

Students' educational careers in higher education : a search into key factors regarding study outcome

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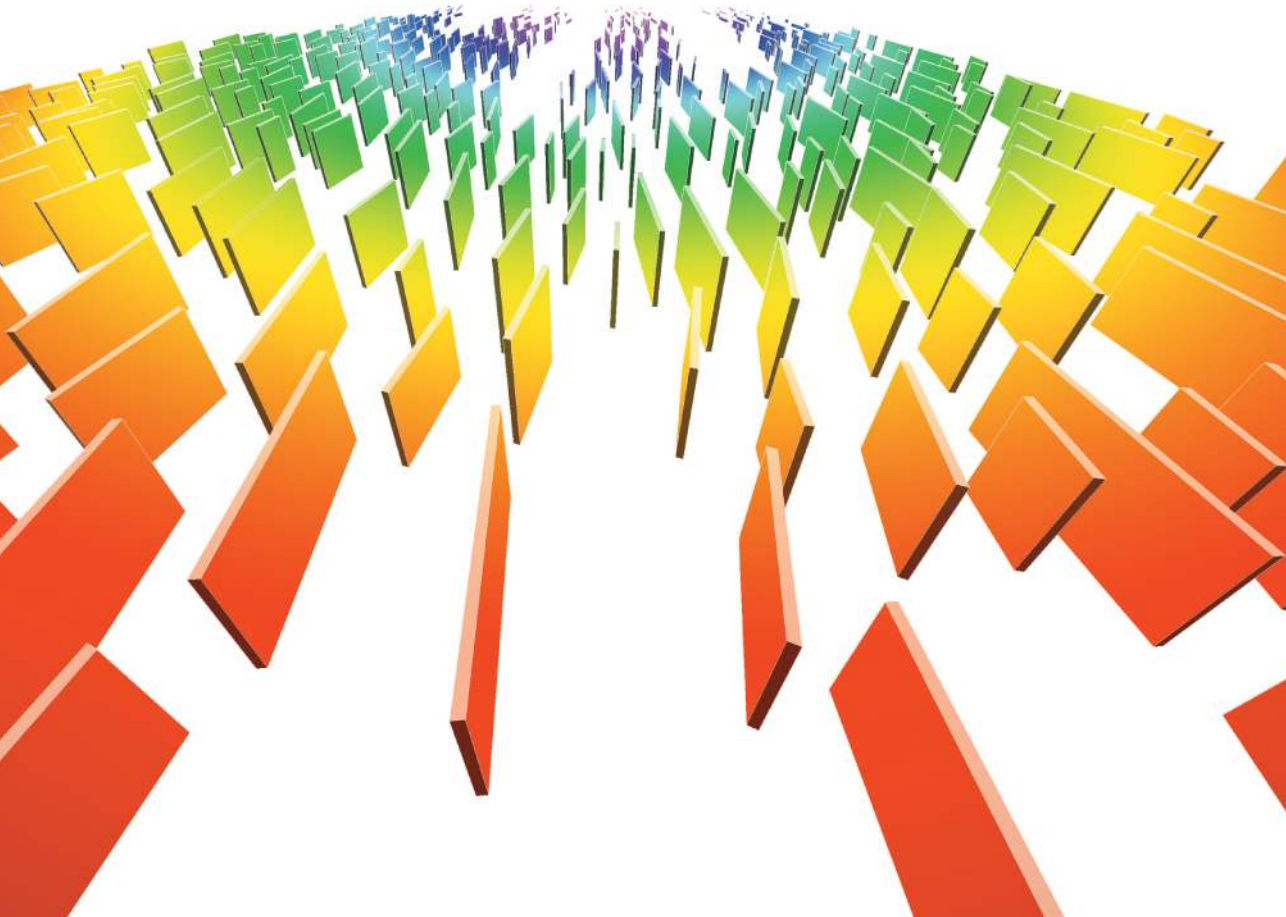
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Students' educational careers
in Higher Education:
a search into key factors
regarding study outcome

Cyrille van Bragt



Students' educational careers in Higher Education: a search into key factors regarding study outcome

Cyrille Arnoldina Catharina van Bragt



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Students' educational careers in Higher Education: a search into key factors regarding study outcome

PROEFSCHRIFT

ter verkrijging van de graad van doctor aan de
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commissie aangewezen door het College voor
Promoties in het openbaar te verdedigen
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door

Cyrille Arnoldina Catharina van Bragt

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Dit proefschrift is goedgekeurd door de promotor:

prof.dr. Th.C.M. Bergen

Copromotoren:

dr. P.J. Teune

en

dr. A.W.E.A Bakx

!n tme world,
fo see
you must
be the change
you want
to see

**‘You must be
the change
you want
to see
in the world’**

Mahatma Gandhi

Dankwoord

Ruim 6 jaar geleden ging ik vol goede moed, intrinsiek gemotiveerd én uitgerust op pad. Mijn reis was onvergetelijk: ik heb zoveel aangeleerd en afgeleerd, geschreven en weer geschrapt, gelachen en gehuild, geïntensiveerd en geëxtensiveerd, veralgemeniseerd en geconcretiseerd, gedanst en geschilderd, gedichten geschreven en weer verscheurd, gewenst en verwenst, hardgelopen en stilgestaan, geademd en ook niet, ingekort en uitgebreid, vastgehouden en losgelaten en mezelf afgesloten en weer opengesteld.

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Cyrille

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1.1 The problem statement and the aim of the study

The Lisbon declaration (2000), followed by the Barcelona summit (2002), set the political goal of developing the EU into 'the most competitive knowledge-based economy in the world by 2010'. This goal strongly motivates Universities of Applied Sciences (UAS) to reduce dropout rates, foster the educational level of students, and increase the flexibility of the educational system (e.g. HBO-raad, 2009c). The Dutch knowledge economy faces an increased demand for higher educated inhabitants (OCW, 2009a). As a consequence, more graduates from Higher Education (HE) are needed. Dutch UAS have experienced a considerable growth in enrolment, resulting into a mixed variety of students. Former education forms one of the sources of this heterogeneity (HBO-raad, 2009a). Thus, more students enter HE and the number of dropouts has increased proportionally. The increasing amount of dropouts counteracts the desire and the potential of HE to increase the volume of graduates with at least a Bachelor degree (OCW, 2009a).

Dropout has considerably economic and psychological consequences for the individual student, as well as on the institutional (e.g. Rodríguez & Coello, 2008; Baum & Payea, 2004) and societal level (e.g. Bruinsma, 2003; Van den Berg, 2002; Van den Berg & Hofman, 2005). Students receive performance funding¹ when they study at UAS for the duration of the fulltime study (four years) and a loan if they need an extra three years. If students obtain their degree within ten years after commencement the performance funding is turned into a gift. If the degree is not obtained within this period of time the student has to repay this funding (IBG, 2008). Besides these financial consequences for the students, dropouts may also experience psychological aftermath, such as lack of self-confidence, doubts regarding their own decision making processes or maybe even wind up in a negative spiral of discouragement with regard to their study career (e.g. Elsen, 1998; Feltzer & Rickli, 2009). Furthermore, student dropout also results in diminished access to employment and earning potential (Fassinger, 2008). Society invests in the education of students. Incorrect study choices, needlessly high dropout rates, lack of utilization of capacities of students and inflexibility of the education system cost Dutch society

¹ In Dutch 'prestatiebeurs'.

annually about 7 billion Euro (source: Elsevier, 2007). Dropout is not only a loss of money but it is also counteracts acquiring the aimed amount of professionals needed. Basically the dropout of HE students is seen as a waste of human capital. On an average, 6.2% of the Gross Domestic Product is spent on educational activities in countries around the world (OECD, 2007). In the Netherlands for instance, the direct costs of college dropout from UAS is (average out) 180 million Euros (Onderwijsraad, 2008).

This study describes a search into students' key factors regarding study outcome in the first year of a study in HE in the Netherlands. In this study, study outcome consists of credits and study continuance. Within study continuance, we recognize two groups: students who continue the study they started with, on the one hand. The other side of continuance concerns those students who drop out. For the purposes of the present study, the general concept of dropout – meaning in a quite general sense students who terminate their studies untimely, before graduating formally – has been operationalized as 'all students who start a study within UAS and end the study within the first 14 months after enrolment'. We have done so to arrive at precise and measurable notion of dropout which covers important parts of the wider notion of dropout.

The aim of the study is to gain deeper insight into the relations between students' personal characteristics and study outcome. Deeper insight into these relations is a necessary condition to enhance study outcome, in order to support students at risk and to prevent dropout more successfully.

1.2 Higher Education in the Netherlands

In the Netherlands, children from 5 to 16 years are obliged (until 18 years partly obliged) to attend education. From the approximate age of 4 until the age of 12, children attend general primary school. After primary school, secondary education is offered at several levels, matching the pupils' ability. As can be seen in Figure 1.1, two main educational secondary routes towards HE can be distinguished. The first route, by means of Senior General Secondary Education² (SGSE), is a direct one. It consists of two programs of general education. After successful completion, these two programs grant direct admission to HE: a five-year general education program, or a six-year pre-university education program. The latter one is offered to students with the highest ability. Generally speaking, potential

² In Dutch 'Voortgezet onderwijs (VO)'.

HE students are seventeen or eighteen years of age when they choose a HE study. Parallel to this educational route a second, alternative route is possible. This route starts with a four-year Prevocational Secondary Educational Program³ (PVSE), which combines general and vocational education. After this, pupils can continue their education in Senior Secondary Vocational Education⁴ (SSVE). This SSVE route lasts one to four years and is offered on four different levels of which level four is the highest. Only the highest level (i.e. level four) students have direct admission to UAS.

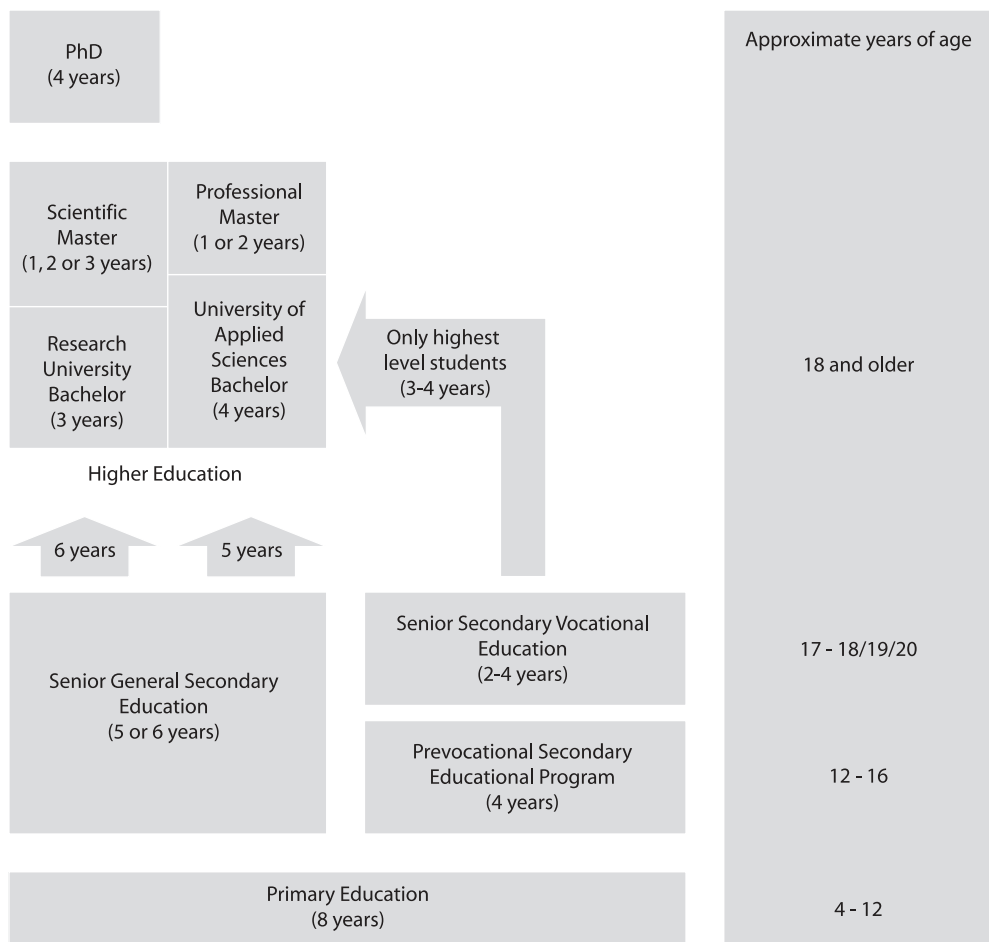


Figure 1.1: Educational system in the Netherlands

³ In Dutch 'Voorbereidend middelbaar beroepsonderwijs (VMBO)'.
⁴ In Dutch 'Middelbaar beroepsonderwijs (MBO)'.

The Dutch HE system is binary and consists of (a) Research Universities, and (b) Universities of Applied Sciences. Together, these universities cover the higher-education segment of Dutch education. Both types of universities fulfill their roles within Dutch HE in their own distinct ways. As a result of the Bologna process (2002), the HE system in the Netherlands has been organized around a three-cycle degree system, consisting of Bachelor's, Master's and PhD degrees^I. Research Universities focus on research-orientated work in an academic setting. Their scientific Bachelor programs take three years of full time studying^{II}. When successfully completed, students obtain the Bachelor's degree and they usually continue with a scientific Master's^{III} of one, two or three years. The so-called third cycle of HE, leading to a PhD, is offered only by Research Universities.

UAS mainly aim at educating and preparing students for a profession and participation within the labour market and are practically orientated. The Bachelor studies of UAS have a length of four years full time study^{IV}. By graduating, students obtain the degree of Bachelor. After finishing a Bachelor's program, students can continue with a Professional Master's^V program of two years. In 2003 (the year this study started) a total of 504.500 students participated in Dutch HE, of which 321.200 (64%) were participating in UAS (OCW, 2005).

1.2.1 Requirements for admission: enrolment in Universities of Applied Sciences

The research in this thesis concentrates on students' first study-year within UAS in the Netherlands. We take a closer look at enrolment into UAS. The two types of education required for admission to Bachelor programs offered by Dutch UAS, SGSE and SSVE, form the two main streams of student enrolment. The 'traditional' way to gain access to UAS is through SGSE. The route through SSVE is a 'new' way to gain access to UAS (Nieuwenhuis, 2006; Van Asselt, 2005). Until recently, SSVE used to be the final educational phase for all kinds of professions in the Netherlands. It was meant to prepare students to enter the labour market. As a consequence, there is an increase of SSVE-students who decide to continue their educational studies in UAS (HBO-raad, 2006).

The two types of former education which initiate these two routes result in a diversity of students with distinctive educational experiences. This heterogeneity might have an effect on the student himself⁵ and on his study outcome in UAS later on.

⁵ We would like to emphasize that whenever we use the words 'himself', 'his', 'him' or 'he' throughout this dissertation also can be read 'herself', 'hers', 'her' or 'she'.

Table 1.1: Enrolment in Former Education (percentage) in Universities of Applied Sciences (HBO-raad, 2009b)

Former Education	1990	2000	2006
Senior Secondary Vocational Education	26%	23%	32%
Senior General Secondary Education	32%	43%	41%
Pre-university	19%	12%	10%
Other	23%	22%	18%

The percentage of students enrolling in HE in the Netherlands is with 60% comparable with surrounding countries (OCW, 2009b). In the past years the total number of students studying within funded education has increased (see also Table 1.1) (OCW, 2009c). This growth is mainly caused by an increasing amount of students within SGSE and the increased flow from SSVE towards UAS (from 22% in 1998 towards 28% in 2007 (OCW, 2009c)).

1.2.2 The context of the study: Fontys University of Applied Sciences

The Fontys UAS is one of the largest UAS in the Netherlands. It offers over 200 fulltime, part-time and dual Bachelor and Master programs within 36 institutes. These institutes are considered to be the 'gates of knowledge' where theoretical knowledge and practical experiences merge with knowledge and issues formulated by the professional field. The core mission of the Fontys UAS is offering qualitatively eminent practice-based Bachelor education. Interaction with others in variable groups and situations, forms the solid base of the students' growth (Fontys UAS, 2009b). Besides preparing students for professions in the future labour market, the Fontys UAS also want to build a strong bond with its students and prepare them to play an active role in society. Offering study career guidance is one of Fontys UAS ways to help students determine the best way to proceed their studies. The core of study career guidance is to help students develop connections between their motivation, identity and capacities. Moreover, it underpins the possibilities the educational institutes offer to develop students' personal talents. Questions with regard to identity, direction and career regulation are offered within study career guidance programs. The students' interest is considered to be the first priority. This kind of guidance is thought to be crucial in the process of making choices during students' study careers. Five main tasks for study career guidance are delineated within Fontys UAS: (1) study progress, (2) personal development, (3) minor choices^{VI}, (4) career testing and (5) referral (Fontys UAS, 2009a). Study career guidance is one of the ways this UAS tries to prevent students from dropping out. However, if dropout is inevitable, this guidance is needed to

help students make new choices considering their study career in general (Fontys UAS, 2009b). In 2003 (the year this study started) 35.174 students participated in Fontys UAS, which was 11% of the total amount of students nation-wide (Fontys UAS, 2004).

1.3 The dropout problem in Higher Education

The meaning of 'dropout' in the context of Dutch HE is ambiguous and fuzzy: depending on various definitions, dropout rates in the Netherlands vary from 16% till 35%. No general guidelines to determine dropout are operationalized on a national or an international level. The use of different sources to retrieve reliable student data and the major variety and diversity in definitions used in national and international settings makes it hard to compare studies, reports and student data (e.g. Tyler & Lofstrom, 2009). Caution is needed when reading and interpreting numbers of dropout.

Various definitions of dropout exist. We can, for instance, distinguish students who drop out and continue their educational career at a lower educational level, or students who continue the same study they started with, yet, at another UAS. Students also switch to another study within the same UAS (or even switch to another UAS) or they drop out and do not continue within any type of education at all. Furthermore, we distinguish students who start their study, obtain their propedeuse and leave to continue their educational career at a Research University. For UAS this kind of dropout is undesirable. However, for students it might be beneficial. This group of students use UAS as a stepping stone to Research Universities.

For the purposes of the present study, the general concept of dropout – meaning in a quite general sense students who terminate their studies untimely, before graduating formally – has been operationalized as 'all students who start a study within UAS and end the study within the first 14 months after enrolment'.

One of the priorities resulting from the Conference of European Ministers responsible for education (Leuven and Louvain-la-Neuve, April 2009) is that HE has a key role in the economic recovery and development within the European society (HBO-raad, 2009b). HE dropout rates should therefore decrease: more students should obtain a degree. The increasingly competitive pressure associated with the global economy and demands of the European knowledge economy make education even more important in determining personal and national well-being. These demands make clear that more students ought to continue their educational careers instead of dropping out.

Dutch dropout scores are around 12% at the moment. The Dutch government aims to reduce dropout back to 8% in 2009 (OCW, 2009b). Unfortunately, obtaining this goal seems farther away than ever: the society is confronted with an increasing number of students dropping out (Source: Central Bureau for Statistics, The Netherlands, 2008). Next to this, the chance to obtain a degree in HE has also decreased over the last few years (OCW, 2009c).

As can be seen in Table 1.2, dropout rates continue to increase (OCW, 2009c)⁶: of all SGSE and SSVE-students 7.060 (11%) had dropped out in 2003. This number increased with 4% to 15% (10.546 students) in 2006. In 2003 15% of SSVE students had dropped out within the first year and in 2006 this percentage grew to 20% (4.914 students). Although it did not increase as much as the percentage of SSVE-students, an increase of the percentage of students from SGSE is also definite: from 10% in 2003 to 12% in 2006 (i.e. 5.632 students).

Table 1.2: Drop out students originating from Senior Secondary Vocational Education (SSVE) and Senior General Secondary Education (SGSE) within one year after the start of their study (Source: Central Bureau for Statistics, The Netherlands, 2008)

Year	Enrolment		Drop out		Total % UAS Drop out
	SSVE	SGSE	SSVE	SGSE	
2003	19.990 (33%)	41.350 (67%)	2.999 (15%)	4.062 (10%)	7.060 (11%)
2004	22.120 (34%)	43.090 (66%)	3.539 (16%)	4.679 (11%)	8.219 (13%)
2005	23.100 (35%)	43.520 (65%)	3.927 (17%)	4.726 (11%)	8.653 (13%)
2006	24.570 (36%)	44.390 (64%)	4.914 (20%)	5.632 (12%)	10.546 (15%)

In 2007 a total of 8.208 students⁷ dropped out from Fontys UAS: the dropout percentages increased from 15,6% in 2003 till 19,3%. This percentage is above the national dropout percentage, which was respectively 14,9% in 2003 and 17,6% in 2007 (Source: www.hbo-raad.nl). Another trend in Fontys UAS is the time it takes before a student drops out: this time has increased from 1.7 years to 1.8 years (Fontys UAS, 2009b). With regard to the three functions of the propedeutical phase^{VII}, this is an undesirable development.

⁶ These national numbers concern dropouts within the first year of fulltime UAS studies.

⁷ These specific numbers concern the total amount of Fontys UAS dropouts, i.e. from all types of education and from all years of the study and regardless their former education.

1.4 A closer look at study outcome

UAS perform better when the study progress of student-cohorts is nominal, dropout rates are low and when dropout, if it happens, takes place at an early stage in the study. Several terms are used with regard to how students perform in education. Frequently used terms are, for instance, academic results, study results, study success, (academic) achievement and study outcome. The widely used term 'achievement' has become synonymous with a broad range of performance outcomes, not just educational ones. The term 'academic' results is not the correct term to use in the context of this study because our study is situated in UAS and not in an explicitly academic setting. Duff and McKinstry (2007) and O'Connor and Paunonen (2007) recommend decomposing the broad criterion variable 'academic achievement' into specific components.

Study outcome itself can be defined in many different ways. Generally, two different ways to describe study outcome can be distinguished. On the one hand numerical descriptions emerge, like study pace in months, ratio of graduates versus numbers of enrolling students, dropout percentages, likelihood of obtaining a degree, the length of the study before obtaining a degree, number of credits realized and so on. On the other hand, student related descriptions of students' performances exist. Examples of this kind of descriptions are Grade Point Average (GPA), grades, credits, assessment scores, students' grades in specific domains, continuance, propedeutical diploma and Bachelor diploma.

Most studies on achievement use an overall indicator of achievement as a criteria measure: GPA is most frequently used. In the present study, two aspects of study outcome within the first 14 months after enrolling in UAS are distinguished. On the one hand, this concerns credits and on the other hand study continuance. There are reasons to choose for these two aspects. The influence of a national context on educational profits and performance rates should be acknowledged (Pascarella & Terenzini, 1991). The first aspect of study outcome in the present study, the amount of credits^{VIII}, is such a national aspect: there is a critical funding limit for Dutch students. Students who do not attain the 21 credits-limit during the first six months (of a total of 42 in one study year) have to pay back their study funding.

The second aspect in this study with regard to study outcome refers to 'study continuance'; i.e. whether the student drops out or continues his study. During their first year of study, students can continue their education, they can switch to another study at the same or even a higher level or they can drop out and do not continue an educational career at all. Students who drop out but continue with a study at a higher level of HE are 'continuing

students' because this group of students uses UAS as a steppingstone to a higher level. Therefore, this specific group of students cannot be considered as dropouts, at this point.

Only numbers and rates, no matter whether descriptions are numerical or student related, do not declare study outcome by itself. To gain insights into why these facts (obtained amount of credits and dropping out or continuing) occur the way they do, we have to delve deeper into key aspects such as students' personal characteristics and how these characteristics influence study outcome. However, if students drop out, we would like to know whether this could be predicted by these personal characteristics. In the next paragraph these characteristics are delineated.

1.5 Theoretical framework

The study presented in this thesis has been based on a working model which aims to explain study outcome. This model consists of several aspects, which are based upon psychological theories of students' learning.

Over the last few decades, a novel perspective on learning has been developed by the so-called constructivists. The constructivistic view on learning emphasizes that learning is an active and constructive process (e.g. Simons, 2000). In this view, the learner is an information constructor and he actively creates his personal representations of the objective reality. A learner builds his own idiosyncratic knowledge structure (Tobin & Tippins, 1993) and new information is linked to prior knowledge, implying that mental representations are subjective. Constructivists assume that all knowledge is constructed and based upon the learners' previous knowledge, regardless of how one is taught.

This constructivistic view has been followed by the social-constructivistic perspective on learning. This perspective underpins the social context of learning. Social-constructivists state that learning is an active process of building personal knowledge structures in interaction with others. This means that perspective taking is important for learning (Simons, 2000). Because of this perspective social constructivism is used as a basis for the working model (i.e. not as an explicit component). A distinction is made between the student and the learning environment, however. Characteristics on a student level, such as personality characteristics, learning conceptions, motivational orientations, regulation strategies and information processing activities, are thought to be of major importance in the determination of study outcome (e.g. Bruinsma, 2003; Loyens, Rikers,

& Schmidt, 2007; OC&W, 2004; Robbins, Lauver, Le, Davis, Langley, & Carlstrom, 2004).

These studies indicate that student characteristics exhibit the most significant and direct influence on study outcome (Wang, Haertel, & Walberg, 1993). Characteristics on the learning environment-level, e.g. school effectiveness studies, confirm student characteristics to be important (e.g. De Maeyer & Rymenans, 2004): school achievement is largely (about 80%) determined by student characteristics like student motivation and meta-cognitive and affective activities (Creemers, 1994; Scheerens, 2000), but also the learning environment influences study outcome substantially. Most school effectiveness studies are performed in primary and secondary education (e.g. De Maeyer & Rymenans, 2004), and the results show clearly that aspects on a student level are of major importance regarding study outcome.

Various models on student-related characteristics and learning have been developed with increasing frequency in the last few decades. The so-called onion model (Curry, 1983) is an example. This model consists of four layers; personality, information processing, social learning and instructional aspects (described here from the inside towards the outside). Another model is the so-called iceberg-model (Spencer & Spencer, 1993) using an iceberg-shaped model. This model also consists of several layers. It is implied that the lowest layers are relatively stable and the upper ones more influential and open to change. Motives, personality characteristics and self-concept formed the so-called stable 'hidden' layer of this model, the lowest layer. The middle and top layers are visible and represent skills and knowledge.

These two models have three starting points in common: (1) there are aspects which are stable and aspects which can be influenced; (2) the aspects included are meaningfully related to each other; (3) there is some sort of consistent pattern concerning aspects influencing one another. The working model of the present study has been built up accordingly, starting from a learning psychological point of view with regard to the individual learner. For this reason this study has a psychological point of view and as a consequence less attention is paid to the students' learning environment.

The working model (see Figure 1.2) consists of biographical aspects, like former education and gender, a more or less stable aspect, like personality characteristics, and more influenceable aspects, like learning patterns and personal reasons to drop out or continue.

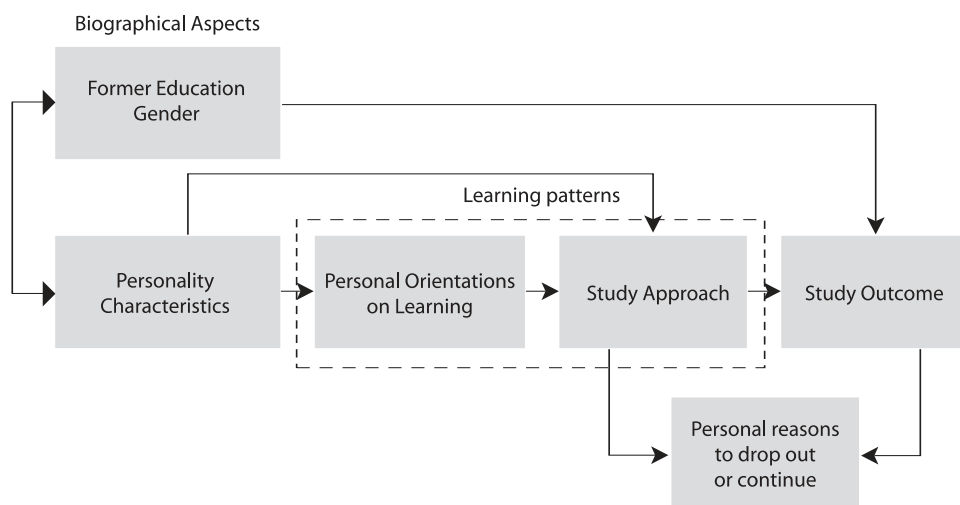


Figure 1.2: Working Model

1.5.1 Former education

Recent research shows that former education is a meaningful determinant of an individual's orientation on learning (Duff, Boyle, Dunleavy, & Ferguson, 2004). Some differences, specifically with regard to educational experiences exist between students originating from either one of these types of former education. As already mentioned, there are two routes with regard to former education for students to enroll in UAS in the Netherlands: one through SSVE and the other through SGSE. Differences in former education leads to variety in the way students learn and affects study outcome. SSVE-students are trained to perform relatively clearly defined professions or tasks. Much emphasis is put on the application of skills and knowledge (Slaats, Lodewijks, & Van der Sanden, 1999). Workplace and problem-based learning are more natural for SSVE-students and they have been exposed to more diverse instructive situations than SGSE-students. Consequently, SSVE-students are more familiar with vocationally orientated learning environments and learning situations emphasizing and enabling participation in authentic situations. Furthermore, SSVE-students who continue their educational careers in UAS have made a well considered choice to prolong their educational studies, despite their present qualifications to enter the labour market. Next to this, SSVE-students are about two years older than average SGSE-students when they enter UAS. There are indications that differences exist between younger and more mature students in their learning.

Vermunt (2005) states that these descriptions are just to a small degree based on empirical comparative research. We assume that the maturity difference between the two different groups of students enrolling in UAS might be of influence with regard to study outcome. SGSE-students, are, compared to SSVE-students, more acquainted with processing relatively large amounts of abstract and codified information. Acquiring and building up organized and coherent bodies of knowledge, is the common 'practice' of these students and they have not participated in authentic learning situations as their SSVE-counterparts did. Results of desk research (Van Bragt, 2004) suggests that little is known about the predictive value of former education with regard to study outcome. Although former education could actually influence study outcome, it was often neglected as a predictive variable (e.g. Bailey & Borooah, 2007; Herweijer, 2008; Wartenbergh & Van den Broek, 2008). That is why it is interesting to examine the role of former education more specifically. Different types of former education and the established implicit assumptions that certain types of former education are less or maybe even not suitable at all for UAS, underpin the possible relevance of the role of former education concerning study outcome.

1.5.2 Gender

Gender is a meaningful determinant of an individual's orientation on learning (Duff et al., 2004). Gender differences relating to personal characteristics and learning patterns occur (Severiens & Ten Dam, 1994). Also with regard to personality characteristics, several gender differences are found; women are more agreeable and extravert than men (Chapman, Duberstein, Sörensen, & Lyness, 2007). Gender differences within the specific context of UAS (e.g. De Fruyt & Mervielde, 1996) might play an important role regarding study outcome. Studies using gender as a predictive variable considering predicting study outcome, show that gender matters (e.g. Bailey & Borooah, 2007; Jorgensen, Ferraro, Fichten, & Havel, 2009; Finn & Rock, 1997; Herweijer, 2008; Wartenbergh & Van den Broek, 2008). In general it can be concluded that male dropout is higher compared to female dropout (Feltzer & Rickli, 2009; Herweijer, 2008; Kenwright, 2002; Wartenbergh & Van den Broek, 2008). Female students obtain more credits (Bruinsma, 2003; 2004) and continue with their education more often than male students (Bailey & Borooah, 2007; Jorgensen et al., 2009). At the same time, there are also studies that report no gender effects whatsoever with regard to study progress and outcomes (De Jong, Vendel, & Hoekstra, 2002; e.g. Zeegers, 2001).

For this reason, the role of gender and its dependence on other concepts that influence

study outcome, is an important component of our working model.

1.5.3 Personality characteristics

Personality characteristics are a meaningful determinant of an individual's orientation on learning (Duff et al., 2004). Several studies show a strong relationship between personality characteristics and study approach (Diseth, 2003; Duff et al., 2004; Furnham & Chamorro-Premuzic, 2004; Swanberg & Martinsen, 2010). As established models have already shown, personality characteristics may be considered to be an important foundation for the development of approaches to learning (Curry, 1983; McClelland, 1993; Spencer & Spencer, 1993). Differences in personality characteristics cause individuals to react to all kinds of situations in their own ways (Carver & Scheier, 1992). This also applies to learning in an educational context (Busato, Prins, Elshout, & Hamaker, 1998; Busato, Prins, Elshout, & Hamaker, 2000; De Raad & Schouwenburg, 1996; Slaats et al., 1999; Zhang, 2003). Based on these findings, we included the concept of personality characteristics into our working model, as one of the key concepts. Personality characteristics are found to be relatively stable and are not fast or easy to change (Curry, 1983; Spencer & Spencer, 1993). A leading theory within the domain on personality characteristics is the 'Big Five' (Carver & Scheier, 1992; Chamorro-Premuzic & Furnham, 2003; Conard, 2006; Hendriks, 1996; Hendriks, 1997; Hendriks, Hofstee, & De Raad 1999a; Jackson, 2006; John & Srivastava, 1999; Mervielde, 1992; Salgado, 1997). The 'Big Five' refer to five broad dimensions of personality, being: (1) extraversion; (2) agreeableness; (3) conscientiousness; (4) emotional stability and (5) autonomy (Hendriks, 1996; Hendriks, 1997; Hendriks, Hofstee, & De Raad 1999b). Extraversion refers to being gregarious, assertive, and generally seeking out excitement. In contrast, people with low scores (introverts), are more reserved, thoughtful, and self-reliant. Agreeableness is a tendency to be pleasant and accommodating in social situations. People with high scores on this dimension are empathetic, considerate, friendly, generous and helpful and they are responsive to others (Tobin, Graziano, Vanman, & Tassinari, 2000). Conscientiousness refers to being responsible, dependable, organized and persistent. Students with high scores on this characteristic are generally hard-working, reliable and are said to be well-organized. Emotional stability refers to the degree of being more or less emotionally secure, more relaxed and calm. Students with high scores on Autonomy, tend to be open and imaginative (Matthews, Zedner, & Roberts, 2006), look for new experiences, have flexibility of thought, are curious, creative and considered to be independent learners.

What separates the Big Five personality theory from all others is that it is empirically driven and based on language, the natural system that people use to communicate their understanding of one another. Several studies demonstrate replicable and generalizable findings within different cultures (Hendriks et al., 2003).

As might be expected all five personality characteristics are significant predictors with regard to study outcome (De Raad & Schouwenburg, 1996; Feltzer & Rickli, 2009).

Evidently, a consistent, predictive relationship between conscientiousness and study outcome has been delineated (O'Connor & Paunonen, 2007): highly conscientious students perform better and are less likely to drop out (Bakx, Vermetten, & Van der Sanden, 2003; Bidjerano & Dai, 2007; Bratko, Chamorro-Premuzic, & Saks, 2006; Chamorro-Premuzic & Furnham, 2005; Conard, 2006; Digman, 1989; Duff et al., 2004; Furnham, Christopher, Garwood, & Martin, 2007; Heaven Ciarrochi, & Vialle, 2007; Hendriks et al., 1999a; Laidra, Pullmann, & Allik, 2007; Nofle & Robins, 2007; Wagerman & Funder, 2007).

Conscientiousness in particular, turns out to be most strongly and consistently associated with study success.

De Fruyt and Mervielde (1996) have shown that extravert students fit well in UAS because these students incline to practical studies. Extraversion is of interest regarding study outcome (De Fruyt & Mervielde, 1996; Furnham & Chamorro-Premuzic, 2004). Meaningful relations between the personality characteristics extraversion, agreeableness, emotional stability and autonomy on the one hand and achievement on the other have been found in other studies (Duff et al., 2004; Hendriks, Kuyper, Offringa, & Van der Werf, 2008). Poropat (2009) conducted a review study on personality characteristics and study outcome. One of his main conclusions is that there are strong relations between personality characteristics and study outcome. Furthermore, he concludes that personality characteristics and factors like former education (educational level) should take a more prominent place in future theories regarding study outcome.

Besides personality characteristics, also students' learning patterns are relevant for study outcome.

1.5.4 Learning patterns

A study of Vermunt (1992) on learning styles was conducted from a social-constructivist perspective on learning. From this perspective it is assumed that a natural wish to learn exists and that the student works actively from a knowledge construction and transformation principle: the student interprets new information by using previously acquired knowledge (e.g. Renkl, 2009). Social-constructivism emphasizes the activities and perceptions of the learner himself. More attention goes out to active and self-regulated learning and the influence of the student's personal perception of the learning environment. One of the critical aspects pointed out by Vermunt (1992) was that institutes merely gathered administrative data and that only little attention was given to students' study approach. This is remarkable, knowing that students' study approach determines learning outcome (Vermunt & Verloop, 1999). Vermunt's model of learning (1992) has been based on four underlying theoretical concepts (Vermunt, 1995; 1998; Vermetten, Lodewijks, & Vermunt, 2000): (1) learning conceptions; (2) motivational orientations; (3) regulation strategies; and (4) cognitive processing activities. These four concepts were found to be related: the first two determine regulation strategies, which in turn affect the students' cognitive processing activities.

The first concept, learning conceptions, are more or less integrated sets of beliefs about different aspects of learning, e.g. what learning is about, how learning proceeds, and which learning activities can be deployed to reach certain goals (Van der Sanden, Terwel, & Vosniadou, 2000). Many studies show the important role of students' conceptions of learning with regard to the deployment of learning activities (Chiou, 1995; Marton & Säljö, 1976; Vermetten et al., 2000; Weinstein & Mayer, 1986). Learning conceptions develop gradually, due to, amongst others, experience with different kinds of instructive situations (Bakx, Van der Sanden, Sijtsma, Croon, & Vermetten, 2006). Students with different types of former education and from different ages show differences in learning conceptions (Klatter, 2004).

The second concept, motivational orientation, referring to the students' intention for learning. This motivational orientation determines how a student approaches and interprets the learning environment. A student's motivational orientation can be seen as a so-called 'catalysator', because it puts the student into action (or not) (Vermetten, Vermunt, & Lodewijks, 1999; Vermunt, 1992). Motivational orientations have several effects on how students learn and how they approach their study (Boekaerts, 2002), and, as a consequence, motivational orientations have a direct or indirect influence on study outcome (e.g.

Bruinsma, 2003).

The third concept, regulation strategies, refer to the way students regulate themselves while studying: they differ with regard to the ways they regulate their learning activities (Vermetten et al., 2000). Students who show a 'lack of regulation' might drop out (e.g. Vermetten, Lodewijks, & Vermunt, 1999). On the other hand, students with high scores on self-regulation show better adjustment, get better grades and have more interpersonal success (Tangney, Baumeister, & Boone, 2004; Bidjerano & Dai, 2007). Differences in regulation with regard to former education have been reported; SSVE-students switch between self-regulation and external regulation depending on the circumstances (Slaats et al., 1999).

The fourth concept, cognitive processing activities, concerns activities which students habitually deploy while studying (Vermunt, 1996). They refer to thinking and learning activities that directly lead to learning results, which may take the form of an increase in knowledge, understanding and skills. It might also apply to the integration processes and competencies. The quality of learning is assumed to be heavily dependent on the amount and quality of students' cognitive processing activities (Vermunt & Verloop, 1999).

These four concepts were brought together in a large empirical study with regard to student learning in HE (Vermunt, 1992). Results of this study show four so-called 'learning styles'^{ix} undirected, reproduction-directed, meaning-directed and application-directed (Vermunt, 1992). In several contexts these four learning styles have been investigated further on (Vermunt; 1996; 1998; Vermunt & Vermetten, 2004; e.g. Ajisuksmo & Vermunt, 1999; Busato et al., 1998; Klatter, 1995; Lonka & Lindblom-Ylänne, 1996; Oosterheert & Vermunt, 2001; Schouwenburg, 1996; Slaats et al., 1999; Wierstra, Kanselaar, Van der Linden, Lodewijks, & Vermunt, 2003).

Coffield, Mosely, Hall and Ecclestone (2004) performed a review study on learning styles in the UK, the US and Western Europe, which started around the same time as the study by Vermunt (1992). Coffield et al. (2004) identified 71 models of learning styles and categorized 13 of them as major models, Vermunt's Learning Style being one of them. Literature basically indicates that there is a wide acceptance of the concept of learning styles (Coffield et al., 2004).

The learning styles might have a tendency towards a classification in itself. As a consequence, the underlying concepts, of which the learning style typologies are the result, do not get much specific attention anymore. The term 'style' is often associated with unchangeability,

an invariant attribute of students, deeply rooted in personality (Vermunt, 2005), whereas it was originally seen as the result of the temporal interplay between personal and contextual influences (Vermunt, 1996). For this reason a new name for the same phenomenon emerged. Vermunt (2005) replaced 'learning style' by 'learning pattern'. This was done to focus on the changeability of the interplay of the four underlying concepts, and to release the idea of stable styles.

If we oversee this domain of learning styles e.g. learning patterns, a large body of research results supports the importance and value of the learning pattern theory as suggested by Vermunt (1995). Indeed, it is of interest to take another look at the underlying four concepts. By doing so we do not reject learning patterns: we would like to contribute to the development of a second generation of conceptualizations focusing on learning conceptions, motivational orientations, regulation strategies, cognitive processing theories and their relationships (e.g. Vermunt & Vermetten, 2004). Overseeing the learning styles, c.q. learning patterns debate, we conclude there may be other learning patterns based upon underlying theoretical concepts which form an addition to the body of knowledge concerning the way students learn. These possibly new patterns might shed more light on factors influencing study outcome of students within UAS.

Personal orientations on learning

Students' personal orientations on learning refers to their view on learning, the way they are motivated and how they regulate themselves. The underlying concepts of personal orientations on learning are learning conceptions, motivational orientations and regulation strategies. These three concepts have shown their contribution with regard to study approach (e.g. Loyens, 2007; Boekaerts, 2002; Vermunt, 1992) and study outcome (e.g. Bruinsma, 2004). We distinguish three aspects within the concept of personal orientations on learning, namely constructive self-regulation (CSR), reproductive external regulation (RER) and ambivalence and lack of regulation (ALR).

Constructive self-regulation (CSR) refers to a preference towards constructing and usage of the knowledge offered. Students with this preference prefer to build up a personal knowledge network structure and like to work together with peers. They prefer to set their own goals and work from a personal interest in the subject studied. Furthermore, they emphasize the practical value of acquired knowledge and experiences and aim to become a member of a certain professional community: they are intrinsically interested. Students like these are self-directed, which is beneficial with regard to study outcome

(Bidjerano & Dai, 2007; Tangney et al., 2004; Vermunt & Vermetten, 2004).

Reproductive external regulation (RER) refers to a preference to perceive knowledge mainly as facts. Students with a preference like this want to obtain a degree or their aim is merely to prove their own capacities and their ability to reach their own goals.

Furthermore, they need someone else to direct them: they seek for and rely heavily on regulation agents available in the learning environment. We consider this orientation to be disadvantageous for study outcome: students with high scores might drop out more easily (e.g. Bruinsma, 2003).

Ambivalence and lack of regulation (ALR) refers to the need of getting impulses to learn. Students with a prevalence like this are ambivalent and do not know what to do, when and why. In short, these students lack focus on structure and direction. This orientation is considered to be the most disadvantageous orientation with regard to study outcome, especially for students who seem to have trouble with both external and self-regulation, and to whom the label 'lack of regulation' applies (e.g. Vermetten et al., 1999).

Ambivalence and lack of regulation indicates problems for students concerning the control of the learning process.

Study Approach

Study approach or approaches to learning is a main topic in educational student learning literature (Coffield et al., 2004; Duff & McKinstry, 2007; Entwistle & Ramsden, 1983; Marton & Säljö, 1976; Marton, 1981). Much of this research stems from the work of Marton and Säljö (1976), who introduced a surface and a deep approach to learning. This formed the start of the deep-surface learning dichotomy approach. Students differ in the way they approach their study. It is known that differences in study outcome are related to a more deep or surface study approach (Diseth, 2003; Kaldewey, 2006; Snelgrove & Slater, 2003; Zeegers, 2001). In academic settings some consensus has been reached in describing learning activities (Coffield et al., 2004).

With cognitive processing activities such as the basis of study approach, a deep (i.e. meaningful) and a surface approach (i.e. superficial) are found in the present study. A meaningful approach is associated with students who construct and understand the meaning of the content to be learned. Students relate things learned to other experiences and ideas in a critical way and look for a deeper meaning. This kind of approach to learning is associated with student intention to understand and to distil meaning from the content to be learned (Baeten, Dochy & Struyven, 2008) and is a key element in being a life-long

learner and a professional expert (Birenbaum 2007; Gijbels, Segers & Struyf, 2008). Students with a meaningful integrative approach (MIA) prefer to relate and structure information and process it critically and concrete. Approaches like these are highly valued in HE (Zeegers, 2001). They are considered to be beneficial with regard to study outcome because students give meaning themselves and integrate the new things they learn with what is learned in the past.

The superficial approach (SUA) on the other hand, refers to students who learn by memorizing and reproducing the factual content (Gijbels, Van de Watering, Dochy, & Van den Bossche, 2005). They avoid deep understanding of a subject. Instead, these students focus on memorizing (i.e. rote learning) and analyzing information. Furthermore, existing ideas get isolated from the things learned which eschews comprehension, and consequently, is assumed to be an ineffective tool in mastering any complex subject. A superficial approach is thought to be counterproductive with regard to study outcome because the information is not internalized and integrated in the students' own new and improving constructs.

There are differences in achievement which can be explained by qualitative activities in study approaches (Kaldewey, 2006). Although in the suspected direction, results with regard to study outcome are rather disappointing (Watkins, 2001): surface approach is negatively related and deep approach positively. Diseth (2003) e.g. found that academic achievement is predicted positively by deep learning conceptions which influence deep learning activities. In general, the use of a deep approach is thought to lead to greater academic success and higher quality learning outcomes than studying from a superficial learning conception (Snelgrove & Slater, 2003; Zeegers, 2001).

Insights from studies on learning in higher academic programs cannot automatically be transferred to the domain of learning in UAS (Oosterheert & Vermunt, 2001). Next to the fact that study approach proved to be of direct influence on study outcome, the heterogeneous student population within UAS welcomes another look at study approach.

1.6 Research questions

Overlooking the relevant aspects in the literature that influence study outcome we are interested to gain deeper insight into the relations between students' personal characteristics in terms of former education, gender, personality characteristics as suggested by the big five, learning patterns in terms of personal orientations on learning and study approach,

and study outcome. The present study focuses on students who drop out, but also on students who continue their education. More specific attention is paid to students' personal reasons to drop out or continue. A closer look at reasons to drop out is obviously of interest, but reasons why successful students continue can also be helpful in order to shed more light on the personal touch of this phenomenon. Not only a drop-out-profile (consisting of predictive aspects on this matter) but also a so-called 'successful student' profile might add to the body of knowledge with regard to explaining study outcome. The following three research questions were formulated to address the aim of the study:

1. What is the influence of personality characteristics on personal orientations on learning which, in turn, influence study approaches and are there any differences between students entering Higher Education with regard to former education (SGSE and SSVE)?
2. To what degree do former education and students' personal characteristics (the 'Big Five personality characteristics', personal orientations on learning and students' study approach) predict study outcome (required credits and study continuance)?
3. Are there any differences between students who continue and students who drop out from the educational system within one year with regard to their study approaches, their personal reasons and the relations between these two?

1.7 Relevance of the study

This research project is *scientifically* relevant in terms of a contribution to the body of knowledge with regard to the relations between students' personal characteristics and study outcome for first year students in UAS. A better understanding of the role of the two different former educational backgrounds (i.e. SGSE and SSVE) and these students' personal characteristics is of interest with regard to their predictive value considering study outcome. It is scientifically important to sort out and explicate their direct or indirect predictiveness with regard to study outcome. This is of interest because it supports insights and scientific developments concerning the aim to obtain a more fundamental grip on aspects predicting study outcome, which is a vast concern for the individual student, institutes and society in general. Furthermore, the results of the present UAS specific study on study outcome extends the existing body of knowledge regarding the predictive

value of students' personal characteristics, sprouting from school effectiveness studies performed within primary and secondary education.

The *practical relevance* of the study concerns the usability of the results: insights into students' personal characteristics causing dropout may help study career coaches influence study outcome positively, for instance by optimizing student support. Student support might be improved based upon conclusions from this study. Evidence-based interventions can be constructed, implemented and conducted within student guidance programs. These kind of programs can be offered directly after the start of students' study career within UAS, in order to help students at risk more successfully, reduce the level of dropout to a minimum and to enhance study success.

1.8 Overview of the study

This first chapter is followed by three chapters addressing the three main research questions. Each of these chapters consists of a separate article that has been published, accepted for publication or submitted for publication. Some repetition and overlap among the contents of chapters two till four is bound to occur.

Chapter two concerns the first main research question. This chapter describes the findings on possible differences between SSGE and SSVE-students with regard to personality characteristics, students' personal orientation on learning and study approach.

Furthermore, it describes findings with regard to the suggested working model and its underlying theoretical concepts for SSGE and SSVE-students.

The second main research question is answered in chapter three. This chapter clarifies to what degree the independent variables 'former education' and 'students' personal characteristics' (the 'Big Five personality characteristics', students' personal orientations on learning and study approach) predict the dependent variable study outcome (required credits and study continuance). Gender is integrated in this study as a control variable.

The third main research question is answered in chapter four. Insight into students' study approach, their personal reasons to continue or drop out and the relations between these two are considered. The focus of this study is not only on students who drop out but also on students who continue their education. A closer look at students' reasons to drop out is obviously of interest, but cognition on successful students' reasons to stay is also considered to be beneficial.

Finally, in chapter five the main findings and conclusions are presented. This is followed

by a critical reflection concerning the conclusions, the overall research aim and methodology. After a discussion about strengths and limitations of the study, we finish the study with suggestions for future research and discuss several implications of the research findings for the practice in the context of UAS.

Students' approaches to learning when entering Higher Education: Differences between students with Senior General Secondary and Senior Secondary Vocational Educational backgrounds

Abstract

Recently, more students have entered Dutch Higher Education. This is a consequence of the possibility to offer students to enter Higher Education, with a certificate from Senior Secondary Vocational Education (SSVE). In earlier days most students in Higher Education had passed senior general secondary education (SGSE), or even pre-university education. It is to be expected that these 'new' students approach learning in a different way compared to the 'traditional' students in Higher Education. The goal of this study was to examine the possible differences between the two groups of students mentioned, and to gain insights into the role possible differences play in the way the two groups of students approach learning. Students' personality characteristics, regulation strategies, learning conceptions and motivational orientations were studied in relation to study approaches. It was assumed that patterns of relations between the variables mentioned would be different for the two groups of students. More specifically, it was expected to find stronger and more crystallised relations between variables within the group of SSVE-students. Indeed, SSVE-students scored higher than SGSE-students on the personality variables autonomy and conscientiousness; as to their personal orientations on learning they were more self-test oriented and they scored higher on concrete processing and construction of knowledge. However, the strength and direction of the relations between the variables are the same for both groups. Our findings increase insights into relations between students' personalities and their approach to learning when entering Higher Education; this concerns two groups of students from different educational backgrounds. Practically this implies that intake assessments considering personality and self-knowledge might help teachers, coaches and policy makers in advising students how to approach learning, when entering Higher Education.

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2.1 Introduction

Senior Secondary Vocational Education (SSVE) used to be the final educational phase for all kinds of professions in the Netherlands. It was meant to prepare students to enter the labour market. However, SSVE (in Dutch 'MBO') has recently been put forward as an alternative way to gain access to Higher Education, in addition to the general 'secondary road' (Senior General Secondary Education (SGSE)) (in Dutch 'VO'). This is especially interesting because of its potential to increase the volume of graduates with at least a bachelor degree. Such an increase is judged necessary because of the demands facing the Dutch knowledge economy. As a consequence, gradually more SSVE-students will decide to continue their educational studies in Higher Education (The Netherlands Association of Universities of Applied Sciences, 2006). These students will make a conscious choice to prolong their educational studies, despite their present qualifications to enter the labour market.

This study was based on an underlying 'iceberg-shaped' model, consisting of three layers, with five concepts altogether. In the introduction section of this article the five concepts are described one by one. The introduction starts with a general section on the context of the study, followed by short descriptions of each concept within the model.

2.1.1 Competence-oriented education

Higher Education has become increasingly competence oriented (Directorate-General for education and Culture, 2004); students are confronted with educational programs emphasizing competence development right from the start. Competence can be considered an integrated and organized whole of knowledge, skills, attitudes, personality characteristics and learning abilities which enables students to act and learn in various and societal situations and thus act as skilled professionals (Taconis, Van der Plas, & Van der Sanden, 2004).

SSVE-students are trained for relatively clearly defined professions or tasks. Much emphasis is put on the application of skills and knowledge (Slaats, Lodewijks, & Van der Sanden, 1999). Workplace learning and problem-based learning are more natural for this group of students. On the other hand, SGSE-students are more acquainted with processing relatively large amounts of more abstract and codified information. These differences can be viewed from the participation versus acquisition perspectives as described by Sfard (1998). As a consequence, when entering Higher Education, students from secondary education, are more familiar with vocationally oriented learning environments than

their fellow students from general secondary education. SSVE-students are more familiar with learning situations that emphasize and enable participation in sets of authentic practices. Acquiring and building up organized and coherent bodies of concepts and principles stemming from disciplinary knowledge, on the other hand, is the common 'practice' of SGSE-students.

2.2. Aim of the study

This article presents a study on the differences between the two groups of students when entering Higher Education: differences with regard to personality characteristics, learning conceptions, motivational orientations, regulation strategies and study approaches. The aim of the study was to inquire whether it is the case that (for both groups) personality characteristics influence learning conceptions, motivational orientations and regulation strategies, which, in turn, influence study approaches.

This study is part of a larger research project, which focuses on the relations between student characteristics, perceptions of the learning environment, study approaches and study results. There are several reasons to presume that there are differences between the two groups, considering, for instance, the fundamental differences in educational perspective between Senior General Secondary Education and Senior Secondary Vocational Education. We are especially interested in possible differences between these two groups with regard to their future achievements; policymakers, counselors and teachers may benefit from the insights into students' characteristics in the development programs aimed at the prevention of students' dropout. Eventually, the aim is to increase the number of graduates with at least a bachelor degree.

The research questions guiding the present study are:

1. Do personality characteristics influence students' personal orientations on learning (learning conceptions, motivational orientations and preferred regulation strategies), which, in turn, influence study-approaches for both SGSE-students and SSVE-students?
2. What differences are there between students with SGSE-backgrounds on the one hand and students with SSVE-backgrounds on the other, concerning personality, personal orientations on learning and study approaches when entering an educational program in Higher Education?

3. What are the relations between these variables and how do these relations differ between the two groups?

In the next sections, the concepts studied are briefly described.

2.2.1 Personality

The first concept is 'personality'. Students' Big Five personality characteristics (Carver & Scheier, 1992; Mervielde, 1992) extraversion, agreeableness, conscientiousness, emotional stability and autonomy, have been examined in this study, because these are assumed to influence learning (Busato, Prins, Elshout, & Hamaker, 1998; 2000), especially in competence-oriented learning environments. Personality produces consistencies in behavior across different contexts. Differences in personality cause individuals to react to learning situations in their own ways (Carver & Scheier, 1992).

Extraversion, conscientiousness and autonomy are often to be found of major relevance in learning contexts (De Raad & Schouwenburg, 1996). Busato et al. (1998) for instance found various relations between these personality characteristics and the ways students learn. Extraversion and conscientiousness were associated positively with meaningful, reproduction-oriented and application-oriented learning, whereas conscientiousness was associated negatively with undirected learning.

Autonomy correlated positively with meaningful and application-oriented learning and negatively with undirected learning. Slaats et al. (1999) found comparable relations between personality characteristics and the way SSVE-students approach learning situations. Personality characteristics are also considered to be of great importance in the process of competence development. Spencer and Spencer (1993) use an iceberg-model as metaphor to visualise competencies. Motives, personality and self-concept form a layer that is considered to be the hidden base of this model. On top of this layer two more layers are situated which refer to the more visible aspects of competencies, viz. skills and knowledge. Like Curry (1983) and Spencer and Spencer (1993) we hypothesise that personality is the most stable element. Following Curry (1983) we suppose that personality influences students' instructional preferences and learning conceptions. It is likely that there are differences in the relations between these variables for the two groups of students. Personality characteristics form the basic layer of our hypothesized model (see Figure 2.1 later on). As mentioned above, in total the model consists of three layers.

The other two layers of our model were based on Vermunt's model of learning (Vermunt, 1995; 1998; Vermetten, Lodewijks, & Vermunt, 2000). His model distinguishes four related

components: learning conceptions and learning orientations are assumed to determine regulation strategies, which in turn influence cognitive processing activities. Direct relations between learning conceptions and learning orientations on the one hand and cognitive processing strategies on the other are also hypothesized.

These four concepts form the next layers in our model. Instead of four separate concepts, we chose to work with two concepts. We treated learning conceptions, learning orientations and regulation strategies as being one concept with different aspects. This one concept refers to 'personal orientations on learning'. Students' personal orientations on learning form the second layer in our model. The top layer of the model consists of information processing activities (third layer), which can also be seen as students' study approach (Vermunt & Verloop, 1999) (see Figure 2.1 further on).

2.2.2 Conceptions of learning

Many studies show the important role of students' conceptions of learning in the way they approach learning situations and tasks. Marton and Säljö (1976) already showed a close connection between learning conceptions and information processing strategies. Ideas and beliefs influence the goals students set for themselves, the activities they undertake (Weinstein & Mayer, 1986), and decisions they make (Chiou, 1995).

Following Klatter (2004) and Van der Sanden, Terwel and Vosniadou (2000) we consider learning conceptions to be more or less integrated sets of beliefs about different aspects of learning, e.g. what learning is about, how learning proceeds, which learning activities can be deployed to reach certain goals, and which learning environments are supportive. There is more than one perspective on learning. An example is the well-known difference between constructivistic and objectivistic beliefs about learning. This difference repeatedly comes to the fore and is rather fundamental. Constructivistic learning conceptions refer to learning as building and using knowledge, whereas more reproductive (or objectivistic) learning conceptions have in common that learning is conceived of as the mere intake of ready-made knowledge. Learning conceptions develop gradually due to, amongst others, experience with all kinds of instructive situations (Bakx, Van der Sanden, Sijtsma, Croon, & Vermetten, 2006).

Differences in learning conceptions have been found for students with different types of education and from different ages (Klatter, 2004). As a consequence, students' learning conceptions should be considered an important factor in programs for teaching learning skills (Vermetten et al., 2000). In their study on learning styles in Senior Secondary

Vocational Education Slaats et al. (1999) detected a constructivistic and a reproduction oriented learning conception, but no separate application-oriented factor, as was found by Vermunt (1996) in academic contexts. They concluded that this might be due to the overall focus on applying knowledge, which is typical of SSVE. On the other hand, it might be possible that in educational settings an orientation on applying knowledge and skills is part of both learning conceptions (Bakx, Vermetten, & Van der Sanden, 2003).

SSVE-students have experienced learning in multiple contexts and in various forms, whereas SGSE- students have been exposed predominantly to learning from codified information sources in more traditional school settings. As a consequence, we expect the SSVE-group to hold more constructivistic learning conceptions, while we expect the latter group to have more reproductive views on learning.

2.2.3 Motivational orientations

It is assumed that SSVE-students have made a more conscious and deliberate choice to enter Higher Education, compared to SGSE-students. Vermetten, Vermunt and Lodewijks (1999) were able to distinguish five different motivational orientations (or learning orientations) among students in Higher Education: (1) orientation on certificates; (2) orientation on future professions; (3), ego and self-test orientation; (4), being personally interested, and (5) having an ambivalent orientation towards one's choice of study and capacities. We expect SSVE-students to be more oriented towards future professions and less ambivalent than SGSE-students. Probably, they may also be more personally interested in their studies, because of the deliberate decisions they took to continue their educational studies instead of entering the labour market.

2.2.4 Regulation strategies

Students differ with regard to the ways they regulate their learning activities. Preferences for self- regulation can be distinguished from preferences for external regulation. In the former case students, amongst others, tend to set their own goals, think about possible learning strategies, think about the criteria for successful learning, devise their own plans, diagnose and monitor their learning activities and evaluate their learning results. In the latter case they seek for and rely heavily on regulation agents that are available in the learning environment. Slaats et al. (1999) found that one quarter of the SSVE-group in their sample gave evidence of a versatile or pragmatic approach towards learning, switching between self and external regulation depending on the circumstances. Vermetten et al.

(1999) examined students who seem to have trouble with both external and self regulation, and to whom the label 'lack of regulation' applies, which indicates problems concerning the control of the learning process. It is supposed that the way students approach learning (information processing activities, the top layer of the model) is influenced by their regulation strategies (third layer) which in turn are influenced by their learning conceptions and motivational orientations (second layer) (Vermunt, 1998). This is presented in Figure 2.1.

2.2.5 Study approach

In the study described in this article the concept of study approach is defined as the set of information processing activities students habitually deploy while studying (Vermunt, 1996). Five different information-processing activities were distinguished: (1) relating and structuring; (2) critical processing; (3) memorising; (4) analysing, and (5) concrete processing. These processing activities refer to thinking and learning activities that directly lead to learning results, which may take the form of increases in knowledge, understanding and skills. It might also apply to the integration processes and competencies mentioned above. The quality of learning processes is assumed to be heavily dependent on the amount and quality of students' information processing activities (Vermunt & Verloop, 1999). In research on academic learning, some consensus has been reached on how to describe these learning activities. A deep processing activity, for example, involves learning activities such as relating, structuring and critical processing, and stepwise processing involves activities such as memorising and repeating (Vermunt, 1996). However, insights from studies on learning in higher academic programs cannot automatically be transferred to the domain of learning in Higher Education (Oosterheert & Vermunt, 2001). Therefore, it is important to take a new look at the information processing activities which are characteristic of our two student groups. Further, more has to be examined how these activities relate to other aspects studied. The hypothesized model with its three layers is presented in Figure 2.1.

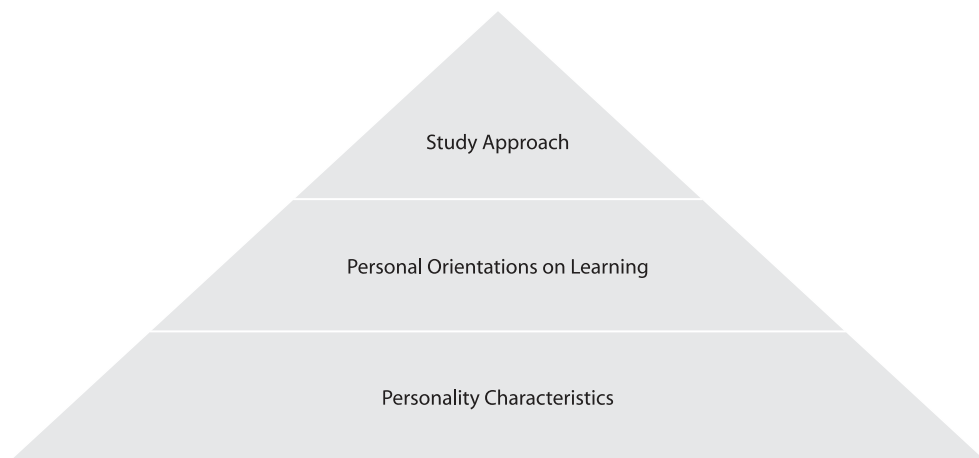


Figure 2.1: Hypothesized model consisting of three layers: personality characteristics, personal orientations on learning and study approach

It may be interesting to investigate possible differences between the two groups, considering the coherence of the variables studied and the strength of this coherence. One might expect that the way these two groups approach learning is different: SSVE-students have been exposed to more diverse instructive situations, and are, for instance, more familiar with competence-based learning. All SSVE-students have experienced the conduct of learning in the workplace for several months. For SGSE-students this is not the case. Next to this, SSVE-students are older than the average SGSE-students.

This difference is about two years of age. Having participated in genuine workplace practices and having more experience with different kinds of learning situations, it might be expected that SSVE-students tend to show more exploration behavior and are more inclined to integrate codified and experiential knowledge.

It is expected that the variables measured can be brought together into a coherent model, which probably is different for SSVE and SGSE-students. We hypothesize that SSVE-students are more self-reliant learners and have a tendency to constructively process information from various sources. It is also expected that SSVE-students use more strategies such as critical processing instead of memorising in comparison with SGSE-students. Finally, we assume that patterns of relations in general differ for the two groups studied, and more specifically, we expect to find that relations between variables are stronger for SSVE-students.

2.3 Method

2.3.1 Participants

Data were collected among first-year students entering Higher Educational programs as part of a project aimed at lowering student wastage. Participants were 2.284 students in Higher Education, from a university of applied sciences in the Netherlands. They participated as part of their 2003/2004 curriculum. The response rate was 71%. The students were all freshmen, full-time students, enrolled in nineteen different four-year Higher Educational programs, including a teacher training institute, an institute for nursing and an institute for technical education.

Students who already failed a year in Higher Education and took a new start, students who came from other universities and students who had switched between educational institutes were excluded from this study (92 in total). This brings the sample studied to 2.192 in total (602 SSVE-students with 46% females and a total of 1.590 SGVE-students with 48% females, mean ages of the groups were 20.4 years for SSVE-students and 18.4 years for SGVE-students). In our sample 52.49% were women. This is significantly larger than the percentage (48.39) in the relevant Dutch population of students: $\chi^2 = 14.18$, $df=1$, $p<.001$.

2.3.2 Materials

Two questionnaires were used in this study. The first questionnaire assessed learning styles by means of Vermunt's learning style inventory for Higher Education (Vermunt, 1998). This questionnaire investigates (1) learning conceptions, (2) learning orientations, (3) regulation of learning, and (4) learning strategies. A five-point Likert scale was used to indicate the frequency of regulation strategies and learning strategies. The scale varied from (1) 'I hardly ever do this' to (5) 'I almost always do this'.

For the assessment of personality-characteristics the Dutch version of the Five-Factor Personality Inventory (FFPI) was used (Hendriks, 1997; Hendriks, Hofstee & De Raad, 1999a, 1999b). This questionnaire is composed of one hundred statements and measures five aspects of personality; (1) extraversion (2) agreeableness (3) conscientiousness (4) emotional stability (5) autonomy. Students indicated on a five-point Likert scale to what extent the statement was descriptive of their personality.

2.3.3 Procedure

The questionnaires were administered in the fifth study week by staff of each institute. To all groups of students (approximately 170 separate groups) a brief set of instructions was read out. Next, the students received the questionnaires, as one complete set. Students had to complete the questionnaires in the same order at their own pace. Students' names were deleted from the data files. The students did not receive any feedback.

2.4 Data analyses

All analyses were carried out on the sample of students who had valid admission diplomas to Higher Education. A total of 2.192 complete sets of questionnaires were analysed; 27.5% of these questionnaires were derived from SSVE-students, 72.5% from SGVE-students. For all scales used in this study reliability analyses were carried out.

2.4.1 The explanatory path model

The statistical analyses reported in this article were based on a path model that reflects a causal order among the variables, in which the five personality measures and the 18 scales from the Learning Style questionnaire were assigned to three consecutive sets of variables. The first set consisted of the five personality measures: extraversion, agreeableness, conscientiousness, emotional stability and autonomy. The second set contained all scales from Vermunt's measurement instrument regarding learning conceptions, learning orientations, and regulation of learning (thirteen scales in total). Finally, the third set comprised the five remaining scales from Vermunt's questionnaire concerning the learning strategies.

The personality variables in the first set were treated as potentially explanatory variables for all learning style variables in the second and third set. Since five of these learning style variables were considered to be outcome variables rather than explanatory variables, they were included in the final third set. The remaining 13 learning style variables were treated as explanatory variables for the five variables in the third set and were assigned to the second set. The variables in this second set may also mediate between the personality variables in the first set and the outcome variables in the third set.

2.4.2 Data reduction

Without further data reduction, the path model described above leads to a system of 18 different regression equations, which could be estimated separately or simultaneously.

The number of variables in the second and third set was reduced by means of two separate principal component analyses, based on theoretical principles.

First, a principal component analysis was carried out on the correlation matrix for the 13 scales at the second set. On the basis of the scree plot and the interpretability of the solution, three components (which explained 50% of the total variance) were retained.

The loadings of the 13 scales on the orthogonally rotated components – the Varimax procedure was used – are given in Table 2.1.

Table 2.1: Component loadings on Varimax rotated components for variables in set 2

Scale	Component 1	Component 2	Component 3
Intake of knowledge	.01	.72	.33
Construction of knowledge	.85	-.02	.08
Use of knowledge	.57	.38	-.13
Being stimulated	.13	.25	.58
Co-operation	.43	.09	.40
Certificate oriented	-.14	.71	.15
Vocationally oriented	.48	.38	-.33
Self-test oriented	.29	.43	.29
Personally interested	.47	.14	.00
Ambivalent	-.19	-.04	.77
Self-regulation	.79	-.18	.03
External regulation	.22	.62	-.08
Lack of regulation	.02	.10	.74

Six scales load highly (absolute value of loading larger than 0.4) on the first component: construction of knowledge, use of knowledge, co-operation, vocationally oriented, personally interested, self-regulation. This first component will be denoted as *constructive self-regulation* (CSR). The second component, with high loadings for four scales (intake of knowledge, certificate oriented, self-test oriented, and external regulation) represents *reproductive external regulation* (RER). The four scales that load strongly on the third component are: being stimulated, co-operation, ambivalent, lack of regulation. This component represents *ambivalence and lack of regulation* (ALR).

From this point, the three component scores were used. Reliabilities for the three component scores were determined, yielding values of .878 for CSR, .850 for RER,

and .855 for ALR (Lord & Novick, 1968).

In a similar way, a second principal component analysis was carried out on the correlation matrix for the five learning style variables at the third set. Two components (explaining 70% of the total variance) were retained and varimax rotated to simple structure. Table 2.2 presents these findings.

Table 2.2: Component loadings on Varimax rotated components for variables in set 3

Scale	Component 1	Component 2
Relating and structuring	.82	.19
Critical processing	.82	.09
Memorising	-.08	.88
Analysing	.28	.80
Concrete processing	.78	-.03

Three scales have a high loading on the first component: relating and structuring, critical processing, and concrete processing. The two remaining scales, memorising and analysing, have a high loading on the second component. The two rotated components represent a *meaningful integrative approach (MIA)* and a *superficial approach (SUA)*.

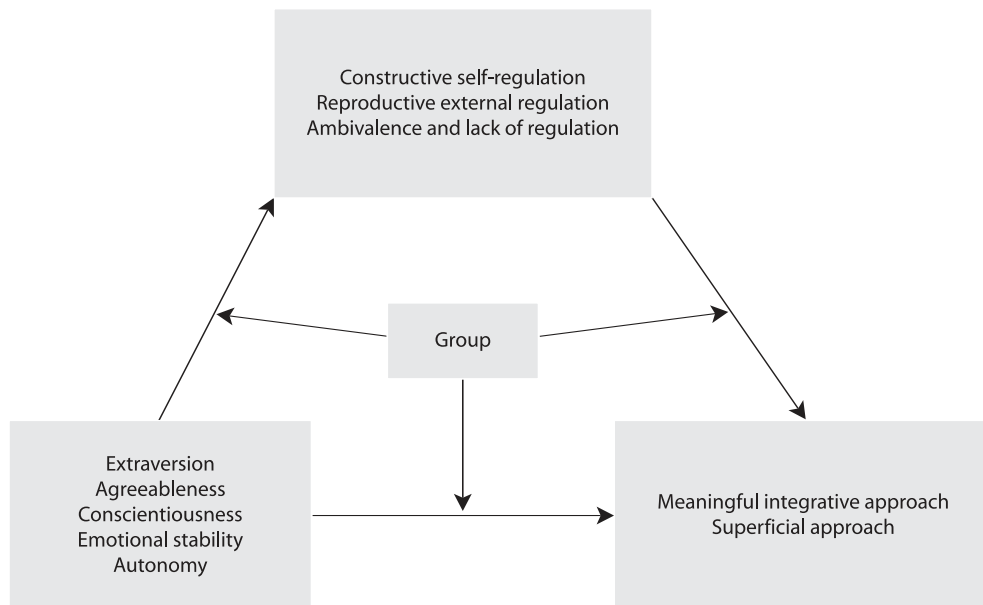


Figure 2.2: Path model with Group as moderator variable

From this point the two component scores were used. Reliability is $\alpha=.867$ for MIA and $\alpha=.843$ for SUA.

Finally, a dummy variable 'Group' was created to represent the different educational backgrounds of the students (SSVE-students were assigned a zero and SGVE-students a score of one). Figure 2.2 presents the final path model. Considering the Group-variable: arrows pointing from this variable to the arrows representing effects of the other independent variables indicate that Group is treated as a moderator; a variable that itself potentially affects the effects of all other independent variables in the regression equations.

2.5 Results

2.5.1 Differences between student groups with different educational backgrounds

The mean differences between SSVE and SGSE-students were tested for significance by means of univariate t-tests. Due to the large sample sizes in both groups these tests are very powerful, leading to a large number of significant outcomes. In order to obtain insight into the substantive relevance of the differences between the two groups, Cohen's effect size d is reported for each scale (1988). Table 2.3 presents these findings.

Significant differences were found for two personality variables: conscientiousness and autonomy. Out of the 18 learning style variables, 12 of them yielded a significant mean difference. All the significant mean differences were in favor of the SSVE group. However, for most significant differences the estimate of the effect size was rather small. Using Cohen's (1988) recommendations for interpreting effect sizes (from 0.0 to 0.2: trivial; ranging from 0.2 to 0.5: small effect; from 0.5 to 0.8: medium effect; larger than 0.8: large effect), one medium effect, six small effects and seven trivial effects were found.

Compared to SGSE-students, SSVE-students score higher on self-test oriented, personally interested, concrete processing, autonomy, conscientiousness and construction of knowledge.

Table 2.3: Means, standard deviation, t-test statistics and effect sizes for comparing samples of students with different educational backgrounds

Scale	M _{total}	S _{total}	M _{SSVE}	S _{SSVE}	M _{SGSE}	S _{SGSE}	t	d
Extraversion	3.82	.483	3.83	.449	3.83	.497	.066	.01
Agreeableness	3.71	.403	3.71	.364	3.70	.420	.176	.02
Conscientiousness	3.42	.463	3.48	.410	3.39	.481	4.182**	.20
Emotional stability	3.75	.443	3.78	.427	3.75	.446	1.223	.08
Autonomy	3.56	.380	3.62	.363	3.55	.384	3.947**	.22
Intake of knowledge	3.64	.463	3.63	.459	3.64	.464	-.107	-.01
Construction of knowledge	3.29	.489	3.36	.476	3.26	.491	4.227**	.20
Use of knowledge	3.89	.461	3.93	.443	3.87	.467	2.660**	.13
Being stimulated	3.05	.637	3.09	.631	3.03	.639	2.039*	.10
Co-operation	3.18	.623	3.27	.613	3.15	.624	3.883**	.19
Certificate oriented	3.62	.681	3.69	.657	3.59	.688	3.284**	.16
Vocationally oriented	4.10	.613	4.17	.571	4.07	.625	3.503**	.17
Self-test oriented	3.22	.839	3.57	.740	3.09	.835	12.508**	.58
Personally interested	2.79	.565	2.93	.554	2.73	.561	7.186**	.34
Ambivalent	2.21	.689	2.26	.690	2.19	.688	1.885	.09
Self-regulation	2.66	.569	2.71	.587	2.63	.560	2.967**	.14
External regulation	3.40	.426	3.46	.429	3.38	.423	3.893**	.19
Lack of regulation	2.64	.623	2.74	.619	2.60	.619	4.954**	.14
Relating and structuring	3.23	.566	3.21	.559	3.23	.568	-.774	-.04
Critical processing	2.66	.655	2.69	.650	2.65	.657	1.262	.06
Memorising	3.30	.702	3.29	.697	3.31	.704	-.405	-.02
Analysing	2.96	.526	2.98	.523	2.95	.528	1.339	.06
Concrete processing	3.28	.595	3.39	.581	3.24	.595	5.343**	.25

M_{total} and S_{total} (N=2.192); M_{SSVE} and S_{SSVE} (N=602); M_{SGSE} and S_{SGSE} (N=1.590)

* = significant at two-sided 5% level

** = significant at two-sided 1% level

2.5.2 Structural equation analyses

The path model was estimated and tested as a structural equation model by using the software package AMOS 5.0 (Arbuckle & Wothke, 1999). This approach allows for a global model fit of the models considered in the analysis and provides many descriptive fit indices for the model as a whole. The model with Group as a moderator variable was tested by means of a multiple-group analysis in which the data from the two groups were analyzed simultaneously. For each group a path model was defined that consisted of five regression equations: three separate regression equations for the component scores in the second set, and two separate regression equations for the component scores in the third set. For each of the five dependent variables all variables in the preceding set or sets were treated as independent explanatory variables. Moreover, the error terms corresponding to dependent variables at the same set were allowed to correlate: the correlations

between error terms for CSR, RER, and ALR were left free as well as the correlations between the error terms for MIA and SUA. If these error terms were uncorrelated, then the partial correlations between the component scores in the same set would vanish when holding constant all the relevant independent variables. Assumptions of this kind only make sense if the path model represents a causally closed system, i.e. a system in which all potential causes of the dependent variables are included in the model so that no relevant cause is omitted from the analysis. This assumption is very unrealistic in the present application. Moreover, if the data were analysed by separate regression analyses, the same error terms would also be allowed to correlate because separate analyses do not impose constraints on the joint distribution of the errors terms for different dependent variables. Note that the correlations among the error terms for CSR, RER, or ALR on the one hand, and MIA or SUA on the other were constrained to be zero. Assuming otherwise would lead to an unidentified model since CSR, RER, and ALR are explanatory variables for MIA and SUA.

In the multiple-group analysis the model in which all corresponding path coefficients for the two groups were constrained to be equal to each other, was tested against the saturated model in which no equality constraints were imposed on the path coefficients. In this way 31 equality constraints were imposed. In the model being tested the constant coefficients for each equation were allowed to differ between the two groups because the groups could be at different mean levels after controlling for all explanatory variables. Moreover, no equality constraints were imposed on the correlations between the error terms. This multiple-group model provided an excellent fit to the data. It yielded a global test statistic $CMIN = 32.176$ with 31 degrees of freedom ($p=.408$). The value of some descriptive fit indices were $SRMR = .012$, $CFI = 1.000$, $TLI = 0.999$, and $RMSEA = .004$ with a 90% confidence interval for the latter index running from .000 to .017. The choice of these fit indices was based on the recommendations formulated by McDonald and Ho (2002). A model is considered to fit the data well when $SRMR$ less than 0.10, $RMSEA$ less than 0.06, and both CFI and TLI larger than 0.95. As a result it may be concluded that the effects of the independent variables on the dependent variables in the global path model are the same for both groups, implying that Group is not a moderator variable in the relationships between the independent and dependent variables.

Next, an attempt was made to obtain a more parsimonious model with a smaller number of path coefficients. Since 'Group' was not a moderator variable, the data from both groups

were merged and the further analyses were carried out on this total group. To account for differences in mean level between the two groups, the dummy variable representing Group was added as an extra independent variable to each equation in the model. Hence, Group joined the five personality measures (Figure 2.3) at the first set of explanatory variables.

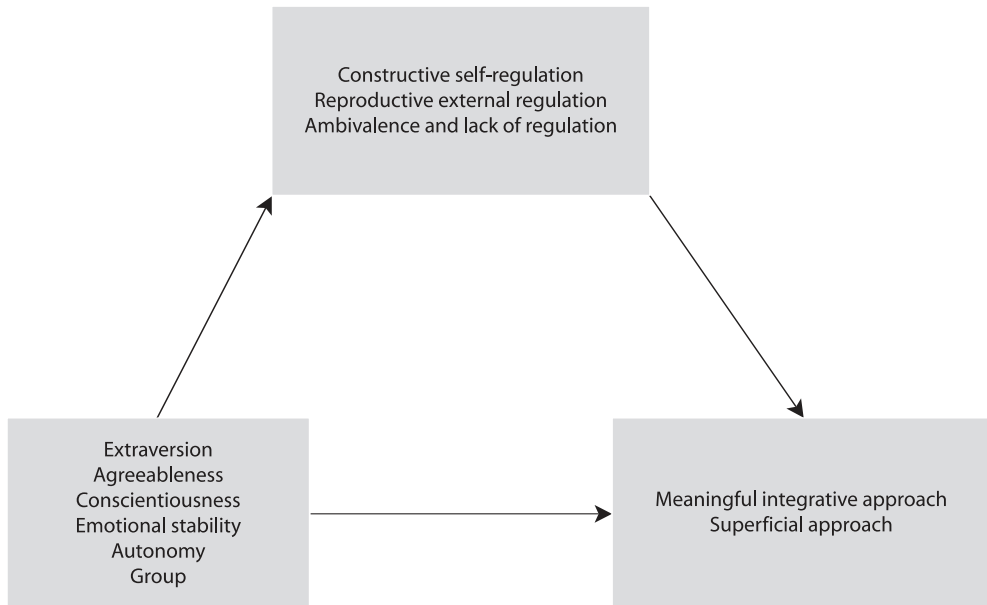


Figure 2.3: Path model with Group as explanatory variable

Starting from this path model a backward elimination procedure was carried out in which non-significant regression coefficients were systematically removed from the model. At each step the independent variable that had the smallest non-significant contribution in one of the regression equations was removed from that equation. This sequential elimination procedure was terminated when none of the independent variables could be removed from an equation without leading to a significantly worse fit of the ensuing global model. The end result was that nine regression coefficients from the original model could be set equal to zero. This more parsimonious model leads to an overall test statistic of $CMIN = 12.591$ which corresponds with a value of $p = .182$ for 9 degrees of freedom. A selection of descriptive fit indices yielded $RMR = .003$, $CFI = .997$, $TLI = .995$, and $RMSEA = .013$ with the latter 90% confidence interval running from .000 to .029. The statistical model test and the fit indices confirm that the parsimonious model provides an acceptable fit to the data.

The results of the analysis based on the parsimonious model are summarized in Tables 2.4 and 2.5. Table 2.4 gives the unstandardized (B) and standardized (β) regression coefficients of the significantly contributing predictors for constructive self-regulation (CSR), reproductive external regulation (RER), and ambivalence and lack of regulation (ALR), respectively.

Table 2.4: Regression results for Constructive self-regulation (CSR), Reproductive external regulation (RER), and Ambivalence and lack of regulation (ALR)

	CSR		RER		ALR	
	B	β	B	β	B	β
Group	-.219**	-.098	-.191**	-.086	-.284**	-.128
Extraversion	.241**	.116	.317**	.154	.000#	.000#
Agreeableness	.345**	.138	-.114*	-.046	.000#	.000#
Conscientiousness	.494**	.228	.385**	.179	-.402**	-.188
Emotional stability	-.342**	-.151	.000#	.000#	-.675**	-.302
Autonomy	.508**	.192	-.331**	-.126	-.325**	-.125
	R ² =.151**		R ² =.055**		R ² =.196**	

* = significant at two-sided 5% level

** = significant at two-sided 1% level

= indicates a parameter set equal to zero in parsimonious model

The dummy variable Group has a significantly negative regression coefficient for all three dependent variables indicating that, keeping all other independent variables constant, the SGSE-students score, on the average, lower than the SSVE-students on the dependent variables. Extraversion has a positive effect on constructive self-regulation (CSR) and reproductive external regulation (RER) but no significant effect on ambivalence and lack of regulation (ALR). Agreeableness has a positive effect on constructive self-regulation (CSR), a negative effect on reproductive external regulation (RER), and no significant effect on ambivalence and lack of regulation (ALR). Conscientiousness has positive effects on constructive self-regulation (CSR) and reproductive external regulation (RER), but a negative effect on ambivalence and lack of regulation (ALR). Emotional stability has negative effects on constructive self-regulation (CSR) and ambivalence and lack of regulation (ALR), no effect on reproductive external regulation (RER). Autonomy has a positive effect on constructive self-regulation (CSR), and negative effects on reproductive external regulation (RER) and ambivalence and lack of regulation (ALR).

The partial correlation between constructive self-regulation (CSR) and reproductive external regulation (RER) and ambivalence and lack of regulation (ALR) respectively, were equal

to $-.065$ and between $.086$, both significant at the 1% level. The partial correlation between reproductive external regulation (RER) and ambivalence and lack of regulation (ALR) (equal to $.021$) was not significantly different from zero.

Table 2.5 gives similar results from the regression analyses for meaningful integrative approach (MIA) and superficial approach (SUA).

Table 2.5: Regression results for Meaningful integrative approach (MIA) and Superficial approach (SUA)

	MIA		SUA	
	B	β	B	β
Group	.000#	.000#	.166**	.074
Extraversion	-.152**	-.073	.000#	.000#
Agreeableness	.000#	.000#	.000#	.000#
Conscientiousness	-.229**	-.106	.488**	.226
Emotional stability	-.121*	-.053	-.187**	-.083
Autonomy	.623**	.236	.000#	.000#
Constructive self-regulation (CSR)	.601**	.602	.175**	.175
Reproductive external regulation (RER)	-.097**	-.097	.293**	.292
Ambivalence and lack of regulation (ALR)	-.080**	-.079	.000#	.000#
	R ² =.433**		R ² =.210**	

* = significant at two-sided 5% level

** = significant at two-sided 1% level

= indicates a parameter set equal to zero in parsimonious model

The partial correlation between meaningful integrative approach (MIA) and superficial approach (SUA) was equal to $-.097$, which is significant at the 1% level.

More variance of MIA and SUA is explained than for constructive self-regulation (CSR), reproductive external regulation (RER) and ambivalence and lack of regulation (ALR). The main reason for this result is that the explanatory variables at the second set of the model - contributions of constructive self-regulation (CSR), reproductive external regulation (RER) and ambivalence and lack of regulation (ALR) - are (with one exception) strong predictors of both meaningful integrative approach (MIA) and superficial approach (SUA). The only exception is that ambivalence and lack of regulation (ALR) does not contribute significantly in the analysis for superficial approach (SUA).

Moreover, some of the personality variables also have strong effects. Extraversion,

Conscientiousness and Emotional stability have a negative effect on meaningful integrative approach (MIA), whereas the effect of Autonomy on this variable is positive.

Agreeableness has no significant effect here. However, in the analysis for superficial approach (SUA), Conscientiousness has a positive effect and Emotional stability a negative effect.

Finally, note that the Group variable has a significant effect on superficial approach (SUA) but does not influence meaningful integrative approach (MIA).

2.6 Discussion

Institutes for Higher Education need to reduce dropout rates, to foster the educational level of the students, and to increase the flexibility of the system. These new demands are reinforced by societal and economical transformations, e.g. with regard to the knowledge economy, and the growing heterogeneity of the student population. It is therefore becoming increasingly relevant to gain insights into the differences between the different groups of students entering Higher Education. These insights might be used to tailor student-counseling practices to the different needs of students and they may be beneficial for the improvement of tutoring and (study) career counseling policies.

We studied differences between students with SGSE and SSVE-backgrounds when entering Higher Education. In the proposed model it was assumed that for both groups of students personality characteristics influenced personal orientations on learning, which in turn influenced study approaches. This model seems to fit sufficiently for the participants in this study and applies to both SGSE-students and SSVE-students. This result is in line with the theoretical assumptions put forward by Curry (1983) and Spencer and Spencer (1993) and corresponds to the findings of Bakx et al., (2006). Spencer and Spencer (1993) define competence as the set of underlying characteristics of a person (skills, knowledge, self concept, personality characteristics, motives and intentions) which is causally related to performance in a (working) situation. Bakx et al. (2006) found that personality characteristics directly influence learning activities and learning conceptions. Busato et al. (2000) and Duff, Boyle, Dunleavy, & Ferguson (2004) concluded that learning orientations are related to personality variables. Duff et al. (2004) even conceive of learning orientations as a learnt subset of personality, and, furthermore they claim that age, gender, personality and prior educational achievement are significant determinants of learning orientations.

Leaving a number of small differences aside, SSVE-students scored higher than SGSE-students on the personality variables autonomy and conscientiousness. As to their personal orientations on learning, they were more self-test oriented and scored higher on concrete processing and construction of knowledge. In this study performance measures were not included - the data were gathered at the beginning of the first year in Higher Education - but in follow-up studies it will be intended to examine the relations between the research variables in the present study and indicators of study success. In this way we shall be able to find out what the initial differences between the SSVE-and SGVE-students mean in terms of obtained study results.

In several studies (Busato et al., 2000; Duff et al., 2004) conscientiousness was found to have positive effects on learning outcomes. In a study by Teune (2004) conscientiousness turned out to be a significant predictor of study progress for student teachers. In a recent study amongst students aged fourteen to sixteen, extraversion and psychoticism were negatively related to academic performance, although their effects were weak and moderated by gender (Petrides, Chamorro-Premuzic, Frederickson, & Furnham, 2005). Duff et al., (2004) found emotional stability to be negatively correlated with academic performance.

We expected that the relations between the variables in the model would be stronger for the SSVE- students than for the SGVE-students. Taking a developmental perspective, we assumed that SSVE- students' experiences with a wide range of learning techniques and instruction methods would lead to relatively strong interrelations between the variables, making up 'the hidden base' (Spencer & Spencer, 1993) of the student's developing competencies. However, this was not the case and it must be concluded that the strength and direction of the relations between the variables in our model are the same for both groups. This might be due to the high scores on self-test orientedness by the SSVE- students: self-test orientedness is indicative of an ambivalent attitude towards one's study.

Because of the time of our study (entrance in Higher Education) it may be the case that SSVE-students were still a bit hesitant about their chances of success. This may lead to a temporary dissociation between the variables measured, however, without leading to a 'break-down' of the model we tested. It would be interesting to examine the relations between the research variables again, at a later point in time, e.g. at the beginning of the second study year.

2.6.1 General discussion and conclusions

The results in this study were obtained by students' self-reports. This is a good way to measure personal views (Vermetten, Vermunt, & Lodewijks, 1999). Metz, Caccamise & Gustafson (1997) found that some skills could be assessed reliably by self-assessment. Zimmerman & Martinez-Pons (1988) have discussed the issue of the validity of students' self-reports of strategy-use; they concluded that students' self-reports pointed to actual differences. We assume that the self-reports used in our study are sufficiently reliable. Students differ considerably in their approaches to learning (Bruinsma, 2003; Bruinsma 2004; Oosterheert & Vermunt, 2001; Vermetten, Lodewijks & Vermunt, 1999; Vermetten et al., 1999). These differences are often associated with specific personal views on learning (i.e. conceptions of learning) which, amongst other things, influence their perceptions of the learning environment (Entwistle, 1991).

Comparable relations were found in our study between personality, personal orientations towards learning and study approaches for SSVE and SGSE-students.

The group participants studied is rather heterogeneous according to the student's vocational fields. We ponder about the possibility whether differences among fields would be more significant than differences between SSVE and SGSE. Further research on this matter might be able to determine this.

In our opinion these findings confirm the universal value of our suggested model. As a consequence, students' learning conceptions should be considered to be an important factor in programs for learning to learn (Lowyck, Lehtinen, & Elen, 2004; Vermetten et al., 2000). Referring to the way we defined the concept of competence in the introduction to this article, we prefer the term 'learning competency' to the frequently used term 'learning skill'. Research into teachers' conceptions about learning to learn has shown that teachers may hold narrower or broader views (Waeytens, Lens, & Vandenberghe, 2002). The narrow interpretation of learning to learn concentrates exclusively on study skills, strategies and techniques. Van der Sanden et al. (2000) stated that the aim of learning to learn is to promote learning competency as an integrated whole of metacognitive knowledge and learning skills, a disposition to apply and improve one's learning skills in varied potential learning situations. In this way, especially in the field of education, learning to participate in communities of practice (Sfard, 1998; Seezink & van der Sanden, 2005) will become an important component of learning to learn programs.

Personality characteristics in general and conscientiousness in particular are important in this matter. In their review, Roberts, Robins, Trzeniewski and Caspi (2003) categorized a

wide variety of personality measures. They concluded that, in general, conscientiousness and agreeableness tend to go up during adulthood, neuroticism tends to go down, openness shows mixed results across studies and extraversion shows no general pattern of change at the factor level. In an earlier study we also found that students' personality characteristics (agreeableness, conscientiousness and autonomy) can slightly change during the first educational year findings (Bakx et al., 2006). This might confirm the idea that a measurement later on in the year, or at the start of the second year, might, indeed, show different kinds of results. In competence oriented education it is essential to pay explicit attention to the development of broad learning competencies. Students should become aware of the influence of personality characteristics on their own personal orientations on learning and study approach. It is recommended to involve these variables in entry and in formative competence assessment procedures to help students gain insight into their own strengths and weaknesses and to guide them in their process of developing adequate personal frameworks or theories for learning.

Looking for students' personal characteristics predicting study outcome

Abstract

The central goal of this study is to clarify to what degree former education and students' personal characteristics (the 'Big Five personality characteristics', personal orientations on learning and students' study approach) may predict study outcome (required credits and study continuance).

Analysis of the data gathered through questionnaires of 1.471 Universities of Applied Sciences students make clear that former Education did not come forth as a powerful predictor for Credits or Study Continuance. Significant predictors are Conscientiousness and Ambivalence and Lack of Regulation. The higher the scores on Conscientiousness the more credits students are bound to obtain and the more likely they will continue their education. On the other hand students with high scores on Ambivalence and Lack of Regulation will most likely obtain fewer Credits or drop out more easily. The question arises what these results mean for the present knowledge economy which demands an increase of inhabitants with an advanced level of education. Finally, implications and recommendations for future research are suggested.

3.1 Introduction

This study is a part of a larger research project aiming to gain deeper insights into which personal characteristics may predict study outcome in Higher Education (HE) in the Netherlands. The aim of our research program is to make a contribution to the body of knowledge regarding the relations between students personal characteristics and their study outcome. Our final goal is to prevent dropout and hereby enhance study success by, amongst other things, developing instruments for guidance and counselling of starting students in HE. Gaining and developing knowledge about one's own preferred learning strategies, effective learning strategies and knowing how and when to use these, and, furthermore, gain insight in how these aspects relate to oneself may help students to be more successful in HE. This insight is important because of the fact that the present 'knowledge economy' demands an increase of inhabitants with an advanced level of education. The Lisbon declaration (2000), followed by the Barcelona summit (2002), set the political goal of developing the EU into 'the most competitive knowledge-based economy in the world by 2010'. This goal and the growing heterogeneity of the student population forces HE to reduce dropout rates, to foster the educational level of students, and to increase the flexibility of the educational system (Van Bragt, Bakx, Van der Sanden, & Croon, 2007).

3.2 Towards a conceptual framework

This article starts by presenting a conceptual framework that is used to identify characteristics that are possible predictors of study outcome. After a short general introduction the variables included in our framework are successively discussed in separate sections: the first three sections consider personality characteristics, personal orientations on learning and study approach. The fourth section concerns the relation between the first three. Former education and study outcome are explained in the last two sections.

Vermunt (1998) and Vermunt and Verloop (1999) developed a model for defining learning styles, distinguishing three layers: (1) learning conceptions and motivational orientations; (2) regulation strategies; and (3) information processing strategies, or study approach. We adopt this model for our conceptual framework which furthermore includes personal characteristics and former education.

We suppose that personal characteristics predispose behaviour. Differences in these characteristics cause individuals to react to (learning) situations in their own ways

(Carver & Scheier, 1992). Many researchers also underpin the importance of individual differences in personal characteristics for learning outcome (cf. Busato, Prins, Elshout, & Hamaker, 1998; 2000; Chamorro-Premuzic & Furnham, 2005; Bratko, Chamorro-Premuzic, & Saks, 2006; Caspi, Chajut, Saporta, & Beyth-Marom, 2006). Learners have ideas and beliefs with regard to learning (Stodolsky, Salk, & Glaessner, 1991) and these learning conceptions are essential for the development of learning activities (e.g. Marton & Säljö, 1976; Entwistle, 1991; Van der Sanden, 2004; Lonka & Lindblom-Ylänne, 1996; Dahl, Bals, & Turi, 2005; Marriott & Marriot, 2003). Motivational orientations (e.g. Vermetten, Vermunt, & Lodewijks, 1999; Pintrich, 1995; Liu, 2005) as well as regulation strategies (Slaats, Lodewijks, & Van der Sanden, 1999; Vermetten et al., 1999; Vermunt, 1998; Loyens, 2007; Boekaerts, 2002) have proven to be significant in students' learning processes. Van Bragt et al. (2007) showed that learning conceptions, learning orientations and regulation strategies were not separated concepts, but rather different aspects of one concept referring to 'personal orientations on learning'. The quality of learning processes and study outcome is assumed to be heavily dependent on the quality of students' study approach (Vermunt & Verloop, 1999). An indirect relationship exists between conceptions and achievement as well as dropout, mediated by actual learning activities (Loyens, Rikers, & Schmidt, 2007). All aspects will be discussed in the next part: (1) Personality characteristics (2) Personal orientations on learning (3) Study approach (4) the relations between these variables (5) Former Education and (6) Study outcome.

3.2.1 Personality Characteristics

In this study the 'Big Five personality characteristics' are used (Salgado, 1997; Chamorro-Premuzic & Furnham, 2003; Conard, 2006; Jackson, 2006) because they have proven to influence learning, especially in competence-oriented learning environments (Busato et al., 1998; 2000). The five personality characteristics examined, are: (1) extraversion; (2) agreeableness; (3) conscientiousness; (4) emotional stability; and (5) autonomy (Hendriks, 1996; 1997; Hendriks, Hofstee, & De Raad 1999a). Extraverts are gregarious, assertive, and generally seek out excitement. Introverts, in contrast, are more reserved, thoughtful, and self-reliant. Agreeableness is a tendency to be pleasant and accommodating in social situations. People with high scores on this dimension are empathetic, considerate, friendly, generous and helpful, have an optimistic view of human nature and are more responsive to others than their peers are (Tobin, Graziano, Vanman, & Tassinari, 2000). Conscientiousness is to be one of the best predictors of performance in the workplace

(Salgado, 1997). It refers to being responsible, dependable, organized and persistent. Students with high scores on this scale are generally hard-working, reliable and are said to be well-organized. Emotional stability refers to the degree of being more or less emotionally secure, more relaxed and calm. A recent study on examining relationships between personality and the use of self-regulated learning strategies by Bidjerano and Dai (2007) shows autonomy contributes to the variance in student GPA (Grade Point Average). Students with high scores on Autonomy, tend to be open and imaginative (Matthews, Zedner, & Roberts, 2006), look for new experiences, have flexibility of thought, are curious, creative and considered to be independent learners.

In general, one can conclude that a consistent relationship between conscientiousness and academic achievement has been delineated (Bidjerano & Dai, 2007). Conscientiousness appears to play a predictive role considering academic achievement in adolescents (Digman, 1989; Bratko et al., 2006; Heaven, Ciarrochi, & Vialle, 2007; Laidra, Pullmann, & Allik, 2007) and the same goes for adults (Duff, Boyle, Dunleavy, & Ferguson, 2004; Chamorro-Premuzic & Furnham, 2005; Conard, 2006; Wagerman & Funder, 2007; see also Noftle & Robins, 2007). With regard to the other four traits (i.e. extraversion, agreeableness, emotional stability and autonomy) the findings considering academic achievement vary (Duff et al., 2004) and show less consistency (Noftle & Robins, 2007) on the one hand. They also show incremental predictive validity (Hendriks, Kuyper, Offringa, & Van der Werf, 2008) on the other, however. Autonomy appears to be beneficial, agreeableness and extraversion vary and a low score on emotional stability places students at risk (Duff et al., 2004). Diseth (2003) also found several relations between extraversion, agreeableness, conscientiousness, emotional stability, autonomy and achievement. For our research it is therefore interesting to gain insights into personality characteristics in predicting study outcome (e.g. Hendriks et al., 2008). In many studies, personality characteristics are conceptualised as a relatively stable base, explaining a disposition to particular patterns of behaviour, cognitions and emotions (Hogan, Hogan, & Roberts, 1996). As a consequence, personality characteristics are likely to influence all kinds of (study) orientations and (study) behaviour: Zhang (2003) concluded, for instance, that personality traits predict learning approaches to a certain degree.

3.2.2 Personal orientations on learning

Learning conceptions are more or less integrated sets of beliefs about different aspects of learning, e.g. what learning is about, how learning proceeds, which learning activities can be deployed to reach certain goals, and which learning environments are supportive (Van der Sanden, Terwel, & Vosniadou, 2000). In the literature about learning conceptions five conceptions are mentioned (Vermunt, 1992) (1) construction of knowledge, which is aimed at building up a personal knowledge network structure; (2) use of knowledge, which emphasizes the practical value of acquired knowledge and experiences; (3) intake of knowledge, which focuses on the intake of information for fact retention; (4) Co-operation, which refers to working together with other students; (5) Being stimulated, which refers to the need to get impulses to learn.

A motivational orientation for the study is a so-called 'catalysator' for the student: this is the intention by which the student learns and how he approaches and interprets the learning environment. The five different motivational orientations used by Vermunt (1992) are: (1) certificate oriented; aiming at getting a degree, (2) vocationally oriented; aiming to become a member of a certain professional community, (3) self-test oriented; aiming to prove to be able to reach one's own goals and prove one's own capacities, (4) personally interested; working from a personal interest in the subject studied, and (5) ambivalent oriented; various motivational orientations to learn, but nothing in particular.

A regulation strategy refers to the way by which the student prefers to regulate himself while studying. The three different regulations strategies are: (1) Self-regulation; student directs himself, (2) External regulation; student needs someone else to direct him, (3) Lack of regulation; student does not know what to do when and why, he does not know where to start and to go (Vermunt & Vermetten, 2004).

Tangney, Baumeister and Boone (2004) conclude that high self-control predicts good adjustment, better grades, and interpersonal success. Bidjerano and Dai (2007) have recently shown that irrespective of the specific features of particular learning situations, students who tend to regulate their efforts are likely to perform better compared to their counterparts lacking these tendencies.

Empirical results by Van Bragt et al. (2007) show that students' learning conceptions, motivational orientations and preferred regulation strategies cluster together into a set of components: students' orientation on learning. Three orientations are found: (1) constructive self-regulation (CSR); (2) reproductive external regulation (RER); (3) ambivalence and lack of regulation (ALR). The first orientation (CSR) is about construction of knowledge, use of

knowledge, co-operation (learning conceptions), vocational orientation, personal interest (motivational orientation), self-regulation (regulation strategy). The second orientation (RER) is built up by intake of knowledge (learning conception), certificate orientation, self-test orientation (motivational orientations), and external regulation (regulation strategy). The third orientation (ALR) contains stimulation, co-operation (learning conceptions), ambivalence (motivational orientation), lack of regulation (regulation strategy). These three orientations directly influence study approach (e.g. Loyens, 2007; Boekaerts, 2002). In our previous research (for more details see Van Bragt et al., 2007) we also found several similar significant contributions from these orientations on study approach.

3.2.3 Study approach

Study approach is defined within the scope of information-processing activities (Vermunt, 1996): processing activities refer to thinking and learning activities that directly lead to learning results, which may take the form of increases in knowledge, understanding and skills. Five different information-processing activities are distinguished: (1) relating and structuring; (2) critical processing; (3) memorising; (4) analysing, and (5) concrete processing. Van Bragt et al. (2007) found that these five aspects are related, and that they cluster into two summarizing components regarding study approach: (1) meaningful integrative approach (MIA), containing relating and structuring, critical processing and concrete processing, and (2) superficial approach (SUA), referring to memorising and analysing. These findings are similar to results within academic settings whereas some consensus has been reached on how to describe learning activities (Coffield, Mosely, Hall & Ecclestone, 2004).

Knowledge construction appeared to be a significant predictor of observed learning activities, which implies that students' beliefs about being the central agent for their own knowledge acquisition have consequences for the actual learning activities they undertake. These observed learning activities emerged as a predictor for dropout (Loyens et al., 2007). In the first year at university, one of the common reasons to explain withdrawal or poor performance is the lack of study and self-management skills (Goldfinch & Hughes, 2007). Meta-analyses on 109 studies by Robbins, Lauver, Le, Davis, Langley and Carlstrom (2004) concluded Psychological and Study skill Factors (PSF) over and above those of socioeconomic status, standardized achievement, and high school Grade Point Average (GPA) predicted college outcomes.

It is known that differences in study outcome are related to a more deep or surface study

approach (Diseth, 2003; Kaldeway, 2006; Zeegers, 2001). Van den Hurk, Wolfhagen, Dolmans and Van der Vleuten (1998) showed that time spent on individual study correlated poorly with scores on short and long-term knowledge measuring tests and that complexity of the relationship self-study time and academic achievement was clearly shown. They therefore emphasized the importance to search for qualitative factors about the way students learn, such as study approach.

The relation between personality characteristics, personal orientations on learning and study approach

Results of the research by Van Bragt et al. (2007) considering differences when entering higher education show a path model considering the variables (1) personality (2) personal orientations on learning and (3) study approach. The model shows the influence of personality characteristics on personal orientations on learning. Furthermore, Van Bragt et al. (2007) found several significant contributions from these personal orientations on Meaningful Integrative Approach (CSR .601**, RER - .097** and ALR -.080**) and Superficial Approach (CSR .175** and RER .293**). Only ambivalence and lack of regulation (ALR) did not contribute significantly in the analysis for superficial approach (SUA). It was concluded that this result is in line with the theoretical assumptions put forward by Curry (1983) and corresponds to the findings of Bakx, Van der Sanden, Sijtsma, Croon and Vermetten (2006). Curry (1983) states that, among other things, personality characteristics influence students' instructional preferences and learning conceptions and Bakx et al. (2006) conclude, that personality characteristics directly influence learning activities and learning conceptions. Busato et al. (2000) and Duff et al. (2004) concluded that learning orientations are related to personality characteristics. Duff et al. (2004) even conceive of learning orientations as a learnt subset of personality, and, furthermore, they claim that besides age and gender, prior educational achievements are significant determinants of learning orientations.

3.2.4 Former Education

The Dutch higher educational system is a binary one and consists of (1) universities of applied sciences (UAS) and (2) research universities. There are two ways to enter UAS: through Senior Secondary Vocational Education (SSVE) on the one hand or through Senior General Secondary Education (SGSE) on the other hand. Until recently, SSVE used to be the final educational phase for all kinds of professions at the middle level in the Netherlands, meant to prepare students to enter the labour market. However, SSVE has recently been

put forward as an explicitly acknowledged alternative way to gain access to HE (Nieuwenhuis, 2006; Van Asselt, 2005), in addition to the general 'secondary road' SGSE. SSVE-students are trained to perform relatively clearly defined professions or tasks. Much emphasis is put on the application of skills and knowledge (Slaats et al., 1999). Workplace and problem-based learning are more natural for SSVE-students. Contrarily, SGSE-students are more acquainted with processing relatively large amounts of abstract and codified information. Consequently, SSVE-students are more familiar with vocationally oriented learning environments, and learning situations that emphasize and enable participation in authentic situations. Acquiring and building up organized and coherent bodies of knowledge, on the other hand, is the common 'practice' of SGSE-students.

Differences in former education as described above, the given binary situation in the Netherlands, but also the existence of implicit expectations about certain types of FE being less or maybe even not at all suitable for UAS and the fact that little is known about the predictive value of FE with regard to dropping out or continuing education we decided to sort out FE as a factor for predicting study outcome.

3.2.5 Study Outcome

Bruinsma (2003) and Van den Berg (2002) put forward that students who drop out raise economic and psychological consequences for themselves, the educational institutions and society. Economic aspects refer to losing study finance for instance or even end up with study debts, but also negative psychological and social aspects like getting discouraged and even discourage others. Educational institutions benefit by a limited length of stay of students, whether they finish their education (if at all possible within four years) or drop out (as soon as possible after starting with school). Finally, society experiences consequences because of the costs which have been made for these students: these costs failed to lead to an increasing access of more highly qualified inhabitants to the labour market (Bruinsma, 2003; 2004; Van den Berg, 2002).

Mäkinen, Olkinuora and Lonka (2004) conclude that non-committed students form the most probable group at risk for both abandoning and prolonging their studies due to a low interest in their current studying. Therefore they need to find personal relevance for their studies to make their orientation become more appropriate. Work-life orientation is said to be the most productive study orientation in terms of study success (cf. Lonka & Lindblom-Ylänne, 1996) and is in line with the participation metaphor proposed by Sfard (1998) whereas learning is seen as participation in a certain community's meaningful

action. Research by Abadzi (2007) suggests that merely financing the ingredients of instruction is not enough to produce learning outcomes; students must also get sufficient time to process the information. Different types and timing of feedback and ways of giving feedback can be used to enhance effectiveness (Hattie & Timperley, 2007) and counselling or other specific forms of intervention which might help students 'at risk' of withdrawing to stay and be successful (Hall, 2001). Zepke, Leach and Prebble (2006) show that being learner-centered could assist student-retention. Prediction and explanation of academic achievement which is mainly operationalized as Grade Point Average and prevention of dropout have been important topics of research in HE (Bruinsma, 2003). In daily practice insights considering differences on an individual level are needed to predict study outcome in order to reduce dropout rates and enhance study success. In this study regarding study outcome two aspects are distinguished: (1) required credits and (2) whether the student stops or continues his/her study. The first aspect of study outcome is operationalized into (1) less than 21 required credits or (2) 21 credits or more, earned during the first six months. This is the critical academical limit in the Netherlands. Students who do not attain the 21 credits-limit (of a total of 42 in an academic year) have to pay back their study costs. The second aspect is 'study continuance'. Students have different options during their first year of study; they can continue their education (category 1), they can switch to another study at the same or even a higher level (category 2), or (category 3) they can drop out and do not continue.

In order to predict study outcome in UAS (required credits and study continuance) we have to determine whether former education and students' personal characteristics (the 'Big Five personality characteristics', personal orientations on learning and students' study approach) are predictive. Figure 3.1 represents the central goal of this study.

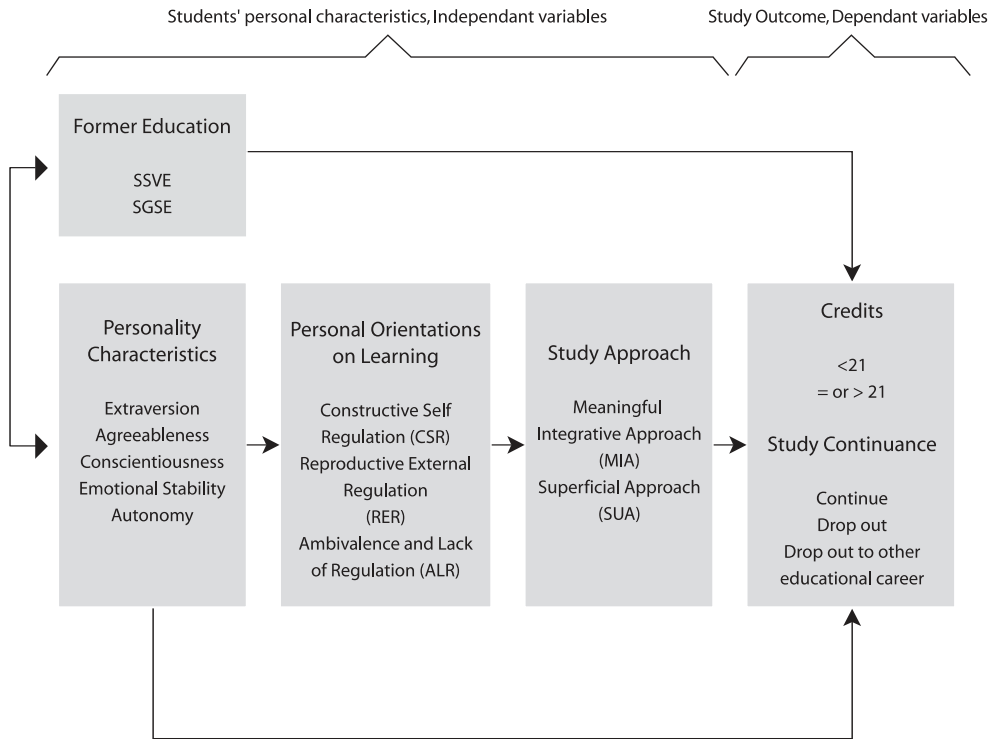


Figure 3.1: Conceptual framework and the operationalizations of the independent and dependent variables

Based on the above mentioned literature three research questions are formulated:

- Which students' personal characteristics predict study outcome?
- Are there any differences considering former education with regards to study outcome and if so, which differences?
- Is there an interaction effect between former education considering students' personal characteristics and study outcome?

3.3 Method

3.3.1 Design

Two questionnaires were administered amongst first-year students entering HE. After one year of study the students' amount of obtained credits and their status were withdrawn from the system of student registration.

3.3.2 Participants

Participants consisted of 2.528 students in HE from a university of applied sciences in the Netherlands. The students were all freshmen, full-time students, enrolled in nineteen different four-year higher educational programs. In our sample 72% are SGSE-students. Of all females 73% are SGSE-students, of all males 71% are SGSE-students. In our sample 48% are female students, which is the same percentage (48.39%) as in the relevant Dutch population of students. Due to missing values (total number of systematic missing data patterns $n=1.090$ and total of unsystematic patterns $n= 268$), the logistic regression analyses have been based on a total of 1.471 students. The analysis confirmed that the missing data were no coincidences. For example, a large group of students did not complete one set of questionnaires.

3.3.3 Materials

The Dutch version of the Five-Factor Personality Inventory (Hendriks, 1997; Hendriks et al., 1999a) is used in this study. This questionnaire has shown to be valid and reliable in various (educational) settings (Hendriks et al., 2008). It has been composed of one hundred statements and measures five aspects of personality; (1) extraversion (2) agreeableness (3) conscientiousness (4) emotional stability (5) autonomy. Students used a five-point Likert scale to indicate to what extent the statement was descriptive of their personality. The second questionnaire is the learning style inventory for HE (Vermunt, 1998) investigating learning conceptions, motivational orientations, preferred learning strategies and learning activities. A five-point Likert scale was used, varying from (1) 'I hardly ever do this' to (5) 'I almost always do this'. This questionnaire has been used in several research projects and has shown its validity and reliability in various (educational) settings (see also Zeegers, 2001; Busato et al., 1998; 2000; Slaats et al., 1999).

The five variables measured in the questionnaire are (1) Constructive self-regulation (CSR); (2) Reproductive external regulation (RER); (3) Ambivalence and lack of regulation (ALR); (4) Meaningful integrative approach (MIA) and (5) Superficial approach (SUA). See Table 3.1 for the number of items of the scales and reliability (Cronbachs Alpha) and Table 3.2 for means and standard deviations.

Table 3.1: Scales of Big Five Personality traits, Personal orientations on learning and Study approach; number of items/scales and reliabilities

Scale	Number of items (n)	Reliability (α)
<i>Big Five Personality Traits</i>		
Extraversion	n = 20	$\alpha = .90$
Agreeableness	n = 20	$\alpha = .83$
Conscientiousness	n = 20	$\alpha = .87$
Emotional stability	n = 20	$\alpha = .88$
Autonomy	n = 20	$\alpha = .82$
<i>Personal orientations on learning</i>		
Constructive self-regulation (CSR)	n = 44	$\alpha = .88$
Reproductive external regulation (RER)	n = 30	$\alpha = .85$
Ambivalence and lack of regulation (ALR)	n = 28	$\alpha = .86$
<i>Study approach</i>		
Meaningful integrative approach (MIA)	n = 16	$\alpha = .87$
Superficial approach (SUA)	n = 11	$\alpha = .84$

Table 3.2: Scales of Big Five Personality traits, Personal orientations on learning and Study approach; Means and Standard Deviations

Scale	M	SD
<i>Big Five Personality Traits</i>		
Extraversion	3.82	.48
Agreeableness	3.71	.40
Conscientiousness	3.42	.46
Emotional stability	3.75	.44
Autonomy	3.56	.38
<i>Personal orientations on learning¹</i>		
Constructive self-regulation (CSR)	-0.02	1.00
Reproductive external regulation (RER)	0.00	.99
Ambivalence and lack of regulation (ALR)	-0.01	.99
<i>Study approach¹</i>		
Meaningful integrative approach (MIA)	-0.01	1.01
Superficial approach (SUA)	-0.01	1.01

¹ Standardized componentscores M=0 and SD=1

3.3.4 Procedure

The questionnaires were administered in the fifth study week by staff of each institute. To all students a brief set of instructions was read out. Next, the students received the questionnaires, as one complete set. Students had to complete the questionnaires in the same order at their own pace and their names were deleted from the data files.

The students did not receive any feedback. After one year of study, obtained credits and status were withdrawn from the system of student registration.

3.4 Data analyses

3.4.1 The explanatory path model

Figure 3.1 represents the model that underlies the data analyses. Two dependent variables (the required 21 or more credits and Study continuance) are related to eleven explanatory variables: former education, five personality characteristics, three personal orientations on learning, and two scales measuring study approach.

Logistic regression analyses are performed in order to answer the research questions in which a dichotomous dependent variable is regressed to former education, personality characteristics, personal orientations on learning and study approach. Firstly rough analyses for Former Education are performed, secondly the same analyses with all variables. Gender is added as a controlling variable because besides traditional work on gender differences also a couple of recent studies conclude gender (amongst other things) to be a predictive variable considering study outcome (Bruinsma 2003, 2004; Wartenbergh & Van den Broek, 2008; Herweijer, 2008; Bailey & Borooah, 2007). The maximum likelihood estimates of the parameters were obtained by means of the Logistic regression module of the Regression procedure in SPSS. Since in the context of a logistic regression analysis standardized regression coefficients are not defined, only the unstandardized coefficients are reported (e.g. Hosmer & Lemeshow, 2000). Missing data analyses have been performed. The total of students in the data file was 2.829 of which 302 students had missing data on either former education, credit, or study continuance. Of the remaining students some more or less systematic patterns occurred, probably as a consequence of the fact that certain scales were not administered. The total number of systematic missing data patterns is 1.090 students. The total of remaining (unsystematic) patterns was 268 students. Only students with complete data on all relevant variables were included in the analyses (N = 1.471).

3.5 Results

Classical chi-square tests for independence revealed that students with a SGSE-background are performing better in this respect than students with an SSVE-background

($\chi^2=9.5125$, $df=1$, $p=.002$), in reading the interpretation of this result the interaction effect between gender and former education should be taken into account⁸.

Study continuance has three categories: 1= continue with present study; 2 = drop out to other educational career, and 3= drop out. Observation of the data shows that very few students (2.7%) switched to another educational career. In order to test whether the subgroups differed considerably with respect to this kind of dropout the variable Study continuance is reduced to two categories: the original category 2 versus the original categories 1 and 3 merged into one. A chi-square test for independence on this table yielded $\chi^2=4.4694$ for $df=3$ and $p=.215$. So, the null hypothesis of no differences between the four groups could not be rejected.

3.5.1 Results of the logistic regression analyses

A logistic regression analysis has been carried out for the variable required credits which is defined as a dummy variable with scores 0 (if less than 21) and 1 (if 21 or more).

Another logistic regression analysis was carried out for the dichotomized variable Study continuance, too. Study continuance is coded 0 when the student dropped out, and 1 when the student chose to continue his present study or switched to another educational career. Former education and Gender are also represented as a dummy variable with score = 0 for SSVE and =1 for SGSE and score = 0 for men and = 1 for women.

Table 3.3 presents the main results of the logistic regression analyses for Credits and Study Continuance. The omnibus chi-square tests for testing whether the dependent variable Credits can be predicted significantly from the entire set of explanatory variables yielded a value of 75.390 ($df=12$ $p=.000$). The omnibus chi-square tests for testing whether the dependent variable Study Continuance can be predicted significantly from the entire set of explanatory variables yielded a value of 93.525 ($df=12$ $p=.000$). Both significant values indicate that Credits and Study Continuance can be predicted by the explanatory variables. Nagelkerke's R² values .085 (credits) and .096 (Study Continuance) indicate that although the relationship between the explanatory variables and these two dependent variables is significant, it still leaves much to be explained.

⁸ For purposes of brevity and clarity we have decided to not report the interaction effects considering Gender. Interaction results can be claimed by contacting the first author.

Table 3.3: Results logistic regression analyses for Credits and Study Continuance (N=1.471)

	Logistic regression analyses for Credits			Logistic regression analyses for Study Continuance		
	B	SE	Odds ratio	B	SE	Odds ratio
Former Education	.13	.17	1.14	.16	.15	1.18
Extraversion	.30	.19	1.36	.13	.18	1.14
Agreeableness	-.09	.21	.91	.00	.19	1.00
Conscientiousness	.69***	.19	1.99	.45**	.17	1.57
Emotional stability	-.05	.23	.95	-.16	.21	.86
Autonomy	-.18	.28	.84	-.07	.25	.93
Constructive self-regulation (CSR)	.02	.11	1.02	.19	.10	1.21
Reproductive external regulation (RER)	.13	.08	1.14	.03	.07	1.03
Ambivalence and lack of regulation (ALR)	-.31***	.09	.74	-.38***	.08	.69
Meaningful integrative approach (MIA)	.09	.10	1.10	.06	.09	1.07
Superficial approach (SUA)	-.09	.08	.91	-.12	.08	.89
Gender	.62***	.17	1.85	.57***	.16	1.77

*p < .05 **p < .01 ***p < .001

Table 3.3 shows that Conscientiousness and Ambivalence and Lack of regulation are significant predictors of both Credits and Study Continuance. The higher the scores on Conscientiousness the more credits students will probably obtain and the more likely they will continue. Students with high scores on Ambivalence and Lack of regulation however will most likely obtain fewer Credits or drop out more easily. Former Education did not come forth as a predictor for Credits or Study Continuance.

Rough logistic regression analysis to examine the predictive value of FE only on credits was not significant either (omnibus chi-square tests yielded a value of .443, df = 1 p = .506). After adding the other covariates in the analysis this result remained unchanged. The same conclusion was drawn for Study Continuance (omnibus chi-square tests for rough logistic regression analysis yielded a value of 1.012, df = 1 p = .314). For Meaningful integrative approach (MIA) and Superficial approach (SUA) no significant results considering the prediction of Credits and Study Continuance were found. Gender was brought into both analyses as a controlling variable and as expected it turned out to be of influence. Female students tend to obtain more credits and continue their studies more often.

3.6 Discussion and conclusions

The central goal of this study is to determine to what degree former education and students' personal characteristics (the 'Big Five personality characteristics', personal orientations on learning and students' study approach) predict study outcome (required credits and study continuance). The main results of this study are the following:

Firstly, there is no empirical evidence in our study that *Former Education (FE)* predicts study outcome.

Secondly, *Conscientiousness* turns out to be a significant predictor for Credits and for Study Continuance: the higher the scores on Conscientiousness the more credits students probably will obtain and the more likely they will continue.

Thirdly, *Ambivalence and Lack of regulation (ALR)* turns out to be a significant predictor of both Credits and Study Continuance. Students with low scores on ALR will most likely obtain more credits and probably also continue more often.

When we take a closer look at the results mentioned above, some interesting considerations emerge.

Former Education did not come forth as a predictor for study outcome in this study, which is a positive result regarding the challenge of Dutch UAS to match up with the growing demands of the knowledge economy. With an increasing flow of SSVE-students into HE it is important to know that not FE itself is a predictor of dropout. Perhaps other predictors are in fact responsible for dropout in general, predictors that are more related to the individual student rather than FE.

Conscientiousness turns out to be a significant predictor: the higher the scores the more credits students will probably obtain and the more likely they will continue. Highly conscientious individuals attempt to achieve their very best by means of good time management and a good organisation of the learning process and they are significantly positively associated with higher school grades across all subjects (e.g. Diseth, 2003).

Conscientiousness is thus one of the personality characteristics that may be a part of an intake assessment. The students' attention could be drawn to a low score at an early stage and assistance through counselling can take place.

Ambivalence and Lack of regulation (ALR) is also a significant predictor of both Credits and Study Continuance. Students with high scores on ALR will probably obtain fewer Credits or drop out more easily. Put in positive words: students with low scores on ALR will most likely reach the borderline more easily and probably also continue more often. ALR implies

that a student does not really know what to do, when and why (Vermunt & Vermetten, 2004). As underlying items indicate, students with an ambivalent orientation on learning most likely have doubts considering their education and the choices they made. In that way it is explicable why ALR can predict dropout (e.g. Loyens, 2007). Non-committed students form a group at risk due to a low interest in their present academic performance and gaining personal relevance for their studies is necessary to make their orientation become more appropriate (Mäkinen, Olkinuora, & Lonka, 2004). If we see learning as a participation in a certain community's meaningful action (cf. Sfard 1998) and work-life orientation is assumed to be the most productive study orientation in terms of study success (cf. Lonka & Lindblom-Ylänne, 1996) the conclusion regarding ALR is important. After all, UAS initiates students for a specific profession and ALR, seen from this point of view, should also be a part of an intake assessment to detect students at risk.

Furthermore, it is remarkable that *meaningful integrative approach (MIA)* is absent as a predictor. This is not in line with the expectation. Diseth (2003) has shown that academic achievement is predicted by approaches to learning. Heikkilä and Lonka (2006) found that approaches to learning, regulation of learning and cognitive strategies were related to each other and turned out to relate to study success.

A study by Goldfinch and Hughes (2007) shows that apart from a low score on the activist learning style scale and low initial confidence in written communication skills, a high initial confidence in self-reliance skills, time management and teamwork form the most significant combination of factors in explaining success.

When the learning environment within schools works from 'opportunity' rather than the prevention of failure, all members of the community still work towards the same goals (Brown, 2005).

The assumption that change in learning behaviour can be influenced relatively more easily than personality characteristics, is commonly accepted (Carver & Scheier, 1992; Curry, 1983; Busato et al., 1998; 2000; De Raad & Schouwenburg, 1996; Hogan et al., 1996). Students must get sufficient time to process the information (Abadzi 2007) within a learner centered environment to assist student retention (e.g. Zepke et al., 2006). Different types and timing of feedback and ways of giving feedback (Hattie & Timperley, 2007) and other specific forms of intervention might help students 'at risk' of withdrawing to stay and be successful. These kind of interventions can scaffold counselling and enhance effectiveness (Hall, 2001). Feedback should vary with stages in development: with personal insights and

self-awareness, acquired through social learning, which is increasingly important with increasing age (Matthews et al., 2006). An increase of self-insight considering one's personality, preferences on personal orientation on learning and study approach embedded within study guidance and counselling by means of working towards the growth of personal relevance might lead to commitment which, in the long term, can be beneficial for all who are involved in the individuals' life time working and learning careers.

3.7 Recommendations for future research

This study shows that predicting leaving or continuing school is complex and multiple. The consequences of study outcome (i.e. drop out or continue) not only have an impact on the level of the individual student but also at institutional and even exceeding levels such as government, finance and society in general. Institutional factors, specifically those that might play a role such as students' perceptions of the learning environment are not included in this research. SAL theory (Students' Approaches to Learning) also supports the existence of two approaches to learning and sees students' learning in its natural setting by understanding the interaction between learners and their environment rather than establishing preferences, or particular ways (styles) of learning (Duff & McKinstry, 2007).

There is evidence that retention rates, and reasons for leaving differ, according to the subject studied (Hall, 2001). We have not taken the different levels and the learning environment into account in this study but we suggest further research on this matter. Furthermore, the dropout process most likely differs from the continuing process and thus predictive variables might be distinct. Additional research on this matter should be performed.

Almost all results in this study were obtained by self-reports of students. Self-reporting is a good way to measure personal views (Vermetten, Lodewijks, & Vermunt, 1999), skills (Metz, Caccamise, & Gustafson, 1997) and points to actual differences considering strategy-use (Zimmerman & Martinez- Pons, 1988). The results of our study (a combination of study outcome as an objective measurement and the self-reports as mentioned earlier) might help by developing intake assessments in the future.

Furthermore, it might be interesting to compare personality characteristics and students' orientations on learning for more mature students to those of first-year students. Study approach measured before starting within UAS should also be taken into account.

Students' characteristics can change significantly during their first academic year, with the

exception of personality characteristics (Bakx et al., 2006). The role of the learning environment considering relations between student characteristics and their personal orientations on learning and their study approach (e.g. Duff & McKinstry, 2007) can be taken into account.

In a further study we will search for factors, which can be assessed in the beginning of the academic year and have the potential to predict study success later. Our results can be used in an integration of research synthesis or a unified theory considering educational and psychological aspects related to college outcomes which absences have been reported (Zepke & Leach, 2007; Zepke et al., 2006; Robbins et al., 2004). Also Gender, the controlling variable that turned out to be of significant influence, should be a part of further research.

Why students drop out or continue their educational careers: A closer look into differences in study approaches and personal reasons

Abstract

The central goal of this study is to gain insight into students' study approach, their personal reasons and the relations between these two for students who continue or drop out from the educational system within one year. Results of our questionnaire study show that students who continue their educational careers show higher scores on a meaningful integrative study approach when entering Higher Education, than students who drop out. Our questionnaire regarding personal reasons to drop out revealed three scales: (1) Perception and experience of educational and organizational aspects, (2) Pragmatic and personal circumstances and (3) Loss of interest in their future occupations.

Personal reasons to continue also shows three scales: (1) Perception and experience of learning environment quality, (2) Pragmatic and personal orientation and (3) Future occupational identity.

Dropout-students' scores on meaningful integrative study approach are negatively related with perception and experience of educational and organizational aspects, while the superficial study approach positively correlates with pragmatic and personal circumstances. With regard to students who continue, high scores on meaningful integrative study approach relate positively to all three reasons: future occupational identity, perception and experience of learning environment quality and pragmatic and personal orientation. No relation between the superficial study approach and reasons to continue are found in this group.

4.1 Introduction

Higher Education (HE) in the Netherlands consists of two distinctive institutions: (1) Universities of Applied Sciences and (2) Research Universities. There are two ways to enter Dutch Universities of Applied Sciences (UAS): (1) through Senior Secondary Vocational Education (SSVE) and (2) through Senior General Secondary Education (SGSE). The SSVE route is put forward as an explicitly acknowledged new way to gain access to UAS (Nieuwenhuis, 2006; Van Asselt, 2005), in addition to the general 'secondary road' through SGSE. An increase of students from SSVE is necessary because of the demands facing the Dutch knowledge economy. Enrolment in UAS grows in the Netherlands (HBO-raad, 2009c): in the second half of the twentieth century more SSVE-students entered UAS (see Table 4.1). At the same time more students drop out as well. In 2006 overall UAS dropout after the first year of study was 16% (12.723 fulltime students).

Table 4.1: Drop out female and male students within one year after the start of their study
(Source: Central Bureau for Statistics, The Netherlands, 2008)

Year	Enrolment		Drop out		
	female	male	female	male	
2003		72.630 total			9.442 (13%)
	37.800 (52%)		34.830 (48%)	4.536 (12%)	5.225 (15%)
2004		76.160 total			10.662 (14%)
	39.460 (52%)		36.700 (48%)	4.735 (12%)	5.505 (15%)
2005		76.860 total			10.760 (14%)
	40.110 (52%)		36.760 (48%)	4.813 (12%)	5.514 (15%)
2006		79.520 total			12.723 (16%)
	41.870 (53%)		37.650 (47%)	6.281 (15%)	6.777 (18%)

One of the priorities resulting from the Conference of European Ministers responsible for HE (Leuven and Louvain-la-Neuve, April 2009) is that UAS have a key role in the economic recovery and development within European society (HBO-raad, 2009b). Table 4.1 shows an increase considering enrolment, which matches the need of the knowledge economy. On the other hand society is confronted with an increasing amount of students switching and dropping out. Dropout has economic and psychological consequences for the student, the educational institutes and society in general (Bruinsma, 2003; Van den Berg, 2002). Society invests in the education of students and dropout is a loss of money. Furthermore, the increasing amount of dropouts counteracts the desire and the potential of HE to meet the demands facing the Dutch knowledge economy. Basically, the unnecessary dropout of HE students is seen as a waste of human capital. For this reason more attention is

raised on factors which might influence students' study outcome in terms of drop out or continuation.

The mainstream research within academic contexts considering dropout focuses on students' study approach. Study career guidance often departs from the point of view that study approach (together with for instance personality, goal orientation and motivation) determines in a large matter whether students obtain sufficient progress and finally get a degree or not. Also in the perception of many counselors the quality of students' study approach is the most determining factor for study success. An other research stream has been inspired by so-called interaction models (Spady, 1970; Tinto, 1975).

These models are based on the idea that the quality of the interaction between student and school determines whether the student decides to quit or not (Bruinsma, 2004). This approach still inspires researchers nowadays (Meeuwisse, Severiens, & Born, 2009). In order to conduct powerful interventions, study career coaches need to gain insight into possible relevant factors of influence and how these might be related.

The central goal of this study is to gain insight into students' study approach, their personal reasons to continue or drop out and the relations between these two. The focus of this study is not only on students who drop out but also on students who continue their education. A closer look at students' reasons to drop out is obviously of interest, but cognition on successful students' reasons to stay is also considered to be beneficial. Not only the dropout-profile, but also a so-called successful-student-profile might be useful as a grip for study career coaches.

4.2 Conceptual framework

4.2.1 Study approach

The underlying idea of study approach is that the quality of learning processes and study outcome depends on the quality of students' study approach (Vermunt & Verloop, 1999). Based on Vermunt's framework (1992; 1998) four related components regarding students' study approach are distinguished: learning conceptions, learning orientations, regulation strategies and cognitive information-processing activities. Study approach is defined within the scope of information-processing activities which refer to thinking and learning activities directly leading to learning results, which may take the form of increases in

knowledge, understanding and skills. Five different information-processing activities are distinguished (1) relating and structuring; (2) critical processing; (3) memorising; (4) analysing, and (5) concrete processing (Vermunt, 1992). Van Bragt, Bakx, Van der Sanden and Croon (2007) reveal that these five aspects are related, and cluster into two broader components regarding study approach: (1) meaningful integrative approach (MIA), containing relating and structuring, critical processing and concrete processing, and (2) superficial approach (SUA), referring to memorising and analysing. These findings (see Table 4.2) are similar to results within other educational settings whereas some consensus has been reached on how to describe learning activities i.e. deep approach and surface approach (see also Kaldeway, 2006; Marton & Säljö, 1976; Slaats, Lodewijks, & Van der Sanden, 1999).

Table 4.2: Loadings of MIA and SUA (including number of items/scales and reliabilities) on Varimax rotated components for five different information-processing activities (Van Bragt et al., 2007)

Scale	MIA n = 11 $\alpha = .84$	SUA n = 16 $\alpha = .87$
Relating and structuring	.82	.19
Critical processing	.82	.09
Memorising	-.08	.88
Analysing	.28	.80
Concrete processing	.78	-.03

Study approach or approaches to learning is a main topic in educational student learning literature (Coffield, Mosely, Hall, & Ecclestone, 2004; Duff & McKinstry, 2007; Entwistle & Ramsden, 1983; Marton & Säljö, 1976; Marton, 1981). Much of this research stems from the work of Marton and Säljö (1976) who studied students' learning conceptions in a specific learning situation and introduced two contrasting concepts being (1) a surface and (2) a deep conception. These learning conceptions are steering for the way how students approach their study. This way of interpreting learning conceptions gave rise to the deep-surface approach to learning dichotomy. A deep study approach is associated with students' who construct and understand the meaning of the content to be learned: students look for the meaning of that what is studied and relate it to other experiences and ideas in a critical way.

The surface study approach on the other hand refers to students' who learn by memorizing and reproducing the factual content (Gijbels, Van de Watering, Dochy, & Van den Bossche, 2005). These students avoid understanding a subject and instead focus on memorization

(rote learning). Furthermore, they isolate their existing ideas from the things they learn which eschews comprehension and consequently, is an ineffective tool in mastering any complex subject.

There are differences in achievement which can be explained by qualitative activities in study approaches (Kaldeway, 2006). Diseth (2003) e.g. found that academic achievement is predicted positively by deep learning conceptions which influence deep learning activities. In general the use of a deep approach is thought to lead to greater academic success and higher quality learning outcomes than studying from a superficial learning conception (Snelgrove & Slater, 2003; Zeegers, 2001). We consider creating possibilities for change and enhancing consciousness about one's self on behalf of positive personal growth, one's own constructive processes and awareness to be crucial in the student's further development and consider study approach to be important in research on reducing dropout and enhancing study success. A big part of the variance however can probably still not be explained by the study approach perspective per se. Next to study approach, we are interested in what else could cause students to drop out or continue.

4.2.2 Students' reasons to continue and reasons to drop out

To shine light onto students' personal reasons to drop out or continue we are wondering if there are differences or similarities between the two groups, considering their reasons to quit or continuing their study. After several qualitative interview studies at our UAS by which we studied opinions and perceptions by for instance policymakers, career counselors and students' answers on open questions in various exit interviews, a number of reasons prevailed (Van Bragt, 2004). The interviews were inspired by several theoretical findings. Lewin (1936) stated for instance that behavior is a function of a person and the environment: an individual relies on his inner urges (like wishes and expectations) as well as on the pressure of the surroundings (for instance wishes and expectations of others). The learning environment is thus presented roughly as a subjective whole composed by the goals of both.

Murray (1938) elaborated on this model by presenting the Need and Press Model, a model by which personal needs are determined by personality characteristics regarding certain goals and learning environment characteristics which determine specific goals by social pressure. The way a student sees his learning environment and experiences it within the momentary situation might help to understand a students' behavior and his reasons to

either drop out or continue. Seen from the perspective of Attribution Theory of Motivation (Weiner, 1974) which describes how the individual's explanation, justification, and excuses about self or others influence motivation interesting questions considering students reasons to drop out or continue arise. Weiner (1974; 1992) was one of the first psychologists who focused on relating the attribution theory to education. Three dimensions that characterize success or failure can be traced: 1) locus of control (internal vs. external), 2) stability (do causes change over time or not) and 3) controllability (causes one can control such as skills vs. causes one cannot control such as luck, others' actions, etc.). For example, the internal /external locus of control seems to be related to feelings of self esteem, stability relates to future expectations and controllability is connected to emotions such as anger, pity or shame. Weiner (1992) states that all causes for success or failure can be categorized within these three dimensions in some way. With regard to the reasons to drop out or continuing as seen in this study the locus might be interesting: there might be differences in the reasons between the two groups. The locus of control indicates to which extent a student seeks the causes of whatever takes place within or outside himself. Roughly two ends of a continuum (not an either or typology) can be distinguished: internality and externality (Lefcourt, 1966). Rotter (1975) concluded that internals tend to attribute outcome to their own control, they believe that their grades are achieved through their own efforts and abilities, they feel responsible for their success or failure and the results are attributed to their own behavior, character and good or bad qualities. Externals on the other hand tend to attribute outcomes to external circumstances such as the learning environment, a higher source, good or bad luck, social position, other people etcetera. Hence, externals are less likely to expect that their own efforts will result in success and are therefore less likely to work hard for high grades (e.g. Kormanik & Rocco, 2009).

Our qualitative interview studies (Van Bragt, 2004) revealed no clear contours at first: 'reasons' varied from personal circumstances such as psychological problems, the amount of working hours besides studying, relationship issues, until making the wrong choice. Perhaps if we take a closer look at the widespread reasons we might discover constructs by which we learn more about students own reasons?

The perception of issues related to the organisation by or within the school itself can be a reason for students to continue or drop out, for instance whether the didactical skills of teachers or study career counseling is sufficient. Reasons related to personal perceptions of the profession like 'the future profession is not interesting anymore' and reasons related

to changes considering one's future job perspective might also cluster together (Borghans, Coenen, Golsteyn, Huijgen, & Sieben, 2008). Especially in UAS this is important because UAS prepare students for a specific profession. When the demands considering future occupational identity is not in line with the expectations or even the personal development of the student himself, it might cause turn over or drop out. On the other hand, one can imagine that when the future occupational identity is in line with expectations and development as wished for it might even be strengthened and thus a reason to continue. More pragmatic reasons are modifying such as 'it is located too far from home', 'I have to travel much' or 'I have to live on my own and it takes a lot of effort'. Other studies searched for reasons to drop out in general (Lacante, Lens, De Metsenaere, Van Esbroeck, De Jaeger, & De Coninck, 2001). Wartenbergh and Van den Broek (2008) found that the most important reason to drop out was personal circumstances, secondly a lack of motivation and thirdly a wrong study choice and trouble with the way education was offered. Meeuwisse and colleagues (2009) recently performed a study into reasons for withdrawal from higher vocational education and made a comparison between ethnic minority and majority non-completers. They found six factors representing these reasons: home situation, future job, quality of education, ability, culture and finally content of education.

4.2.3 Educational Career: Drop out or continue

Most studies on academic achievement use an overall indicator of achievement as a criteria measure: Grade Point Average (GPA) is the most frequently used. Duff and McKinstry (2007) and O'Connor and Paunonen (2007) recommend decomposing the broad criterion variable 'academic achievement' into specific components. In this study we operationalize study success as study continuance on the one hand and drop out on the other hand. Students who drop out are those students who decide at a certain moment during the year to quit the study they started with. Whether they continue the following year in another or the same study at the same level of HE, continue at a lower level of education or completely drop out of the educational system is not the subject of this study. In this study all these students are assigned as dropouts. Students who drop out but continue with a study at a higher level of HE are added to the students who continue their educational career because this group of students uses UAS as a steppingstone to a higher level and therefore this specific group of students will not be considered as 'regular' dropouts.

4.2.4 Research questions

The following three research questions guide the present study:

1. Are there any differences regarding study approach between students who drop out and students who continue their education after one study year?
2. What are students' personal reasons to drop out or continue their study?
3. Which relations are there between students' study approach and students' reasons to drop out or to continue?

4.3 Method

4.3.1 Design

This study is part of a larger survey study. The study was set up according to a longitudinal, within- and inter-subjects design in order to study intra-individual as well as inter-individual changes.

The first measurement (study approach) is administered in the fifth study week by staff. The second questionnaire considering reasons to continue or drop out is administered approximately one year later. After one year of study in HE study results of all participants are retrieved from the school system and added to the data.

4.3.2 Participants

Data considering students who continue have been collected after one year of study in HE. In total 1.176 second year students who continued a full time bachelor education filled in their forms (54% females). The response rate for this group is 47%. Students who dropped out have been questioned during the intermediate year. The response rate for this group is 31%. Of all the students who stopped 288 filled in their forms (47% females).

4.3.3 Data collection

All students received the questionnaires considering study approaches and reasons to continue or drop out as one complete set and did not receive any feedback. After one year in HE the students' amount of obtained credits and their status (whether they dropped out or are still studying) are withdrawn from the system of student registration. The questionnaires have been administered by e-mail to students who dropped out, as soon

as possible, when they had to arrange their paperwork. All students involved completed the questionnaires voluntarily.

4.3.4 Instruments

4.3.4.1 Measuring study approach

The questionnaire used in this study is a part of Vermunt's learning style inventory for HE (1998). It has shown its validity and consistency in various (educational) settings (e.g. Zeegers, 2001; Busato, Prins, Elshout, & Hamaker, 1998; 2000; Slaats et al., 1999). We used the original Vermunt-scales. Earlier research showed that it is possible to reduce these to two components: (1) Meaningful integrative approach (MIA) and (2) Superficial approach (SUA). These two components have proven to be reliable (for details see Van Bragt et al., 2007). A five-point Likert scale is used, varying from (1) 'I hardly ever do this' to (5) 'I almost always do this'.

4.3.4.2 Measuring reasons

The various items considering reasons to drop out and reasons to continue were identified in literature (Lacante et al., 2001; Wartenbergh & Van den Broek, 2008) and reasons to drop out from Higher Education gathered in UAS qualitative research (Van Bragt, 2004). Based on this, we constructed two retrospective questionnaires using a five-point Likert scale, varying from (1) 'I completely disagree with this' to (5) 'I completely agree with this'. The items of both questionnaires were formulated in opposite ways: the questionnaire measuring reasons to drop out consisted of 28 items, the one measuring reasons to continue consisted of 32 items. The four additional questions for students who continued were a result of findings throughout the year. Examples of items from both questionnaires⁹ can be found in Table 4.4 and 4.5.

4.4 Data analyses

For the first research question t-tests for both MIA and SUA were conducted. In order to answer the second research question first a Principal Component Analysis (PCA) was carried out to investigate the construct validity of the factors. Cronbach's alpha (α) is used considering the reliability of the factors. A correlation matrix is carried out in order

⁹ Both complete questionnaires are available by contacting the first author.

to answer the third research question. Only datasets from students with complete answers on all relevant variables were included in the statistical analyses.

4.5 Results

To answer the first research question *'Are there any differences regarding study approach between students who drop out and students who continue their education after one study year?',* mean differences between the two groups are assessed by t-tests (see Table 4.3). The sample size is N = 2.114 for MIA with 1.584 continuing students and 530 dropouts. For SUA the sample size is N = 2.109 with 1.580 students who continue and 529 dropouts.

Table 4.3: Results for Meaningful Integrative Approach (MIA) and Superficial Approach (SUA)

	N		Mean		SD	
	MIA	SUA	MIA	SUA	MIA	SUA
Students who drop out	530	529	3.00	3.11	.51	.51
Students who continue	1.584	1.580	3.08	3.13	.50	.54

A significant difference between both groups is found on MIA when students enter HE ($t = 2.9, df = 2112, p = .004$). Students who continue their educational career score higher when entering HE on the meaning integrative approach (MIA). The SUA-component shows no significant difference between the two groups.

To answer the second research question *'What are students' personal reasons to drop out or continue their study?',* Factor Analyses (FA) for (1) students' reasons to drop out and (2) students' reasons to continue¹⁰ are carried out: on the items in the questionnaire for students who dropped out and on the questionnaire for students who continued.

Considering reasons to drop out

Results of the FA (N = 288) with oblimin rotation (because of coherence between the factors) on 28 items show three factors. This solution explains 47% of the total variance. Four items were not taken along in the reliability analyses because the absolute value of

¹⁰ Complete output of both Factor Analyses can be requested by contacting the first author.

loading was below 0.4 or items had high loadings on more than one factor. Hence, the factors found are studied upon with respect to logical content meaning. The next three labels fit the factors: (1) perception and experience of educational and organizational aspects, 2) pragmatic and personal circumstances and (3) loss of interest in future occupation. Reliability (Cronbach's α) of the factors yielded respectively .84, .71 and .78 as can be seen in Table 4.4. From this point on, students' reasons to drop out denoted as the three factors mentioned above are used.

Table 4.4: Reasons to drop out with item example: Reliability (Cronbachs Alfa), Number of items, Mean and Standard Deviation (N = 288)

	Reasons to drop out	Reliability	Number of items	Mean	SD
Factor 1	Perception and experience of educational and organizational aspects <i>Item example: I had the feeling the institutes main concern was not with the students</i>	$\alpha = 0.84$	9	2.6	0.8
Factor 2	Pragmatic and personal circumstances <i>Item example: I had a hard time to combine work and studying</i>	$\alpha = 0.71$	10	2.1	0.6
Factor 3	Loss of interest in future occupation <i>Item example: The future profession is not interesting</i>	$\alpha = 0.78$	5	2.9	1.0

Considering reasons to continue

In a similar way, the second FA considering students' reasons to continue (34 items) was carried out. Results of this FA (N = 1.176) with Oblimin rotation (correlated factors) also show three factors. This solution explained 44% of the total variance. Six items were not taken along in the reliability analyses because the absolute value of loading was below 0.4 or items had high loadings on more than one factor. The three factors found were labelled as follows: (1) future occupational identity, 2) perception and experience of learning environment quality and (3) pragmatic and personal orientation. The reliability (Cronbach's α) yielded respectively .91, .84 and .53 (see Table 4.5). From this point, students' reasons to continue denoted as the three factors mentioned above are used. Results concerning the third factor, Pragmatic and personal orientation, should be interpreted with caution because the reliability is considered to be low.

Table 4.5: Reasons to continue with item example: Reliability (Cronbachs Alfa), Number of items, Mean and Standard Deviation (N = 1.176)

	Reasons to continue	Reliability	Number of items	Mean	SD
Factor 1	Future occupational identity <i>Item example: The future profession is interesting</i>	$\alpha = 0.91$	11	3.9	0.5
Factor 2	Perception and experience of learning environment quality <i>Item example: I had the feeling the institutes main concern was with the students</i>	$\alpha = 0.84$	8	3.2	0.6
Factor 3	Pragmatic and personal orientation <i>Item example: Combining work and studying went well</i>	$\alpha = 0.53$	6	3.2	0.5

In order to answer the third research question ‘Which relations are there between students’ study approach and students’ reasons to drop out or to continue?’, relations were investigated by means of Pearson correlation coefficients, resulting in two correlation matrices. Table 4.6 firstly reveals that the MIA and SUA are related for both groups ($r=.19$).

If we look at the *dropout group* we see that two of the three reasons to drop out are related: Pragmatic and personal circumstances and Perception and experience of educational and organizational aspects ($r=.30$). With regard to study approach and reasons to drop out two significant correlations are found.

MIA correlates negatively with Perception and experience of educational and organizational aspects ($r=-.23$) and SUA correlates positively with Pragmatic and personal circumstances ($r=.33$). Students who dropped out and had higher scores on MIA had lower scores on reasons related to educational and organizational aspects. Students who dropped out and had higher scores on SUA had higher scores on reasons related to Pragmatic and personal circumstances.

If we look at the *continuing group* Table 4.6 reveals that MIA is positively related to all three reasons to continue: Future occupational identity ($r=.17$), Perception and experience of learning environment quality ($r=.13$) and Pragmatic and personal orientation ($r=.11$). No correlations are found between SUA and reasons to continue.

The correlations between the reasons are all significant for the continuing group (respectively $r=.37$, $r=.25$ and $r=.42$). This is not the case for the dropout group. Regarding the reasons the correlation patrons differ qualitatively between both groups.

Table 4.6: Correlations between students' study approaches (MIA = Meaningful Integrative Approach and SUA = Superficial Approach) and reasons to drop out and correlations between students' study approaches (MIA and SUA) and reasons to continue

Reasons to drop out				
N = 288				
	MIA	SUA	Perception and experience of educational and organizational aspects	Pragmatic and personal circumstances
SUA	.19**			
Perception and experience of educational and organizational aspects	-.23*	.08		
Pragmatic and personal circumstances	-.01	.33*	.30*	
Loss of interest in future occupation	.11	.05	.13	.09

Reasons to continue				
N = 1.176				
	MIA	SUA	Future occupational identity	Perception and experience of learning environment quality
SUA	.19**			
Future occupational identity	.17**	.07		
Perception and experience of learning environment quality	.13**	.03	.37**	
Pragmatic and personal orientation	.11**	.07	.25**	.42**

** Correlation is significant at the 0.01 level (2-tailed); * Correlation is significant at the 0.05 level (2-tailed)

4.6 Conclusions and discussion

The central goal of this study was to gain insight into students' study approach, their personal reasons and the relations between these two for students who continue or drop out from the educational system within one year.

4.6.1 Conclusions

Heikkilä and Lonka (2006) found that, amongst other aspects, approaches to learning is related to study success. Diseth's findings (2003) show that approaches to learning predict academic achievement. This fits our findings, showing that students who continue their educational career after one year of study, score higher on the meaningful integrative approach (MIA) when entering HE. We consider this meaningful integrative approach valuable for learning because students discover and experience different kind of relations,

connect this with their tacit occupational and work specific experiences and develop a long holding idiosyncratic knowledge structure. The fact that students with high scores on the MIA-approach continue their education after one year more than students with low MIA-scores, supports this idea. This study approach might help students to be better equipped in future circumstances and is the most productive study orientation in terms of study success (e.g. Lonka & Lindblom-Ylänne, 1996).

Two comparable questionnaires have been developed: one for students who dropped out and one for students who continued their educational career. Three corresponding main reasons were found for both groups of students: (1) reasons related to future occupations; (2) pragmatic and personal reasons, and (3) perceptions and experiences with issues related to education, organisation and the learning environment. This equity in reasons for both groups is understandable. Pragmatic and personal orientation is a bit of an exception: students who continue have less reasons related to their personal circumstances of which they believe are a reason to continue, which is obvious. However, HE dropout-students often encounter study choice problems because of personal problems (Kunnen, Holwerda, & Bosma, 2008). As can be expected, the continuing students show lower scores on this scale, while the dropout-students report more frequently pragmatic en personal circumstances. Mäkinen, Olkinuora and Lonka (2004) concluded that non-committed students are most likely to abandon or prolong their studies due to a low interest in their current studying, possibly also in their future profession, and a lack of personal relevance. This is in line with our findings.

Weiner's attribution theory (1992) can explain some of our findings regarding the reasons students report for leaving or continuing their study. Summarised, Weiner states: when a student succeeds, he often attributes internally ('my own skill'). When a rival succeeds, some students tend to credit external ('the other has more luck'). When one fails or makes mistakes himself, he will more likely use external attribution, attributing causes to situational factors rather than blaming themselves, for instance reasons related to the learning environment. When others fail or make mistakes, internal attribution is often used, saying it is due to their internal personality factors (Weiner, 1992). The students attribute one way or another but in essence all reasons point in the same three directions. This suggests that the same reasons say something about students who drop out and also about those who continue, the difference is made by the direction of attribution

by the student.

Some interesting relations appeared between students' study approach and their reasons to quit or to stay. High scores on our preferred study approach, the Meaningful integrative approach (MIA) relate positively to all three reasons to continue studying. Next to this, considering the group of dropouts, MIA is negatively related to the dropout reason Perception and experience of educational and organizational aspects. This implies that dropout-students with high scores on MIA, do not drop out because of the education or the organisational aspects. These students end their education because of other reasons, like the future profession they do not really aspire. Indeed, these findings imply that MIA is of value when we would like to combine several predictors into a profile of successful students. However, it is also important to measure the Superficial approach (SUA). This study approach relates to pragmatic and personal circumstances which is an important reason for dropout. We have not proven that students who show very high scores on SUA and very low scores on MIA evidently drop out, but our findings do show that these students might need some extra attention during their study career guiding process regarding issues related to practical and personal problems. A study career coach can keep an extra eye on these students when signalled at an early stage, in order to avoid unnecessary dropout.

4.6.2 Discussion

The relationship between students' approaches to learning and their academic performance was one of the central questions in a cross cultural meta-analysis performed by Watkins (2001) although in the expected direction the results were rather disappointing (-.11 for surface and .16 for deep approaches). Does it help students if we put effort in changing their study approach or is it merely a supplement to the body of knowledge which helps us detecting students at risk so we can be of better assistance? Our results show that study approach is related to reasons to drop out or to continue. This insight might be useful when intake assessments for potential students are designed.

The identification of those who are successful can help us to characterize future successful students, and probably also students at risk. Potential students, interested in entering HE can be assessed in their process towards a deliberate choice to study in HE. Students with scores comparable to scores of those who continue might be stimulated to enter HE. Students who score high on variables predicting dropout can also be detected at an early

stage to be monitored and guided more intensively, when they do enter HE. Reducing dropout is not only a matter of acting when dropout occurs, it is also the openness and the will to learn more about factors of influence to prevent and guide towards success at an early stage. In an intake assessment this knowledge can be used to enhance better flow-through in HE for students in general, not only for the sake of the institute and society considering the increasing dropout rates and consequences for the knowledge economy but also for students themselves in a broad perspective.

Professional development is essential in UAS. Results learn that students' reasons considering their future occupations are a main reason to drop out and on the other hand a reason to continue. Students who drop out report they lost interest in their future profession, or they did not have the right ideas about their future profession from the start on. Students continuing their educational career detected that their future profession fits them well. During periods of traineeships this awareness arises or grows stronger. Awareness in advance considering this particular aspect will cause students to choose their study upon a more realistic future occupational perspective. By that it can reduce unnecessary dropout and enhance study success. Realistic Job Previews (RJPs) are used in the early stages of personnel selection to provide potential applicants with information on both positive and negative aspects of the job (Premack & Wanous, 1985; Roth & Roth, 1995). RJP is a set of activities, all directed towards the same end: providing a more realistic view future job which is under consideration. This way of thinking used in an educational context might result in providing starting student with a realistic picture of the study and the future profession. Overly attractive pictures of the study or the future profession ahead might create unrealistic expectations and diminishes the credibility of the school once it becomes clear that the student has been misled or simply 'recruited'. RJP and similar ways of helping students to choose deliberate for a study in UAS might help to meet their future job and study expectations more accurately and reduce dropout or switch behavior.

Our findings, can be brought together with findings from other studies on dropout and success-factors (e.g. Borghans et al., 2008; Kuijpers & Meijers, 2008; 2009; Lacante et al., 2001; Loyens, Rikers, & Schmidt, 2007; Parker, Hogan, Eastbrook, Oke, & Wood, 2006; Robbins, Lauver, Le, Davis, Langley, & Carlstrom, 2004; Van Bragt, Bakx, Bergen, & Croon, accepted; Wartenbergh & Van den Broek, 2008; Zepke, Leach, & Prebble, 2006; Zepke & Leach, 2007).

All predictors studied can be used to obtain separate profiles of (1) students who are at risk and (2) successful students. Such profiles scanned upon when entering HE might be helpful to detect students at risk and help them at an early stage within student counseling and study guidance during the first year of study. These kind of intake-assessments may help educationalists to design and hence conduct relevant interventions in order to help students at risk with their learning. By enforcing specific interventions study career coaches may consequently bring about change. Insights from Sustainable Educating en Developing (SED), can add extra value. SED is a constructive way of thinking and working which uses insights and strategies on the basis of ecological insights ('linkedness') and high intentions and values such as wellbeing and involvement, by which the quality of interactions can be improved (Laevers & Verboven, 2000; Van Herpen, 2008). Kuijpers and Meijers (2008) concluded that the time available for study guidance is very limited and that the time spent by coaches is most of time with students who are at risk and tend to drop out. High potentials or students who have been at risk but have decided to continue (with success) can for instance help study career coaches by tutoring others. These students are accessible, available and can talk from their own experience. We can learn from these students why they are successful and use this knowledge to help their fellow students who are at risk.

We are aware of some limitations of our study. The first one is related to the both newly developed questionnaires for reasons to drop out or continue. They still have to prove their validity and reliability in other empirical studies. The second one is related to the learning environment as a specific factor of influence. This was not specifically taken into account in this research. Gijbels and colleagues (2005) performed a study on relations between powerful learning environments and changes in learning and conclude that even when the learning environment becomes more challenging the students keep on learning the same way they do. They advise interventions on student characteristics rather than on the learning environment. Kappe, Boekholt and Den Rooyen (2008) conclude that, offering students a variety of learning environments which gives them the chance to develop different ways of learning, does not dramatically change the latter. From a social economic perspective our research group is homogeneous and mostly consists of Dutch speaking indigenous students. Meeuwisse and colleagues (2009) compared ethnic minority and majority non-completers but found no main effect for ethnic background of non-completers, only interaction effects with type of withdrawal (dropout versus switching course or institution) and moment of withdrawing (early or late).

Having students keeping up with a study they prefer, prevent needless dropout and even obtain good results is not just a matter of numbers, specific measurements and instruments utilisation at one specific moment only (e.g. Meeuwisse et al., 2009); it is a matter of individual and flexible combination of all aspects and predictors involved before the start and after entering HE. Creating individual possibilities for change by detecting and conveying opportunities for personal growth and awareness, enhances and stimulates the students' consciousness self by constructive learning processes and study approaches within scaffold guidance and career counseling throughout the first year of study: we consider all of this to be crucial for becoming successful learners and further development of one's self.

5.1 Aim of the study and research questions

The central aim of the study described in this thesis was to gain deeper insight into the relations between students' personal characteristics and study outcome. Deeper insight into these relations can help enhancing study outcome, in order to support students at risk and to prevent dropout more successfully. The present study describes the search for students' key factors regarding study outcome in the first study-year in Higher Education, at a University of Applied Sciences (UAS) in the Netherlands. The participants of the study were full-time students in their first study-year in Higher Education, at the Fontys UAS.

In this study, a distinction is made between students who continue their study and students who drop out. Dropout is considered to be an undesirable study outcome. Dropouts are defined as 'all students who start a study within UAS and end the study within the first 14 months after enrolment'. Dropout is seen as an important concept, because it has considerable economic and psychological consequences for the individual student, as well as for the institute (e.g. Rodríguez & Coello, 2008; Baum & Payea, 2004) and for society in general (e.g. Bruinsma, 2003; Van den Berg, 2002). The Dutch knowledge economy faces an increased demand for higher educated inhabitants (OCW, 2009a) and more graduates from Higher Education are needed. Therefore, UAS need to reduce dropout rates and foster the educational level of students (HBO-raad, 2009c). Learning more about the causes of dropout might contribute to the prevention of dropout and raise the level of Bachelor graduates.

In order to determine key factors predicting study outcome in the first study-year in Higher Education, the present study used a working model at its starting point. This model uses a learning psychological point of view with regard to the individual learner. This point of view has been chosen because of the fact that approximately 80% of study outcome can be predicted by learner-related characteristics (Creemers, 1994; Scheerens, 2000; e.g. De Maeyer & Rymenans, 2004). By focusing on student-related aspects and distinguishing certain aspects in these, it was assumed that a good insight could be gained into the prediction of study outcome for different student groups in UAS. To do so, three concepts

regarding students' personal characteristics were taken as central variables, as can be seen in Figure 5.1. These three concepts are (1) biographical aspects, being former education: i.e. students with a Senior General Secondary Education background (SGSE) or a Senior Secondary Vocational Education background (SVSE), and gender, (2) personality characteristics, and (3) learning patterns, being personal orientations on learning and study approaches. These concepts are considered to be of major importance with regard to study outcome and exhibit a most direct influence on (academic) study outcome (e.g. Bruinsma, 2003; Creemers, 1994; De Maeyer & Rymenans, 2004; De Raad & Schouwenburg, 1996; Feltzer & Rickli, 2009; Loyens, Rikers, & Schmidt, 2007; OC&W, 2004; Robbins, Lauver, Le, Davis, Langley, & Carlstrom, 2004; Scheerens, 2000; Wang, Haertel, & Welberg's, 1993).

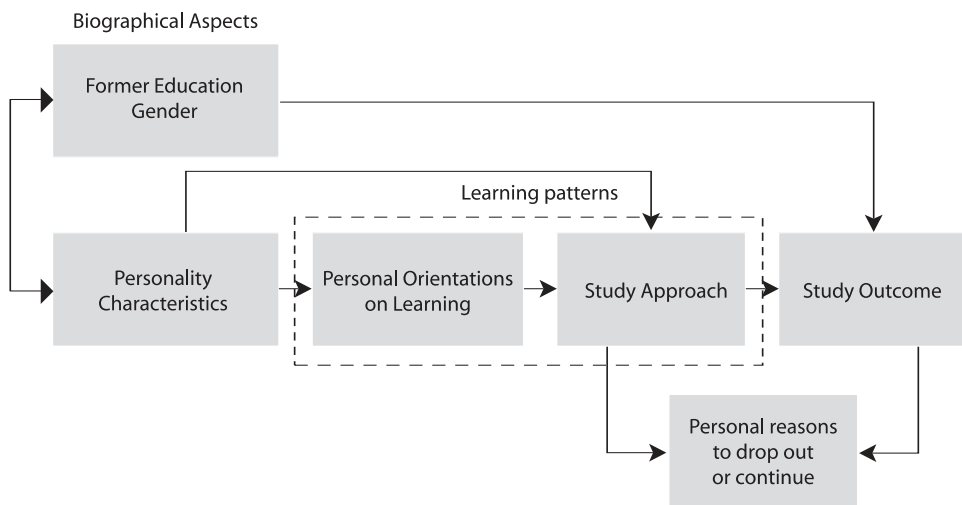


Figure 5.1: Working Model

The possible predictive value of these three central concepts regarding study outcome was studied. Furthermore, students' personal reasons to continue or drop out were investigated as well as how these reasons were related to the students' study approach. The central aim of the study, gaining deeper insight into the relations between students' personal characteristics and study outcome, was addressed by the following three main research questions:

1. What is the influence of personality characteristics on personal orientations on learning which, in turn, influence study approaches and are there any differences between students entering Higher Education with regard to former education (SGSE and SSVE)? (Chapter 2)
2. To what degree do former education and students' personal characteristics (the 'Big Five personality characteristics', personal orientations on learning and students' study approach) predict study outcome? (Chapter 3)
3. Are there any differences between students who continue and students who drop out from the educational system within one year with regard to their study approaches, their personal reasons and the relations between these two? (Chapter 4)

5.2 Main findings

The first research question of this study was: *'What is the influence of personality characteristics on personal orientations on learning which, in turn, influence study approaches and are there any differences between students entering Higher Education with regard to former education (SGSE and SSVE)?'*

With regard to this research question, the main findings were¹¹:

- At the level of personality characteristics, SSVE-students were found to be significant more autonomous and conscientious than SGSE-students.
- In general, all five personality characteristics; extraversion, agreeableness, conscientiousness, emotional stability and autonomy, influenced students' personal orientations on learning, however, not to the same degree. Students who were more extravert, agreeable, conscientious or autonomous had a significant preference for *constructive self-regulation*. Students who were emotionally instable did not show this preference. Students who were more extravert, conscientious or emotionally unstable had a strong preference for *reproductive external regulation*. Students who were more agreeable or autonomous did not show this

¹¹ See chapter 2, paragraph 2.4 for detailed information regarding data analyses i.e. univariate t-tests / Cohen's effect size *d*, the explanatory path model / structural equation analyses and data reduction (principal component analysis). See the same chapter, paragraph 2.5 for detailed statistical results.

- preference. Finally, more conscientious, autonomous or emotionally instable students had a lower preference for *ambivalence and lack of regulation*. These findings fitted both groups of students.
- Furthermore, personality characteristics influenced study approach directly in four ways. This happened for all participating students, regardless their former education. (1) Extraverts did not prefer the meaningful integrative study approach. (2) Highly autonomous students often showed a meaningful integrative study approach. (3) Students with high scores on conscientiousness preferred a superficial study approach and did not prefer a meaningful integrative study approach. (4) The 'emotional stable' students preferred neither the meaningful integrative approach, nor the superficial approach.
 - A second order factor analysis was performed upon the underlying concepts of personal orientations on learning: learning conceptions, motivational orientations and regulation strategies. This analysis revealed three types of personal orientations on learning: (1) 'constructive self-regulation', (2) 'reproductive external regulation' and (3) 'ambivalence and lack of regulation'. One substantial difference existed between SGSE-students and SSVE- students with regard to these three types of personal orientations on learning. SGSE-students showed significant lower preferences on all three personal orientations on learning than SSVE-students did: they reported to be less constructively self-regulated, reproductively externally regulated and they reported less ambivalence and lack of regulation.
 - A second order factor analysis regarding the underlying concept of study approach, being cognitive processing activities, revealed two types of study approaches: (1) 'meaningful integrative approach' and (2) 'superficial approach'. SGSE-students tended to report a more superficial approach than SSVE-students did. No difference between both groups of students was found regarding the meaningful integrative approach.
 - The assumption that students' personal orientations on learning were related to study approach was confirmed. Personal orientations on learning were strong predictors for study approach with the exception

of ambivalence and lack of regulation, which had no predictive value for a superficial approach. Students who reported a more constructive self-regulated orientation preferred a meaningful integrative approach. The other two orientations (reproductive external regulation and ambivalence and lack of regulation) pointed into the other direction. However, these were negatively related to the meaningful integrative study approach. With regard to the superficial study approach both constructive self-regulation and reproductive external regulation were positively related.

- The causal relations between the concepts of the working model appeared to be identical for SGSE-students and SSVE-students with regard to the strength and direction of the relations. This means the working model applied to both groups: there were no specific parts in the working model for one of the groups. The concepts appeared to be 'general', regardless of students' former education.

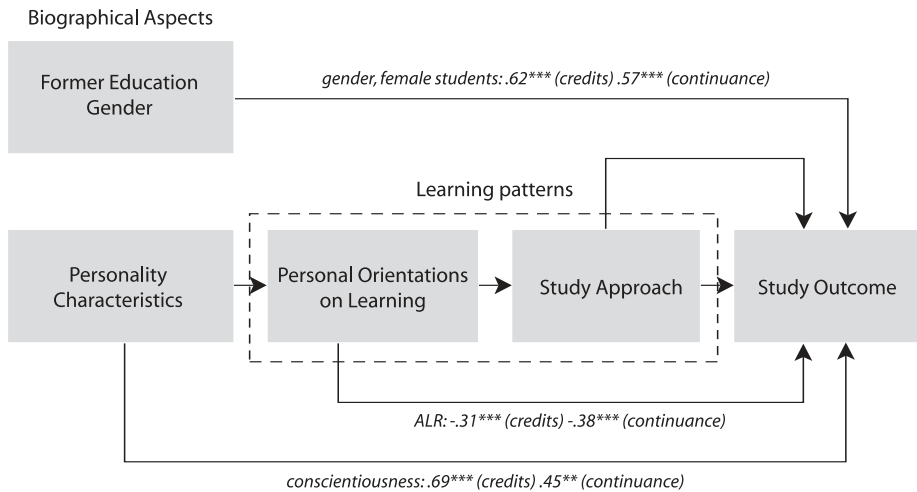
The second research question of this study was: *'To what degree do former education and students' personal characteristics (the 'Big Five' personality characteristics, personal orientations on learning and students' study approach) predict study outcome (required credits and study continuance)?'*

With regard to this research question, the main findings were¹²: (see Figure 5.2)

- Differences in former education (i.e. students originating from SSGE or SSVE) did not seem to be a predictor for study outcome. Gender, however, seemed to be of influence: female students obtained more credits and continued their studies more often than their male counterparts did. This applied to female students from SSGE as well as from SSVE.
- With regard to personality characteristics, conscientiousness turned out to be a significant predictor for study outcome. It could be concluded that being more conscientious was beneficial with regard to study outcome.
- With regard to students' personal orientations on learning, ambivalence and lack of regulation seemed to matter: students with high scores on this orientation obtained fewer credits and dropped out more often.

¹² See chapter 3, paragraph 3.4 for detailed information regarding data analyses i.e. the explanatory path model / logistic regression analysis. See the same chapter, paragraph 3.5 for detailed statistical results.

- Finally, the two different types of study approaches, 'meaningful integrative approach' and 'superficial approach', showed no significant influence on study outcome.



* $p < .05$
 ** $p < .01$
 *** $p < .001$

ALR = Ambivalence and Lack of Regulation

Figure 5.2: Results logistic regression analyses (N=1.471)

The third research question of this study was: 'Are there any differences between students who continue and students who drop out from the educational system within one year with regard to their study approaches, their personal reasons and the relations between these two?'

With regard to this research question, the main findings were¹³:

- Significant differences existed between students who dropped out and those who continued with regard to their study approach. Students who continued, scored significantly higher on the meaningful integrative approaches when entering UAS.

¹³ See chapter 4, paragraph 4.4 for detailed information regarding data analyses i.e. t-tests, Principal Component Analysis (PCA), reliability measurements by using Cronbach's alpha and correlation matrix. See the same chapter, paragraph 4.5 for detailed statistical results.

- Students' personal reasons to drop out or to continue their study were threefold. Principal Component Analysis revealed three reliable main factors, as being reasons for leaving education or for staying in their educational program. The three main reasons were identical for dropouts and for students who continued, but these reasons corresponded in the opposite direction. These reasons were: (1) students' views on their 'future occupations', (2) 'pragmatic and personal matters', and (3) students' 'perceptions and experiences with issues related to education, organization and the learning environment'.
- Students who dropped out most frequently reported pragmatic and personal circumstances to be the reasons for ending their study. Personal circumstances in combination with issues related to education, organization and the learning environment were often mentioned as a cause for leaving education. On the other hand, issues related to future occupation were a reason to drop out as well. Dropout students' expectations of the future profession eventually turned out to be different from reality.
- Students who did proceed their studies, claimed that their future profession was a reason to stay, next to issues related to education, organization and their learning environment. All three reasons to continue were of major importance for these students. This implied that students who continued to derive their motivation for continuation derived this from a combination of all three reasons, not from one single reason in particular.
- Regarding the relation between study approach and these three reasons, differences between students who dropped out and continuing students existed. Dropouts with a meaningful integrative study approach apparently dropped out less often, due to educational and organizational aspects. Dropouts with a superficial study approach dropped out more often due to pragmatic and personal circumstances. For continuing students, the superficial study approach was not related to reasons to continue their study. Their meaningful integrative approach was related to all three reasons.

5.3 Discussion

Based on the conclusions for each research question separately, the *main conclusions* for each research question are drawn. These conclusions are important for various reasons. Some of the conclusions are in line with the expectations whereas other conclusions contrast with accepted views. Furthermore, the relevance of several conclusions is scientific or practical. In the next paragraph each research question and its main conclusions will be discussed in more detail.

Discussion regarding the main conclusions of the three research questions

The first research question of this study was: *'What is the influence of personality characteristics on personal orientations on learning which, in turn, influence study approaches and are there any differences between students when entering HE with regard to former education (SGSE and SSVE)?'*

With regard to this research question, the first main conclusion is that the findings reported in this dissertation confirm that personality characteristics influence personal orientations on learning which, in turn, influence study approach. Furthermore, personality characteristics influence study approach directly. This conclusion is valid for SGSE-students as well as for SSVE-students. Next, there are differences between students with regard to former education with respect to personality characteristics and learning patterns, personal orientations on learning and study approach when entering UAS.

The first main conclusion mentioned above, is in line with the theoretical assumptions put forward by Curry (1983) and Spencer and Spencer (1993) and corresponds to the findings of other research (e.g. Bakx, Van der Sanden, Sijtsma, Croon, & Vermetten, 2006; Bruinsma, 2003; Busato, Prins, Elshout, & Hamaker, 2000; De Raad & Schouwenburg, 1996; Duff, Boyle, Dunleavy, & Ferguson, 2004; Feltzer & Rickli, 2009; Loyens et al., 2007; Robbins et al., 2004; Wang et al., 1993). These researchers stated, among other things, that personality characteristics are a meaningful determinant of an individual's orientation on learning and show a strong relationship with study approach.

It was expected that the relations between the variables in the model would be stronger for the SSVE- students than for the SGVE-students, because the two groups of students have different educational backgrounds when entering UAS. The two types of former education result in a diversity of students with distinctive educational experiences. These experiences might have an effect on the student himself and on his study outcome in UAS later on. For instance, recent research showed that former education is a meaningful

determinant of an individual's orientation on learning (Duff et al., 2004).

Taking a developmental perspective, it was assumed that SSVE-students' experiences with a wide range of learning techniques and instruction methods would lead to relatively strong interrelations between the different concepts in our working model, making up the so-called 'hidden base', consisting of personality characteristics and personal orientations (Spencer & Spencer, 1993). However, the fit of the model applied to both SGSE-students and SSVE-students for strength and direction of the relations, and no specific aspects could be specified for one of the groups. This might be due to the high scores on self-test orientation by the SSVE-students: self-test orientation is indicative of an ambivalent attitude towards one's study. Because of the time of our study (entrance in UAS) it may be the case that SSVE-students were still a bit hesitant about their chances of success. Differences found in this study may be less prominent than expected.

As delineated earlier, the fit of the model applied to both SGSE-students and SSVE-students. However, differences between these two groups of students have been found with respect to personality characteristics and learning patterns, personal orientations on learning and study approach when *entering* UAS.

With regard to personality characteristics, SSVE-students scored higher on autonomy and conscientiousness than SGSE-students. This is in line with findings from other research: in their review, Roberts, Robins, Trzeniewski and Caspi (2003) concluded that, in general, conscientiousness and agreeableness tend to go up during adulthood. On average, SSVE-students are two years older than SSGE-students. In their phase of life, two years may account for a difference. Furthermore, students' personality characteristics (agreeableness, conscientiousness and autonomy) can slightly change during the first educational year findings (Bakx et al., 2006).

With regard to students' personal orientations on learning, SGSE-students show lower preferences on all three personal orientations on learning than SSVE-students do: in comparison with SSVE-students they report less constructive self-regulation, reproductive external regulation and less ambivalence and lack of regulation. Students' personal orientations on learning refers to their view on learning, the way they are motivated and how they regulate themselves. High scores on constructive self-regulation are generally seen as beneficial with regard to study outcome (Bidjerano & Dai, 2007; Tangney, Baumeister, & Boone, 2004; Vermunt & Vermetten, 2004). SSVE-students score low on this orientation, which might have a negative influence on their study outcome. Opposite to constructive self-regulation, high scores on the two other orientations, reproductive

external regulation and ambivalence and lack of regulation, are generally seen as disadvantageous for study outcome. It indicates problems for students concerning the control of the learning process. Students with high scores on these orientations might drop out more easily (e.g. Bruinsma, 2003). Specifically, the combination of ambivalence and lack of regulation is considered to be the most disadvantageous orientation with regard to study outcome (e.g. Vermetten, Vermunt, & Lodewijks, 1999). SSVE-students show lower preferences for both of these orientations which might have a positive influence on their study outcome.

Also, differences are found with regard to study approach between SGSE-students and SSVE-students. SGSE-students tend to report a more superficial approach than SSVE-students do. A superficial approach is thought to be counterproductive with regard to study outcome because the information is not internalized and integrated in the students' own new and improved constructs.

A meaningful integrative approach is associated with students who construct and understand the meaning of the contents to be learned. Approaches like these are highly valued in Higher Education (Zeegers, 2001). They are generally assumed to be beneficial with regard to study outcome because students give meaning themselves and integrate the new things they learn with what was learned in the past. However, no difference between both groups of students has been found regarding the meaningful integrative approach.

The second research question of this study was: *'To what degree do former education and students' personal characteristics (the 'Big Five personality characteristics', personal orientations on learning and students' study approach) predict study outcome (required credits and study continuance)?'*

With regard to this research question, the first main conclusion is that 'gender', 'conscientiousness' and the personal orientation on learning 'ambivalence and lack of regulation' are *the three key factors predicting study outcome*. These are the three key factors because they were significantly related to study outcome (see Figure 5.2). Contrary to the expectations, former education turns out to be not a key factor predicting study outcome. The first key factor predicting study outcome turned out to be gender. As expected, female students obtained more credits and continued their studies more often than their male counterparts did (e.g. Bailey & Borooah, 2007; Bruinsma, 2003; 2004; Feltzer & Rickli, 2009; Finn & Rock, 1997; Herweijer, 2008; Jorgensen, Ferraro, Fichten, & Havel, 2009; Wartenbergh &

Van den Broek, 2008).

Conscientiousness refers to being responsible, dependable, organized and persistent. Students with high scores on this characteristic are generally hard-working, reliable and are said to be well-organized. As expected, the second key factor predicting study outcome in the present study was conscientiousness. Several studies found comparable results regarding the positive effects of conscientiousness on study outcome (e.g. Bakx, Vermetten, & Van der Sanden, 2003; Bidjerano & Dai, 2007; Bratko, Chamorro-Premuzic, & Saks, 2006; Chamorro-Premuzic & Furnham, 2005; Conard, 2006; Digman, 1989; Duff et al., 2004; Furnham, Christopher, Garwood, & Martin, 2007; Heaven, Ciarrochi, & Vialle, 2007; Hendriks, Hofstee, & De Raad 1999a; Laidra, Pullmann, & Allik, 2007; Nofle & Robins, 2007; O'Connor & Paunonen, 2007; Teune, 2004; Wagerman & Funder, 2007). As delineated earlier, SSVE-students scored significantly higher on the second key factor, conscientiousness, than SGSE-students did.

In a recent study amongst young students, amongst others, extraversion was negatively related to performance (Petrides, Chamorro-Premuzic, Frederickson, & Furnham, 2005). Duff et al. (2004) found emotional stability to be negatively correlated with academic performance. The present study did not confirm these latter two findings regarding predictive value of extraversion and emotional stability for study outcome.

The third key factor was Ambivalence and Lack of Regulation. As explained earlier, high preferences for Ambivalence and Lack of Regulation are generally seen as disadvantageous for study outcome because they indicate problems for students concerning the control of the learning process. Students with high scores on these orientations might drop out more easily (e.g. Bruinsma, 2003; Vermetten et al., 1999). The present study confirms this. As delineated earlier, SSVE-students scored significantly lower regarding these personal orientations on learning than SGSE-students.

The two different types of study approaches, 'meaningful integrative approach' and 'superficial approach', showed no significant influence on study outcome. The relationship between students' approaches to learning and their academic performance was one of the central questions in a cross cultural meta-analysis performed by Watkins (2001). Although the results were in the expected direction, the effects were rather small (-.11 for surface and .16 for the meaningful approaches). This, alike the results of the present study, is not in line with the general assumption that differences in achievement can be explained by qualitative differences in study approaches (Kaldeway, 2006). Other research (Diseth, 2003) shows, for instance, that academic achievement was predicted positively

by deep learning conceptions which influence deep learning activities. In general, the use of a deep approach is thought to lead to greater academic success and higher quality learning outcomes than studying from a superficial learning conception (Snelgrove & Slater, 2003; Zeegers, 2001). As stated above, the present study did not confirm the relation between deep study approach and study outcome.

Furthermore, little has been known about the predictive value of former education with regard to study outcome until now. Although former education could actually influence study outcome, it was often neglected as a predictive variable (e.g. Bailey & Borooah, 2007; Herweijer, 2008; Wartenbergh & Van den Broek, 2008). Different types of former education and the established implicit assumptions that certain types of former education are less suitable or may even be not suitable at all for UAS, underpin the possible relevance of the role of former education concerning study outcome. That is why the present study has examined the role of former education more specifically. However, differences in former education, did not turn out to be a key factor predicting study outcome in the present study.

The third research question of this study was: *'Are there any differences between students who continue and students who drop out from the educational system within one year with regard to their study approaches, their personal reasons and the relations between these two?'* With regard to this research question, the first main conclusion is that differences exist between dropouts and continuing students with regard to their study approach when entering UAS; continuing students score higher on the meaningful integrative approach. Secondly, both groups of students, i.e. the dropouts and the students who continue their education, show the same three reasons to drop out or to continue in the opposite direction. Finally, there are statistical differences between students who drop out and students who continue with regard to the correlations between their study approach and these reasons.

Differences exist between dropouts and continuing students with regard to their study approach when entering UAS; continuing students score significantly higher on the meaningful integrative approach. This is in line with other findings explicating the importance of the meaningful study approach with regard to a positive study outcome and supports earlier research. For instance, Heikkilä and Lonka (2006) and Diseth (2003) found that approaches to learning are related to study success and predict academic achievement, respectively. As delineated earlier, a meaningful integrative approach is

considered to be beneficial with regard to study outcome. The fact that students with high scores on the meaningful integrative approach continue their education after one year more often than students with low scores on the meaningful integrative approach, supports this idea. This study approach might help students to be better equipped in future circumstances and is the most productive study orientation in terms of study success (cf. Lonka & Lindblom-Ylänne, 1996). Rather unexpectedly though, study approach did not come forth as a predictor of study outcome in the present study.

Both groups of students, i.e. the dropouts and the students who continue their education, show the same three reasons to drop out or to continue (in opposite direction): (1) reasons related to future occupation; (2) pragmatic and personal reasons, and (3) perception and experience with issues related to education, organisation and the learning environment. This equity and opposition in reasons for both groups is understandable. The students attribute one way or another, but in essence all reasons point in the same three directions. This suggests that the same reasons say something about students who drop out but also about those who continue, the difference is made by the direction of attribution by the student (e.g. Weiner, 1992). Pragmatic and personal reasons for instance are often mentioned as the cause of encountering study choice problems and dropout (Kunnen, Holwerda, & Bosma, 2008; Van Bragt, 2004). Mäkinen, Olkinuora and Lonka (2004) concluded that non-committed students are most likely to abandon or prolong their studies due to a low interest in their current studying, possibly also in their future profession, and a lack of personal relevance. This is in line with our findings.

Scientific implications

The aim of the study was to gain deeper insight into the relations between students' personal characteristics and study outcome. We have reached this goal by obtaining the main findings and deriving the conclusions. A relevant question is whether the working model adequately predicts study outcome. In the present study it was assumed that approximately 80% of study outcome would be predicted by learner-related characteristics (Creemers, 1994; Scheerens, 2000; e.g. De Maeyer & Rymenans, 2004). By focusing on student-related aspects and distinguishing certain aspects in these, it was assumed that a good insight could be gained into the prediction of study outcome for different student groups in UAS. Although meaningful differences between SGSE and SSVE-students were found, and the relationship between the explanatory aspects of the working model and study outcome was significant, much of the variance was left explained,

unfortunately¹⁴. The expected relations between aspects within the working model were confirmed, with the exception of the direct relationship between study approach and study outcome. Students' personal characteristics clearly had a predictive value for study outcome. Three predictive key factors concerning study outcome were found: (1) one of the biographical aspects: gender, (2) one of personality characteristics: conscientiousness, and (3) the personal orientation on learning: 'ambivalence and lack of regulation' within the learning patterns. Together with these three key factors, differences with regard to the biographical aspect former education have been pointed out in the study.

As delineated above, there is still an amount of variance which was left unexplained by the working model. Therefore, the working model might need further adaptation in order to increase its predictive value. In an adapted model we would like to include the biographical aspects gender and former education. We would like to include gender because of the relevance for study outcome. Even though it did not seem to be significant in the present study, we state that former education should be further investigated. The amount of SSVE-dropouts is still (much too) high and insights on this matter need to be deepened further. The UAS population is heterogeneous and SGSE and SSVE-students differ. Therefore, the inclusion of former education within an adapted model is still of interest.

Other learning psychological aspects should be added, in order to increase the predictive value of the model and in order to gain more insight in student-related characteristics predicting study outcome.

Possible examples are goal orientations and motivation in terms of expectancy (e.g. Bruinsma, 2003). Students' goal orientations reflect the types of goals which they prefer to pursue (Van der Sanden, 2003; 2004). These goal orientations determine the amount of effort which students are willing to invest in a particular learning task (Driscoll, 1999). Several attempts have been made to categorize the different types of learning goal orientations (e.g. Boekaerts & Simons, 2003; Duda & Nicholls, 1992; Elliot & McGregor, 2001). Two main goal orientations are mastery-oriented goals and performance-oriented goals. Goal orientations are related to study approach (Kaldewey, 2006; Novak, 2002) as well as to study outcome (i.e. development of knowledge) (e.g. Koopman, 2010; Hubers, 2003). Bruinsma (2003) showed that motivation in terms of expectancy and the teachers' behaviour (perceived by the students) are two of the most consistent predictors for study

¹⁴ Nagelkerke's R2 values .085 (credits) and .096 (Study Continuance). I.e., for more statistical details see Chapter 3, paragraph 3.5.1, 'Results of the logistic regression analyses'.

outcome. Together with goal orientations, expectancy motivation might be a good addition to our model in order to increase the predictive value from the psychological point of view. Next to the suggested addition of these two psychological, student-related aspects, we suggest integrating students' reasons to continue or drop out into the adapted model once more. We would like to know whether these reasons are related to the aspects in the model. In our study students reported three main reasons to make the decision to drop out or to continue: (1) students' views on their 'future occupations', (2) 'pragmatic and personal matters', and (3) students' 'perceptions and experiences with issues related to education, organization and the learning environment'. Students' study approach turned out to be connected to their reasons for dropping out or continuing their education. Incorporating these reasons into an adapted model and investigating possible relations with biographical and psychological aspects might deepen the insights into students' personal reasons to continue with their study or not.

Third, the dominant psychological point of view in this study might be broadened in order to gain more insight in characteristics explaining and predicting study outcome. The perspective of the learning environment based on Lewin's Equation¹⁵ $B=f(P,E)$ might be added to the model. Lewin's equation basically says 'behaviour is a function of the person and their environment' (Sansone, Morf, & Panter, 2003). Integrating the role of the learning environment is a serious suggestion for improving the working model. It is important to underline the fact that the reported quality of the learning environment depends mainly on the students' perception of the learning environment and not the necessarily the learning environment itself (Entwistle, 1991; Van der Sanden, 2004). Research into students' perceptions of their learning environments reveals the impact of these perceptions on the way students cope with aspects within their learning environments. Consequently, this influences their study outcome (e.g. Gijbels, Van de Watering, Dochy, & Van den Bossche, 2005; Kappe, Boekholt, & Den Rooyen, 2008).

Approximately 20% of the variance of declaring study outcome occur at the level of the learning environment, which - and that is relevant for our approach - can effectively be influenced by teachers and curriculum developers (Scheerens, 2000). Aspects such as teacher quality, the curriculum and forms of assessment are important. They have shown to have an effect on study outcome (e.g. Bruinsma, 2003; Prins, 1998; De Maeyer & Rymenans, 2004; Elsen, 1998; Janssen, 2003; 2004). Summarised, an adapted model could consist of:

¹⁵ $B=f(P,E)$ states that Behavior is a function of the Person and his Environment (Sansone, Morf, & Panter, 2003)

(1) biographical aspects: former education and gender, (2) psychological aspects: personality characteristics, learning patterns, goal orientations and expectancy motivation, (3) learning environmental aspects: teacher quality, assessment and curriculum, (4) students' reasons to continue or drop out, and (5) study outcome (see Figure 5.3).

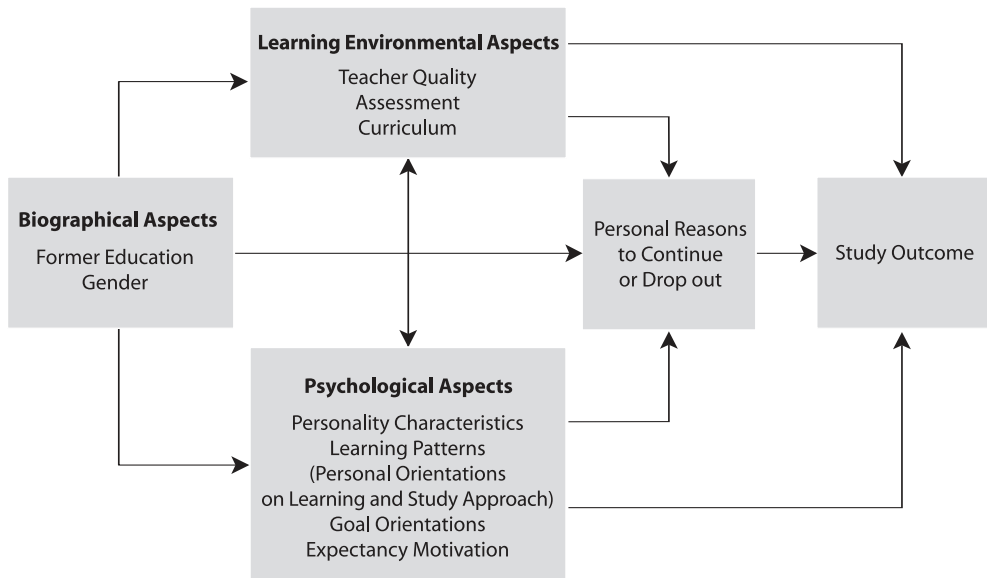


Figure 5.3: Adapted Model

Biographical aspects might have an influence on learning environmental aspects, psychological aspects and students' reasons to continue or drop out. Also, relations between psychological aspects and learning environmental aspects are assumed. Reasons to continue or drop out might be influenced by learning environmental aspects as well as by psychological aspects. Finally, study outcome as the dependent variable is situated at the right side of the model, indicating that all aspects included in the model might have either direct effects or indirect effects on study outcome and more specific on undesired and unnecessary dropout.

5.4 Strengths and limitations of the study

The present study started from a working model looking at the possible causes of dropout or continuation of the study. The three key factors predicting study outcome were 'gender', 'conscientiousness' and the personal orientation on learning 'ambivalence and lack of regulation'. The findings and conclusions have resulted in a deeper insight into the key factors predicting study outcome, and suggestions for an adapted model, which might be used in further research.

This study directs specific attention to the concept of dropout, which is reflected by the central aim of this study; namely gaining deeper insight into the relations between students' personal characteristics and study outcome. Dropout is highlighted and seen as undesired study outcome.

The use of valid and reliable questionnaires in this survey study is of great importance because the conclusions are drawn upon these findings. In the present study the psychometric value of all the questionnaires was secured through the use of validated questionnaires (Hendriks, 1996; 1997; Hendriks et al., 1999a; Vermunt, 1992). The psychometric quality of the newly structured questionnaires concerning students' reasons to drop out or continue turned out to be reliable. Because these questionnaires are new, construct-validity and reliability need to be (re)confirmed in further research.

The study was limited to enrolling students at one study year (cohort) of one particular UAS. After all, a longitudinal design is believed to be a better option in the future. Within a longitudinal design dropouts after the first 14 months of education can also be included. Following a cohort throughout the entire study until graduation, or at least for a period of two years, might add extra information and more insights in the relations between students' personal characteristics and study outcome and how these relations develop or change over time. By doing so, the total amount of observations could be enlarged and confirmed and conclusions will not only be drawn over the first year of study but also over a longer period of time, in which dropout also occurs.

Besides a longitudinal design, also different types of research methods should be used to gain more and deeper insight into the predictors of study outcome. A so-called mixed method approach (a combination of quantitative and qualitative research) might be useful, because a mixed method design is a good way to shed light upon the complex relationships between personal aspects, environmental aspects and study outcome (e.g. De Maeyer & Rymenans, 2004).

The representative of the setting of the present study is something that needs attention.

The study was conducted in a large UAS in the South of the Netherlands. It is possible to generalize the obtained results because Fontys UAS is in general representative for UAS nation-wide. Generalizability is defined as the extrapolation of the findings to other contexts with different characteristics, making it possible to formulate predictions about recurring practice (Shaughnessy, Zeichmeister, & Zeichmeister, 2000). However, this generalizability has a limitation with regard to ethnic participants. From a social economic perspective, the Fontys UAS participants are mainly Dutch speaking indigenous students. It is possible that in some other specific parts of the Netherlands, with more ethnic diverse inhabitants, some differences in results might be found.

5.5 Suggestions for future research and implications for practice

With regard to the above mentioned strengths and limitations it is suggested to replicate this study longitudinally: participants need to be followed for a period of at least two years or, preferably, during the completion of their entire study. Longitudinal research with regard to predictors of study outcome early in the SSGE and SVSE-students' study career, even before enrolling in UAS, deepens insights regarding differences and the influence of the transfer. A developmental starting point can be of interest, but also possibilities to compare first year students to more mature students is of interest with regard to prevention of dropout after the first study-year in UAS. The adapted model with the new aspects might be taken into account within future research regarding study outcome.

The second suggestion for future research is to design a quasi-experimental study in order to assess the effects of intervention programs, which have the aim to support students during their study career.

Thirdly, we underline the need for designing case studies and studies with mixed method approaches in addition to the dominant survey research approach, because these approaches deepen insights into complex relations between the students, their learning environment and study outcome. Small-scale research regarding in-depth aspects of dropout and continuation, like the effect of interventions on a students' personal orientation on learning, might shed specific light upon predictive aspects of individual students, the underlying processes and the earlier mentioned reasons to drop out or continue.

Finally, we want to make some remarks regarding the practical implications of our study. When a potential student meets all the formal requirements, enrolment in UAS is possible.

However, this does not guarantee a positive study outcome. Although the development of intake assessments and specific interventions has not been the focus of this study, our results may be a starting point for UAS for the design of an intake assessment program. It is important for the designers of intake assessments to have insights into which section of dropout could have been prevented (and how) and whether the process of choosing a study, having doubts and dropping out is just part of the maturing process for some students (e.g. Onderwijsraad, 2008). If intake assessments and interventions regarding students at risk within study career guidance will be initiated, based upon the conclusions drawn within this study, these new developments need to be monitored in order to assess the effect of these interventions. The core of intake assessments should be 'student-centred', a well-known way of saying that 'it is all about the student'. Detecting and signalling students at risk at an early stage is a powerful way to reduce dropout. The findings in our study can be used to obtain separate profiles of students who are at risk on the one hand and successful students on the other hand. Including profiles of potential dropouts and of continuing students in intake assessments might be an option. Profiles should help students, create awareness and from there on interventions should be made, not just signalling a potential problem. Profiles like these should be integrated through temporary assessments during students' learning careers within study career guidance programs. Consequently, interventions can be implemented by student coaches in dialogue with lecturers and become embedded within an integral study career guidance program during at least the first year of study.

Kuijpers and Meijers (2008) conclude that the time available for study guidance is very limited and that the time spent by coaches is mostly with students who are at risk and tend to drop out. Routing of student career guidance for dropouts and continuing students within the institute should be a part of this integral program because this might enhance a positive study outcome for the individual student.

Within SSVE a more 'personal approach' has shown to be effective, resulting in enthusiastic and competent students who actively think about, reflect on and realize their own career development (Mittendorff, 2010; e.g. Peterson, 2006). This might work for UAS as well. Reflecting on the whole of results of this study, a final important practical implication is to be made for UAS. Former education has been included in the working model from the perspective of heterogeneity in enrollment and possible differences with regard to study outcome. Although dropout percentages show that more students from SSVE drop out compared to their SGSE-counterparts, the present study did not assign former

education as a key characteristic predicting either a desired study outcome or an undesired one. Furthermore, study approach, which is seen as an important predictor of study outcome by a large amount of study career coaches is at stake. Indeed, differences regarding the relation between former education and study approach were found. However, study approach did not come forth as a key characteristic with predictive value for study outcome. So, if in the perception of the teachers and study career coaches of the UAS former education and study approach are two factors determining study outcome, these will be misconceptions. These misconceptions could have originated from a so-called external attribution preference (Heider, 1958). If the causes of the dropout problem could be assigned to students' biographical aspects such as former education, there is no need for institutes to look at the problem more fundamentally, because they do not attribute dropout to internal factors. As a consequence, they reduce their responsibility. A form of defence mechanism might be the underlying cause of this external attribution phenomenon. This study clearly shows that study outcome cannot be described adequately as a problem caused by the students' individual characteristics alone, but it also comes to life by a complex interaction between students' psychological and environmental characteristics (for instance the third reason found: students' 'perception and experiences with issues related to education, organization and the learning environment').

Saying this, study outcome should be of interest and of concern, to all parties involved, students, lecturers and study career coaches, including the management of institutes and society. The results of our study underline the necessity to gain more insights into the causes of the phenomenon of dropout in order to reduce dropout and enhance study outcome of UAS-students.

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Students' educational careers in Higher Education: a search into key factors regarding study outcome

One of the political goals of the EU is to develop 'the most competitive knowledge-based economy in the world by 2010'. The Dutch knowledge economy faces an increased demand for highly-educated inhabitants, and more graduates from Higher Education are needed. Dutch Universities of Applied Sciences have experienced a considerable growth in enrolment, resulting into a mixed variety of students. Former education of the students forms one of the sources of this heterogeneity. More students enter HE and the number of dropouts has increased proportionally. The increasing amount of dropouts counteracts the desire and the potential of HE to increase the volume of graduates.

This study describes a search into students' key factors regarding study outcome in the first year of a study in Higher Education in the Netherlands. The aim of the study is to gain deeper insight into the relations between students' personal characteristics and study outcome. It is deeper insight in these relations which is a necessary condition to enhance study outcome, in order to support students at risk and prevent dropout more successfully. This is considered to be important because dropout has considerably economic and psychological consequences for the individual student, as well as on the institutional level and societal level. In general, we define dropout as 'ending the study before obtaining a degree'. In this study dropouts are defined as 'all students who start a study within a University of Applied Sciences and end the study within the first 14 months after enrolment'.

In order to determine key factors predicting study outcome, the present study started from a working model. This model is based on a learning psychological point of view with regard to the individual learner. Three concepts were taken as central variables: (1) biographical aspects, being former education: i.e. students with a Senior General Secondary Education-background (SGSE) or a Senior Secondary Vocational Education-background (SVSE), and gender, (2) personality characteristics, and (3) learning patterns, being personal orientations on learning and study approaches. Furthermore, students' personal reasons to continue or drop out were investigated as well as how these reasons were related to the students' study approach. The main research questions in this study are:

1. What is the influence of personality characteristics on personal orientations on learning which, in turn, influence study approaches and are there any differences between students when entering Higher Education with regard to former education (Senior General Secondary Education and Senior Secondary Vocational Education)?
2. To what degree do former education and students' personal characteristics (the 'Big Five personality characteristics', personal orientations on learning and students' study approach) predict study outcome?
3. Are there any differences between students who continue and students who drop out from the educational system within one year with regard to their study approaches, their personal reasons and the relations between these two?

These research questions were answered with three different studies, each addressing one of the main questions.

In chapter 2, the first research question is answered by a survey study using two questionnaires. The first questionnaire was Vermunt's learning style inventory for Higher Education. This questionnaire investigates learning conceptions, motivational orientations, regulation strategies and cognitive processing activities. For the assessment of personality characteristics the Dutch version of the Five-Factor Personality Inventory was used. This questionnaire measures five aspects of personality: extraversion, agreeableness, conscientiousness, emotional stability and autonomy. Participants were 2.284 full-time first-year students entering a Dutch university of applied sciences. The questionnaires were administered in the fifth study week. Cohen's effect size d , principal component analyses and structural equation analyses with backward elimination procedures were used to obtain results.

The main findings of the study were that at the level of personality characteristics, SSVE-students were found to be significantly more autonomous and conscientious than SGSE-students. In general, all five personality characteristics (extraversion, agreeableness, conscientiousness, emotional stability and autonomy) influenced students' personal orientations on learning. Personality characteristics also influenced study approach directly. This happened for all participating students, regardless their former education. The study revealed three personal orientations on learning: 1) constructive self-regulation, (2) reproductive external regulation and (3) ambivalence and lack of regulation. SGSE-students

showed significantly lower preferences on all three personal orientations on learning than SSVE-students did. Furthermore, two types of study approaches were revealed: (1) meaningful integrative approach and (2) superficial approach. SGSE-students tended to report a more superficial approach than SSVE-students did. No difference between both groups of students was found regarding the meaningful integrative approach. Personal orientations on learning were strong predictors for study approach with the exception of ambivalence and lack of regulation, which had no predictive value for a superficial approach. Finally, the causal relations between the concepts of the working model appeared to be identical for SGSE-students and SSVE-students with regard to the strength as well as to the direction of the relations. The concepts appeared to be 'general', regardless of students' former education.

To answer the second research question, we report in chapter three on a study that investigated the possible predictive value of former education and students' personality characteristics, personal orientations on learning and students' study approach regarding study outcome (system of credits and study continuance). The two questionnaires of the first study were used and the data were extended with the students' amount of obtained credits and their status. Logistic regression analyses of the gathered data of 1.471 students are performed in order to answer the research questions.

The main findings of the study showed that differences in former education (i.e. students originating from SSGE or SSVE) did not seem to be a predictor for study outcome. Gender, however, seemed to be of influence: female students obtained more credits and continued their studies more often than their male counterparts did. This applied to female students both from SSGE and from SSVE. With regard to personality characteristics, conscientiousness turned out to be a significant predictor for study outcome: being more conscientious was beneficial with regard to study outcome. With regard to students' personal orientations on learning, ambivalence and lack of regulation seemed to matter: students with high scores on this orientation obtained fewer credits and dropped out more often. Finally, the two different types of study approaches, meaningful integrative approach and superficial approach, showed no significant influence on study outcome.

In chapter four we report on a study that answers the third research question. The central goal of this study was to gain insight into students' study approach, their personal reasons and the relations between these two for students who continue or drop out from the

educational system within one year.

Vermunt's questionnaire of the first study was used and the data was extended with the students' status. In order to gain insight into students' personal reasons, two retrospective questionnaires with items considering reasons to drop out and reasons to continue, were constructed. A Principal Component Analysis was carried out to investigate the construct validity of the factors. Cronbach's alpha (α) was used considering the reliability of the factors.

The main findings of the study were that significant differences existed between students who dropped out and those who continued with regard to their study approach. Students who continued, scored significantly higher on the meaningful integrative approaches when *entering* UAS. Students' personal reasons to drop out or to continue their study were threefold. Principal Component Analysis revealed three reliable main factors, as reasons for leaving education or staying in the educational program.

The three main reasons were identical for dropouts and for students who continued, but these reasons corresponded in the opposite direction. These reasons were: (1) students' views on their future occupations, (2) pragmatic and personal matters, and (3) students' perceptions and experiences with issues related to education, organization and the learning environment. Regarding the relation between study approach and these three reasons, differences between students who dropped out and continuing students existed. Furthermore, relations between the reasons differed with regard to both groups studied.

Chapter five presents the conclusion and discussion of this dissertation. Regarding the first main research question the main conclusions are that the findings reported in this dissertation confirm that personality characteristics influence personal orientations on learning which, in turn, influence study approach. Furthermore, personality characteristics influence study approach directly. This conclusion is valid for SGSE-students as well as for SSVE-students: the fit of the working model applied to both SGSE-students and SSVE-students for strength and direction of the relations. Next, there are differences between students with regard to former education with respect to personality characteristics and learning patterns, personal orientations on learning and study approach when *entering* UAS.

Regarding the second research question the main conclusions are that *gender*, *conscientiousness* and the personal orientation on learning *ambivalence and lack of regulation* are the three key factors predicting study outcome. Contrary to the expectations,

former education turns out to be not a key factor predicting study outcome.

Regarding the third research question the main conclusions are that differences exist between dropouts and continuing students with regard to their study approach when *entering* UAS: continuing students score higher on the meaningful integrative approach. Secondly, both groups of students, i.e. the dropouts and the students who continue their education, show the same three reasons to drop out or to continue their studies in the opposite direction. Finally, there are statistical differences between students who drop out and students who continue with regard to the correlations between their study approach and these reasons.

Although meaningful differences between SGSE and SSVE-students were found, and the expected relations between aspects within the working model were significant, much of the variance was left unexplained. Therefore, the working model might need further adaptation in order to increase its predictive value. Three main suggestions for an adapted model are made. Firstly, other learning psychological aspects should be added, in order to increase the predictive value of the model and in order to gain more insight in student-related characteristics predicting study outcome. Possible examples are goal orientations and motivation in terms of expectancy. Secondly, to the suggested addition of these two psychological, student-related aspects, we suggest integrating students' reasons to continue or drop out into the adapted model once more. Thirdly, the dominant psychological point of view in this study might be broadened in order to gain more insight into characteristics explaining and predicting study outcome. Approximately 20% of the variance of declaring study outcome occur at the level of the learning environment. Aspects such as teacher quality, the curriculum and forms of assessment have shown to have an effect on study outcome. An adapted model could consist of: (1) biographical aspects: former education and gender, (2) psychological aspects: personality characteristics, learning patterns, goal orientations and expectancy motivation, (3) learning environmental aspects: teacher quality, assessment and curriculum, (4) students' reasons to continue or drop out, and (5) study outcome.

The limitations of the study were that it was limited to enrolling students at one study year (cohort) of one particular UAS. After all, a longitudinal design is believed to be a better option in the future. Furthermore, besides a longitudinal design, also different types of research methods could be used to gain more insight into the predictors of study outcome. A so-called mixed method approach (a combination of quantitative and qualitative research) might be useful, because a mixed method design is a good way to shed light

upon the complex relationships between personal aspects, environmental aspects and study outcome. Finally, the representative of the setting of the present study is something that needs attention. From a social economic perspective, the Fontys UAS participants are mainly Dutch speaking indigenous students. It is possible that in some other specific parts of the Netherlands, with more ethnic diverse inhabitants, some differences in results might be found.

Three suggestions for future research were made. Firstly, to replicate this study longitudinally: participants need to be followed for a period of at least two years or, preferably, during the completion of their entire study. Secondly, it was suggested to design a quasi-experimental study in order to assess the effects of intervention programs, which have the aim to support students during their study career. Thirdly, the need for designing case studies and studies with mixed method approaches in addition to the dominant survey research approach was underlined, because these approaches deepen insights into complex relations between the students, their learning environment and study outcome. Small-scale research regarding in-depth aspects of dropout and continuation, like the effect of interventions on a students' personal orientation on learning, might shed specific light upon predictive aspects of individual students, the underlying processes and the earlier mentioned reasons to drop out or continue.

Finally, several implications for practice are presented in chapter five. When a potential student meets all the formal requirements, enrolment in UAS is possible. However, this does not guarantee a positive study outcome. Detecting and signalling students at risk at an early stage is a powerful way to reduce dropout. Although the development of intake assessments, specific interventions and obtaining separate profiles of students who are at risk on the one hand and successful students on the other hand has not been the focus of this study, our results may be a starting point for UAS for the design of an intake assessment program. These kind of implications can be implemented by student coaches in dialogue with lecturers and become embedded within an integral study career guidance program during at least the first year of study and should be 'student-centred'.

This study clearly shows that study outcome cannot be described adequately as a problem caused by the students' individual characteristics alone (external attribution phenomenon), but it also comes to life by a complex interaction between students' psychological and environmental characteristics (for instance the third reason found: students' 'perception and experiences with issues related to education, organization and the learning environment'). Study outcome should be of interest and of concern, to all parties involved, students,

lecturers and study career coaches, including the management of institutes and society. The results of our study underline the necessity to gain more insights into the causes of the phenomenon of dropout in order to reduce dropout and enhance study outcome of UAS-students.

ALR	Ambivalence and Lack of Regulation
CSR	Constructive Self-Regulation
EC	European Credits
ECTS	European Credit Transfer System
FE	Former Education
GPA	Grade Point Average
HE	Higher Education
IBG	Informatie Beheer Groep
MIA	Meaningful Integrative Approach
OCW	(Ministerie van)Onderwijs Cultuur en Wetenschap
OECD	Organisation for Economic Cooperation and Development
PhD	Doctor of Philosophy, abbreviated PhD (also Ph.D.)
PVSE	Prevocational Secondary Educational Program (VMBO)
RER	Reproductive External Regulation
RU	Research University
SSGE	Senior Secondary General Education (VO)
SSVE	Senior Secondary Vocational Education (MBO)
SUA	Superficial Approach
UAS	Universities of Applied Sciences

Cyrille van Bragt (1972) studeerde na het afronden van de HAVO (Augustinianum te Eindhoven) in Arnhem aan de Hogeschool voor de Schone Kunsten. Daar studeerde zij in 1993 af aan de dansacademie, studierichting 'Uitvoerend' Toneeldans Jazz.

Aansluitend studeerde zij aan de Fontys Sport Hogeschool (Academie voor Lichamelijke opvoeding) waar ze in 1997 als Primus Inter Pares afstudeerde. In 1997 en 1998 werkte ze als lerares Lichamelijk Opvoeding in het voortgezet onderwijs op een Montessori school en van 1997 tot 2001 was ze Hogeschooldocent aan de Fontys Sporthogeschool in Tilburg. Begin 2001 maakte zij de overstap naar de Afdeling Onderwijs, Centrum voor Onderwijsinnovaties en Onderzoek van het Facilitair Bedrijf van Fontys Hogescholen waar zij als consultant en onderzoeker werkte aan diverse onderzoeksprojecten in het Hoger Onderwijs. Eind 2003 startte zij daar als STIP promovendus met haar promotie-onderzoek en combineerde dit met haar baan als onderzoeker. Medio 2009 vervolgde Cyrille haar loopbaan bij de Fontys Pabo Eindhoven als opleidingscoördinator van de Master Leren en Innoveren (MLI) en onderwijsconsultant zakelijke dienstverlening.

Cyrille van Bragt (1972) completed the study 'Performance' Theatre Jazz Dance at the Arnhem Fine Arts University of Applied Sciences in 1993 after obtaining her HAVO degree (Augustinianum, Eindhoven). Four years later (1997) she graduated as Primus Inter Pares at the Fontys University of Applied Sciences Sports and Education (Sports Academy, Teacher Physical Education). In 1997 and 1998 she worked as a teacher Physical Education in Senior Secondary General Education (Montessori). Consequently, she was a lecturer at Fontys University of Applied Sciences Academy for Sports and Education from 1997 until 2001. At the start of 2001 she continued her career as a consultant and researcher at The department of Education, Centre for Educational Innovations and Research at the Fontys University of Applied Sciences. She worked on several research projects in Higher Education. At the end of 2003 she started her PhD research project and combined this with her work as a researcher. Halfway 2009, Cyrille started to work at Fontys PABO Eindhoven as a course coordinator and lecturer of the Master Learning and Innovating (MLI) and as an educational consultant.

Articles in peer-reviewed journals

- Van Bragt, Cyrille A.C., Bakx, Anouke W.E.A., Teune, Peter J., Bergen, Theo C.M., & Croon, Marcel A. (under review). Why students drop out or continue their educational careers: A closer look into differences in study approaches and personal reasons.
- Van Bragt, Cyrille A.C., Bakx, Anouke W.E.A., Bergen, Theo C.M., Croon, Marcel A. (accepted). Looking for students' personal characteristics predicting study outcome. *Higher Education*.
- Van Bragt, Cyrille A.C., Bakx, Anouke W.E.A., Van der Sanden, Johan M.M., & Croon, Marcel A. (2007). Students' approaches to learning when entering higher education: Differences between students with senior general secondary and senior secondary educational backgrounds. *Learning and Individual Differences*, 17(1), 83-96.

Other scientific articles and conference papers

- Van Bragt, Cyrille A.C., Bakx, Anouke W.E.A., Bergen, Theo C.M., & Croon, Marcel A. (2008). *Wat zijn de meest bepalende studentkenmerken om studieresultaat in het eerste studiejaar van het HBO te voorspellen? [What are the most influential students' characteristics for predicting study-results in the first year at Universities of Applied Science?]*. Paper presented at the Onderwijs Research Dagen (ORD) 'Licht op Leren', 18-19-20 juni 2008, Eindhoven School of Education (ESoE), Eindhoven.
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Professional publications

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^I Doctor of Philosophy, abbreviated PhD (also Ph.D.) is an advanced academic degree awarded by universities. In many English-speaking countries, the PhD is the highest degree one can achieve and applies to graduates in a wide range of disciplines in the sciences and humanities. The PhD or equivalent has become a requirement for a career as a university professor or researcher in most fields.

^{II} A scientific Bachelor program at a Research University in the Netherlands is a full time study which has a length of three years. Also here one year of study matches 60 EC and so this Bachelor's degree consists of 180 EC.

^{III} A scientific Master at a Research University takes one year (60 European Credits). However, also scientific Masters of two (120 European Credits) or even three years (180 European Credits) exist.

^{IV} A UAS Bachelor in the Netherlands is a full time study which has a length of four years. One year of study matches 60 European Credits (EC) so this Bachelor consists of 240 EC's. 1 EC is 28 hours of study. ECTS (the European Credit Transfer System) is a part of the Bachelor-Master structure which has been implemented in the Netherlands in the academic year of 2002-2003.

^V A professional Master's at a UAS in the Netherlands consists of 60 (one year full time or two year part time) or 120 EC (two year full time).

^{VI} A Bachelor in UAS is formed by a Major and Minor structure. The Major is the core of the Bachelor and is the largest part. Besides the Major program, a student adds a Minor to apply their study to their personal ambitions and talents. Minors can be seen from a broadening but also from a specializing perspective.

^{VII} The propedeuse is a diploma issued after the first year of a study, still in use after the introduction of the Bologna process and the international Bachelor-Master system in the Netherlands. It is a mandatory diploma which a student acquires after having successfully completed the first year which is therefore also known as the propedeutical phase. First years give a certain view on the rest of the study chosen and as such the propedeuse fulfills its first function: orientating. Students may discover that the study chosen is not what was expected and as such the propedeuse fulfills its second function: referring. By

means of the propedeuse the student and the Department both form their opinion with regard to personal potential capability whether to continue the study at hand. As such the third function of the propedeuse is delineated; selecting.

^{viii} Credits refer to the amount of credits students in UAS had to obtain at the time this study was conducted. This amount used to be 42 credits in one study year until 2004. The term 'credits' has been replaced by EC (European Credits). With the introduction of the new term, the amount of credits also changed. The former 42 of the study equal 60 EC's now. EC's are a part of ECTS, the European Credit Transfer and Accumulation System (ECTS). ECTS is a standard for comparing the study attainment and performance of students of HE across the European Union and other collaborating European countries. For successfully completed studies, ECTS credits are awarded. One academic year corresponds to 60 ECTS-credits that are equivalent to 1500–1800 hours of study in all countries irrespective of standard or qualification type and is used to facilitate transfer and progression throughout the Union.

^{ix} Recently a new terminology with regard to learning styles is introduced, which shifts the term learning 'styles' into learning 'patterns' (Vermunt & Vermetten, 2004).