Journal of Postsecondary Student Success 4(1)
doi: 10.33009/fsop_jpss132840

Academic Capital Formation Upon the Transition to Higher Education: First-Year Students' Experiences After Participation in a Preacademic Program

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Abstract

The transition from secondary education to the first year of higher education is a phase in which students are faced with many challenges. First-year students may lack the academic capital that is needed to understand explicit and implicit rules of higher education. We investigated students' participation in a preacademic program and the development of their academic capital. In a mixed method study, we showed that first-year students who participated in a preacademic program perceived peer mentors and teachers to be relevant sources of information, learned how to overcome educational barriers, and became more acquainted with explicit and implicit college requirements.

Keywords: higher education, preacademic program, academic capital, first-year students

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Academic Capital Formation Upon the Transition to Higher Education: First-Year Students' Experiences After Participation in a Preacademic Program

The transition from secondary education to the first year of higher education is a phase in which students may face various challenges. Students in secondary education have usually experienced years of structured lessons with many contact hours and became, in many cases, very familiar with their classmates and teachers. A successful transition to higher education requires first-year students to integrate into a new academic and social environment (Tinto, 1998). First-year students need to acquire new academic and social skills and need to adapt to the role of a more independent learner (Richardson et al., 2012). In recent decades, first-year students from various nationalities, ages, and cultural and socioeconomic backgrounds enrol in higher education, resulting in a growing number of students who were traditionally underrepresented in higher education entering college (Moriña, 2017). This growing diversity in higher education is transforming student groups, as they embody a higher variety of backgrounds in terms of culture, living environment, and socioeconomic conditions (Crul, 2016).

First-year college students, as a broad group, share the experience of making the common transition into higher education marked by new academic challenges, social experiences, and personal growth. However, within this diverse cohort, a significant subgroup is comprised of first-generation students, whose experiences are shaped by the unique circumstances of being the first in their families to attend college (Toutkoushian et al., 2019). Similarities among first-year college students include the excitement associated with navigating a new environment. Both first-generation and non-first-generation students face the common challenges of adapting to rigorous academic demands, forging new friendships, and gaining a sense of independence. Compared to other first-year students, first-generation students experience a more difficult transition to higher education (Pascarella et al., 2004). In the United States, a study by Ishitani (2006) showed that first-generation students were 8.5 times more likely to drop out of their studies than students whose parents graduated college. One explanation for these higher dropout rates is that first-generation students may have lower levels of academic capital that is required to understand the explicit and implicit rules of higher education (O'Shea, 2007, 2016). Academic capital may enable first-generation students to experience success in college (St. John et al., 2010). Therefore, more and more institutions try to support first-year students in academic capital formation upon their entrance in higher education (van Herpen et al., 2019). These support programs can greatly contribute to the success of first-year students, fostering a sense of belonging and helping them navigate the landscape of higher education. The transition to higher education is also an issue in the Netherlands.

Students in the Dutch education system are separated during secondary education into three tracks: prevocational, general, and preuniversity. Students in the general

and preuniversity tracks have the option to continue into higher education. The Netherlands has a binary system of higher education consisting of 13 research universities (universities) and 41 universities of applied sciences (colleges; Allen & Belfi, 2020; Nuffic, 2023). Almost all first-year students in higher education enrol in bachelor's programs (96%; OECD, 2019). Dutch universities have a strong focus on scientific research. This study focuses on the context of Dutch universities of applied sciences that, like U.S. colleges, are more practical and vocational oriented and prepare students for specific professions. From this point, we will use 'college' and 'college students' to refer to the universities of applied sciences. In this study, we investigated first-year students' experiences with a preacademic program and their academic capital formation at one large college in the Netherlands.

Theoretical Framework: Academic Capital Formation

The concept of academic capital formation provides a new perspective on the way that students from different backgrounds navigate to and through higher education (St. John et al., 2010). To develop the academic capital that is required to study successfully, students have to build supportive networks, navigate social and educational systems, and acquire trustworthy information about higher education (Winkler & Sriram, 2015). St. John et al. (2010) initially proposed six social processes as a basis for interventions aimed at academic capital formation: (a) concern about costs, (b) navigation of systems, (c) trustworthy information, (d) supportive networks, (e) college knowledge, and (f) family uplift. Winkler and Sriram (2015) added two processes to the six of St. John which together form a foundation to understand the challenges first-year students in higher education face: (g) overcoming barriers, and (h) familial expectations. Most of these eight processes to develop academic capital can be affected by higher education interventions such as a preacademic program. In this study, we did not focus on students' concern about costs, family uplift, and familial expectations as these processes are much harder to be affected by preacademic programs. Below, we provide more information about the five processes of academic capital formation that are included in this study.

Navigation of systems, trustworthy information, and supportive networks can be considered aspects of students' social capital; they refer to the resources that are available for a student as a result of belonging to a specific group (Dika & Singh, 2002). Social capital refers to the relationships with other persons (Coleman, 1988), who can provide support and assistance in a given social situation (Stanton-Salazar, 2011). For students who enter higher education, these resources can be found among all persons in their social network, both inside and outside higher education. Overcoming barriers and college knowledge can be considered aspects of students' cultural capital; they refer to the transferred knowledge about education constructed by experience (St. John et al., 2010). The most natural system to transmit cultural capital is the family. Based on the transfer of cultural capital, children can develop the attitude and knowledge that makes education a comfortable place in which they can succeed (Dumais, 2002; Fellows, 2006).

Navigation of Systems

Navigation of systems refers to students' ability to navigate through the higher education environment and find the help and information they need (St. John et al., 2010; Wilson et al., 2016). The ability to navigate the system is an early priority for first-year students as they must navigate through online and library resources as well as lectures and tutorials in their first weeks in college (Wilson et al., 2016). The support is not provided by family alone; it can be found in all social relationships, such as with peers or teachers (Coleman, 1988; St. John et al., 2010). When students participate in group activities and interact with peers and teachers, it provides them information to understand and navigate the higher education environment (Jensen & Jetten, 2015).

Trustworthy Information

Trustworthy information refers to students' perception that the support they receive can be trusted. In the context of academic capital formation, it is specifically about students' perception of the information they found in their supportive networks to navigate the college system. As first-year students experience higher education as a new education community, they will initially perceive information from family and friends as more trustworthy than information from educators (St. John et al., 2010). Every student who is going to live away from their family and previous school community needs to learn what it takes to become an engaged student. Identifying people who provide trustworthy information about higher education is part of that engagement process. If there are college students or graduates in their families and broader community, students have more opportunities to find relevant and trustworthy information about higher education. First-generation students who enter a new college environment will need to build new supportive networks by seeking people with whom they can identify and bond and get relevant and trustworthy information (St. John et al., 2010).

Supportive Networks

To find the support students need to navigate the college system, students can interact within supportive networks outside college, such as family and peer networks, and supportive networks inside college consisting of teachers and students (St. John et al., 2010). Supportive networks refer to students' ability to create various relationships and networks (St. John et al., 2010; Winkler & Sriram, 2015). New supportive networks are developed when students enter higher education, for example, with fellow freshmen, with senior students who may serve as mentors, and with teachers and educators. First-generation students have been found to have more limited access to resources in their supportive networks that help them in understanding the values, norms, and language in higher education (Scanlon et al., 2007). Parents who do not have postsecondary degrees are often unfamiliar with, and may have limited knowledge about, college life and expectations (Pascarella et al., 2004). Students' ability to create supportive networks is not fixed: Students can develop their ability in a new educational environment (Jensen & Jetten, 2015). First-generation students who enter higher education can interact with students from more educated families, which may assist their academic capital formation.

Overcoming Barriers

First-year students who enter higher education may encounter various barriers. In particular, first-year students, whose academic preparation, prior performance, or personal characteristics may contribute to dropping out of college, need additional support to overcome these barriers (Yeh, 2002). First-generation students, for example, are forced to develop active coping skills when dealing with challenges such as lack of college knowledge or social support (Pizzolato et al., 2009). First-generation students report uncertainty related to college language, expectations, protocols of behaviour, and challenges in persisting in college (Hooker & Brand, 2010; O'Shea, 2007). Strengthening students' coping skills to overcome educational barriers can promote students' success in college. When students recognize they have control over their own achievement, they are better able to cope with challenges and obstacles (Pizzolato et al., 2009).

College Knowledge

College knowledge can be defined as students' understanding of the academic requirements for college-level work, and their understanding of the cultural differences between secondary and postsecondary education (Hooker & Brand, 2010). Students' college knowledge plays an important role in achieving success (St. John et al., 2010). Some examples of college knowledge are students' ability to study and understand college course material and knowing what their teachers expect from them (Collier & Morgan, 2008). Students from college-educated families generally have more college knowledge than first-generation students (Collier & Morgan, 2008; Hooker & Brand, 2010). Hooker and Brand (2010) argue that "The attainment of college knowledge involves both acquiring practical information about how to plan for and enrol in college, as well as developing a college-going identity through exposure to the world of postsecondary education" (p. 78). In this study we focus on students' study skills and effective learning habits as two critical components of college knowledge (Hooker & Brand, 2010).

Present Study

In the Netherlands, the student composition in higher education has changed in the last two decades (Allen & Belfi, 2020). In 2020, almost 125,000 students enrolled in college, and many started after completing the general track of secondary education (54%). They followed bachelor programs of economics, society, and law (35%), and of health and welfare (30%; Van den Broek et al., 2021). Many of these first-year students (70% in 2019) started at an age between 17 and 19 years old (Van den Broek, 2021). The proportion of female students that graduated from college increased to 60% in 2017 (Allen & Belfi, 2020). The greatest change in student composition was in the proportion of students with a migration background, from 13% in 2011 to 17% in 2020 (Van den Broek et al., 2021). In the Netherlands, a distinction is made between first-generation migrant students (born abroad) and second-generation migrant students (born in the Netherlands to foreign born parents; e.g., from Surinam, Turkey, and Morocco). These second-generation migrant students are now graduating from higher education. Among first-year students,

first-generation students in the Netherlands come from families where neither parent has completed higher education. In 2020, almost one in four students was a first-generation student without a migration background (23%); from these students 11% came from the two highest income groups (Van den Broek et al., 2021). Furthermore, 11% were first-generation students with a non-Western migration background; from these students 6% came from the two lowest income groups.

Many higher education institutions try to help first-year students successfully access and navigate college by offering transition programs (van Herpen et al., 2019), first-year seminars (Inkelas et al., 2007), career guidance (te Wierik et al., 2015), early assessment tasks (Thomas et al., 2019), and summer bridge programs (Wathington et al., 2016). Preacademic programs prepare students for their transition from secondary education to higher education. Most programs tend to focus on either the acquisition of course-specific knowledge or on study skills more generally (Winkler & Sriram, 2015). Studies on the outcomes of such interventions often focus on degree attainment as a primary indicator of student success, such as the number of credits obtained at the end of the first year (te Wierik et al., 2015). Other researchers study the effect of preacademic programs on noncognitive factors, such as students' sense of belonging in higher education (van Herpen et al., 2019). In this study, we focus specifically on noncognitive factors and use the concept of academic capital formation.

Our preacademic program was designed through the Four Component Instructional Design (4C/ID) model (Van Merriënboer & Kirschner, 2017). The basic assumption of the 4C/ID model is that educational programs for complex learning can be described according to four components, namely learning tasks, supportive information, procedural information, and part-task practice. Several lecturers in the program were involved in the design procedure. The preacademic program consisted of three days with several workshops, keynotes, and activities. The five processes for academic capital formation were used as design principles (St. John et al., 2010; Winkler & Sriram, 2015).

To develop students' ability to navigate through the higher education environment, workshops were provided that gave insights into the sources of information in college, and the differing beliefs and expectations between students and teachers. Keynotes were provided about the challenges faced by former first-generation students, and about happiness in college. To develop students' ability to trust the support they receive, and their ability to create various relationships and networks, students had to work as a team to solve challenges in an escape room, and played a diversity game to recognise and acknowledge similarities and differences between students. Furthermore, students were divided into groups of five to six with an assigned peer mentor, who was a senior student. Students were encouraged to interact with their peers and the peer mentor and this allowed the participants to connect with each other. To develop students' coping skills to overcome barriers, workshops were provided in which the opportunities and demands of higher education were discussed and how these differ from their previous education. To develop students' college knowledge, several workshops were offered for managing life in and out of the classroom: workshops focused on strategies to read a

course textbook, to use the right tone of voice when emailing a teacher, and to schedule homework and leisure time in one week.

The preacademic program provided students with information about the campus culture and structure, aimed at enhancing academic skills and creating a community with peers, as well the knowledge and skills they need to develop their academic capital. The preacademic program was designed for first-generation students, although it was not possible to specifically invite or select first-generation students. Therefore, the participants of the program included a mix of first-year students with 69% being first-generation students. Preacademic programs can give first-year students a head start in their first year in higher education. We investigated students' participation in a preacademic program and the development of their academic capital with the following research question: How do first-year students perceive their academic capital formation after participation in a three-day preacademic program?

Method

Design

Mixed method research was deemed most suitable for understanding the complex processes of academic capital formation. In this study, a mixed methods sequential explanatory design was used (Creswell & Clark, 2011). Sequential indicates that the quantitative data were collected first, followed by the qualitative data; explanatory indicates that the qualitative data were used to explain and elaborate on the quantitative results (Boeije, 2010; Creswell & Clark, 2011). For the explanatory sequential strategy, a participant-selection method was applied (Creswell & Clark, 2011). In the initial quantitative phase, academic capital components were identified that contributed to students' academic capital formation. In the second phase, a qualitative approach was used to investigate students' views on these components.

A one-group pretest-posttest design was used to identify the academic capital formation components. The questionnaire data were investigated with a quasi-experimental pre-post design in which students' academic capital (dependent variable) was measured at two different points in time: before (t0) and after (t1) the preacademic program (independent variable). Next, participants were selected for qualitative data collection and analysis. We applied triangulation by data source as we collected data from different students at different moments in time. We applied triangulation by method and data type as we quantitively analysed questionnaire data and qualitatively analysed focus group interview data (Miles & Huberman, 1994).

Context

Dutch higher education consists of a research-oriented track (WO) offered by research universities, and a higher professional track (hbo) offered by universities of applied sciences.

The present study was conducted at the largest college in the Netherlands. Colleges prepare students for professions and are more practically oriented than research-oriented universities. Respondents in this study participated in one of the many undergraduate study programs. The preacademic program was targeted at undergraduate freshmen.

Participants

In the Netherlands, the so-called *study choice advice days* are obligatory for all students planning to enrol in higher education. They are one example of the ways higher education institutions try to inform new students about the program they have selected. All students receive career orientation lessons as part of the standard curriculum in secondary education. In addition, the study choice days are mandatory for higher education institutions and offer prospective students an evaluation of how well their skills and competencies match the program they are interested in. The study choice days are designed to help students make informed decisions about their future academic paths. During study choice days, the student affairs office recruited students to participate in the preacademic program. A total of 65 students voluntarily signed up for the preacademic program. No costs were charged for participation in the program. The participants were undergraduate students (*M* age = 19.9; 58% female; n = 38) from different family educational backgrounds; many students had parents that did not study in higher education and were considered first-generation students (n = 45; 69%). All participants came directly from secondary school; they completed senior general secondary education (HAVO; n = 40; 62%), level 4 of secondary vocational education (MBO; n = 21; 32%), or preuniversity secondary education (VWO; n = 4; 6%). Most students were born in the Netherlands (n = 51; 78%). The participants were about to start their educational program at different faculties within the institution: Social Sciences and Law (n = 21; 32%), Technology (n = 18; 28%), Digital Media and Creative Industries (n = 12; 19%), Business and Economics (n = 6; 9%), Education (n = 4; 6%), Health (n = 2; 3%), and Sports & Nutrition (n = 1; 2%). Students were informed that researchers were investigating the outcomes of the program. All participants agreed to participate and gave informed consent before data collection started. A month after the program ended, the students received an invitation to participate in focus groups. We targeted a maximum of 6 to 7 students per focus group. Eventually, 18 students agreed to participate.

Measures

Academic Capital Formation

To determine students' academic capital formation, we measured students' academic capital with a questionnaire before and after their participation in the preacademic program. Data from focus group interviews were collected to interpret and explore the results from the questionnaires.

Quantitative Data Collection. The Academic Capital Questionnaire (ACQ) consisted of five different scales with 18 self-report questions (see Appendix A). Four scales and

questions were derived from the Academic Capital Scale (ACS; Winkler, 2013; Winkler & Sriram, 2015) and adopted to the context of Dutch higher education: Navigation of Systems (n = 4; e.g., 'I know how to use the different support services offered by my college'); Trustworthy Information (n = 3; e.g., 'I view teachers who work at my college as trustworthy sources of information'); Supportive Networks (n = 4; e.g., 'There are people I trust who support me in finishing college'); and Overcoming Barriers (n = 3; e.g., 'Despite any obstacles that I face, I am confident that I can continue attending college'). The fifth scale, College Knowledge (n = 4; e.g., 'The reading skills I developed in high school will be adequate for college'), was constructed based on items from two questionnaires by Fellows (2006) and Hicks (2003). These 18 items were scored on a six-point Likert-type scale from 1 (*strongly disagree*) to 6 (*strongly agree*).

Factor Analysis. A factor analysis was conducted with data from the 65 students who filled out the questionnaire at Time 1. Exploratory factor analysis was conducted to empirically explore the underlying structure of the 18 items of the ACQ. As we anticipated the scales to be correlated, a principle component analysis with oblique (oblimin) rotation was applied. The pattern matrix and scree plot were used to determine the number of components, and factor loadings were used to interpret and label the components (Costello & Osborne, 2005). The nonfixed principle component analysis provided a six-component structure. For this six-component model, sampling appeared to be adequate (*Kaiser-Meyer-Olkin* measure of sampling adequacy = .64) and interitem correlations appeared to be sufficiently large (Bartlett's test of sphericity $\chi 2$ (153) = 369.59, $p < .001$). This solution accounted for 68.6% of the total variance. The Eigenvalues (after rotation) showed that the factor corresponding to the scale of Supportive Networks explained the most variance (24.2%) in the data structure and contributed most to the factor solution. Item 2 ('I trust the information about my education that I receive from my college more than from my family') and item 6 ('I know how to use the different support services offered by my college') each loaded as a single and separate factor. Item 17 ('I know exactly what the teachers expect of me') loaded on the second factor. For these three items the interitem correlations within the second factor were adequate. Following the outcome of this analysis four scales were created: Navigation and Trust (n = 8), Supportive Networks (n = 4), Overcoming Barriers (n = 3), and College Knowledge (n = 3).

Reliability Analysis. Cronbach's alpha and item-rest correlations were analysed for each scale (see Table 1). Three scales were considered reliable (Cronbach's alpha > .70). Item 17 about teacher expectations was theoretically placed within the scale of College Knowledge, but after factor analysis item 17 loaded on the factor about Supportive Networks. The scale of College Knowledge consisted of three remaining items: 'The reading and writing skills I developed in high school will be adequate for college' (item 15); 'It will be difficult for me to take a lot of responsibility for my own learning' (item 16); and 'I will have to discipline myself to attend classes and being prepared for class' (item 18). The scale of College Knowledge was not sufficiently reliable (.40) and therefore was removed from further quantitative analysis. However, we argue the construct of College Knowledge to be an important part of the academic capital theory and therefore have included it in the qualitative data gathering.

Table 1. Reliability Analysis of Subscales of the ACQ (Pretest) and ACQ (Posttest)

	Scale	N_{items}	N	Mean	SD	Min	Max	Alpha
ACQ Pretest	Navigation and Trust	8	60	34.48	4.42	25.00	43.00	.70
	Supportive Networks	4	65	21.05	3.32	9.00	24.00	.86
	Overcoming Barriers	3	63	15.03	1.89	9.00	18.00	.73
	College Knowledge	3	63	11.06	2.87	6.00	18.00	.40
ACQ Posttest	Navigation and Trust	8	50	40.48	4.91	30.00	48.00	.88
	Supportive Networks	4	52	21.21	2.75	16.00	24.00	.86
	Overcoming Barriers	3	52	15.44	1.90	10.00	18.00	.79
	College Knowledge	3	48	11.08	2.46	7.00	17.00	.43

Note. ACQ = Academic Capital Questionnaire.

Qualitative Data Collection. The quantitative data analysis provided a general understanding of students' academic capital formation. To interpret the results of the ACQ, we conducted semistructured focus group interviews. This qualitative analysis helped to refine and explain the results of the quantitative analyses by exploring students' views on their academic capital formation in more depth. The structure of the interview guide was based on the four adapted scales after factor analysis of the ACQ (see Appendix B).

Procedure and Materials

Academic Capital Questionnaire

On the first day of the preacademic program, students were welcomed by peer mentors. Before the program started, students received more information about the research, and were asked to sign informed consent. The ACQ was administered before the preacademic program started (Time 1), and after the preacademic program ended (Time 2).

Focus Group Interview

Three focus group interviews were conducted two months after the preacademic program. All students that participated in the program were invited for the focus groups; 18 students agreed to participate (see Table 2). Participants' characteristics, including gender, age, first-generation (or not) and former education, varied sufficiently to compose three heterogeneous focus groups. The three focus groups were held at the same

time in separate rooms. The first and second authors acted as interviewers and an experienced research assistant acted as the third interviewer. The first and second authors were closely involved in the design of the preacademic program. The third interviewer was not involved in the design process but gave one of the two diversity workshops. The three interviewers constructed the interview protocol together and coordinated with each other on how to conduct the interviews (see Appendix B). First, students were asked about their general opinion about the preacademic program. Second, they were asked about their Navigation and Trust (e.g., 'In what way did the program make it easier for you to find your way in college?'); their Supportive Networks (e.g., 'In what way did the program provide insights on how to build a supportive network?'); their Overcoming Barriers (e.g., 'In what way did the preacademic program contribute to recognize any educational obstacles?'); and their College Knowledge (e.g., 'In what way did the program contribute to your knowledge about studying at college?'). Participants were assured of confidentiality. The focus group interviews were audiotaped and lasted for 90 minutes.

Table 2. Student Characteristics of Focus Group Participants

Focus Group 1					Focus Group 2					Focus Group 3				
ID	G	Age	First	Edu	ID	G	Age	First	Edu	ID	G	Age	First	Edu
24	F	18	NFG	HGCE	29	F	19	FG	HGCE	13	F	17	FG	HGCE
9	M	20	FG	VE	8	M	17	NFG	HGCE	6	F	21	NFG	HGCE
16	F	21	FG	VE	36	F	18	NFG	PUE	61	F	18	FG	HGCE
65	F	17	FG	HGCE	7	F	19	FG	VE	22	M	17	FG	HGCE
28	F	18	FG	PUE	35	M	20	NFG	VE	5	F	20	NFG	VE
10	F	19	NFG	PUE	25	F	22	NFG	HGCE	2	F	17	NFG	HGCE

Note. ID = Participant number; G = Gender; Age in years; FG = First-Generation Student; NFG = Non-First-Generation Student; HGCE = Higher General Continued Education (HAVO); PUE = Preuniversity Education (VWO); VE = Vocational Education (MBO)

Interview Transcripts

The three interviews were transcribed verbatim into simple transcripts. As each focus group consisted of six students and one interviewer, this resulted in seven different speakers' turns. We imported all transcripts into the qualitative data analysis software program of MAXQDA® (VERBI, 2020).

Data Analysis

Academic Capital Formation

Academic capital formation was investigated by analysing the questionnaire data and the focus group interview data.

Pretest and Posttest Analysis. After reliability and factor analysis, we tested for normality of the pretest and posttest scales with histogram and Shapiro-Wilk test of

normality. We applied a nonparametric Wilcoxon signed rank test, as most of the data were not normally distributed. We tested for differences between Time 1 and Time 2 on the median percentages of the three academic capital scales. For these analyses, the completed questionnaire data of 45 students at Time 1 and Time 2 were used. Effect sizes were calculated ($r = z / \sqrt{N}$) and were qualified as a small (.10), medium (.30), or large (.50) effect (Cohen, 1988; Fritz et al., 2012).

Content Analysis. The qualitative analysis focused on the students' utterances only; the unit of analysis consisted of each student's turn. As we used a relatively structured interview guide with little additional questioning beyond what was specified beforehand, we applied a deductive content analysis (Boeije, 2010). A frame of analysis was developed based on the theory of academic capital formation as described in our theoretical framework. We started the analysis with an open coding procedure with a focus on the four predefined themes of navigation and trust; supportive networks; overcoming barriers; and college knowledge. Several subcodes emerged from the data and were applied when we were looking specifically for students' utterances on academic capital. During the axial coding phase, several codes were refined or modified. The end of the analysis was marked by the phase of selective coding in which the selection of the core categories was reached. An academic capital coding system was created (see Appendix C). The first author coded all students' turns (n = 2,059).

Audit Trail. To ensure the quality of this study, an audit trail was created (Akkerman et al., 2008). The focus of this validation procedure was on all the steps of the data gathering and analysis. The auditor verified the research design and the procedure for data gathering and data analysis according to three criteria: visibility, comprehensibility, and acceptability. The first author prepared the procedure and presented all the findings to the auditor, accompanied by a justification of all decisions made. The third author acted as the auditor and conducted a summative audit. This type of audit meant the judgment of the auditor could not be used to improve the study, but merely aimed at validating the results that were reported (de Kleijn & Van Leeuwen, 2018). The auditor reported on the strengths and limitations and gave input to realize a more transparent method section.

Results

Academic Capital Formation

Navigation and Trust

The quantitative analysis showed that students perceived their ability to navigate and trust the environment of college significantly higher after their participation in the program (see Table 3).

In the focus group interviews, the participating students addressed four different sources of information that they used or might use to navigate appropriately through

Table 3. Wilcoxon Signed Rank-Test Results Comparing Time 1 and 2 on Academic Capital for First-Year Students (n = 45)

	Time 1			Time 2			Difference			
	Mdn	Min	Max	Mdn	Min	Max	*t*	*z*	*p*	*r*
Navigation and Trust	35.00	25.00	43.00	41.00	30.00	48.00	943.50	–5.24	< .001*	.55##
Supportive Networks	23.00	12.00	24.00	22.00	16.00	24.00	251.00	–.39	.80	.04
Overcoming Barriers	15.00	9.00	18.00	16.00	10.00	18.00	398.50	–3.00	.003**	.32#

*$p < .001$, **$p < .01$, ***$p < .05$, #$r \geq .30$, ##$r \geq .50$.

the educational system: (a) student resources, (b) teacher resources, (c) family resources, and (d) college resources. Participants mentioned these resources as information that can help first-year students navigate college. Student resources were addressed several times as a relevant source of information. The peer mentors especially helped the first-year students during the preacademic program with tips and tricks. One student explained the advice of his peer mentor:

> I remember our peer mentor gave advice about working with other students in groups: 'When you make agreements with each other, write them on paper, and sign them in a contract. When a member does not follow the contract, you can give them a warning or even expel them from the group'. (Miles; S8; I2; turn 175)

These student resources were more appreciated than teacher resources. One of the students explained why the information from a student was more important for her than from a teacher:

> On the first evening a teacher from our educational program provided lots of information, but I liked the information from the student more; it was so much better. That teacher should not have given that information. A teacher is standing too far from the student to know how a student experiences these things. (Emily; S10; I1; turn 335)

Although student resources were reported as relevant, teacher resources are considered as useful when students exchange information with each other and would like to verify their interpretation:

> Students can come a long way on their own; other students read and interpret the information or the assignment just in a different way than you do. You can discuss this difference: how do you see it? If it is still not completely

> clear, you can go to the teacher together, to ask if we have interpreted it in the right way? (Yoselin; S5; I3; turn 303)

Supportive Networks

The quantitative results did not show any differences in students' ability to create and use social networks after their participation in the preacademic program (see Table 3). The qualitative analysis gave insight into which supportive networks students have experienced and were perceived as important when starting at college. Four different networks were identified: (a) preacademic program students, (b) fellow students, (c) society students, and (d) professional contacts. Participants emphasized that students they met during the preacademic program provided a supportive network for them:

> Well, I felt more prepared, I was starting at college in a city I did not know at all, and I did not know anyone there. And during the pre-academic program, I made some friends, thus for me it was easier to meet up after class with them for example, or at least to feel support from someone. (Bella; S61; I3; turn 107).

The participants addressed their fellow students as another network of support. Contradicting utterances were expressed about these fellow students: Some students appreciated the mix of students from different educational programs during the preacademic program while others would have liked to have met more students from their own educational program. Students liked to create a network with others they would meet in class: "The pre-academic program supplied me with several new social contacts. I was placed in a group with merely program students. I liked that and still have contact with them" (Reagan; S36; I2; turn 11).

Student societies were reported as another network of support. Some participants explained their membership in a student society as opportunities to network and to take part in field trips. Others just mentioned to have signed up for the entertainment, the parties, and the fun:

> I have joined one of the student societies, because I heard about it through the pre-academic program. During one of the keynotes, the different student societies were discussed. The society organizes all kinds of things and I have been to one of the meetings. It was a lot of fun, I came into contact with some senior students and that's how I've been able to find my way a bit. (Antonio; S9; I1; turn 168).

The network of professional contacts was mentioned as result of a workshop about starting your own LinkedIn page. Students found it useful, especially when thinking about completing their study and applying for internships or a job:

> I found the workshop about professional networking very interesting. Especially with LinkedIn, that is quite important. My group and I immediately created that. Then we immediately added each other to it. The presenter said

> that can do quite a lot for you. I haven't noticed much of it yet, but I'm sure I will later. (Jennifer; S28; I1; turn 57).

Overcoming Barriers

The quantitative results showed that students reported to be able to overcome barriers significantly better after the preacademic program (see Table 3). From the qualitative analysis, students addressed five different coping skills to overcome barriers when starting at college: (a) finding your way, (b) obtaining a sense of belonging, (c) dealing with uncertainty, (d) gaining confidence, and (e) taking initiative. Several students addressed that finding their way in the big city and their way to campus was hard:

> The guest lecturers were very informative. The story of that man who lived in a small village, who got lost in the bus or the metro on his first day to college and had to take a taxi. I am also not from the city, I thought this could happen to me. Luckily, I can cycle and now live in the neighbourhood. But sometimes I also get lost travelling by train . . . (Emily; S10; I1; turns 66, 68, and 70)

Students recognized themselves in the stories of the keynote speakers during the preacademic program. One speaker spoke about his first day of college, getting lost travelling by train, arriving too late for class, and asking himself "what am I doing here." Coming to college made several first-year students think about the time they went to secondary school for the first time. These students searched in college for that sense of belonging they had experienced before:

> First, I came to college and I thought well, this does not really feel as home, that feeling you have after five years of secondary school. But at a certain moment, it did feel as a place where I belong. And now I do not feel as an outsider anymore; not anymore, the 'freshman of higher education'. (Saul; S22; I3; turn 461).

Some students did not meet any obstacles yet and felt at home immediately because they saw that everybody was accepted, and they were as welcome as the others. Other students felt that college was a completely new environment where you meet a lot of new people who are much older than you are and have a lot more experience in student life. Although a student can feel equal to other students, the transition to higher education is a new phase in students' lives in which they must deal with uncertainties:

> It is all a bit unsure in the beginning. And you do not know where you stand. It is all new, and thus a bit uncertain about what is yet to come and if you can handle that. What the news is bringing can be frightening too, about students with a burn-out, and a lot of stress. Hence, it is quite intense. (Noelle; S13; I3; turn 547)

Several students experienced stress when entering college, about their level of competence to start, about making new friends, and about studying at college itself. The

preacademic program has helped students in gaining confidence: "I had more confidence because I knew what to expect. It's not that you had to come to your first day out of nowhere. You have gained some experience about studying" (Saul; S22; I3; turn 43 and 45). Furthermore, students learned from the preacademic program that they must take initiative themselves when they have questions or need help:

> Yes, you must do it yourself. That is what I have learned from the program. In my mind I still was a student from secondary school. But a college tutor won't pay attention to you like the tutor from secondary school. I know now that I must contact my tutor myself, can you help me, and coach me in the right direction. (Amelia; S29; I2; turn 385 and 360).

College Knowledge

We asked students about their understanding of the academic requirements and the differences between secondary and higher education. From the qualitative analysis, students mentioned five different aspects of college knowledge that are needed when starting at college: (a) collaboration, (b) discipline, (c) reading and writing, (d) diversity, and (e) information technology. Students addressed collaboration skills as necessary when starting at college. Many projects are done in groups in which for many weeks you are working together with peers: "Well, collaborating is quite difficult sometimes, especially when someone in your group is not willing to do anything, it is kind of hard to speak up to that person and say: 'Come on, do something!'. It is not easy" (Fiona; S6; I3; turn 444).

Students perceived the need for discipline when studying at college and talked about the discipline to do homework and the discipline to plan studying next to doing fun things:

> Sometimes you notice that a fellow student really did not read any homework. That is awkward when working in a group and one cannot connect and then you are explaining it all again to him, which I don't mind, but in fact he could just have read it, it wasn't a lot of work. (Yoselin; S5; I3; turn 340).

Discipline and the planning of homework are especially important as students in college experience few contact hours and a lot of self-study:

> The amount of homework is quite tough. We have 12 contact hours with our teachers per week, all the other work you have to do it yourself. It is going well so far, but I was not used to it. (Selena; S24; I1; turn 187).

When studying at college, students need discipline to do their homework, but they also need the reading and writing skills to do it efficiently. Students mentioned the difference in college versus high school for texts they must read, and the way they have to comprehend them:

> Those reading lessons did not work for me. I have troubles with reading comprehension, but it is more the way in which you must comprehend the

> subject matter. It is different from what I was used to. It is not about cramming up a lesson. You have to explain how something works with the use of specific terminology. (Camila; S16; I1; turn 22).

Students who start at college meet a lot of new students with all kinds of different cultural, religious, educational, and family backgrounds. The preacademic program paid explicit attention to these differences, or in fact to the similarities between students:

> It is interesting when students talk about their different backgrounds. I am also someone who is on the outside looking in, thus I hoped for more diversity and that's what I found. As a result, I feel more comfortable here. (Antonio; S9; I1; turn 277).

A final theme that appeared from the interview transcripts was the need for college knowledge about information technology. Several students mentioned they would have wanted to learn more about college's digital learning environment, about emailing, and about printing.

Discussion

We answered the research question: "How do first-year students perceive their academic capital formation after participation in a three-day preacademic program?" We analysed questionnaire and interview data to provide insight in students' perception on four aspects of their academic capital formation: Navigation and trust, Supportive networks, Overcoming barriers, and College knowledge.

Navigation and Trust

The quantitative results on students' perceived ability to navigate college and to trust college information showed an expected increase; the qualitative results illustrated these findings. Students in the preacademic program perceived peer mentors and teachers to be relevant information sources about college. The participants appreciated the help and input of the peer mentors; they provided participants with information on how to navigate the educational system of college. The use of informal peer interactions during our preacademic program matched findings from a similar program (van Herpen et al., 2019). Peer mentoring has been shown to positively affect first-year students' experience at college; mentored students feel more integrated and connected to college (Yomtov et al., 2017) and have higher final grades after the first year (Rodger & Tremblay, 2003). Student-teacher interactions during the preacademic program occurred during keynote speeches and workshops. Although the program offered few opportunities for our respondents to interact with teachers, students perceived teachers to be helpful sources of information. These findings are in line with other studies that provide insights about the effect of teacher interaction on student success. For example, McKay and Estrella (2008) found that communication between teachers and first-generation students

facilitated student integration, and Trolian et al. (2020) showed that student-teacher interaction was positively associated with students' well-being. Therefore, it is advisable that all first-year students learn that peer mentors and teachers can be relevant and reliable sources of information about college.

Supportive Networks

The quantitative results on students' perceived ability to create and use social networks in college did not show any differences after the preacademic program. During the focus group interviews students shared they really liked meeting other students who were in the same position as they were. It is well known that supportive networks are important when students start in a completely new educational environment without having any friends yet (St. John et al., 2010). Brouwer et al. (2016) showed the importance of friendship as it has a positive effect on study success in the first year of college. Jensen and Jetten (2015) argued that students who enter college with a supportive network can view the transition to college as a normal part of their lives. It could be that our respondents already possessed the ability to create social networks before they entered the program, which may explain why no significant increases were found while students were enthusiastic about the social function of the program in the focus groups. Respondents provided several examples of networks they created and appreciated, with peer students from the preacademic program, with fellow students from class, and with peers they met in student societies. Respondents' appreciation of these supportive networks fits findings by Jensen and Jetten (2015) that students perceived interaction with other students to be important to make them feel at home at college. The interactions with peer mentors during the preacademic program worked out well. Hence, hbo institutions are to be advised to provide many opportunities for first-year students to interact with peers and teachers, especially during the first weeks in college.

Overcoming Barriers

The quantitative results on students' perceived ability to overcome educational barriers showed an expected increase; the qualitative results illustrated these findings. Respondents experienced several barriers when studying the first months at college: it was sometimes hard to find their way, they did not always find that sense of belonging, and they dealt with social uncertainties. They emphasized the importance of gaining confidence and taking initiative to overcome these problems: that is what they learned during the preacademic program. These findings are in line with the outcomes of previous work on first-year students, showing that these students may face many challenges when entering college as adjusting to college environment and academic anxieties (O'Shea, 2007; Terenzini et al., 1996). First-generation students are especially at risk of experiencing stress and even depression symptoms (Jenkins et al., 2013). Dumais (2002) states that college demands students to have the ability to overcome barriers they encounter, but colleges do not always provide students with opportunities to do so. This suggests that college teachers will have to do more than just encourage

students to come to college; programs are needed that help students to believe in their own competence (Pizzolato, 2003). Based on our findings, it seems that colleges need to provide their students in general, and first-year students specifically, with opportunities to gain confidence and take initiative. With confidence and initiative students will find their way, obtain their sense of belonging, and deal with social uncertainties.

College Knowledge

The qualitative analysis of respondents' ability to understand the academic requirements for college showed that respondents learned that several aspects of college knowledge are relevant. They mentioned discipline as an important aspect; the discipline to prepare for class, not only because the teacher is expecting you to do so. Preparation is also needed as students need to collaborate with fellow students on assignments. Another aspect is the discipline to plan and do your homework. Planning is especially important as contact hours with teachers are lower in college compared to secondary school. Discipline, preparation, and planning are the requirements that respondents mentioned during the focus groups, and these are in line with the teachers' expectations addressed in the study by Collier and Morgan (2008). In their study, teachers were very clear about the time students should spend on homework, that students should prioritize college above other commitments, and "that college level coursework would be more demanding than what they had experienced before" (p. 432). Another aspect that respondents mentioned were the reading and writing skills that are needed. The way in which students need to be able to comprehend texts and understand the level of vocabulary teachers use is different from secondary school. These results fit the arguments of Hooker and Brand (2010) about secondary and postsecondary differences. First-generation students, in particular, have reported these obstacles in previous studies: They experience weak language skills, inadequate study skills, and difficulties comprehending teachers' style of speaking (Collier & Morgan, 2008; Stebleton & Soria, 2013). A preacademic program could better inform students about these differences when starting at college and help them to prepare for the requirements of higher education.

Practical Implications, Limitations, and Future Research

The results revealed a significant increase in students' perceived ability to navigate and trust the college environment after participating in the preacademic program. Peer mentors and teachers were identified as essential sources of information for students to navigate the college landscape effectively. The peer mentorship aspect of the program, where experienced students provided guidance, emerged as a particularly impactful element. These findings underscore the importance of incorporating peer mentorship and teacher-student interactions in preacademic programs to facilitate students' navigation and instill trust in their new educational environment.

While the quantitative analysis did not indicate a significant change in students' ability to create and utilize social networks, qualitative interviews provided valuable insights

into the significance of supportive networks for first-year students. The preacademic program was effective in facilitating connections among participants, particularly through peer interactions during the program. The social networks formed through the program played a crucial role in helping students adjust to college life and establish a sense of community. Institutions should consider fostering opportunities for peer interactions and creating a supportive network environment, especially during students' initial weeks on campus.

The results demonstrated a significant improvement in students' perceived ability to overcome barriers following their participation in the preacademic program. Students identified coping skills, such as gaining confidence and taking initiative, as crucial for overcoming challenges encountered during their transition to college. The program's focus on building students' self-assurance and problem-solving skills proved beneficial. Institutions should incorporate activities that promote self-confidence and empower students to take initiative in seeking help and addressing obstacles.

Finally, the qualitative analysis revealed that students identified several aspects of college knowledge that are essential for a successful transition to higher education. These aspects include collaboration, discipline, effective reading and writing skills, awareness of diversity, and proficiency in information technology. The preacademic program effectively addressed these knowledge domains, preparing students to meet the academic demands of college. Institutions should consider integrating targeted training and workshops in these domains to equip students with the necessary skills and knowledge to excel in their academic endeavors.

This study has focused on a specific preacademic program in a specific context with a relatively small sample of students in higher education. The gathered and analysed data provided valuable insights into their academic capital formation in the first few months of college. In future studies, students could be observed for one or two years to investigate how students' academic capital is developing during a longer period of their academic careers. Such designs could help to find answers to the question of what specific student groups may need to prepare themselves better for their first year at college. Future research could compare the formation of academic capital between first-generation and non-first-generation students, taking into account migration background and secondary education tracks. With these future studies we could seek to understand how the intersectionality of student characteristics, including first-generation status, migration background (non-Western vs. no migration background), and the type of secondary education track (general vs. preuniversity vs. prevocational) influences the development of academic capital among students. Such insights could help to improve preacademic programs; give student counselling more focus; and/or integrate aspects of the preacademic program in the student introductions of the undergraduate programs. In this study we did not focus on students' academic achievement. As a result, we could not draw any conclusions about the effects of their participation in the program on their study results or on their study engagement.

Conclusion

In conclusion, this study aimed to investigate the impact of a three-day preacademic program on first-year students' perception of their academic capital formation. The program aimed to enhance students' abilities in navigation and trust, building supportive networks, overcoming barriers, and acquiring college knowledge. The findings provide valuable insights into how such a program can contribute to students' academic capital formation and their successful transition to higher education. The findings underscore the importance of peer mentorship, teacher-student interactions, and the formation of supportive networks in facilitating students' transition to college. Furthermore, the program's focus on building self-confidence, problem-solving skills, and college knowledge proved effective in helping students overcome barriers and succeed academically. These insights have important implications for the design and implementation of preacademic programs, as well as the broader support systems offered by higher education institutions.

Funding This research was supported by the Center of Applied Research in Education of Amsterdam University of Applied Sciences.
Disclosure statement No potential conflict of interest was reported by the authors.
Acknowledgements The authors thank the participating students for their collaboration.

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Appendix A

Academic Capital Questionnaire (ACQ) Adapted from Winkler and Sriram (2013; 2015)

Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree

A. Navigation of Systems (NoS) (Winkler, 2013)

Item	Variable	Question
1.	I01_NoS	I am aware of the resources at my college that can help me to be a more successful student.
6.	I02_NoS	I know how to use the different support services offered by my college.
11.	I03_NoS	When I will struggle in college, I know that there is someone to turn to for help.
16.	I04_NoS	I feel comfortable seeking information from those who work at my college.

B. Trustworthy Information (TrIn) (Winkler, 2013)

2.	I05_TrIn	I trust the information about my education that I receive from my college more than from my family.
7.	I06_TrIn	I trust the information about my education that I receive from my college more than from my friends.
12.	I07_TrIn	I view teachers who work at my college as trustworthy sources of information.

C. Supportive Networks (SuNe) (Winkler, 2013)

3.	I08_SuNe	I have people in my life who support my decision to attend college.
8.	I09_SuNe	I have people in my life who encourage me to succeed in college.
13.	I10_SuNe	I have the emotional support that I need to get through college.
17.	I11_SuNe	There are people I trust who support me in finishing college.

D. Overcoming Barriers (OvBa) (Winkler, 2013)

4.	I12_OvBa	I am confident that I can overcome any barriers to my success in college.
9.	I13_OvBa	Despite any obstacles that I face, I am confident that I can continue attending college.
14.	I14_OvBa	I can overcome the obstacles that would prevent me from being a successful student.

E. College Knowledge (CoKn) (Fellows, 2006; Hicks, 2003)

5.	I15_CoKn	The reading and writing skills I developed in high school will be adequate for college.
10.	I16_CoKn	It will be difficult for me to take a lot of responsibility for my own learning.
15.	I17_CoKn	I know exactly what the teachers expect of me.
18.	I18_CoKn	I will have to discipline myself to attend classes and being prepared for class.

Appendix B

Semistructured Interview Protocol Academic Capital Formation

Table B1. Semistructured Interview Protocol Academic Capital Formation

Topic	Question
A. Opening Questions	1. What did you think of the program? 2. How did you feel about the program? 3. What do you like best about the proposed program? Tell me about positive experiences you've had with the preacademic program? What went particularly well? 4. Tell me about disappointments you've had with the preacademic program? What needs improvement?
B. Navigation and Trust	1. In what way did the program make it easier for you to find your way in college? 2. How did the program do that for you? Can you give an example? 3. In what way did the program contribute to valuing the information the college is offering to you? 4. How did the program do that? Can you give an example? 5. What did you like? What did you miss?
C. Supportive Networks	1. In what way did the program provide insights on how to build a supportive network? 2. How did the program do that? Can you give an example? 3. What did you like? What did you miss? 4. In what way do you still have contact with your peer students and peer mentor of the program? 5. What does it do for you?

(continued)

Table B1. Semistructured Interview Protocol Academic Capital Formation (*continued*)

Topic	Question
D. Overcoming Barriers	1. In what way did the preacademic program contribute to recognize any educational obstacles? 2. How did the program provide support to overcome these barriers? 3. What did you like, what did you miss?
E. College Knowledge	1. In what way did the program contribute to your knowledge about studying at college? 2. How did the program provide insights about teacher's expectations of a student? 3. What did you like? What did you miss?

Appendix C

Coding Scheme

Table C1. Final Coding Scheme for Academic Capital Components

Code	Definition
Navigation and Trust	**Student's ability to use human and information resources to navigate appropriate pathways through educational systems of college (Navigation). Student's ability to obtain accurate and reliable information from people (Trust). The student addressed . . .**
Student resources	. . . other students as resources of information about studying at college
Teacher resources	. . . teachers as resources of information about studying at college.
Family resources	. . . family or friends as sources of information about studying at college.
College resources	. . . information resources that are provided by the college.
Supportive Networks	**Student's ability to create and use social networks, mentors, and teachers to ease the process of learning about college. The student addressed . . .**
Pre-academic program	. . . students from the academic program.
Fellow students	. . . students from their own educational program or class.
Student society	. . . students from their student society.
Professional network	. . . contacts from a professional network.

Table C1. Final Coding Scheme for Academic Capital Components (*continued*)

Code	Definition
Overcoming Barriers	**Student's ability to overcome educational barriers. The student addressed . . .**
Finding your way	. . . literally finding their way to college or in college buildings.
Taking initiative	. . . taking initiative as part of their student role.
Dealing with uncertainty	. . . stress of going to college, trying to overcome stress moments.
Gaining confidence	. . . his/her confidence to overcome any barriers.
Obtaining a sense of belonging	. . . feeling connected and integrated when studying at college.
College Knowledge	**Student's ability to understand the academic requirements for college level work. The student addressed . . .**
Discipline	. . . the discipline to attend and prepare classes, to plan homework.
Collaboration	. . . the knowledge or skills of working together with other students.
Reading and writing	. . . reading or writing skills needed in college.
Diversity	. . . the diversity among students in college.
Information technology	. . . the knowledge about IT services e.g., the electronic learning environment.