media groups in order to establish contact with other students at the university.
 - I am motivated to find fellow students from higher semesters.
 - I intend to subscribe to the newsletter of the university.
 - I follow latest public information of the university (for example on Twitter or Instagram).
 - I have the intention to inform myself on the university's website about their staff to become familiar with university's network.
 - I am motivated to find out the main research topic of my future professors and lecturers.
 - I have the intention to search for adequate job advertisements (for example Stepstone, Monster) that would fit to my degree.
 - I am motivated to search for websites and information about my future profession.
 - I do not yet need to know the research interests of lecturers and professors, because they are not yet relevant for me. *
 - I am not more engaged in my university network than necessary. *
- Goal-orientated learning activities
 - I am highly motivated to differentiate between important and unimportant study sessions.
 - I intend not to take part on a discourse about tests and written exams that are too difficult but to focus on things relevant for my studies.
 - I am highly motivated to collect my learning material myself in the online area of the university.
 - I am motivated to ask lecturers questions via e-mail directly.
 - I am highly motivated to search for the right contact person in the university network in case of learning-related problems.
 - I intend to actively approach lecturers and tutors.
 - I am motivated to create my own learning scripts.
 - I have the intention to make my self-created learning materials available to other peers.
 - I am motivated to do project work together with other fellow students.

I have the intention not to question given software tools and learning materials. *

I intend to get learning materials from peers. *

I have the intention to ask for task solutions within social media groups. *

* inversed item

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