



ENHANCING STUDENT SELF-REFLECTION: THE SRT SCALE INVENTORY

DESCRIPTION OF THE SELF-REFLECTION TOOL (2.1)
DEVELOPMENT AND ITS CONTENTS

Nolden, Philipp

Wosnitza, Marold
Karabenick, Stuart A.
Peixoto, Francisco
Gonida, Eleftheria
Stepanović Ilić, Ivana
Almeida, Leandro S.
Stamovlasis, Dimitrios
Taveira, Maria do Céu
Tošković, Oliver
Falanga, Konstantina
Aivazidis, Konstantinos
Krstić, Ksenija
Videnović, Marina
Gouveia, Maria João
Castro Silva, José
Delzepich, Ralph
Holder, Lena
Enoch, Clinton

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1 Introduction and approach

Self-reflection tools and online self-assessments are internet-based advisory and information instruments which are conducive to self-examination (Hornke, Wosnitza & Bürger, 2013). The ‘Student Self-Reflection Tool’ (SRT 2.0) is part of the SUnStAR online platform that aims to identify issues potentially at risk for students’ continuation of their studies by raising their awareness and self-reflection through feedback. The SRT 2.0 helps **students** to reflect anonymously on their study situation without time restrictions and in a structured manner. This can lead to strengthened study decisions and increased study satisfaction. If various issues are identified (e.g., a lack of intrinsic motivation), SUnStAR provides an online platform to facilitate low-threshold access to a remediating guidance process: (a) target-oriented information about university and non-university support-services and (b) topic-specific learning recommendations on a self-directed learning platform (see Figure 1).

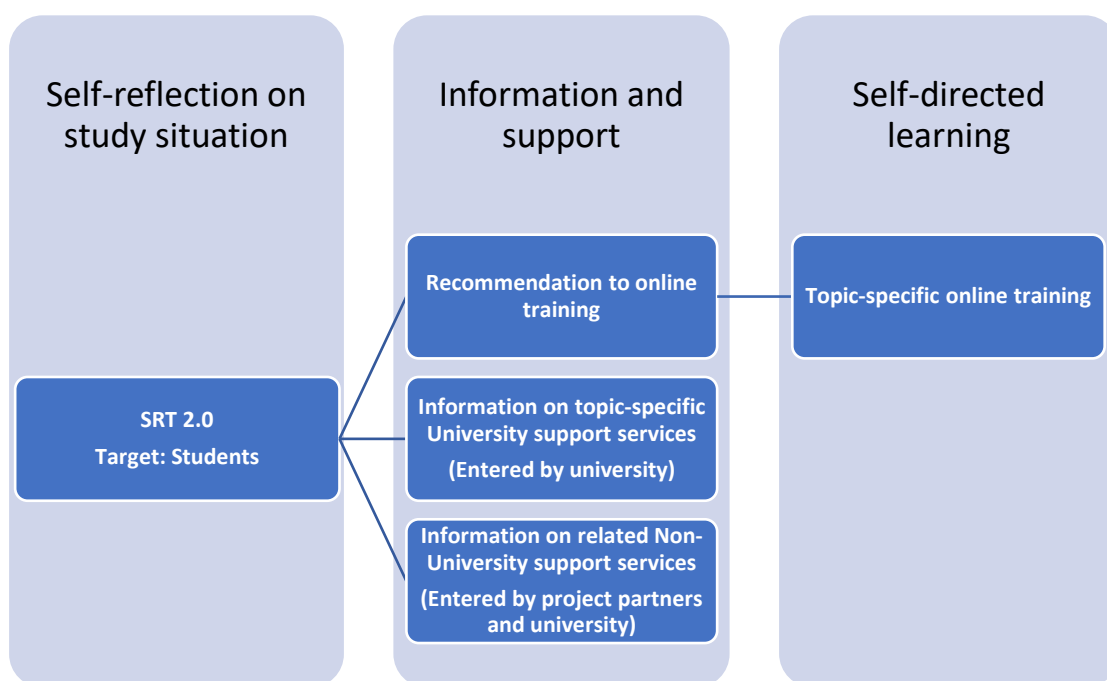


Figure 1 Process of support on the SUnStAR online platform

The SRT 2.0 is based on the development of the preceding EU-project (SRT 1.0; see Nolden, Wosnitza, & Delzepich, 2017): “PrevDrop – Detecting and Preventing Drop out from Higher Education or Supporting Students to Switch Successfully to VET”. SRT 2.0 includes further psychometric developments and expands the opportunities to provide precise and suitable information to the users. The SUnStAR online platform allows participating **universities** to adjust the tool to their needs by inserting information into the SRT 2.0, linking to their university web and support services. This is an

important improvement that enables universities to integrate and leverage existing support services. Also, advice-seeking students can share their results of the SRT 2.0 with **counsellors** in order to support the case history and the counselling process.

This description gives decision-makers, advisors, counsellors and others interested information on the development process with underlying learning theories as well as the selection procedures for contents. Next, we describe the structure, constructs and scale measurements used in the SRT 2.0 as well as the feedback given. Most of the scale inventory was developed within the project and can be used and cited by this document, according to the information provided in the appendix. Scales not authored by the SUnStAR consortium are labelled with their original reference. Concerning usage and more information on these scales please refer to these publications.

2 Development process

The SRT 2.0 was developed in a multi-stage process in which all project partners participated, contributing their international expertise as researchers in the field of higher education. Furthermore, in the different phases of development, feedback from possible users was included; e.g., from students and academic advisors and counsellors. This development process is briefly outlined as follows.

2.1 Literature review

In order to identify the central issues and factors impacting the study situation, an extensive and structured literature review across all participating countries (Portugal, Germany, Greece and Serbia) was conducted (see Gonida et al., 2019). This review informed the following steps and decisions on the content of the SRT 2.0. The second goal of this development stage was to detect specific issues of different educational contexts that have to be taken into consideration for the SRT 2.0 to be generalisable. The review extracted a wide range of important factors for the student adaptation to university, individual, socio-demographical and institutional domains. A synthesis describing the main results of this review across all participating countries is available on ResearchGate (Gonida et al., 2019).

2.2 Theoretical background

The help-seeking process

The initial point of developing a tool that fosters self-reflection is two-fold as already mentioned: (a) if in the self-reflection no or few issues arise, the tool serves as decision confirmation. However, if (b) the self-reflection produces feedback indicating at risk for the continuation of studies, the goal is to initialise self-regulation that focuses on the help-seeking process to actively tackle these issues. (Karabenick & Gonida, 2018; Karabenick & Newman, 2006; Makara & Karabenick, 2013). The potential

sources of help consist of platform-internal online trainings on certain issues as well as platform-external sources in and out of the University like counsellors, teachers, courses, other online materials etc.

Makara and Karabenick (2013), for example, systematise the help-seeking process into seven stages (see Figure 2), which the SRT 2.0 builds on. In the first stage, students have to determine that a problem exists and, in the second stage, that help is needed. The SRT 2.0 supports these stages with the feedback given specially to raise awareness of the need for help. In order to support the third stage, stigma to seek help from others is targeted by providing feedback; e.g., for the scale “help seeking” in Chapter 4.7. The establishment of a goal is supported by the differential feedback on several potential issues. The feedback gives hints on the issues to be targeted. The SRT 2.0 is intended to combine the fourth stage of setting a goal (topic-specific information) with the fifth stage of deciding whom to ask by providing information about who or what might be the adequate and most competent source of help on this specific issue. The stages six and seven of soliciting and obtaining help are in control of the students. This process guides the development in order to define the main goals and objectives.

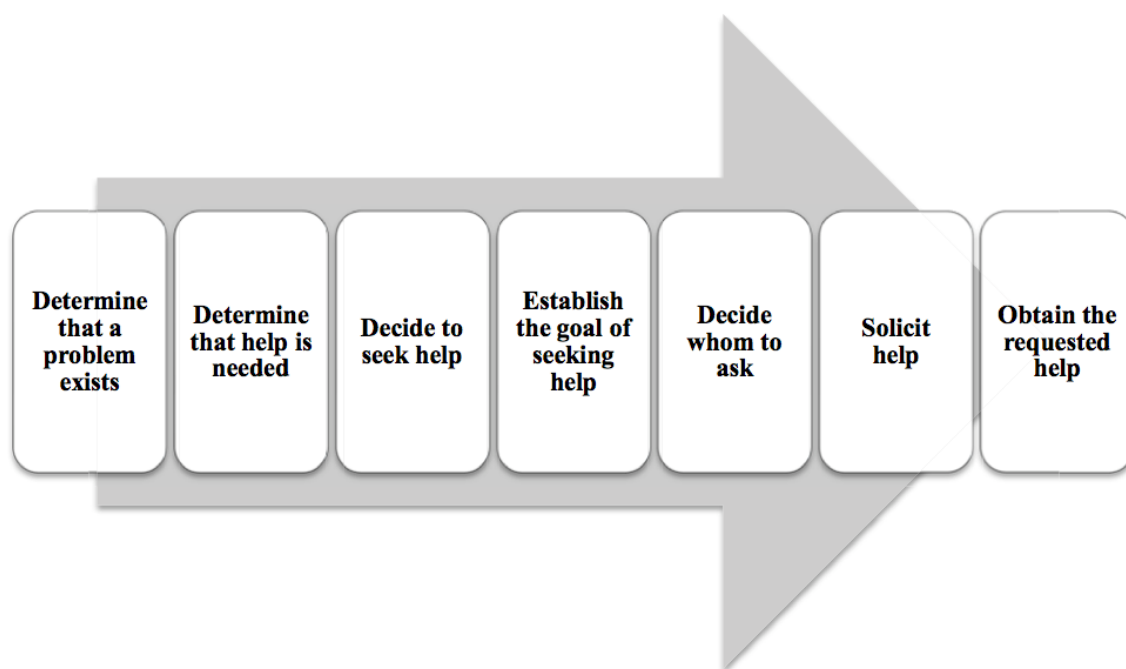


Figure 2 The help-seeking process by Makara and Karabenick (2013, p. 38)

Structuring the study situation

In order to define the contents needed in the SRT 2.0 a systemisation of the study situation is fruitful. Additionally, to the literature review (Gonida et al., 2019), the tool as a whole relies on the

theoretical conceptualisation of the SRT 1.0 and subsequent developments. In order to structure the large number of factors that can influence the study situation, an integrative theoretical model is employed, taking theories from psychological, sociological and educational domains and the systematisation of the literature review into account. This theoretical background is extensively described by Nolden (2019). In this conceptualisation the university context is composed of the system levels ‘educational system’, ‘organisation university’ and ‘interaction in the study programme’ (Luhmann, 1984, 1992, 2002; Parsons & Platt, 1973). Each level consists of several components:

- Each system level requires **resources** in order to interact with the environment.
- These resources are used for certain **goals** on each system level.
- Next, systems coordinate internal differentiation via **roles and expectations** on each level. The social interactions at university follow certain schemes and expectations addressed to a role; e.g., the role as a fellow student or the role as a teacher. These roles have to be learned. And, they can lead to conflicts e.g., when expectations are not known or conflicting.
- Each system defines its borders via **value commitments**. These commitments should produce a certain identification with different aspects of the student situation.

It is vital that, within such a concept, students and the university do not oppose each other, but are interrelated. For higher education, the theory of Person-Environment Fit (e.g., Eccles & Midgley, 1989; Etzel & Nagy, 2016; Li, Yao, Chen, & Wang, 2013; Schmitt, Oswald, Friede, Imus, & Merritt, 2008) highlights the congruence between students’ characteristics and the opportunities the higher education institution offers to students. This congruence between a person’s characteristics and the corresponding characteristics of the environment a person belongs to is realized in regard to three dimensions: (a) person-organization fit (the degree of congruence between individual and organizational values), (b) needs-supplies fit (the degree of congruence between the student’s basic and psychological needs and the need reinforcers of the university), and (c) abilities-demands fit (the degree of congruence between students skills and the requirements of the university) (for more details see Edwards & Shipp, 2007).

The way students perceive and evaluate the situation at university guides their actions. This assumption is central to the development of an online tool with self-reports. Based on this perception of the context, it is assumed that students make decisions according to Expectancy-Value Theory (EVT: Eccles & Wigfield, 2002; Breen, Van de Werfhorst & Meier Jaeger, 2014). The assumption is that students take into consideration the value (with several components, such as interest value, importance, utility value) of their studies and their expectancy to succeed, as well as the costs of engaging in an activity (e.g., time or effort). This implies a certain amount of control over the decisions

that students make at university. This conceptualisation and the literature review support the decision on contents for the SRT 2.0.

2.3 Scale selection

As described, the scope of potential factors that affect the study situation is multifaceted, and selections are necessary to enable a reasonable and time efficient reflection process. On the basis of the literature review and the theoretical structure, the selection of constructs for the SRT 2.0 was conducted in two steps:

1. Theoretical selection: Expert ratings

The project partners are experts in counselling, higher education research, motivation, study satisfaction and drop-out intentions, achievement and emotions, help seeking and student situations, rated and discussed a list of extracted factors according to their importance for the study situation. This list of constructs was the basis of the next step: the empirical selection.

2. Empirical selection: Pilot studies

In essence, the SRT 2.0 is a questionnaire with items with a closed answer format. *However, it goes far beyond a questionnaire by providing feedback based on the answers given.*

Thus, the theoretical constructs (e.g., intrinsic motivation) identified in the development process were operationalised into items. For a reliable measurement, most constructs are measured with more than one item, forming a scale (for an introduction in this measurement concept see Field, 2013). The scales implemented in the SRT 2.0 were either existing or newly developed instruments. The existing scales were selected based on reports on the criteria of reliability, validity and empirical relevance with regard to university drop-out and study satisfaction as well as availability. The rights to use the scales in this project were verified beforehand. The newly developed scales were constructed based on theory and tested in several pilot studies. As these scales are meant to be used in the SRT, some scientific scale names are rephrased into target group-oriented names. All items were translated from the English blueprint language or their original language into German, Serbian, Greek and Portuguese. The theoretical background, authorship and construction principles of each instrument implemented in the SRT 2.0 are described in Chapter 4. The answer format is consistent so that almost all items are rated by the participants with '0 – strongly disagree' to '5 – strongly agree'. The reason for using this format is that respondents have the option of rating items with a zero. The use of a zero also avoids an association with school grades. For the analysis and feedback, the values are recoded to a scale from 1 to 6. In the following, the scales and their construction principles are described. The scales selected for

our pilot studies were tested in survey studies in the participating countries. Table 1 describes the research design and main information of the samples.

Table 1 Method and Sample Description

	PT	GER	GRC	SER
Design	Paper & Pencil and Online	Online	Online	Online
Field phase	May 2018	June-July 2018	Spring 2018	April-June 2018
<i>N</i>	704	509	930	673
<i>M</i> Age (<i>SD</i>)	20.74 (5.01)	24.20 (4.52)	23.04 (6.48)	21.39 (2.86)
<i>M</i> Sem (<i>SD</i>)	3.61 (2.04)	5.15 (3.99)	5.67 (3.78)	5.69 (5.85)
% Female	79.6%	51.1%	62.9%	77.6%

On the solid basis of these samples, the following psychometric properties were employed to assess the distribution, dimensionality and reliability of the items and scales for further selections (for a general introduction in testing theory, see Field, 2013; Hair Jr., Black, Babin, & Anderson, 2014):

- Descriptive: Mean (*M*), standard deviation (*SD*)
- Principal component analysis (PCA) with Varimax-Rotation. Criteria in this test for dimensionality are the number of factors (by Eigenwert-Criterion), factor loadings (λ) and cross-loadings.
- Internal consistency based on Cronbach's Alpha (α) and selectivity (corrected item-scale-correlation, $r_{(it)}$)
- External validation by significant correlation of a scale with criteria scales 'Drop-out intention' and/or 'Study satisfaction'. These criteria are chosen with regard to the project goals.

Based on this, the number of items of some scales was reduced due to either semantical reduction (e.g., because of redundancies, also indicated by high correlations) or empirical indications by the PCA and/or reliability analysis (e.g., low or inconsistent factor loadings, peculiarities concerning internal consistency).

In general, the scales show very comparable properties across all countries concerning dimensionality. Thus, the empirical analyses led to consensus across all countries on the scales; i.e., the SRT 2.0 uses the same measurements in all countries except for one scale only used in Germany (for reasons related to the German educational system). This selection of contents led to the following structure of the SRT 2.0.

3 Structure of the SRT 2.1

SRT 2.1 differs from the SRT 2.0 in the way its scales are organized and the way how feedback is presented to students. In SRT 2.0 scales were organized in three main set of scales (“My studies and I”, “My University and I” and “Don’t worry”), whereas the SRT 2.1 organizes the scales in six sets. Additionally, the way how feedback is structured is also different, despite the same rationale behind its structure has been kept.

Following a short introduction on the landing page and the data privacy statement, students are asked to provide basic information regarding themselves and their studies. The responses to these questions are optional; they are used for standardisation purposes and as basic information for student advisory services, and are later issued as part of the feedback form.

After this page users reach the menu, from which scales sets can be opened and completed in any order. The scales sets reflect the fundamental understanding of the interaction between individual characteristics of the students and the perception of the higher education environment. Students can complete the scales sets in any order and in their own pace, taking into account that the platform will save their responses when each page is completed. The six scales sets are depicted in Figure 3.

Scales Set 1 “My perspective on the university” contains scales measuring student perceptions or self-evaluation about the university and the studies.

Scales Set 2 “Getting along with others” contains scales regarding the social relationships within University including both peers and professors.

Scales Set 3 “Motivation” includes scales focusing on different factors that can contribute to academic motivation.

Scales Set 4 “Being a learner” comprises scales that focus on individual characteristics associated to academic achievement and learning.

Scales Set 5 “Career development” includes scales related to knowledge about the present and future of professional career.

Scales Set 6 “My burdens” contains items on possible perceived study-related burdens by the student and serves to provide an overview of potential issues.


With this structure and optional settings students have a lot of autonomy in their usage of the tool, which should enhance motivation to complete SRT (Ryan & Deci, 2000a). The load of answering questions and statements is split up into several content-related topics. Nevertheless, incomplete participations are likely and have to be accepted.

1 SRT > 2 Feedback > 3 4 Support 5 E-learning > Modules 6


Part 2

The SRT

☐



My perspective on the university

☐




My perspective on the university

First cluster of scales



Getting along with others

☐




Getting along with others

Second cluster of scales



Motivation

☐




Motivation

Third cluster of scales



Being a learner

☐




Being a learner

Fourth cluster of scales



Career development

☐




Career development

Fifth cluster of scales


My burdens

☐



My burdens - Checklist

Please indicate how you agree with these statements on potential issues at university.
This is a checklist aiming at common worries.

Figure 3 Menu SRT 2.1 with the scales set structure

4 Content: Measurements

In order to provide suitable information on the constructs used in the SRT 2.0 and SRT 2.1, the theoretical background as well as their respective measurement are described. For each scale, study satisfaction or drop-out intention are chosen as criterion for the feedback (see Chapter 5). The description of the implemented scales and their criteria refers to the module structure of the SRT 2.1. The psychometric properties of all measurements used in our pilot studies are depicted in Table 2 at the end of this chapter.

Reminder: The scales constructed by project partners can be used for research purposes only. For scales from other sources usage rights have to be clarified otherwise and cannot be referred to this document.

4.1 Scales set 1: My perspective on the university

This set of scales contains 4 constructs evaluated using 4 scales described as follows.

4.1.1 Study organisation and teaching quality

Theory: Construct and relevance for studying

Study conditions and the instructional quality constitute an important component of a university's 'supply'. A large proportion of quality control measures in institutions of higher education therefore involve evaluating this 'supply'. Many studies have confirmed the necessity of creating high-quality study and learning conditions, showing that study conditions and the quality of instruction influence the (tendency) to drop out of studies and study satisfaction (Braxton et al., 2014; Costa & Lopes, 2008; Georg, 2009; Heublein, 2014; Kuh, Cruce, Shoup, Kinzie & Gonyea, 2009; Larsen, et al., 2013; Nolden, 2019; Reić Ercegovac & Jukić, 2008; Thomas & Hovdhaugen, 2014; see also Gonida et al., 2019).

Operationalisation: Construction principles and criteria

The implemented scale was based on a development by project partners Nolden, Wosnitza and Karabenick. The items reflect the evaluation of the study conditions from a student perspective and include evaluative adjectives. To select the items, we focused on identifying those that are relevant for the study conditions of all disciplines and for all students.

Sample item: In my degree programme the courses are well-organised.

Feedback criterion: Study satisfaction

Total number of items: 5

4.1.2 University Infrastructure for studying

Theory: Construct and relevance for studying

The material and physical learning environment of an institution of higher education can influence learning – e.g., the buildings, campus, library facilities, technical equipment and the way seminar rooms are arranged (Larsen et al., 2013; Wosnitza, 2007; see also Gonida et al., 2019). Our pilot studies showed that a positive perception of the learning environment is significantly associated with study satisfaction.

Operationalisation: Construction principles and criteria

The item used was developed within the project and Nolden (2019) gives a detailed description of the development. As it would be virtually impossible to draw up a complete list of all components of infrastructure and keep it up-to-date, the construct is measured with a generally formulated item.

Sample item: “Overall, the university offers a good infrastructure for learning and studying (e.g., learning spaces, technical facilities, wireless network, libraries, etc.”

Feedback criterion: Study satisfaction

Total number of items: 1

4.1.3 Independent organisation of studies

Theory: Construct and relevance for studying

Following the Bologna reform and the introduction of more structured study programmes, aspects related to students’ independence and autonomy in organising and shaping their studies have repeatedly been a subject of discussion (for information on the perception of students, see Bargel, Heine, Multrus & Willige, 2014). On the one hand, for students, the freedom to shape their own learning reflects the academic freedom. To this effect, the goal of the education system and of institutions of higher education is also to develop the personality of young adults and their independence (e.g., Grundmann, 2012; Parsons & Platt, 1973). Educational research has shown that experiencing autonomy can boost motivation in different learning environments (Ryan & Deci, 2000b; Wosnitza, 2000, 2007). On the other hand, particularly at the beginning of their studies, orientation is important to students (Hovdhaugen & Aamodt, 2009) and autonomy can be ambivalent (Nolden, 2019).

Operationalisation: Construction principles and criteria

The implemented scale was a (further) development within the project, referring to Wosnitza (2000) and Nolden (2019). The items cover aspects related to self-responsibility and interest in organising one's own studies. In addition, one general item is implemented.

Feedback criterion: Study satisfaction

Sample item: “I have a lot of freedom to individually arrange my studies.”

Total number of items: 3

Country-specifics: This scale is only used in the German Version of the SRT 2.0 and SRT 2.1.

4.1.4 Identification with my university studies

Theory: Construct and relevance for studying

Several theoretical and empirical conceptions of university drop-out assume that the development of a degree of identification with or commitment to the study programme (and the scientific subject), as well as with the organisation “university” can be important factors in the prediction of study outcomes (Braxton, 2014; Heublein, 2014; Heublein et al., 2017; Robbins et al., 2004). Our pilot studies confirm this assumption showing a strong relationship between the construct “Identification with my university studies” and the criterion “study satisfaction”.

Operationalisation: Construction principles and criteria

The implemented scale was a development within the project and for more details see Nolden (2016) and Nolden (2019). The scale is based on the theoretical conception of Parsons and Platt (1973); it integrates the variables “affect”, “value system” and “cognitive orientation” at the university level and studies programme level.

Feedback criterion: Study satisfaction

Sample item: “I am proud to be a student at my university.”

Total number of items: 4

4.2 Scales set 2: Getting along with others

This set of scales assesses 4 constructs using 5 scales that are described as follows.

4.2.1 Contact to teachers

Theory: Construct and relevance for studying

The possibility to contact teachers both during and outside of office hours plays an important role for students. Moreover, the type of contact and the student’s perception of the behaviour of teachers are important and can affect study satisfaction (Bargel, 2015; Georg, 2009; Larsen et al., 2013; Nolden, 2019). According to the findings in our pilot studies, a contact perceived as negligible increases the

probability for intentions to drop out of university, while a positively perceived contact increases study satisfaction.

Operationalisation: Construction principles and criteria

The implemented scale was a (further) development within the project, referring to Wosnitza (2000). The scale was split into the facets ‘positive contact with teachers’ and ‘negative contact with teachers’; each of these facets is captured through three items. The scale direction of negative contact is obviously negative and the items are recoded for feedback.

Feedback criterion ‘positive contact with teachers’: Study satisfaction

Feedback criterion ‘negative contact with teachers’: Drop-out intention

Sample item ‘positive contact with teachers’: “The teachers take their time to respond to my needs.”

Sample item ‘negative contact with teachers’: “I feel neglected compared to how other students are treated.”

Total number of items: 6

4.2.2 Social relations and cooperation among students

Theory: Construct and relevance for studying

During his or her studies, a student's contact with fellow students is crucial for several reasons. Students provide each other with emotional support, informally exchange information or learn together –factors that are conducive to studying. The construct of social integration has been intensively explored in drop-out research since Spady (1970) and Tinto (1975). Due to different operationalisations, its influence on various criteria of university drop-out is described ambiguously (e.g., Eckles & Stradley, 2012); however, many studies have revealed an association with drop-out (Gold, 1988; Schiefele, Streblow & Brinkmann, 2007; Halpin, 1990; Pascarella & Terrenzini, 1980; Larsen et al., 2013; Müller & Schneider, 2012; Nolden, 2019). The understanding of the construct of social integration implemented here is exclusively related to the integration of students in their network of fellow students. Our pilot studies revealed a correlation with both criteria, that is drop-out intention and study satisfaction.

Operationalisation: Construction principles and criteria

The implemented scale was based on a development by project partners Nolden, Wosnitza and Karabenick. The items link aspects of individual integration with an evaluation of the atmosphere among peer students.

Feedback criterion: Study satisfaction

Sample item: “In my degree programme, I easily made contact with other students.”

Total number of items: 5

4.2.3 Help seeking

Theory: Construct and relevance for studying

Universities provide a wide range of support services as measures of drop-out prevention; e.g., advisory services, mentoring systems or simply teachers being open for questions. Seeking help from these sources can be an adaptive and self-regulating strategy for students in critical situations. However, this strategy is often attached to stigmatisation (Winograd & Rust, 2014) and constitutes a perceived threat to competence (Karabenick & Newman, 2006; Karabenick & Gonida, 2018). It can be assumed that one piece of the puzzle to reduce university drop-out is accomplished by helping students to detect and solve conflicts, as well as to detect difficulties to make progress with the studies and be aware that help by others is often necessary (see Chapter 2.2). Students’ attitudes towards the strategic use of helping resources are key to this process (Karabenick & Newman, 2006; Karabenick & Gonida, 2018; see also Gonida et al., 2019).

Operationalisation: Construction principles and criteria

The implemented scale was based on a development by project partners: Karabenick, Wosnitza and Nolden. The main focus is on the stigmatisation of seeking help from others in the university context. Thus, the items target issues of help-seeking avoidance. The scale direction is negative and the items are recoded for feedback.

Feedback criterion: Drop-out intention

Sample item: “I would be embarrassed if others at the university found out I needed help.”

Total number of items: 3

4.2.4 Emotional support from family and friends

Construct and relevance for the studies

Several studies have shown that family circumstances and friends outside of university are factors that can impact the study situation (Heublein et al., 2017; Fernandes & Lopes, 2017; Silva, 2015; Panagiotopoulos, 2015; Ilišin, 2009; Pavić & Vukelić, 2009). Besides burdens (see Chapter 4.24), like critical financial situations, personal tragedies or private commitments; e.g. the obligation to take care of relatives – the social system outside university can also provide emotional support (Larsen et al., 2013; Robbins et al. 2004), which is particularly helpful in periods of stress during studies and for study satisfaction (Nolden, 2019).

Operationalisation: Construction principles and criteria

The implemented scale is a translated, substantially shortened and adapted scale from Zimet et al. (1988). For usage of this scale please refer to original reference. The items cover friends and family as a source of support very generally. For simplification purposes, they do not differentiate between these reference groups.

Feedback criterion: Drop-out intention

Sample item: “I can count on my family and friends outside university when things go wrong.”

Total number of items: 2

4.3 Scales set 3: Motivation

This set of scales comprises 5 constructs with 7 scales that are described as follows.

4.3.1 Intrinsic and extrinsic motivation

Construct and relevance for the studies

As previously mentioned, EVT (also as components of self-determination theory) posits that the value of a task can be divided into several value types; e.g., intrinsic value components and a utility value of extrinsic benefits (Deci & Ryan, 1985; Wigfield et al., 2015). Intrinsic motivation means that studying and learning of the respective contents is an end to itself. The intention to take on the task (e.g., to learn) comes from within the student through interest in the subject and joy of learning. No external regulation is needed. Extrinsic motivation, on the contrary, reflects the utility of the studies; the incentive to take on the task is the expected study outcome. Students are motivated to conduct study-related activities, e.g., to learn, because of the grades they achieve, social comparisons, parental

expectations, the graduation certificate they obtain and, in particular, the economic benefits and benefits for their careers. These two types of motivation are not necessarily mutually exclusive; they can exist simultaneously (Nolden, 2019).

Research has sufficiently shown the positive impact of intrinsic motivation on studying (Georg, 2009; Larsen et al., 2013; Perez, Cromley, & Kaplan, 2014; Robins et al., 2004; Rump, Esdar, & Wild, 2017; see also Gonida et al., 2019). Although extrinsic motivation has a weaker influence on the success of learning, there is no consensus in the literature on the exact direction and its interaction with intrinsic motivation. Based on our pilot studies it is assumed that moderate extrinsic motivation is conducive to studying, but the motivation to study mainly driven by extrinsic goals is detrimental to study satisfaction (to the complex effects of extrinsic motivation see also Nolden, 2019).

Operationalisation: Construction principles and criteria

The implemented scales with the facets 'intrinsic motivation' and 'extrinsic motivation' were (further) developed by project partners; a detailed description of their development is given by Nolden, Bürger and Wosnitza (2015). The theoretical concept integrates the achievement goal approach (e.g., Harackiewicz et al., 2000) and EVT (e.g., Eccles & Wigfield, 2002). The intrinsic motivation scale comprises facets of the mastery goal approach. The understanding of extrinsic motivation is limited to economic and status benefits on the labour market (utility value).

Feedback criterion: Study satisfaction

Sample item 'intrinsic motivation': "I study my subject(s), because my interests fit well with many topics of the degree programme."

Sample item 'extrinsic motivation': "I study my subject(s), in order to have good opportunities for a secure and permanent job."

Total number of items: 7

4.3.2 Relevance to practical application

Construct and relevance for the studies

In light of the allocation role of university studies (see also career prospects), the practical application of subject-related contents has become a quality hallmark for study programmes and courses. This refers either to application in subsequent professional activities or to general application to 'real-life' questions. According to various studies, the way in which students perceive this transfer of (theoretical) content can affect their studies (Bargel, 2015; Heublein et al., 2017; Georg, 2009).

Operationalisation: Construction principles and criteria

The items used were developed within the project. Nolden (2019) gives a detailed description of their development. They capture the link between theory and practice from a student perspective. Here, practice is understood as working life, on the one hand, and general practical applications, on the other.

Feedback criterion: Study satisfaction

Sample item: “In my studies I gain a lot of professional knowledge.”

Total number of items: 2

4.3.3 Academic efficacy

Construct and relevance for the studies

Self-efficacy beliefs refer to the confidence in one’s own competence for a certain task and to the question “Can I succeed in this task?” (Bandura, 1997). According to EVT they are an important predictor of expectancy estimations (Wigfield & Eccles, 2000; Wigfield et al. 2015). Empirically, studies show that academic self-efficacy is positively related to achievement and to a decreased probability of university drop-out and drop-out intentions (Lent, Brown & Larkin, 1986; Nolden, 2019; Perez, Cromley & Kaplan 2014; Robbins et al., 2004; see also Gonida et al., 2019).

Operationalisation: Construction principles and criteria

The scale is taken from Lent et al. (2005) and tackles various issues of studying and their respective efficacy. For usage of this scale please refer to original reference.

Feedback criterion: Drop-out intention

Sample item: “How confident are you that you can: Balance the pressures of studying with the desire to have free time for fun and other activities.”

Total number of items: 6

4.3.4 Emotions

Construct and relevance for the studies

Academic emotions such as enjoyment, boredom and anxiety have been recently studied in educational research (e.g., Pekrun, 2006; Pekrun & Stephens, 2010). A variety of academic emotions both positive and negative may be experienced by university students which are usually related to personal achievement or university factors (e.g., academic demands), often in a mediating position. As

expected, students who experience negative academic emotions and, especially high anxiety, are more likely to intend to drop-out or to withdraw a course and are reported by students who have dropped out their studies (Respondek et al., 2017; Ruthig et al., 2008). Our pilot studies also confirm these results.

Operationalisation: Construction principles and criteria

The implemented scales were developed by project partners Wosnitza, Karabenick, Peixoto and Nolden and differentiate between negative and positive emotions in university life with 4 items each. The scale direction of negative emotions is obviously negative and the items are recoded for feedback.

Feedback criterion ‘positive emotions’: Study satisfaction

Feedback criterion ‘negative emotions’: Drop-out intention

Sample item ‘positive emotions’: “When I think about my life at university, I feel happy.”

Sample item ‘negative emotions’: “When I think about my life at university, I feel anxious.”

Total number of items: 8

4.3.5 Time, Effort and Stress

Construct and relevance for the studies

This factor is related to the costs in the EVT calculation. Costs can arise from excessive efforts to master studies successfully, costs of not realised alternatives, as well as psychological and emotional costs like stress (Eccles, 1983). A study situation that is perceived as stressful, requiring extensive efforts and absorbing a lot of time from other activities has a negative impact on different criteria related to academic success (Georg, 2009; Nolden, 2019; Perez, Cromley, & Kaplan, 2014).

Operationalisation: Construction principles and criteria

The scale was (further) developed by project partners with reference to contents of the online Self-Assessment of RWTH Aachen University (RWTH-Self-Assessment-Team, 2015). It aims at capturing all three cost dimensions. The scale direction is negative, and the items are recoded for feedback.

Feedback criterion: Drop-out intention

Sample item: “I have to give up many things I enjoy in order to be successful in my degree programme.”

Total number of items: 3

4.4 Scales set 4: Being a learner

This set of scales includes 5 constructs using 7 scales that are described as follows.

4.4.1 Learning strategies

Construct and relevance for the studies

Self-regulatory learning skills include a broad array of cognitive, metacognitive and motivational strategies such as planning, monitoring, regulation, evaluation, study/time management, effort regulation, study-leisure conflict and help seeking (see factor help seeking) indicative of the active, conscious and purposeful engagement of the learner her/himself in the learning process as well as her/his personal responsibility of her/his own learning. The role of self-regulation in learning and academic outcomes has been internationally acknowledged and high-level self-regulatory strategies have been associated with better academic outcomes including GPA and persistence to study (e.g., Boekaerts & Corno, 2005; Robins et al., 2004; Schunck & Greene, 2018; Zimmerman & Schunk, 2011; see also Gonida et al., 2019).

Focusing on metacognitive strategies, regulating the learning process has the aim of being able to flexibly adapt to the requirements of a task, while reflection involves assessing the methods that accompany the learning process (Wosnitza, 2000). Their right use in combination with the personality trait “conscientiousness” has a positive effect on learning outcomes (Larsen et al., 2013; Nolden, 2019; Richardson, Abraham, & Bond, 2012; Robbins et al., 2004; Schiefele, Streblow & Brinkmann, 2007; Van Bragt et al., 2011). Our pilot studies confirm this finding for both criteria, i.e. study satisfaction and drop-out intention.

Operationalisation: Construction principles and criteria

The implemented scale was (further) developed by project partners, referring to Wosnitza (2000). The scale combines both facets, reflection and regulation/monitoring.

Feedback criterion: Study satisfaction

Sample item: “While learning, I keep trying to find out which parts of the subject matter I still do not understand.”

Total number of items: 6

4.4.2 Concentration and learning

Construct and relevance for the studies

Also, closely related to learning strategies is the ability to concentrate, which is of crucial importance in particular for self-regulated learning processes that largely characterise learning in higher education (Nenniger, 1999). It enables students to smoothly process information in a focused manner. Thus, cognitive strategies used for keeping up concentration support learning processes and achievement and have an impact on drop-out intentions (Nolden, 2019).

Operationalisation: Construction principles and criteria

The implemented scale was (further) developed by project partners, referring to Wosnitza (2000) and describes a lack of concentration. Some items refer specifically to learning and some are general. This scale is enlarged by items developed by project partners Gonida and Stepanovic. These items refer to the absence of certain learning strategies. The scale direction is negative and the items are recoded for feedback.

Feedback criterion: Drop-out intention

Sample item: “While learning, I frequently think about something else.”

Total number of items: 6

4.4.3 Emotional stability

Construct and relevance for the studies

As individual factors, some personality traits (e.g., of the Big-Five traits) are associated to university drop-out. One of these traits is the general emotional stability (as opposite to neuroticism). Emotional stability can influence the study situation and is related to academic satisfaction as well as drop-out intentions (Gold 1988; Nolden, 2019; Trapmann, Hell, Hirn, & Schuler, 2007). A closely related construct, academic hardiness, indicates the contribution in building resilience and moderates university stressors such as academic pressure, fear of failure, financial difficulties, competition, etc. (Kamtsios & Karagiannopoulou, 2013, 2015; see also Gonida et al., 2019).

Operationalisation: Construction principles and criteria

The operationalisation was based on a scale of the International Personality Item Pool (IPIP; Goldberg, 1999) referring to the Multidimensional Personality Questionnaire (MPQ) and covers a negative (neuroticism) and a positive (emotional stability) sub-facet that are treated separately according to the results in our pilot studies. For usage of this scale please refer to original reference.

For the SRT 2.0 and SRT 2.1 the negative sub-facet was renamed for the target group into 'general doubts and concerns' and recoded for feedback.

Feedback criterion 'emotional stability': Study satisfaction

Feedback criterion 'general doubts and concerns': Drop-out intention

Sample item 'emotional stability': "I am relaxed most of the time."

Sample item 'general doubts and concerns': "I panic easily."

Total number of items: 8

4.4.4 Self-discipline and Self-organisation

Construct and relevance for the studies

Within the five-factor model of personality traits (Costa & McCrae, 1992), conscientiousness has been consistently found as the strongest predictor of study continuance and academic performance (GPA). Highly conscientious university students better organise their studies, persist more in their studies, have higher performance and in turn are less likely to drop-out (e.g., Poropat, 2009; Richardson et al., 2012; Van Bragt et al., 2011; Vedel, 2014; see also Gonida et al., 2019). Moreover, a special facet of conscientiousness, namely procrastination as a lack of self-discipline, is considered as a particularly risky behaviour for university students with students high in procrastination being more likely to achieve less and to not persist with the demands posed by tertiary-level studies (Poropat, 2009; Richardson et al., 2012).

Operationalisation: Construction principles and criteria

The implemented scale is taken from the International Personality Item Pool (IPIP; Goldberg, 1999) referring to the NEO-PI-R reflecting the facet 'self-discipline'. For usage of this scale please refer to original reference. According to the results of our pilot studies, two sub-facets were treated separately: A positive sub-facet, named 'Self-organisation' and a negative sub-facet as lack of self-discipline, close to procrastination. As the items of the negative facet are recoded for feedback this scale was called 'Self-discipline'.

Feedback criterion 'Self-organisation': Study satisfaction

Feedback criterion 'Self-discipline': Drop-out intention

Sample item 'Self-organisation': "I am always prepared."

Sample item 'Self-discipline': "I need a push to get started."

Total number of items: 8

4.4.5 Determination

Construct and relevance for the studies

Another facet of the personality trait conscientiousness is determination. A disposition to strive for goals and achievement can affect both the academic performance of students and their drop-out intentions (Nolden, 2019; Trapmann et al., 2007).

Operationalisation: Construction principles and criteria

The implemented scale is taken from the International Personality Item Pool (IPIP; Goldberg, 1999) referring to the NEO-PI-R. For usage of this scale please refer to original reference. According to the results of our pilot studies, a positive and a negative sub-facet were extracted, but the negative facet was eliminated due to poor psychometric properties.

Feedback criterion: Study satisfaction

Sample item: I do more than what's expected of me.

Total number of items: 5

4.5 Scales set 5: Career Development

This set of scales contains 5 constructs with 5 scales that are described as follows. Importance of my studies

4.5.1 Importance of my studies

In EVT, attainment is a value (Wigfield et al. 2015) and represents the subjective importance to succeed in a certain task; e.g., for students with high attainment value it is important to graduate from university. These students are less likely to drop-out of their studies (Perez et al., 2014; Voelkle & Sander, 2008; see also Gonida et al., 2019).

Operationalisation: Construction principles and criteria

The scale was developed by project partners Wosnitza and Nolden and targets the importance of different organisational levels to students, i.e. degree programme and the university.

Feedback criterion: Drop-out intention, Satisfaction in Greece

Sample item: “How important is it to you to complete your degree programme?”

Total number of items: 3

4.5.2 Personal development

Construct and relevance for the studies

As described before, one goal of studying can be personal development (e.g., Parsons & Platt, 1973). Insights gained from the contents of a study programme can foster students' personal and intellectual development (Pascarella & Terenzini, 1980). However, if students do not perceive the university as a stimulating environment and their studies as intellectually demanding, drop-out intentions can arise (Nolden, 2019). This finding is confirmed in our pilot studies.

Operationalisation: Construction principles and criteria

The implemented scale was developed by project partners Karabenick, Wosnitza and Nolden. The scale covers such aspects of the university as learning environment and the development of an individual ideal self.

Feedback criterion: *Study satisfaction*

Sample item: "My degree programme gives me the possibility to grow intellectually."

Total number of items: 4

4.5.3 Career prospects

Construct and relevance for the studies

As university qualifications have an allocating function, a clear idea of the potential career prospects after studying can provide students with valuable orientation (Georg, 2009; Heublein et al., 2017; see also Gonida et al., 2019). As an evaluating construct it is not only affected by individual factors but also developments in the labour market. In our pilot studies the perceived career prospects affect both criterion scales, study satisfaction and drop-out intention.

Operationalisation: Construction principles and criteria

The implemented scale was developed by project partners Karabenick, Wosnitza and Nolden. The items refer to knowledge about vocational opportunities, perceived readiness and employability for the labour market as well as own interests.

Feedback criterion: *Study satisfaction*

Sample item: "I am confident that upon graduation I will be ready to begin the career I want."

Total number of items: 6

4.5.4 Certainty about chosen studies

Construct and relevance for the studies

The decision to study a specific programme at a specific institution of higher education is the initial and critical point in the temporal structure of the phenomenon of university drop-out. All of the subsequent study-related actions and, in turn, subjective perceptions are based on this decision and dependent on the chosen path (Christie, Munro, & Fisher, 2004; Georg, 2009). For this reason, a high degree of certainty about the choice of a degree programme is an important indicator for the subjectively perceived 'right' path. A low degree of certainty regarding the choice of a course of studies, on the other hand, increases the risk of dropping out (Heublein et al., 2017). In our pilot studies the construct is strongly correlated to drop-out intentions.

Operationalisation: Construction principles and criteria

The implemented scale was (further) developed by project partners with reference to contents of the online self-assessment of RWTH Aachen University (RWTH-Self-Assessment-Team, 2015). The items relate to the choice and decision for both the study programme and the university.

Feedback criterion: Drop-out intention

Sample item: "My current subject was the one I wanted to study."

Total number of items: 3

4.5.5 Knowledge about my studies and myself

Construct and relevance for the studies

Self-efficacy as confidence in own abilities (see Academic efficacy) is even more significant to studying if students are well informed about their studies and the demands placed upon them. Thus, in summary, this construct is represented by the sentence "I know what is required of me and I know what I am capable of". This relationship of being informed and self-evaluation as a factor with an impact on drop-out decisions is empirically established by Aymans and Kauffeld (2015) as well as Nolden (2019). Additionally, in our pilot studies the factor has strong positive correlations with study satisfaction and negative correlations with drop-out intentions.

Operationalisation: Construction principles and criteria

The scale was (further) developed by project partners with reference to contents of the online self-assessment of RWTH Aachen University (RWTH-Self-Assessment-Team, 2015). The scale combines aspects related to being informed about the study requirements and to assessing own competences.

Feedback criterion: Study satisfaction

Sample item: “I know what is required in my degree programme.”

Total number of items: 5

4.6 Module 6: My Burdens

In a separate module, a list of potential burdens reflecting the most common issues in university studies is used.

4.6.1 Study-related burdens

Construct and relevance for the studies

The items specify the extent to which each topic is perceived as burdening. The list has been compiled as thoroughly as possible in order to provide an overview on the potential issues; e.g., for counselling, advisory and institutional self-improvement.

Operationalisation: Construction principles and criteria

The list was developed by project partners Nolden, Wosnitza and Karabenick. The participants can add burdens missing in the list in an open-ended item. For this module, feedback is not provided with comparative data. Strongly expressed burdens (items ranked as 4, 5 and 6 on scale from 1 to 6) are listed in the feedback in order to give to the participant, as well as potential counsellors a general and easy to read overview on the issues at hand. There is a deliberate focus on the potentially negative perception of burdens rather than using formulations focusing on desires or wishes, because it is assumed that they provide more information: Every student would like to have more money, but only some students perceive their financial situation as burdening, producing a risk for the continuation of studies.

Sample item: “In my academic studies, I find it very burdening to meet the many requirements.”

Total number of items: 15

Table 2 Psychometric properties of final scales for the SRT 2.0 and SRT 2.1

	i	N				α				M (SD)				Range $r_{(it)}$				Range λ			
		PT	GER	GRC	SER	PT	DE	GRC	SER	PT	GER	GRC	SER	PT	GER	GRC	SER	PT	GER	GRC	SER
Study organisation and teaching quality	5	684	509	930	673	.85	.80	.86	.84	4.74 (0.75)	4.37 (0.83)	4.21 (0.98)	4.29 (1.01)	.628- .707	.508- .633	.435- .755	.543- .721	.770- .821	.677- .789	.761- .827	.691- .832
University Infrastructure for studying	1	680	509	930	673	/	/	/	/	4.96 (1.02)	4.63 (1.20)	3.36 (1.38)	4.1 (1.51)	/	/	/	/	/	/	/	/
Independent organisation of studies ¹	3	/	509	/	/	/	.88	/	/	/	3.91 (1.30)	/	/	/	.754- .811	/	/	/	.886- .921	/	/
Identification with my university studies	4	681	509	930	673	.90	.84	.86	.84	5.06 (0.90)	4.57 (0.98)	4.45 (1.11)	4.74 (1.06)	.722- .886	.635- .711	.481- .755	.513- .743	.842- .916	.796- .850	.758- .853	.687- .871
Positive contact with teachers	3	690	509	930	673	.87	.89	.88	.85	4.41 (0.90)	3.82 (1.17)	3.54 (1.18)	3.73 (1.28)	.730- .784	.753- .804	.667- .774	.631- .783	.880- .909	.888- .917	.843- .908	.820- .911
Negative contact with teachers	3	680	509	930	673	.64	.87	.75	.76	2.35 (1.02)	2.40 (1.31)	1.96 (0.99)	1.95 (1.10)	.387- .530	.722- .730	.483- .508	.594- .600	.777- .829	.875- .917	.756- .829	.823- .828
Social relations and cooperation among students	5	675	509	930	673	.85	.87	.85	.80	4.71 (0.90)	4.25 (1.11)	3.98 (1.13)	4.43 (1.04)	.516- .797	.581- .793	.460- .654	.438- .725	.663- .887	.714- .884	.739- .845	.601- .865
Help seeking	3	683	509	930	673	.85	.88	.859	.84	2.53 (1.19)	3.16 (1.34)	2.57 (1.30)	2.02 (1.19)	.760- .816	.764- .779	.651- .703	.68- .736	.856- .890	.896- .904	.874- .897	.856- .889
Emotional support from family and friends	2	684	509	930	673	.88	.88	.89	.90	5.40 (0.87)	4.83 (1.14)	4.97 (1.17)	5.42 (1.04)	.796	.787	.805	.818	/	/	/	/
Intrinsic motivation	4	680	509	930	673	.87	.86	.90	.85	5.09 (0.78)	4.73 (0.91)	4.55 (1.17)	5.06 (1.02)	.660- .790	.665- .798	.558- .760	.638- .760	.808- .895	.762- .897	.829- .905	.786- .874
Extrinsic motivation	3	683	509	930	673	.92	.91	.93	.94	4.61 (1.25)	4.84 (1.18)	3.89 (1.47)	4.73 (1.41)	.767- .883	.789- .827	.404- .702	.860- .896	.890- .951	.897- .925	.814- .837	.937- .954
Relevance to practical application	2	675	509	930	673	.77	.82	.78	.74	4.75 (0.95)	4.21 (1.22)	4.06 (1.24)	4.40 (1.16)	.623	.703	.644	.588	/	/	/	/
Academic Efficacy	6	671	509	930	673	.80	.73	.84	.85	4.23 (0.78)	4.07 (0.78)	4.09 (1.03)	4.61 (0.99)	.445- .642	.331- .539	.330- .653	.484- .699	.598- .782	.497- .728	.564- .841	.617- .815
Positive Emotions	4	670	509	930	673	.84	.84	.91	.85	4.77 (0.84)	4.06 (0.98)	4.36 (1.16)	4.35 (1.11)	.605- .719	.529- .744	.666- .796	.585- .763	.771- .853	.713- .856	.857- .874	.749- .882

	i	N				α				M (SD)				Range $r_{(it)}$				Range λ			
		PT	GER	GRC	SER	PT	DE	GRC	SER	PT	GER	GRC	SER	PT	GER	GRC	SER	PT	GER	GRC	SER
Negative Emotions	4	678	509	930	673	.73	.78	.77	.73	3.15 (1.00)	3.01 (1.05)	2.98 (1.24)	3.43 (1.13)	.288- .648	.328- .708	.404- .702	.352- .612	.478- .857	.348- .875	.724- .850	.560- .834
Time, Effort and Stress	3	680	509	930	673	.77	.82	.87	.82	4.26 (1.12)	4.12 (1.17)	4.22 (1.27)	4.58 (1.21)	.560- .693	.661- .694	.641- .765	.662- .702	.790- .884	.849- .868	.864- .918	.849- .874
Learning strategies	6	678	509	930	673	.85	.84	.83	.83	4.84 (0.70)	4.40 (0.86)	4.42 (0.90)	4.71 (0.95)	.599- .697	.594- .659	.289- .750	.567- .647	.716- .812	.721- .793	.716- .794	.712- .748
Concentration and learning	6	673	509	930	673	.84	.88	.88	.88	3.47 (1.02)	3.56 (1.13)	3.04 (1.18)	3.23 (1.26)	.440- .728	.471- .794	.370- .847	.555- .813	.562- .852	.597- .889	.630- .888	.657- .906
General doubts and concerns	4	681	509	930	673	.84	.86	.88	.88	3.82 (1.20)	3.76 (1.23)	3.96 (1.28)	3.97 (1.37)	.467- .776	.657- .760	.525- .711	.681- .799	.643- .894	.736- .848	.683- .756	.815- .898
Emotional stability	4	678	509	930	673	.71	.78	.75	.76	3.80 (1.00)	3.61 (1.03)	3.50 (1.11)	3.82 (1.10)	.464- .549	.516- .663	.338- .486	.512- .617	(-.705)- .777	.680- .771	.784- .879	.724- .808
Self-discipline	5	673	509	930	673	.86	.91	.92	.92	3.29 (1.15)	3.82 (1.21)	3.36 (1.4)	3.43 (1.45)	.578- .779	.480- .698	.566- .804	.744- .835	.719- .875	.776- .872	.763- .860	.834- .899
Self-organisation	3	679	509	930	673	.90	.81	.88	.89	3.65 (1.09)	3.52 (1.07)	3.33 (1.19)	3.42 (1.28)	.688- .867	.582- .732	.594- .893	.65- .848	.845- .947	.791- .838	.813- .868	.823- .94
Determination	5	671	509	930	673	.68	.81	.89	.85	4.35 (0.77)	4.16 (0.86)	4.29 (1.03)	4.45 (0.99)	.371- .609	.426- .723	.475- .691	.588- .710	.477- .830	.581- .848	.782- .859	.73- .832
Importance of my studies	3	682	509	930	673	.77	.79	.74	.83	5.53 (0.73)	5.32 (0.87)	5.43 (0.79)	5.76 (0.58)	.515- .701	.560- .743	.445- .793	.637- .812	.752- .894	.790- .901	.709- .907	.839- .929
Personal development	4	682	509	930	673	.90	.86	.90	.88	4.96 (0.88)	4.53 (0.96)	4.45 (1.17)	4.62 (1.12)	.750- .808	.656- .756	.632- .748	.676- .793	.857- .895	.806- .873	.868- .893	.815- .891
Career prospects	6	679	509	930	673	.88	.91	.88	.90	4.34 (0.96)	4.36 (1.11)	3.53 (1.19)	4.36 (1.17)	.556- .766	.525- .672	.378- .771	.687- .758	.670- .859	.793- .881	.703- .844	.783- .843
Certainty about chosen studies	3	681	509	930	673	.83	.62	.84	.82	4.99 (1.2)	4.56 (1.12)	4.50 (1.39)	4.93 (1.22)	.641- .736	.312- .552	.554- .746	.653- .733	.832- .894	.521- .850	.811- .869	.844- .891
Knowledge about my studies and myself	5	681	509	930	673	.87	.86	.87	.86	4.78 (0.84)	4.47 (0.94)	4.40 (1.07)	4.75 (1.05)	.629- .747	.638- .719	.458- .773	.509- .765	.765- .843	.750- .816	.706- .849	.652- .868

Note. i =Number of items; N =Number of Cases; α =Cronbach's Alpha, M =Mean, SD =Standard deviation, $r_{(it)}$ =Selectivity, λ = Factor loadings; ¹Scale used in Germany only

5 Structured feedback

After each scale set completed, the SRT 2.1 users can view their feedback in the sections “My feedback” (sections 3 and 4). First of all, this feedback is intended to provide students with a reference on their statements given before in order to enhance self-reflection. All information given in the feedback can be printed or stored as a PDF-file. Thus, another goal of the feedback can be to accompany a counselling process by students providing the feedback to support services. In such situations, the feedback can serve as an initial point of discussion. This step depends on the students consent to share the feedback and should always be voluntary.

Universities implementing the SRT 2.1 and adjusting it to their own environment can select constructs not to be presented in the feedback.

5.1 Construction principles

The feedback entails summarising information as well as detailed information on each construct. It is provided in two sections and following a colour scheme (green-yellow-red, see figure 4), according to the position of individual results among the results’ distribution of all respondents in a country/institution:

The **green colour** means that the students, for that specific scale, obtained individual scores within the upper third of the country/institution distribution.

The **yellow colour** means that the individuals scores are located in the intermediate third of the distribution.

The **red colour** means that students are located in the lower third of the country/institution distribution.

Numerical values are not represented in order to avoid confusion. A first feedback is given to students when they finish a scale. This feedback is shown at the front page of section 2 using the colour scheme (Figure 4).

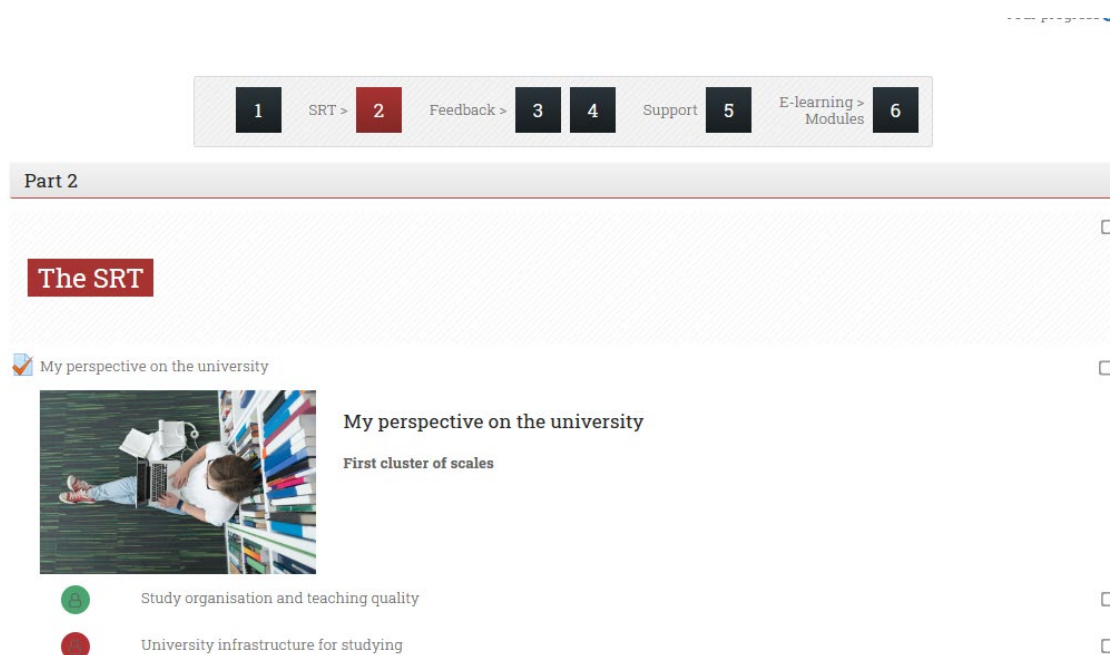


Figure 4 Example feedback in section 2

1. Visual representation of results

Based on a normalisation, the user data for each construct is represented through the colour scheme. On section 3 of the platform, the number (sum) of categories (constructs) assigned to the red, yellow and green colour is shown (see Figure 5). This information is explained to the users as follows:

Green area: You are in [count] categories in the green colour.

Yellow area: You are in [count] categories in the yellow colour.

Red area: You are in [count] categories in the red colour.

Besides this global presentation, the same type of information is provided for each set of scales, with exception of the scale set 6 (My Burdens). This visual representation is intended to provide an overview on the student's own study situation, as well as an easy to read indicator for the following detailed feedback on each construct.



Figure 5 Example of the global feedback given in section 3

2. Construct description

This overview is grounded on the feedback on each construct with the visual representation and a brief description of why the construct is important for the study situation and can be found in section 4 of the platform. These descriptions are based on research evidence and our pilot studies (see construct descriptions in this handbook, Chapter 4), but transformed into a target group oriented and

non-scientific wording. For an example see Figure 6. All construct descriptions used in the feedback are shown in the Table 3. These construct descriptions are fixed for all SRT-Versions of a country.

Your SRT Feedback

My perspective on the university

Your SRT results for the first set of clusters

Based on your results for this set of scales we recommend the following e-learning modules for you to do:

Module 1 - Motivation
Module 2

Study organisation and teaching quality

General information

Offering a well structured and organised course as well as high teaching quality are important objectives of any university. The individual evaluation of these objectives by the student may have an effect on his or her satisfaction with the studies.

What can you do?

(This is just repeating the other content as an example...) Offering a well structured and organised course as well as high teaching quality are *important objectives* of any university. **The individual evaluation of these objectives by the student may have an effect on his or her satisfaction with the studies.**

University infrastructure for studying

Getting along with others

Your SRT results for the second set of clusters

Positive contact with teachers

Social relations and cooperation among students

Motivation

Your SRT results for the third set of clusters

Extrinsic motivation

Figure 6 Example feedback based in the colour scheme and general description

Table 3 Construct descriptions (feedback)

Construct	Feedback text – Construct description
Study organisation and teaching quality	Offering a well-structured and organised course as well as high teaching quality are important objectives of any university. The individual evaluation of these objectives by the student may have an effect on his or her satisfaction with the studies.
University infrastructure for studying	Universities strive to provide the necessary infrastructure for a successful study experience. The individual evaluation of this objective by the student may have an effect on his or her study satisfaction.
Independent organisation of studies	University studies should encourage students to work and act independently, and organising the course independently is an important part of studies. If students feel they are free and flexible to organise their studies, they may be more satisfied with their course. The freedom and flexibility may, however, also hinder them in finding their way.
Identification with my university studies	During their studies, students spend most of the time at the campus, and the field of study is their point of reference in terms of their social and intellectual environment. The identification of a student with his or her university and field of study may also increase his or her satisfaction with the studies.
Positive contact with teachers	The contact with teachers makes an important part of studies for many students. If they perceive this contact as being supportive, this may increase course satisfaction and improve learning outcomes.
Negative contact with teachers	Teachers supervise a large number of students. Students who perceive their contact to teachers as being negative and inhibitive may have difficulties with their studies.
Social relations and cooperation among students	"Studying is much harder when you are alone". A good network among students facilitates course organisation, learning, and dealing with difficulties during studies in general. It doesn't necessarily have to be friendships; a good cooperation among students is often important for their studies and study satisfaction.
Help seeking	At institutions of higher education, you can find support services for many difficulties that can be burdening during academic studies. Seeking this support can be a very helpful strategy and students should not be worried about asking for help. There are services offered by students as well as services offered by the institution itself, and everyone involved is more than happy to help with small and big problems. Many successful students know where they can get the specific help they need and accept it.
Emotional support from family and friends	Emotional support from the social environment outside university may be a relevant factor for study satisfaction and for university adaptation.
Intrinsic motivation	"If students deal with course topics on their own initiative, this is called intrinsic motivation or learning-goal orientation. In this case, studying is an end in itself and doesn't need further external incentives. Many studies prove that a strong intrinsic motivation helps to succeed in studies and is a reason for long-term motivation."
Extrinsic motivation	Extrinsic motivation means that a course is chosen due to external (i.e., material) incentives. Students may in fact be more motivated if they take into account the job market and their personal career goal when choosing their course. However, if the course is only a means to an end, and the student is not very interested in the field of study, his or her motivation is likely to be insufficient when difficulties arise.

Construct	Feedback text – Construct description
Relevance to practical application	Recognising the reasons for studying the, sometimes abstract course topics and understanding how they can be put into practice, makes an important part of satisfaction with the studies.
Academic efficacy	During studies one could face many different challenges. Academic self-efficacy represents the confidence in dealing with academic tasks and problems. This confidence may contribute to the achievement and adjustment, by supporting student initiative, involvement and performance.
Positive emotions	Experiencing positive emotions, such as enthusiasm and enjoyment, is frequently a good thing for any individual person and for others around them. Positive emotions are related to effective learning, academic success and well-being in university.
Negative emotions	Experiencing negative emotions, such as anxiety and boredom, may constitute a barrier to effective learning, academic success and well-being in university. If these negative emotions prevail, students are more likely to be not satisfied with their studies, and the risk of dropping out increases. It is possible to regulate these negative emotions and to learn how to do it.
Time, effort and stress	Any university studies require a certain willingness to make sacrifices. However, if students feel they need to invest too much time and effort, this may be a reason for them to consider abandoning their studies.
Learning strategies	Depending on the course and learning environment, there are several learning strategies which have proven a positive impact on the learning success. The ability to revise and, if necessary, adjust one's individual learning process may result in a better performance and a higher satisfaction with the course.
Concentration and learning	"It is a big challenge to remain focused and concentrated while learning, since there are many ways to get distracted. Knowing how to study effectively is not an easy thing and study time management may also be difficult. Too much distraction and failure to use study skills or to organise study time effectively may have a negative impact on the studies."
General doubts and concerns	General concerns and self-doubt also affect the studies and sometimes result in questioning the continuation of studies.
Emotional stability	Serenity and emotional stability, in general, empower students in their studies and have a positive impact on their satisfaction with the studies.
Self-discipline	"Procrastination", that is, to postpone tasks and decisions, is very common among students and sometimes it may work out. However, if this strategy is used too frequently, the successful continuation of studies is at risk.
Self-organisation	The general skill to organise and prepare oneself makes a positive contribution to study satisfaction.
Determination	Striving for performance and having clear objectives, in general, may increase satisfaction with the course and study success.
Importance of my studies	Attributing high importance to one's educational aspirations is crucial factor of study satisfaction and completion. Adults with a higher education degree are more personally satisfied and benefit from their studies in many ways.

Construct	Feedback text – Construct description
Personal development	University studies should be intellectually stimulating and promote intellectual growth. Studies show that students less likely think about abandoning their studies, if they feel their course is stimulating and challenging.
Career prospects	What can I do with my degree? Having a clear and positive vision about their future career and being provided with career opportunities can make a positive contribution to the determination and course satisfaction of the students.
Certainty about chosen studies	"This is exactly what I want to do!" Feeling confident about the chosen course of study is important for the personal perseverance to complete the studies.
Knowledge about my studies and myself	If students feel well informed about and prepared for the study requirements and at the same time are good at evaluating their personal strengths, this makes an important part of satisfaction with the studies.

3. Precise feedback and support recommendations

In addition to this general description, one new feature of the SRT 2.1 is the possibility to insert a detailed feedback for each construct that is adaptive to the result. If the result is in the green area a confirming feedback can be given. If the result is in the yellow or red area, information on “What to do?” can be provided. This could be rather general, e.g., by a recommendation to talk to someone, or really concrete, i.e., a recommendation to talk to a certain person and providing the contact details, or a recommendation for a course/event on the topic at the university. Another recommendation can guide to the online trainings developed in the SUnStAR-Project.

This information has to be inserted by the implementing university itself. Thus, the participating universities are in control of the information provided and are able to keep these information up-to-date.

This important feature serves functions on several levels (see Chapter 6) and closes the circle from structured reflection to actual, topic-related and precise recommendations of support.

4. Summary

Following the visual representation of the results of the modules ‘My studies and I’ and ‘My university and I’, the feedback on the module ‘My Burdens’ along with demographic details is represented descriptively without comparison. The main goal of this section is to reflect a summary on the main stated burdens to students. This summary, as well as the demographic information, also intend to provide support services with information that can guide the counselling process, given that students agree to give access to their SRT-feedback.

5.2 Normalisation

In order to determine which value on a certain scale (construct) can be defined as ‘high’ (green area), ‘medium’ (yellow area) or ‘low’ (red area) a normalisation is calculated for each scale. This process is conducted for each country and relies on the samples of our pilot studies. It employs the stated criterion scales study satisfaction or drop-out intention. For each scale, one of these two criteria is selected according to correlational analysis. This takes into account, that some constructs are more related to study satisfaction and some more to drop-out intention (concerning the theoretical and empirical differentiation of study satisfaction and drop-out intention, see Nolden, 2019). Using an empirical threshold, the criterion scales are recoded to a binary level; e.g., for scales with a positive correlation with study satisfaction into “1=satisfied students” and “0=dissatisfied students”. For these two groups the mean and standard deviation of the scale to be normalised is calculated. The values of the three areas are calculated as follows:

$$\text{Green area} \geq M_0 + 1SD_0$$

$$\text{Red area} \leq M_1 - 1SD_1$$

$$(M_1 - 1SD_1) > \text{Yellow area} < (M_0 + 1SD_0)$$

Fictive example: For the scale “Self-organisation” with the feedback criterion study satisfaction the mean of satisfied students (1) is $M_1=3.79$ with a standard deviation of $SD_1=1.09$, while unsatisfied students (0) show $M_0=3.08$ with a standard deviation of $SD_0=1.12$. Therefore, the calculation would be:

$$\text{Green area} = 3.08 + 1.12 = 4.20 \text{ to highest value}$$

$$\text{Red area} = 3.79 - 1.09 = \text{lowest value to } 2.70$$

$$\text{Yellow area} = 2.71 \text{ to } 4.19$$

Scales with a negative effective direction on a criterion are recoded in order to enable the application of the formula.

This procedure is developed to identify fairly precise thresholds and to reduce the focus on comparison as would be done with e.g., percentile rankings. Although comparison to other students is stated as the reference in the description of the green, yellow and red feedback areas, the main focus is self-reflection and the visual representation reduces the aspect of comparison.

The feedback-thresholds for extrinsic motivation (see Chapter 4.1.1) are calculated in a particular way due to their complex effects. Based on our above-mentioned insights on moderate extrinsic motivation, the medium values represent the 'green' area for these scales, and 'excessive' extrinsic motivation is defined as the 'yellow' area.

6 Summary: What the SRT 2.0 and SRT 2.1 are and what they are not

To sum up, the SRT 2.0 and SRT 2.1 are a thoroughly developed online tools to trigger self-reflection of students. They address multiple issues that are relevant for the perception of the study situation and more specifically, for study satisfaction and drop-out intentions. The relevance of each issue was carefully established with theoretical grounding and empirical evidence in current research. The operationalisation was also theory- and data-driven, as all scales were tested in four pilot studies in the participating countries (Portugal, Germany, Greece and Serbia) with a total of 2816 students.

The SRT 2.0 and SRT 2.1 address different **target groups**:

As mentioned above, **students** are the main focus and should be enabled to reflect anonymously on their studies whenever (no time constraints) and wherever (no constraints in space) they feel like to. Due to the thorough development of the SRT 2.0 this reflection process is structured and not arbitrary.

One goal is to engage students with certain issues in a help-seeking process. As they should not be left alone with their results, a feedback on their statements is given providing them with information, which issues are detected and how and where to seek support. One piece of support is the online self-learning platform of the SUnStAR project, that provides a first step to actively tackle certain issues in a self-regulated way. The other piece is the support system at the university level by implementing and monitoring the SRT 2.1 tool. Therefore, **universities** are another target group of the SRT 2.1. By entering information on their own support system assigned to a specific issue, they can concentrate their services and keep the information updated. With this, universities deliver information on their services target-oriented to those students that are in need of help in this specific area. This precise information delivery avoids presenting all information to all students burdening them with the task of selecting just the relevant ones. This selection process is instead provided by the SRT 2.1.

If the precise information delivery is successful, students can bring their feedback results to counselling and advisory services. **Student and career counsellors** can use this feedback as an initial look at the issues at hand with some background information on the student that can form the basis of the session. However, it also works the other way around: Student and career counsellors can encourage students to use the SRT 2.0 before, during or after counselling sessions to accompany the counselling process. The usage of the SRT 2.1 is multifaceted and depends on the university's goals, resources as well as on the its distribution. It can be used during the entire student life cycle for all students (not only students at risk).

Besides the many opportunities, the SRT 2.0 and SRT 2.1 also have limitations that have to be kept in mind. First, the SRT 2.0 and SRT 2.1 cannot cover all potential student issues: As described, selections were necessary for a reasonable scope of the tool. Second and in addition to these content limitations, there are some methodological issues that need to be stated. The SRT 2.0 and SRT 2.1 rely on student self-reports and therefore cannot be seen as “objective” measurement (see Döring & Bortz, 2016): Students can lie, they can answer without thinking thoroughly, they can use it without the necessary concentration etc. The SRT 2.0 and SRT 2.1 include some measures on these issues, but false usage cannot be avoided or detected completely. However, as this tool serves student self-reflection, false usage distorts one’s own feedback. This responsibility for the validity of their results is pointed out to the participants on several occasions.

Furthermore, the SRT 2.0 and SRT 2.1 cannot claim to conduct a clean diagnostic measurement meeting all standards of diagnostics. There are several confounding issues like the uncontrolled setting and the large number of factors making short scales necessary. Also, measurement errors cannot be ruled out (see also Döring & Bortz, 2016).

These issues emphasize that the SRT 2.0 and SRT 2.1 should not be seen as a stand-alone-product. It should always be integrated in a holistic support system and associated to face-to-face-counselling or other sources of support. This is pointed out to the students in the tool. The developments and new features of the SRT 2.0 and SRT 2.1 take this necessary linkage into account and highlight it.

In consideration of these issues it can be concluded, that the SRT 2.0 and SRT 2.1 brings different target groups together and helps to match student needs with organisational services.

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Appendix

This appendix states all scales developed within the project or by project partners. The numeration refers to the chapters.

All scales are available in English, German, Greek and Serbian Language.

If not stated differently, the answer format is '0 -strongly disagree' to '5-strongly agree' (recoded for analysis to 1-6).

(r) = Item reversed in scale

4.1.1 Study organisation and teaching quality

In my degree programme...

- 1 ... the course of study is well structured.
- 2 ... the educational quality of teaching is high.
- 3 ... the courses are well organized.
- 4 ... I am introduced to interesting topics, ideas, and concepts.
- 5 ... I am given information I find useful.

4.1.2 University infrastructure for studying

- 1 Overall, the university offers a good infrastructure for learning and studying, e.g. learning spaces, technical facilities, wireless network, libraries, etc.

4.1.3 Independent organisation of studies

- 1 I can choose my lectures according to my interests.
- 2 I have a lot of freedom to individually arrange my studies.
- 3 I am responsible for arranging my studies myself.

4.1.4 Identification with my university studies

- 1 I am proud to be a student at my university.
- 2 My values and attitudes fit well with my university.
- 3 I get along well at university.
- 4 I feel I belong in my degree programme.

4.2.1 Contact with teachers

Facet positive contact

- 1 The teachers take their time to respond to my needs.
- 2 The teachers also take care of my problems.
- 3 The teachers make an effort to also accommodate my wishes as far as possible.

Facet negative contact

- 4 I have a feeling that the teachers are hostile towards me.
- 5 I feel neglected compared to how other students are treated.
- 6 My particular efforts are often overlooked by my teachers.

4.2.2 Social relations and cooperation among students

In my degree programme...

- 1 ... I regularly work with fellow students outside of classes.
 - 2 ... I easily made contact with other students.
 - 3 ... the students support each other when necessary.
 - 4 ... I exchange important information and aspects regarding studies with my fellow students.
 - 5 ... I can count on my fellow students when something concerning my studies goes wrong.
-

4.2.3 Help seeking (i.e., avoidance)

- 1 I would be embarrassed if others at the university found out I needed help.
 - 2 I would feel too dependent asking others at the university for help.
 - 3 I wouldn't want others at the university to know that I needed help to be a successful student.
-

4.3.1 Intrinsic and extrinsic motivation

I study my subject(s), ...

Intrinsic

- 1 ...because my interests fit well with many topics of the degree programme.
- 2 ...in order to learn as much as possible in this field.
- 3 ...in order to deal with exciting topics in this field.
- 4 ...in order to be challenged in this field.

Extrinsic

- 5 ...in order to have a steady income in the future.
 - 6 ...in order to have good income opportunities in my future career.
 - 7 ...in order to have good opportunities for a secure and permanent job.
-

4.3.2 Relevance to practical application

- 1 In my studies I gain a lot of professional knowledge.
 - 2 The theoretical knowledge of my studies is relevant to practical application.
-

4.3.4 Emotions

When I think about my life at university, I feel...

- 1 ... happiness
 - 2 ... enthusiasm
 - 3 ... pride
 - 4 ... enjoyment
 - 5 ... distress
 - 6 ... anxiety
-

4.3.5 Time, effort and stress

- 1 I have to give up many things I enjoy in order to be successful in my degree programme.
 - 2 I have to invest a lot of time and effort in order to study this subject(s) successfully.
 - 3 My studies mean a lot of stress and effort.
-

4.4.1 Learning strategies

- 1 When my learning strategies do not work out properly, I try to identify the problems and work through the assignment once again.
- 2 When I need to solve a difficult problem, I adapt my approach to the corresponding requirements (e.g. by proceeding more thoroughly).
- 3 When something is confusing or unclear to me, I work through the subject matter again more slowly.
- 4 I ask myself questions to make sure that I have understood the content.
- 5 While working on an assignment, I ask myself questions to help me follow a more targeted approach.
- 6 While learning, I keep trying to find out which parts of the subject matter I still do not understand.

4.4.2 Concentration and learning (i.e., lack of)

- 1 I have great difficulties to understand the main points of what I am reading.
- 2 I have great difficulties to organize my study time effectively.
- 3 I get lost in details while studying.
- 4 My thoughts are consistently somewhere else.
- 5 While learning, I frequently think about something else.
- 6 I continually get distracted by other things.

4.5.1 Importance of my studies (Answer format: '0-not important at all' to '5-very important')

How important is it to you...

- 1 ... to graduate from university?
- 2 ... to study your degree programme.
- 3 ... to complete your degree programme.

4.5.2 Personal development

My degree programme...

- 1 ... provides many ways for me to become the person I want to be.
- 2 ... allows me to actualize my important life goals.
- 3 ... gives me the possibility to grow intellectually.
- 4 ... creates an intellectually stimulating learning environment.

4.5.3 Career prospects

I am confident that upon graduation I will...

- 1 ... get a job I want.
- 2 ... be employable.
- 3 ... know how much money I will probably make.
- 4 ... be ready to begin the career I want.
- 5 ... know the occupations that are open to me.
- 6 ... know the career I want to pursue.

4.5.4 Certainty about chosen studies

- 1 My current subject was the one I wanted to study.
- 2 I am sure that I chose the right field of study.

3 I would rather have studied a different subject. (r)

4.5.5 Knowledge about my studies and myself

- 1 I feel well prepared for my studies.
 - 2 I have a good sense of whether I am suitable for my degree programme.
 - 3 I feel well informed regarding my degree programme.
 - 4 I know what is required in my degree programme.
 - 5 I am good at evaluating my strengths and weaknesses for my studies.
-

4.6.1 Study-related burdens

- In my academic studies, I find it very burdening...
- 1 ... to meet the many requirements.
 - 2 ... to pass upcoming exams.
 - 3 ... to cope with the workload of my academic studies.
 - 4 ... to recognize the link to practical applications.
 - 5 ... to maintain interest in my degree programme.
 - 6 ... to organize and advancing my academic studies.
 - 7 ... to finance my living expenses.
 - 8 ... to balance going to school and earning money at the same time
 - 9 ... to manage other responsibilities outside of university with my academic studies.
 - 10 ...to establish helpful contact with my teachers.
 - 11 ... to juggle childcare and my academic studies.
 - 12 ...to not know what my occupational future looks like.
 - 13 ... to get in contact with fellow students.
 - 14 ... to learn in a goal-oriented manner.
 - 15 ... other, namely
-