

Clearinghouse – research series

2013 number 15

Dropout Phenomena at Universities:
What is Dropout? Why does Dropout Occur? What Can be
Done by the Universities to Prevent or Reduce it?

A systematic review

by

Michael Søgaard Larsen
Kasper Pihl Kornbeck
Rune Müller Kristensen
Malene Rode Larsen
Hanna Bjørnøy Sommersel

**Danish Clearinghouse
for Educational Research**



AARHUS
UNIVERSITY

DEPARTMENT OF EDUCATION
DANISH CLEARINGHOUSE FOR EDUCATIONAL RESEARCH

Copenhagen 2013

Dropout Phenomena at Universities:
What is Dropout? Why does Dropout Occur?
What Can be Done by the Universities to Prevent or Reduce it?
A systematic review

The Danish Clearinghouse for Educational Research is a research unit at the Department of Education, Aarhus University

Title	Dropout Phenomena at Universities: What is Dropout? Why does Dropout Occur? What Can be Done by the Universities to Prevent or Reduce it? A systematic review.
Copyright	© 2013 by Danish Clearinghouse for Educational Research
ISSN	19045255
ISBN	978-87-7684-917-7
Section	Technical report
Review group	Professor Donald Broady, Department of Sociology and Culture, Uppsala University, Sweden Professor Barbara M. Kehm, International Centre for Higher Education Research, Kassel University, Germany Professor Per Fibæk Laursen, Department of Education, Aarhus University, Denmark Associate professor, Samuel Mühlemann, Centre for Research in Economics of Education, University of Bern, Switzerland Associate professor, Rie Troelsen, Institute for the Study of Culture, University of Southern Denmark, Denmark
Authors	Michael Sjøgaard Larsen Kasper Pihl Kornbeck Rune Müller Kristensen Malene Rode Larsen Hanna Bjørnø Sommerel
Dansk Clearinghouse – reference number	SR16
Month and year of publication	April, 2013
This report shall be cited as	Larsen, M. S., Kornbeck, K. P., Kristensen, R. M., Larsen, M. R. & Sommerel, H. B. (2013) Dropout Phenomena at Universities: What is Dropout? Why does Dropout Occur? What Can be Done by the Universities to Prevent or Reduce it? A systematic review. Copenhagen: Danish Clearinghouse for Educational Research, Department of Education, Aarhus University
Contact address (postal address, telephone, e-mail)	Danish Clearinghouse for Educational Research, Department of Education. Aarhus University Tuborgvej 164 DK-2400 Copenhagen NV Phone: +45 87163942 http://edu.au.dk/en/research/research-areas/danish-clearinghouse-for-educational-research/

Foreword

This is the full technical report of a systematic review of the international empirical research on dropout phenomena at universities. The report offers a conceptual analysis of what dropout is and also an analysis of the research which investigates either determinants of dropout or effects of measures undertaken by universities to prevent or reduce dropout. The results of the research are presented in a synthesis.

The project was commissioned by The Swiss Council for Educational Research (CORECHED). Work on the project was carried out in the period 01.03.2012-15.04.2013.

Clearinghouse is grateful for the work done by the Review Group. The Review Group not only accepted our invitation to participate in the project, they actively took up the challenge as reviewers of all the relevant international research and the overall project.

Clearinghouse also wishes to thank *the National Library of Education, Denmark* for competent assistance in the search for and procurement of the many documents on which this report is based.

Finally, Clearinghouse wishes to thank the commissioner of this piece of research, The Swiss Council for Educational Research (CORECHED), and especially the excellent working relationship with Director & Professor Stefan C. Wolter, who acted as contact point to the commissioner.

This report was completed in April 2013.

Michael Sjøgaard Larsen

Copenhagen, April, 2013

Contents

1	Introduction	11
1.1	Background	11
1.2	General background and problem area.....	11
1.3	Aims	14
1.4	Review group	15
1.5	The structure of this report	15
2	Methods of the systematic review	17
2.1	Design and method.....	17
2.2	Scope of the systematic review	17
2.3	Searches.....	20
2.4	Screening.....	25
2.4.1	Phase 1: Screening of references	25
2.4.2	Phase 2: Full text screening	26
2.4.3	Phase 3: Iteration, the setting of the final scope	26
2.5	Coding and data extraction.....	28
2.6	Summary of the review process	30
3	Dropout phenomena at universities: concepts and theories.....	32
3.1	Conceptualising university dropout.....	32
3.2	Consequences of university dropout – what consequences does it have and who is affected when university dropout occurs?.....	35
3.3	The political and economic context of university dropout	37
3.4	Theoretical models of university dropout	40
3.5	Summary.....	46
4	Research mapping.....	49

4.1	Context of the studies.....	49
4.2	Content of the studies	51
4.2.1	Curriculum area(s) covered	51
4.2.2	Operationalisation of dropout.....	53
4.2.3	Enquired aspects of dropout	55
4.2.4	Studies investigating the possible determinants of dropout	57
4.2.5	Studies investigating effects of dropout preventing or reducing measures at institutional level	58
4.3	Design of the studies	59
4.3.1	Overall study design	59
4.3.2	Study timing.....	60
4.3.3	Data sourcesData sources	61
4.3.4	Sample sizes.....	62
4.3.5	Methods of data analysis.....	64
4.4	Identification of a ‘British’ and ‘German’ research approach	65
4.4.1	Strengths and weaknesses of the two research approaches and the kind of evidence to be obtained from each	70
4.5	Quality of the studies.....	72
4.6	Summary.....	79
5	Narrative synthesis.....	82
5.1	Method of the synthesis	82
5.2	The theoretical model behind the narrative synthesis	84
5.2.1	Characteristics of the research field of university dropout.....	90
5.3	The narrative synthesis based on the theoretical model of university dropout.....	92
5.3.1	Premises for reading the synthesis.....	92
5.3.2	Evidence on ‘What is dropout from university studies?’	95

5.3.3	Evidence on ‘Why do such dropout phenomena occur at universities?’ including evidence on ‘What can be done by the universities to prevent or reduce such dropout phenomena?’	108
5.4	The robustness of the narrative synthesis.....	140
5.4.1	Methods applied in the completion of the synthesis.....	140
5.4.2	Methods applied in the completion of the research mapping	142
5.4.3	The quality and quantity of the studies available for the synthesis.....	144
5.4.4	The generalisability of the studies available for the synthesis within the geographically set scope of the review (external validity of the synthesis).....	149
5.5	Conclusion.....	150
5.6	Recommendations for research, policy and practice	152
5.6.1	Research.....	153
5.6.2	Policy and practice	154
6	Appendix 1: Search profiles	157
7	Appendix 2: Data extraction and coding tool	161
7.1	EPPI-Centre tool for education studies V2.0 - editable version	161
7.2	Keywording tool.....	184
8	Appendix 3: Characteristics of the studies available for the synthesis	187
9	References for the studies available for the synthesis	194
10	Abstracts for the studies available for the synthesis.....	199
11	Complete overview of references included in the systematic review	225
12	References for textual commentary	231

Tables

Table 2.3.1 Searched databases, ressources and search hits.....	22
Table 2.4.1 Screening: result of all phases.....	28
Table 4.1.1 Country of conduct.....	50
Table 4.1.2 Publication type.....	51
Table 4.2.1 Curriculum area(s) investigated	52
Table 4.2.2 Operationalisation of university dropout	54
Table 4.2.3 Review question addressed	56
Table 4.2.4 Possible determinants of dropout investigated.....	57
Table 4.3.1 Overall study design	60
Table 4.3.2 Study timing	61
Table 4.3.3 Data collection.....	62
Table 4.3.4 Achieved sample sizes.....	63
Table 4.3.5 Main method of data analysis.....	64
Table 4.5.1 Adequacy of description	72
Table 4.5.2 Are ethical concerns/problems raised?	73
Table 4.5.3 Do ethical concerns/problems exist?.....	74
Table 4.5.4 Sufficient justification for the conduct of study	74
Table 4.5.5 Appropriateness of research design for addressing research questions posed.....	74
Table 4.5.6 Sufficient attempts to establish repeatability/reliability and validity/trustworthiness in the data collection and data analysis process.....	75
Table 4.5.7 Extent to which research design and methods are able to rule out sources of error/bias	75
Table 4.5.8 Whether and how the generalisability of the study is addressed	76
Table 4.5.9 Whether reviewers and authors differ over the study findings	76

Table 4.5.10 Sufficient attempts to justify the conclusions making them trustworthy	77
Table 4.5.11 Weight of evidence	78
Table 1.1.3.1 Overall study design.....	146
Table 8.1 Country of conduct.....	187
Table 8.2 Publication type.....	187
Table 8.3 Curriculum area(s) investigated	188
Table 8.4 Educational level at which dropout is investigated	188
Table 8.5 Analytical level at which dropout is investigated	189
Table 8.6 Review question addressed	189
Table 8.7 Possible determinants of dropout investigated.....	190
Table 8.8 Overall study design	190
Table 8.9 Study timing	191
Table 8.10 Data collection.....	191
Table 8.11 Achieved sample sizes.....	192
Table 8.12 Main method of data analysis.....	192
Table 8.13 Weight of evidence	193

Figures

Figure 1.2.1 Actual and expected rates of graduates of Upper Secondary School	12
Figure 1.2.2 Tertiary-type A graduation rates (2010)	13
Figure 1.2.3 Population that has attained tertiary education (2010).....	14
Figure 2.6.1 Filtering of references from search results to research mapping and potential synthesis	31
Figure 3.1.1 Institutional levels university dropout can occur at	34
Figure 3.2.1 The ‘consequences’ of university dropout: consequence levels and areas possibly affected when university dropout occurs	37
Figure 3.4.1 Tinto’s model of college student dropout	43
Figure 4.4.1 Data sources, ‘British’ vs. ‘German’ research approach.....	68
Figure 4.4.2 Possible determinants of university dropout investigated, ‘British’ vs. ‘German’ research approach.....	68
Figure 4.4.3 Achieved sample sizes, ‘British’ vs. ‘German’ research approach.....	69
Figure 4.4.4 Study timing, ‘British’ vs. ‘German’ research approach	69
Figure 4.4.5 Overall study design, ‘British’ vs. ‘German’ research approach.....	70
Figure 5.2.1 Model of the dropout process.....	87
Figure 5.2.2 Operationalised model of university dropout.....	89
Figure 5.3.2.1 How different variable sets affect transfer and dropout respectively.....	99

1 Introduction

1.1 Background

This report has been written based on a contract between 'Die Schweizerische Koordinationskonferenz Bildungsforschung' (*The Swiss Council for Educational Research*) (CORECHED) and *Danish Clearinghouse for Educational Research*.

CORECHED has since it was established in the early 1990s been a forum for the most important actors in Swiss educational research. The central aim of the organisation is to improve cooperation in education between research, policy and administration. CORECHED is managed by three Swiss institutions: 'Schweizerische Konferenz der kantonale Erziehungsdirektoren' (EDK), 'Staatssekretariat für Bildung und Forschung' (SBF) und 'Bundesamt für Berufsbildung und Technologie' (BBT). In CORECHED is also represented: 'Schweizerische Nationalfonds' (SNF), 'Bundesamt für Statistik' (BFS) and 'Schweizerische Gesellschaft für Bildungsforschung' (SGBF).

Danish Clearinghouse for Educational Research (Danish Clearinghouse), a unit at the Department of Education at Aarhus University has since it was established in 2006 worked with evidence in educational research. Danish Clearinghouse has since its establishment produced twelve systematic research mappings or systematic reviews based on contracts with education authorities in Denmark and other countries.

The systematic review presented in the present report consists of a mapping of research that addresses dropout phenomena at universities as well as a synthesis of the research findings.

1.2 General background and problem area

The problem setting takes its point of departure in Switzerland. Of all the OECD countries Switzerland has one of the lowest rates of graduates of Upper-Secondary School that qualify directly for university studies¹. According to Statistik Schweiz, in 2010 19.8% of a cohort obtained the so-called 'gymnasiale Maturität', which can be used for entry into university studies (Statistik Schweiz, 2012b).² As seen in Figure 1.2.1 this rate has been relatively stable, but increasing, over

¹ I.e. has obtained a degree from a programme assigned the ISCED 3A which is designed to prepare for direct entry to tertiary-type A education (OECD, 2012: 53). A possible explanation for this is given in the recent 'Education at a Glance 2012' OECD-report: 'Programmes that facilitate direct entry into tertiary-type A education (ISCED 3A) are preferred by students in all countries except Germany, Slovenia and Switzerland, where the education systems are more strongly oriented towards vocational education and thus, more young people graduate from Upper-Secondary programmes that lead to tertiary-type B programmes.' (Ibid.: 44).

² For an overview of the Swiss educational system consult Statistik Schweiz (2012a).

the last decade and is expected to increase in a slight, but constant, pace over the next decade as well.³

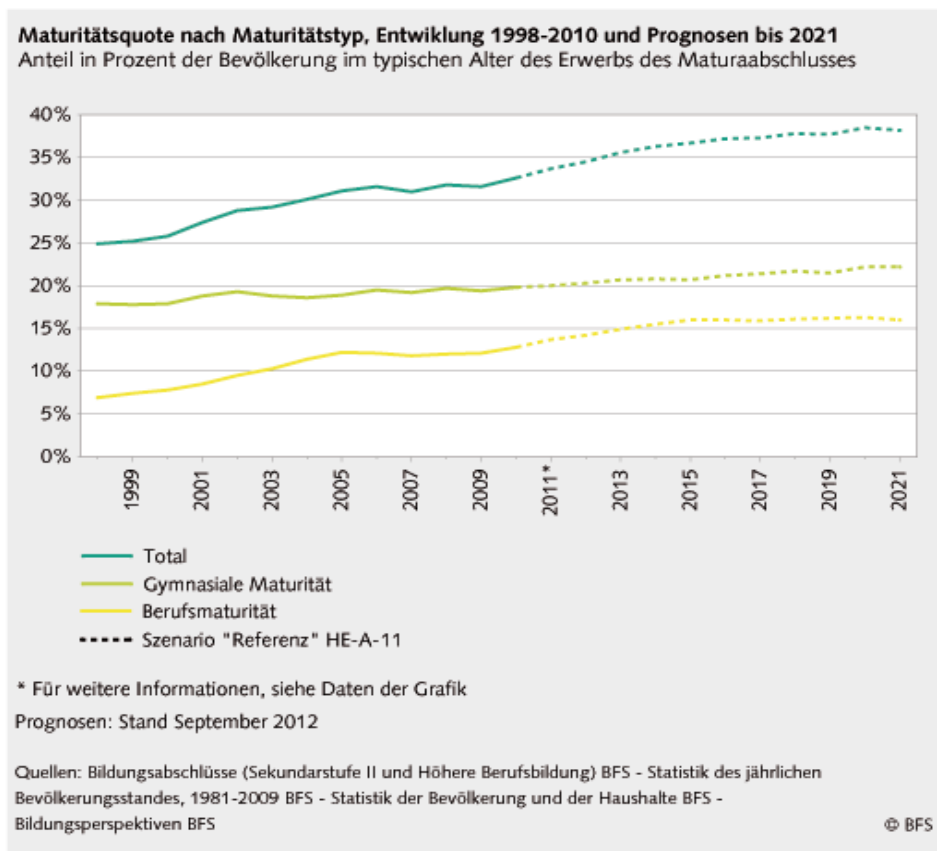


Figure 1.2.1 Actual and expected rates of graduates of Upper Secondary School in Switzerland by type of baccalaureate.
Source: Statistik Schweiz (2012b).

In spite of the low rate of graduates from Upper-Secondary School in Switzerland that qualify for university studies, the graduation rate from university studies (i.e. tertiary-type A programmes) for first-time graduates is found to be quite low in Switzerland (31%) and somewhat below the OECD average (39%) (OECD, 2012: 67), cf. Figure 1.2.2 below.⁴

³ As observed in Figure 1.2.1 within the time period (1998-2021) the expected increase in the rate of the other Upper-Secondary School baccalaureate 'Die Berufsmaturität' is observed to exceed the rate of 'Die gymnasiale Maturität'.

⁴ The graduation rate here referred to is based on the number of students who have been admitted to a university study, not to be confused with the number of people within a certain youth cohort.

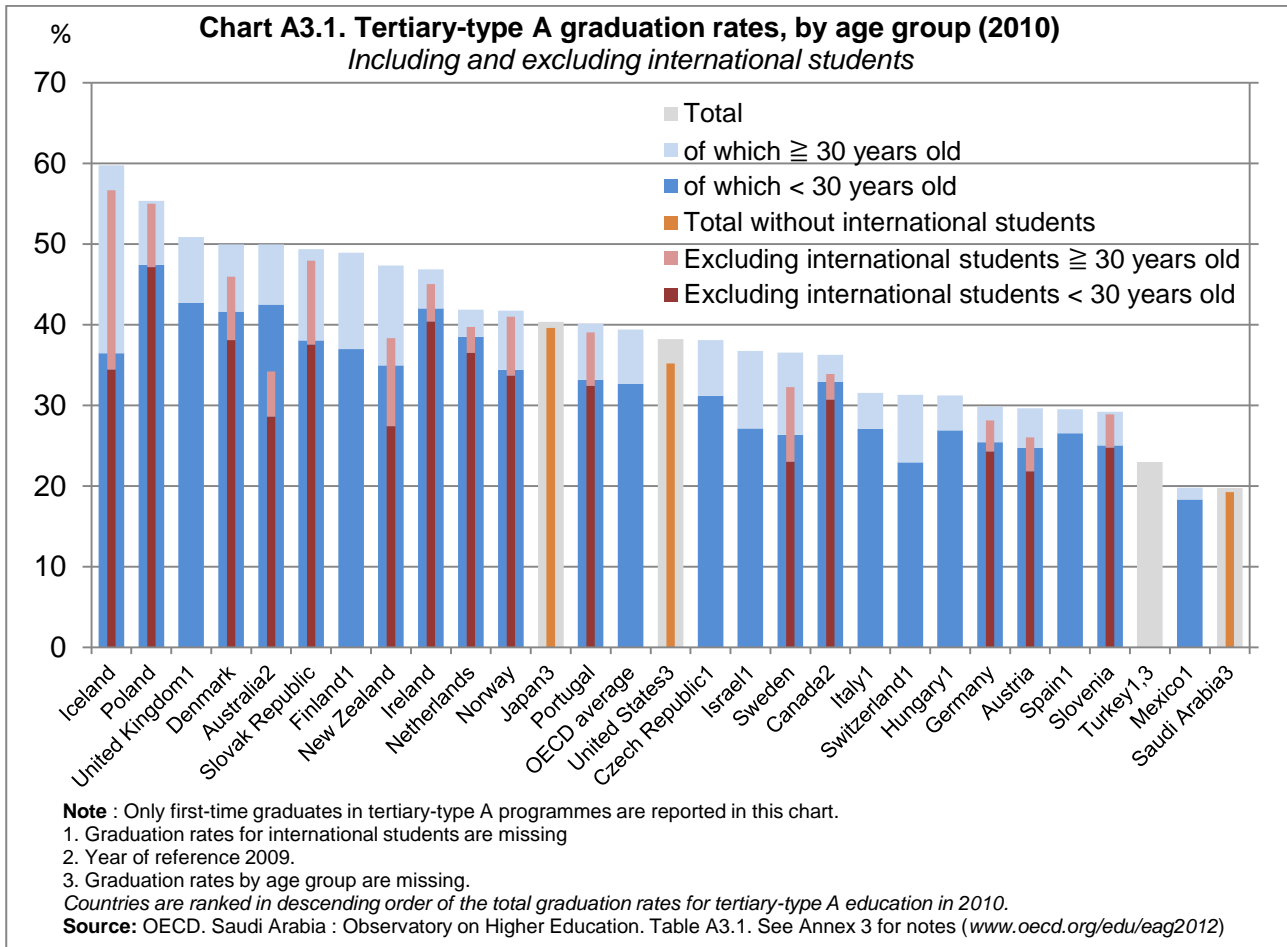


Figure 1.2.2 Tertiary-type A graduation rates (2010)
Source: OECD (2012: 60).

Taking this into consideration it is not surprising, as seen in Figure 1.2.3 below, that the difference in the so-called tertiary education attainment rate⁵ between the age cohort of 25-34 year olds and 55-64 year olds is found to be lower in Switzerland compared to many other OECD countries and lower than the OECD average.^{6,7} What is also evident in Figure 1.2.3 is that Switzerland, in line with countries such as e.g. the United States (Bound & Turner, 2011: 575-576) and Germany, has fallen behind over time regarding the proportion of the young population holding a tertiary-level degree. As such, quite a few countries with a lower tertiary education attainment rate than Swit-

⁵ This rate includes both tertiary-type A and tertiary-type B programmes.

⁶ The percentage increase in the tertiary education attainment rate between the age cohort of 25-34 year olds and 55-64 year olds is for Switzerland: $((40-28) \% / 28 \%) * 100 = 43 \%$ and for the OECD countries on average: $((38-23) \% / 23 \%) * 100 = 65 \%$ (OECD, 2012: 36).

⁷ It is worth noting that these data suffer to some degree from nontrivial problems with alignment in degree types across countries (Bound & Turner, 2011: 576).

zerland among the age cohort of 55-64 year olds are observed to have a higher tertiary education attainment rate than Switzerland among the younger age cohort of 25-34 year olds, cf. Figure 1.2.3.

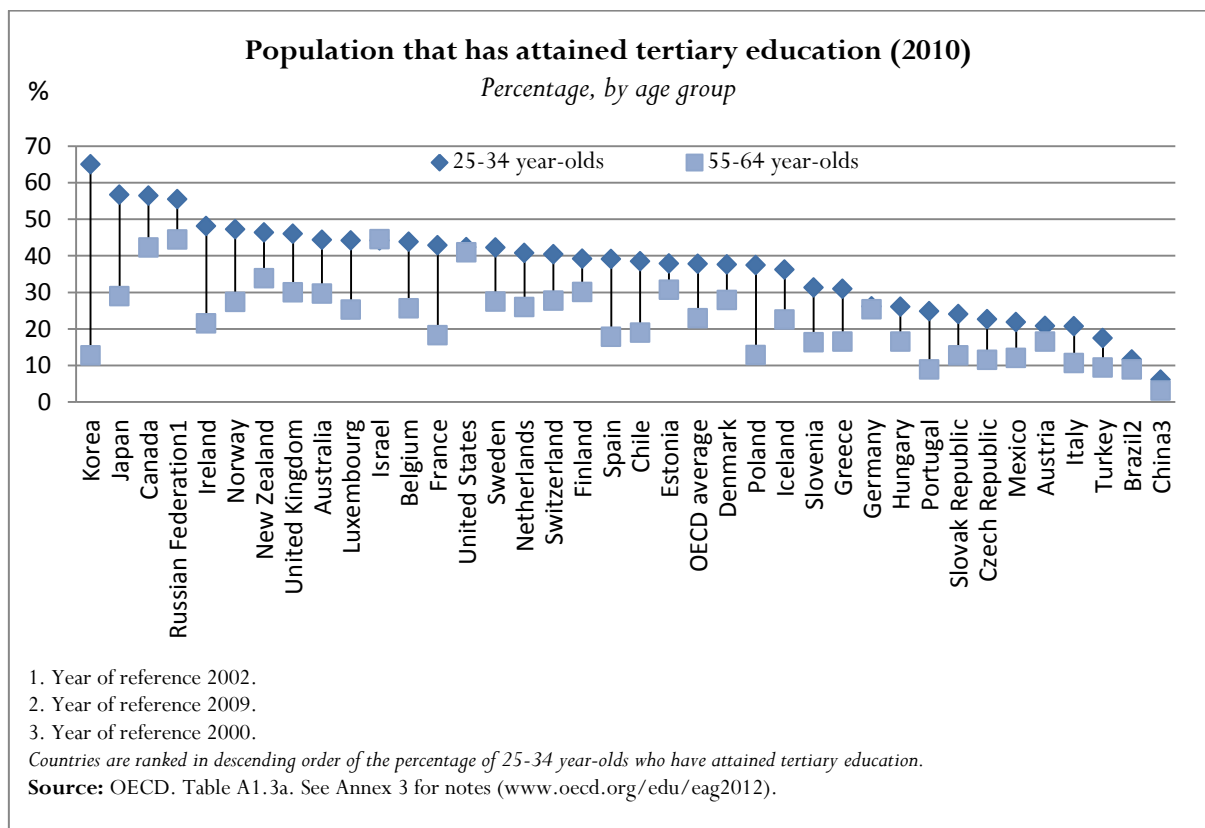


Figure 1.2.3 Population that has attained tertiary education (2010).
Source: OECD (2012: 26).

1.3 Aims

The aims of this systematic review can be summarised as this:

What research has been carried out to examine these questions and what are the findings:

What is dropout from university studies?

Why do such dropout phenomena occur at universities?

What can be done by the universities to prevent or reduce such dropout phenomena?

In the research mapping the relevant empirical research will be characterised with a focus on the aim, content, design, results and quality of the empirical research. The evidence on dropout phenomena at universities, comprising answers to the above questions, will be produced in the re-

search synthesis which contains only those studies which in the research mapping have been found relevant to include in the synthesis.

1.4 Review group

A review group consisting of five leading researchers in the field from Denmark, Germany, Sweden and Switzerland worked on the project.

From Denmark: *Professor Per Fibæk Laursen*, Department of Education, Aarhus University and *Associate Professor Rie Troelsen*, Institute for the Study of Culture, University of Southern Denmark.

From Germany: *Professor Barbara M. Kehm*, International Centre for Higher Education Research Kassel.

From Sweden: *Professor Donald Broady*, Department of Sociology of Education and Culture, Uppsala University.

From Switzerland: *Associate Professor Samuel Mühlemann*, Centre for Research in Economics of Education, University of Bern.

The members of the review group carried out quality assessment of the relevant research in cooperation with researchers from the Danish Clearinghouse. The members of the review group also functioned as reviewers of the overall process from scoping, searching, screening, redescription and data extraction to the research mapping and the research synthesis. Finally, the members of the review group have reviewed the present report. There have been no conflicts of interest for any member of the review group during their work with the research mapping and the research synthesis. I.e. close relationships between the authors of the studies included in the systematic review and members of the review group have been avoided in the distribution of studies among the review group members.

1.5 The structure of this report

Chapter 2 describes the methods applied in the systematic review. An account of the conceptual scope for this analysis followed by a description of the search universe of databases and resources and search profiles applied to find the research can be found here. The screening of the many hits from searches is then set out. Finally the methods used to extract data from relevant studies and to assess their quality is presented.

Chapter 3 gives an outline of the concept of dropout phenomena at universities and the theories underlying this specific research field. The consequences of dropout phenomena at universities and their political and economic context are analysed according to the scope for this systematic review.

Chapter 4 contains the research mapping on dropout phenomena at universities. This chapter gives a general characterisation of all the 62 studies found to be relevant for inclusion in the research mapping including an assessment of the research quality of these studies.

Chapter 5 comprises the research synthesis on the basis of those 44 studies which in the research mapping were assigned an overall weight of evidence of either medium or high. Thus, this chapter synthesises the research findings to present the evidence on the three review questions: *'What is dropout from university studies?', 'Why do such dropout phenomena occur at universities?', 'What can be done by the universities to prevent or reduce such phenomena?'*

The report contains three appendices: Chapter 6 (Appendix 1) describes all search profiles applied for searches of databases and resources. In chapter 7 (Appendix 2) is offered an example of a full redescription of one of the studies in the systematic review. Chapter 8 (Appendix 3) contains a characterisation of the studies available for the synthesis, i.e. of those 44 studies which in the research mapping were assigned an overall weight of evidence of either medium or high.

Chapter 9 lists all the references to the 44 studies available for the synthesis including their unique item ID's.

Chapter 10 contains the abstracts of the 44 studies available for the research synthesis.

Chapter 11 lists all the references to the 62 studies included in the research mapping.

Chapter 12 lists all the references applied in the commentary text of this report.

2 Methods of the systematic review

2.1 Design and method

The present systematic review is the result of following standardised procedures described in two documents developed by Danish Clearinghouse: *Concept Note* and *Concept Note on Quality of Research* (see <http://edu.au.dk/en/research/research-areas/danish-clearinghouse-for-educational-research/concept-note/>).

The procedure is also described in a protocol established at the beginning of the project. The procedure has the general feature of following a series of steps transparently and explicitly. This is explained further in this chapter.

To secure transparency in the process two software tools have been applied: The EPPI-Reviewer was used to keep track of all content of the review process from search to systematic map. The software is explained in more detail on the producer's website:

<http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=184>. Communication between the members of the review group and Danish Clearinghouse was established with the software Sharepoint. A description of this software can be found here: <http://sharepoint.microsoft.com/en-us/Pages/default.aspx>

Data extraction from relevant and suitably qualified documents was carried out following the methodology and systematics of the EPPI-Reviewer. This procedure was developed by the *EPPI-Centre* at the *Institute of Education, University of London*. In this particular systematic review the procedure was adapted to the conceptual universe of the research in question (cf. section 2.5).

The systematic review was carried out on the basis of codings and evaluations of the research reports by the members of the review group working together with researchers from Danish Clearinghouse. The studies were characterised and their thematic relationships analysed.

2.2 Scope of the systematic review

A full systematic review has two phases:

- *Systematic research mapping*: A mapping of the research published in the field. The mapping is aimed at gaining insight into both determinants of dropout and effects of measures undertaken to prevent or reduce dropout phenomena. Integrated in this will be the identification of research with sufficient evidence weight, i.e. studies which are reported with sufficient reliability. Only such studies can form the basis of an evidence-informed practice.
- *Systematic synthesis*: Analysis of the results identified in the studies which in the mapping were assigned sufficient evidence weight. The nature of the synthesis to be developed will depend on the nature of the included studies. A quantitative meta-analysis will be carried

out if there are randomised studies of the same phenomenon. The principles applied in meta-analysis are well described in the literature (e.g. Borenstein, Hedges, Higgins, & Rothstein, 2009; Torgerson, 2003). If there are no randomised studies of the same phenomenon, the synthesis will take the form of a narrative synthesis (a method described by Popay et al., 2006, Gough et al., 2012). The exact procedure of the narrative synthesis will depend on the qualitative/quantitative character of the studies in the research mapping.

The present systematic review has as a point of departure applied these concepts:

Dropout: Withdrawal from a university degree program before it has been completed.⁸

Temporary withdrawals due to illness, pregnancy etc. are not considered to be cases of dropout. A student's intention to withdraw, e.g. as stated in a survey, is not considered to qualify as dropout either. Only actual dropout (of whatever type and for whatever reason) from a university degree program will be taken into consideration as dropout when seeking answers to the review questions. The phenomenon 'change of study' where a student has enrolled in one subject of study and after a shorter or longer period of time changes/transfers to another subject of study or to another institution, must be taken into consideration as well when analysing dropout phenomena at universities. The dropout concept furthermore presupposes that the student has actually been active in his/her university study.

Dropout could be based on the student being either:

- Pushed out by features within the chosen university degree program and their relations to the student's interests and competencies (dropout), or
- Pulled out by features outside the chosen study program, e.g. on the labour-market or in another line of study and their relations to the student's interests and competencies (optout).

Dropout is, however, not necessarily associated with student external phenomena (within or outside the chosen university degree program) only. The role played by the student himself/herself in this must also be taken into consideration.

In order to be relevant for this systematic review, studies must investigate possible determinants of the dropout phenomena analysed or investigate the possible effects of programs/interventions directly aimed at preventing or reducing dropout. In the first case, studies which only give information on university degree program completion are not relevant. In the second case, studies

⁸ Included in this notion is also dropout from single courses of study within a given university degree program.

must investigate programs/interventions directed at all students or at-risk (for dropout) students. For these studies the completion rate could comprise a relevant evaluation measure of effect.

This was the dropout concept as set out from the beginning of the systematic review process which governed the searching for and screening of studies. Because one of the review questions deals specifically with the concept of dropout (*'What is dropout from university studies?'*), one of the result of the systematic review will be a more complete picture of dropout phenomena at universities which will be presented later in the synthesis section.

University: This term is understood as a public or private institution which does research and offers degree programs with public accreditation at bachelor, master, and doctoral level. Hence, several institutions of tertiary education are not within the scope of the present systematic review (e.g. Community Colleges, Teacher Training Colleges in some countries, etc.).

Student: This term means a full-time student at a university institution. Both students with special needs and students without such needs are within the the scope of the systematic review. Ph.D.-students and students who study abroad are not. Studies which only address such groups of students are, therefore, excluded form the systematic review. During the screening process the scope was narrowed further down to exclude studies which investigate distance learning students only.

Dropout determinants: Factors which have been demonstrated through a relevant research design and methods of analysis to determine, more or less directly, occurrences of dropout phenomena at universities.

Dropout interventions: Measures applied at universities to prevent or reduce dropout phenomena.

Effects: That something has an effect means that a causal relation exists, i.e. if one knows that B follows from A, one can state that A is the cause of B. In this systematic review the following effects will be considered when programs/interventions directed at preventing or reducing dropout are researched:⁹

- Students' completion rate of studies or programs
- Students' retention rate of studies or programs

⁹ Originally also cognitive effects on students' competencies as well as motivational effects were to be considered as outcomes. However, since such measures are at best indirect measures of students' completion or retention rates, studies investigating such effects only have been excluded.

The scope of the systematic review is further set on the basis of the following delimitations (as is evident from below, the originally set scope has been narrowed down on some of the parameters during the screening process):

Delimitation in time: Originally the scope was set temporally to include studies which have been published from 1990-ff. During the screening process this was changed to 2000-ff. This was mainly done as a consequence of recruitment to the universities being much broader today than 20 years ago. Also, globalisation processes have intensified the competition substantially among the universities when it comes to recruitment. Both of these developments set the dropout phenomena at universities and the ways to handle them differently today.

Geographic delimitation: Originally the scope was set geographically to include studies conducted within the industrialised nations: EU member states, Norway, Switzerland, USA, Canada, New Zealand, Australia and some countries in Southeast Asia. Later, the scope was narrowed down to include only studies conducted within a European context: EU member states, Norway and Switzerland.

Language delimitation: The language universe of the systematic review has been set to studies reported in English, German, French and the Scandinavian (Danish, Swedish and Norwegian) languages.

Research delimitation: During the screening process it was decided to exclude studies which have not applied a research design and methods of analysis adequate for the investigation and documentation of determinants of dropout or dropout preventing or reducing effects. Such research includes studies which apply a purely qualitative design as well as studies which analyse data for one group only with regard to the outcome in question (dropout). That is, studies which analyse data for dropouts only excluding persisters without at the same time distinguishing between different types of dropout behaviour.

2.3 Searches

Searches were carried out by the National Library of Education in cooperation with Danish Clearinghouse. The members of the review group have been given the opportunity to discuss and correct both sources to be searched and the search profiles. The search universe of databases and resources were thoroughly described in the protocol set up in the initial phase of the project.

From the beginning the members of the review group were also encouraged to suggest additional references. During the project, three such proposals were made by the review group.

The fields covered in this systematic review include education, psychology, economics and sociology. Therefore the search universe is set broadly. Also the decisions taken on delimitations of lan-

guage and geography have been taken into consideration in the selection of databases and resources.

The core content of the systematic review exercise has been 'dropout phenomena at universities'. Search profiles have focused on this, not on matters like effects, causes, (relevant) research designs etc. In other words the searches have been developed and performed in order to find the whole literature on 'dropout phenomena at universities'. Sorting of the many search hits were taken up later in the screening of all search hits. For a description of this see Section 2.4.

Source	Date of search	Number of hits
BEI (Dialog)	07/03/2012	157
AEI (Dialog)	06/03/2012	246
Psychinfo(Proquest)	02/03/2012	664
ERIC(Proquest)	29/02/2012	818
Evidensbasen	01/03/2012	0
Sociological abstracts(Proquest)	07/03/2012	403
Fis Bildung	09/03/2012	132
Canadian Education Index (Proquest)	07/03/2012	141
Bibliotek.dk	29/02/2012	42
Libris.se	09/03/2012	98
Bibsys Forskdok publikasjoner (Norge)	12/03/2012	28
Econlit	02/03/2012	343
Web of Science (ISI)	08/03/2012	137
Higher Education Empirical Research Database	14/03/2012	21
Education Research Complete	07/03/2012	293
Datenbank der SKBF	16/03/2012	5
Handsearch of key journals in the field	16/03/2012	2672
Francis (Proquest)	19/03/2012	22
IDS	28/03/2012	87
BNF Catalogue	16/03/2012	16
Internet homepages of major research players in the field	28/03/2012	7
References from references	Continuous during re-view process	57
References from review group	Continuous during re-view process	3

Table 2.3.1 Searched databases, ressources and search hits

A full description of all search profiles are found in Chapter 6. Sources and hits are shown in Table 2.3.1. All searches were uploaded in the EPPI-Reviewer software.

The nature of the search universe can be briefly described like this:

BEI (British Education Index) is the major British source to educational research.

AEI (Australian Education Index) is the major Australian database for educational research. Like *BEI* it shares some, but not all content with ERIC.

Psychinfo is the world's largest database with psychological research.

ERIC is the largest database in the world on education. It has an overrepresentation of US research, but it also covers research from many other countries around the world.

Evidensbasen is a database produced by Danish Clearinghouse for Educational Research. It covers systematic research mappings and reviews produced by the 10 major Clearinghouses of education in the world.

Sociological Abstracts is the major database for sociological research in the world.

FIS Bildung is the most important source for educational research published in the German language in Germany or elsewhere.

Canadian Education Index gives access to Canadian educational research. It has some but not full overlap with ERIC.

Bibliotek.dk is the common catalogue of all libraries in Denmark. It also gives access to Danish educational research.

Libris.se is the common catalogue for the libraries in Sweden. It also gives access to Swedish educational research.

Bibsys Forskdok Publikasjoner is the Norwegian research documentation system which gives access to all Norwegian research.¹⁰

Econlit is the American Economic Association's database. It is the major source to references in the economic literature.

¹⁰ During 2012 the system has been replaced by a new one, CRISTIN. The old system was searched as it covered the timespan relevant for this project.

Web of Science is the major source to citations in science and social studies. It was searched in the social science section (SSCI) and the humanities section (AHS).

The Higher Education Empirical Research Database is a British database which specialises in (any kind of) empirical studies of higher education.

Education Research Complete is a database which only covers journal articles in education. It is broader in its coverage than ERIC.

Datenbank der SKBF is the Swiss national database on projects, researchers and institutions in educational research.

Francis is a French bibliographic database covering the humanities and the social sciences.

IDS is a specialised German research database on higher education produced by the University of Halle.

BNF Catalogue is the catalogue of the National French Library.

Handsearch of key journals in the field: 3 journals have been chosen for hand-search, because the ERIC-search yielded most relevant hits in them: *The Journal of College Student Retention: Research, Theory & Practice* ISSN: 1521-0251. *Higher Education: The International Journal of Higher Education and Educational Planning* ISSN: 0018 1560. *Economics of Education Review* ISSN: 0272-7757. All references on articles from these journals (1990-2012) have been uploaded and subsequently screened.

The *internet homepages* of 2 major European research institutions in the field have been looked through for extra studies. The homepages of The Higher Education Academy, <http://www.heacademy.ac.uk/> and Institut für Hochschulforschung (HoF) Wittenberg, Martin-Luther-Universität Halle-Wittenberg, <http://www.hof.uni-halle.de/index.php> were checked.

References from references come in most cases from existing reviews of research in the field. From such reviews relevant references of relevant empirical studies have been extracted. In addition to this every included reference has been checked for additional relevant references.

As mentioned earlier the *review group also had the opportunity to add extra references* in the process.

The field of dropout phenomena at universities will be well covered by searching this long array of databases and resources from different social sciences, different national and international educational settings, and different degrees of specialisation in education, different languages and different forms of publication. As an addition to this the last 3 mentioned resources were added.

2.4 Screening

The searches have been performed to ensure that all relevant material would be found. In order to ensure this, it is necessary to search in ways which also give substantial numbers of non-relevant hits. A subsequent screening is therefore necessary. The way the searches have been performed also makes it expectable that duplicates occur in the search hits. 185 duplicates were removed before screening. 6207 unique references were subsequently screened according to their relevance.

The screening was based solely on the relevance of the studies. No weighting of research quality was involved. Attention was given solely to whether the material belonged in the conceptual universe described above in Section 2.2 **Fejl! Henvisningskilde ikke fundet.**¹¹

The screening process also looked at whether the references reported primary research. Popular presentations, secondary research reporting and discussions of scientific methodology etc. were not included.

The screening was carried out as a process with 3 phases:

2.4.1 Phase 1: Screening of references

All the search hits uploaded to EPPI-Reviewer were sorted into different categories. The result of the total screening process (of all 3 phases) can be seen in Table 2.4.1. All references for which the information was deemed insufficient were regularly subjected to additional searches in order to supplement with an *abstract* or other additional information.

This phase included everything that could not be excluded *with confidence*. Both 'certain' and 'uncertain' references were thus included at this stage. Exclusion was only performed with references where it could be done with a high degree of certainty.

The exclusion criterion 'wrong research design' was in general deemed impossible to apply with certainty in the screening of references. However, when studies applied a purely qualitative design they were excluded during this phase. This category was only introduced in the next phase of the screening process.

The screening in this phase only excluded references on studies which only had data from non-industrialised nations. Also, during this phase studies published 1990-2000 were not excluded.

¹¹ As can be seen from the description of different phases of the screening process, criteria were gradually narrowed in on the following parameters: the geographical scope, publication year, the student concept (distance learning students excluded) and research design.

2.4.2 Phase 2: Full text screening

In phase 2 the books, articles or reports that were the subject of all the remaining references were obtained and they were then screened on the basis of the full text. If during phase 1 a decision on exclusion or inclusion of a reference could not be taken, a search for an open access online version or a hard copy on the shelves in the university library of the document referred to in the reference was done immediately. In cases where such documents were found, phase 2 of the screening process took place directly. In all other cases the interlending department of The National Library of Education were forwarded a request on the reference.

The screening was carried out using the same criteria as in phase 1 including the exclusion criterion 'wrong research design'. This criterion was included so as to ensure that the included studies did in fact research determinants/causes and effect in the context of dropout phenomena. Studies should in order to be included apply designs that are capable of establishing causal relationship or measure effects, respectively. As a consequence, only studies that use a quantitative or mixed methods design have been included. Furthermore, the studies have to investigate actual dropout. Hence, only studies that offer information on whether students have actually dropped out are included.

In this phase also references on studies were excluded which only gave information on distance studies.

It is important to remember as a general point that research quality or reporting quality was not used as a basis for inclusion/exclusion.

By the end of the second phase screening there remained 523 references. This presented a challenge to both Danish Clearinghouse and the review group.

2.4.3 Phase 3: Iteration, the setting of the final scope

To carry through a thorough systematic review exercise with such a huge material would be impossible. So, setting a narrower scope was necessary.

Therefore, different sortings of the references have been considered to search for possible ways to set a more narrow scope of the review. The requirements to such a scope are threefold:

- That it is possible to operationalise (i.e. possible to make a precise screening of references).
- That it makes sense in light of the review questions.
- That it offers the opportunity for providing relevant and interesting information.

An analysis of the 523 references available after phase 2 of the screening revealed that 213 of these were published between 1990 and 1999. The rapid changes of universities on intake, content and output makes it plausible to concentrate on the more recent studies.

A further look at the remaining references (523-213=310) showed that a further 212 of these were on studies only offering data on university studies outside of Europe. Most but not all of these were studies from the USA. Many of the American references report studies on 4-year Colleges - it is not always certain when the study is concerned with universities which offer full degree programs. Based on the argument that the European university culture is different from the American such studies were excluded. The European tradition could be divided between the Continental-European and the Anglo-Saxon traditions, with the American tradition being closest to the Anglo-Saxon. Previous reviews of dropout phenomena have in general concentrated on American higher education. As such, an untapped potential in investigating European based studies is prevalent. But the wish remained to somehow inform the systematic review with results from previous reviews on Non-European research.

During this phase additional scoping on research design was also considered. To demonstrate possible determinants of dropout, it is necessary that studies apply an outcome measure that actually varies within the group of individuals (students). Otherwise causal relationships cannot be analysed. Descriptive studies cannot demonstrate such relationships. Therefore studies which only analyse data on dropouts without distinguishing between different types of dropout behaviour – involuntary dropout (i.e. dropout due to academic failure), voluntary withdrawal and student transfer, early or late dropout etc.) *and* which only look at the characteristics of the dropouts or at their own explanations for their dropout decision *without* also considering the characteristics or explanations of persisters, should be excluded.

Moreover not all research designs which can be used for investigating possible effects of interventions to prevent or reduce dropout are considered appropriate: one-group pre-post test and multiple baseline designs are not appropriate for demonstrating effects on interventions to prevent or reduce dropout. The reason for this is because dropout is an either-or decision which cannot be graded over a period of time as for instance medicine intake. It is simply not possible to drop out more or less. Therefore to measure an effect on a dropout preventing or reducing intervention it is necessary to apply a two group design with the effect (dropout or completion rate) measured on participants and non-participants in the intervention.

Based on these considerations the final scope was set like this:

References based on dropout of European university students published from 2000 onwards. Studies that do not report on both students who drop out and students who do not, or differentiate between different types of dropout students are excluded. The review is to be informed by previously published systematic reviews of non-European

studies of the dropout phenomena, including reviews focusing on interventions to prevent or reduce dropout.

Criteria for inclusion/exclusion	Criteria described	Number of references
EXCLUDE wrong scope	Not dealing with seeking of causes of dropout from universities or looking for effects of interventions at universities directed at reducing dropout phenomena	3747
EXCLUDE Wrong paper	Not a paper with data from empirical research: Editorials, commentaries, book reviews, policy documents, resources, guides, manuals, bibliographies, opinion papers, theoretical papers, philosophical papers, research methodology papers. Exam papers are also excluded except for PhD dissertations	673
EXCLUDE Wrong educational context	Only other educational contexts than universities are examined	736
EXCLUDE Wrong social context	Only with data from other countries than industrialised nations	419
Published before 1990	References published before 1990	2
Insufficient information	Not enough information available to screen	0
EXCLUDE Wrong research	References on studies which do not apply a research design adequate for the documentation of effects or causes	104
EXCLUDE Published 1990-1999	The documents published 1990-1999	213
EXCLUDE: Non-European study	References on studies only giving data on university studies outside of Europe	212
EXCLUDE: Only distance studies at university	References on studies which only give data on distance studies at universities	24
EXCLUDE: Non European reviews	Reviews on noneuropean research which will inform the analysis of the European research	7
Inclusion	Original empirical research on causes of dropout or effects of dropout reducing interventions in full time University studies in Europe published 2000ff with a proper research design	69

Table 2.4.1 Screening: result of all phases

2.5 Coding and data extraction

After the screening, 69 relevant documents referring to 62 different studies were available. All 62 included studies were subsequently coded and data extracted. When more documents treat the

same study, one is categorised as the primary document. Each secondary document is linked to its primary document in the EPPI-database, ensuring it will be considered in the analysis as well.

The *EPPI-Centre* at the *Institute of Education, London University*, has developed a coding and data extraction system for educational research. This is known as the *EPPI-Centre data extraction and coding tool for education studies V2.0*. This system has been used in a shortened and edited form for all coding and data extraction in this systematic review. The version applied here is presented in full in Appendix 2. The coding and data extraction system is an integrated part of the EPPI-reviewer.

The EPPI-reviewer was used to make a coding and data extraction of all the studies included in the research mapping. The principle of *tertio comparationis* was applied here. That is to say, a comparison between two elements is made possible by introducing and comparing them with a third (common) element. A prerequisite for creating an overview or synthesis covering all the studies is that they are described using such a common system.

Coding and data extraction consists of answering questions about all the studies in such a way that relevant data are made available for use in the comparison. The system is built up in sections which are subdivided into questions which in turn are subdivided into multiple choice answers. At all points it is possible to insert notes and explanatory remarks linked to the selected multiple choice answer. In terms of content, the system covers the purpose of the study, its focus with respect to policy and practice, sampling considerations, results and conclusions, design and method, quality of research and reporting. The original EPPI questions have been modified considerably and supplemented with a frame of questions directly related to the theme of this systematic review. This can be seen in Appendix 2.

All the included studies were distributed to the researchers from Danish Clearinghouse and to members of the review group in such a way that one researcher from Danish Clearinghouse and one member of the review group were responsible for the same specific studies. The researcher from Danish Clearinghouse answered all question while the member of the review group gave answers to questions with a bearing on research quality. The peer review principle was then applied systematically, so that every study was examined by at least two people.

Special focus was given to ensure the quality of the evaluation of the weight of evidence, which forms part of the coding and data extraction.

In connection to this a procedure was employed to permit establishment of an 'agreed version': if there were differing opinions as to the evaluation of the four questions in the section concerning weight of evidence (cf. Appendix 2, Section M, Question 11-14), a dialogue took place between the member of the review group and the researcher from Danish Clearinghouse, in which explicit arguments for the differences were exchanged in regards to establishing agreement. If agreement

could not be reached in this way, a third party was assigned the task of establishing an ‘agreed version’ on the basis of the presented arguments. In connection with this review it was not necessary to employ the services of a third party in any single case.

An example of a complete coding and data extraction for one document is presented in Appendix 2.

The coding and data extraction of all studies provide the data for the research mapping. The facilities for analysis and reporting available in the EPPI–Reviewer could then be applied for the research mapping and the potential synthesis.

2.6 Summary of the review process

Figure 2.6.1 presents the process *from search to research mapping*. The figure also indicates that a research synthesis can potentially be performed starting from the research mapping that has been carried out.

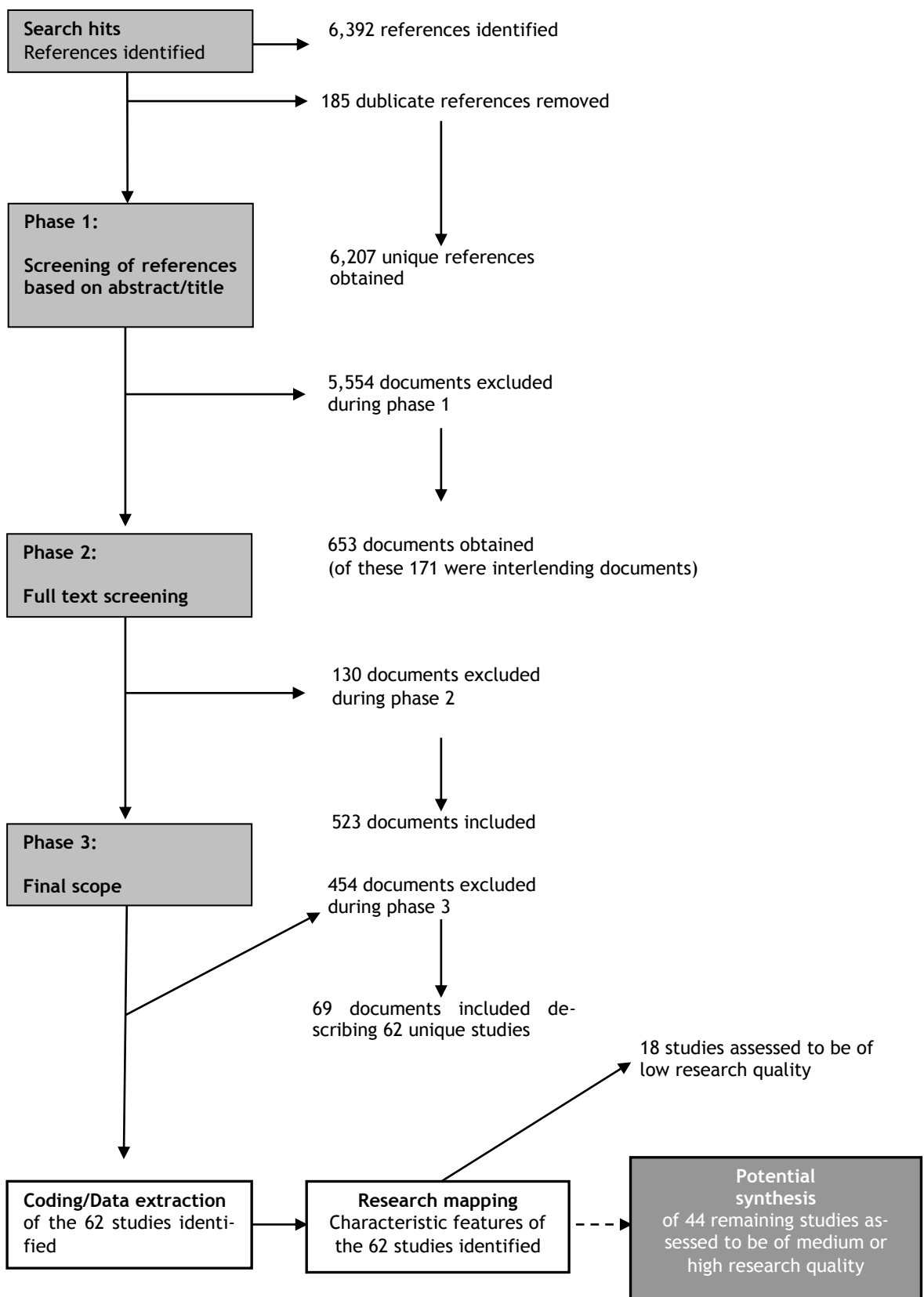


Figure 2.6.1 Filtering of references from search results to research mapping and potential synthesis

3 Dropout phenomena at universities: concepts and theories

This chapter gives a characterisation of the field of study of university dropout. The subsequent sections describe university dropout on the following parameters: 1) what does the concept of university dropout encompass? ¹² (section 3.1), 2) what are the consequences of university dropout, that is, how does it affect and who are affected when university dropout occurs? (section 3.2), 3) how can the political and economic context of university dropout be characterised? (section 3.3) and 4) what theories are currently available to explain university dropout? (section 3.4). Section 3.5 summarises and concludes upon the previous sections.

3.1 *Conceptualising university dropout*

Section 1.2 outlined the point of departure of the present systematic review, that is, recent statistics on university attendance and dropout in Switzerland were investigated and reflected upon within a wider, comparative context.

The figures presented in section 1.2, however, only tell a somewhat superficial story of university dropout. Before one can dig deeper into the problem area and look for possible determinants of dropout or investigate the possible effects of programs/interventions directly aimed at preventing or reducing dropout, the concept of university dropout must be defined, further elaborated and discussed.

The term 'university dropout' is commonly used to describe situations where students leave the university study in which they have enrolled before they have obtained a formal degree. Dropout is thus defined in a negative sense as 'non-completion' of a given university study. From here it follows that the concept of university dropout is not an unequivocal concept. In line with this, various labels have been attached to it depending on factors such as its deeper content (i.e. the reason(s)/rationale(s)/motivation(s) lying behind it), at what institutional level the dropout occurs and at what analytical level it is evaluated. The research setting in which university dropout is evaluated also plays a role for the terms being used (cf. Hovdhaugen, 2009: 2; Jones, 2008: 1). The most common terms used to describe university dropout within a student perspective are: dropout, departure, withdrawal, failure, non-continuance, non-completion, whereas their positive counterparts are: persistence, continuance, completion etc. Within an institutional and governmental perspective positive terms as retention and graduation rate are commonly used (Jones, 2008: 1), whereas student attrition regularly denotes the negative outcome.

¹² Whereas section 2.2 outlined the dropout concept as set in the conceptual scope from the beginning of the systematic review process which governed the searching for and screening of studies, the present section of the report presents a more complete analysis of the concept of university dropout phenomena having emerged on the basis of the additional knowledge of the field of study obtained during the work on the different phases of the systematic review process.

Concerning the ambiguity of the concept of university dropout; for one thing university dropout can be more or less voluntary in character as seen from the individual student's point of view depending on the reason(s)/rationale(s)/motivation(s) lying behind it. A student can drop out due to failure to meet the academic standards/demands within university. In this case dropout should be viewed as involuntary in character (i.e. the student has been pushed out of his/her specific subject of study/university). Furthermore, a student can decide to drop out for reasons more voluntary in character (withdrawal is a better term in this case, because it is a case of opting-out/the student being pulled out of his/her specific subject of study/university), e.g. due to financial difficulties, family related or personal problems, favourable job prospects/opportunities or due to better educational alternatives elsewhere. Vincent Tinto, in one of his later theoretical works, recognises that the university system is merely one system out of a greater network of other simultaneous systems each with their own values and goals (Troelsen, 2011: 41; Tinto, 1998). As such, the student is often not only influenced by university internal factors, but also by external factors when (s)he makes the decision to stay or leave his/her specific subject of study/university. Even though the decision to leave the specific subject of study/university in these last-mentioned 'externally provoked' cases might have been taken partly reluctantly by the student, e.g. in the case of family related or personal problems, the decision is not controlled by the university and, as such, is more voluntary in character after all.

The case of a voluntary withdrawal might, but need not, be followed by a transfer of the student to another subject of study or to another university, and might therefore be termed a 're-selection' of study or what Tinto has called an 'institutional departure' (Tinto, 1993: 36). Likewise, cases of voluntary withdrawal due to favourable outside opportunities such as a favourable business cycle might be termed a 'de-selection' of study or what Tinto has called an educational 'system departure' (Ibid.: 36). As will be discussed in Section 3.2 university dropout is, therefore, not automatically experienced as a negative 'event' or process, at least not from the student's own point of view. This can, however, also be true for dropout due to academic failure, because, as will be discussed in Section 3.2 as well, dropout due to academic failure might not always be viewed negatively from the point of view of the academia either.

Furthermore, a specific dropout case is contingent upon the institutional level it occurs at, combined with the analytical level at which it is evaluated. From Figure 3.1.1 below it is evident that university dropout can occur at different institutional levels as dropout from either 1) the level of the specific course of study (i.e. where the student transfers to another course of study within the same department at the same university), 2) the departmental level (i.e. where the student transfers to another department within the same faculty at the same university), 3) the faculty level (i.e. where the student transfers to another faculty within the same university), 4) the university level (where the student transfers to another university) and 5) the university system level (where the student leaves the university system altogether). As such, what is viewed as a case of dropout at one analytical level might not be viewed as such at another analytical level. In the case of for

example a direct student transfer from one department to another within the same faculty and university, the student might not actually view himself/herself as having dropped out and formally (s)he has not dropped out of that specific faculty or university, only from that specific department. A dropout from the system of higher education altogether is, to the contrary, a dropout as viewed by all institutional levels within the system of higher education and most likely also by the student him-/herself. Notwithstanding this, dropout almost always has at least negative economic consequences also when viewed from an institutional point of view. Even a transfer is synonymous with a waste of time and money compared to a situation where a student completes a university degree without a transfer. This is also due to the fact that performance-based funding is increasingly applied as an economic instrument, cf. section 3.3 below. A transfer (an 'institutional departure') should, however, be seen as less serious than a dropout of the university system altogether (a 'system departure') from a societal point of view.

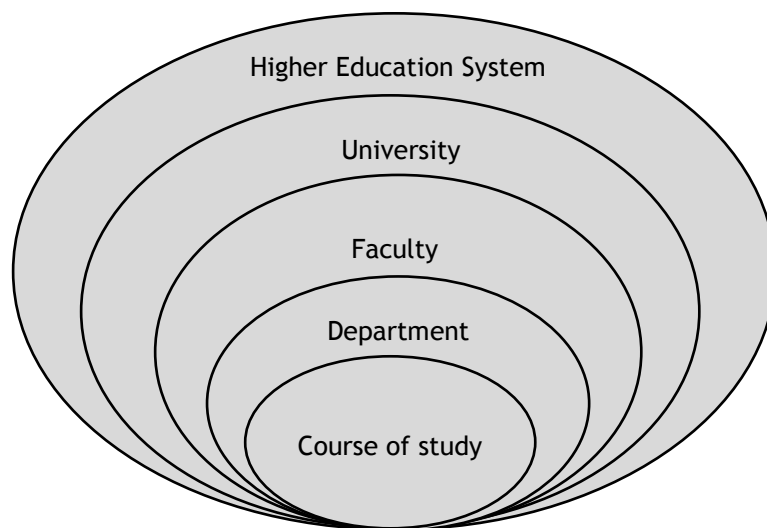


Figure 3.1.1 Institutional levels university dropout can occur at
 Source: Revised version of a similar figure in DMA/Research (2002: 10).

Besides characterising university dropout on (A) whether it is more or less voluntary in character, (B) what institutional level it occurs at combined with the analytical level at which it is evaluated (distinguishing between an 'institutional departure'/student transfer and a 'system departure'/formal dropout), university dropout can be characterised on a number of other parameters, e.g. on (C) the timing of dropout (early vs. late dropout) and (D) whether the dropout has happened with or without the student having first acquired useful skills to be used as transfer of credits to another (related) subject of study or to be used subsequently on the job market.

This diversity of university dropout terms as well as of its definitions and empirical operationalisations will be evident in Chapters 4 and 5, where the empirical research included in the systematic review is presented. It is worth noting that this diversity is as much a result of practical (data related) possibilities/constraints as it is a result of a conscious choice made by the researcher(s) in

question (cf. Chapter 4). Bearing this diversity in mind, however, the term ‘dropout’ will throughout the report be used as the common designation to describe the various phenomena included under the heading of students who leave a university study before they have obtained a formal degree, unless it is both possible and useful to use a more specific term.

3.2 Consequences of university dropout – what consequences does it have and who is affected when university dropout occurs?

When university dropout occurs it has consequences at different levels –the society (cf. e.g. Bound & Turner, 2011: 574), the university (different institutional levels within) and the individual student are affected (cf. e.g. Ulriksen, 2010: 210). Furthermore, for each of these levels different consequence areas can be identified.

The characterisation of each specific dropout case on the basis of the above mentioned factors (A-D) in section 3.1 inevitably leads to different outcomes concerning the severity of consequences felt by the student who dropped out, by the different institutional levels as well as by society in a broader sense. Also, differences in the systems and structures of higher education between the European countries naturally lead to differences in the pertinence of the various problematics and consequences surrounding university dropout within each national setting. Common to all of these various characterisations, dropout is essentially associated with negative consequences in the form of a waste in invested capital, structures, time and psychological endeavours (cf. Figure 3.2.1).

At the individual student level, a dropout (at least concerning the involuntary cases of dropout) is likely to be associated with emotions of personal inadequacy/self-doubts/not belonging (cf. e.g. Edwards & Cangemi, 1990). Furthermore, a dropout is inevitably synonymous with a waste of personal resources, time and money (unless the dropout has happened with the student having acquired useful skills to be used as transfer of credits to another related subject of study or to be used subsequently on the job market).

At university level, cf. Figure 3.2.1 below, the consequences of dropout can be divided into an economic and an academic part. The introduction of performance-based university funding in many countries within the past decade (see below) makes dropout, including student transfer, purely negative in an economic sense for the affected university. Furthermore, within a university pedagogical perspective where one goal is to get as many students to complete their studies as successfully as possible, dropout must inevitably be viewed negatively. From the point of view of the academia dropout can, however, also be viewed as having positive consequences and, hence, be looked at as both undesirable and desirable. Undesirable to the extent that dropout means the loss of valuable academic input from the students who dropped out (Larsen, 2000: 13). Desirable, on the other hand, if (building on Bourdieu’s theory of different societal fields having their own internal rules, values, interests and competition for power (Bourdieu, 1990, 1998)), dropout is a

consequence of a student not having been able to create or maintain a position in the academic field of university. A movement out of the academic field is, thus, thought to be due to the student having the wrong amount/composition of social capital, that is, networks and relations, and cultural capital, including certain dispositions and formalised educational qualifications, and thereby an inappropriate habitus for that field (Ulriksen et al., 2010: 216-217). As Ulriksen et al. formulate it: *“Students entering higher education from a background that is socially and culturally remote to the academic field will therefore be more likely to have a habitus that makes it more difficult for them to understand how to play the game in the academic field, and to take part in this game.”* (Ibid.: 216). In other words, if dropout equals a situation where the academically most foreign students leave university, dropout could be seen as desirable from the internal logic of the academic field, because this is a way of preserving and reproducing the dominant culture within the academic field (Bourdieu, 1990) and upholding the academic standards. Summing up, from the perspective of the university the attitude towards dropout can be described as ambiguous (Ulriksen, 2010: 217).

At societal level, university dropout has socioeconomic consequences because the supply of university graduates affects both the returns to education as well as overall economic growth (Bound & Turner, 2011: 574). As stated above even dropout in the form of a student transfer represents additional/extraordinary time consumption within the educational system on the aggregate level. Moreover, every specific case of dropout represents significant opportunity costs because every specific case of dropout (at least if access restrictions are present) means a missed opportunity for another potential student to complete that certain university study. Also, within a Danish context calculations from the Ministry of Finance have shown that people without a degree in higher education, despite the fact that they use less time in the educational system, on average spend eight years less on the labor market, because they more often struggle with unemployment and more frequently end up on early retirement or welfare benefits (Larsen, 2000: 13).

Figure 3.2.1 below presents a crude characterisation of the ‘consequence space’ to be identified when university dropout is broken down on a) the possible consequence levels affected (who is affected?) and b) the possible consequence areas (how does it affect?) when university dropout occurs.

Consequence areas (how does it affect?)	Psychological	Academic	Social	Economic
	Consequence levels (who is affected?)			
Student (individual)				
University (different institutional levels within)				
Society				

Figure 3.2.1 The ‘consequences’ of university dropout: consequence levels and areas possibly affected when university dropout occurs

On the basis of the above reflections it is, despite the ambiguity of the concept, overall speaking, desirable to make an effort to try to prevent or reduce university dropout as long as this is not tantamount to a deterioration of the academic standards and the quality of studies at university level. To be able to do that, however, the determinants of dropout must first be investigated as a way to subsequently seek out potentially relevant remedies and interventions to prevent or reduce dropout rates.

3.3 *The political and economic context of university dropout*

The above sections contained a conceptualisation of dropout phenomena at universities as well as a description of the ‘consequence space’ of university dropout concerning who and how it affects.

Just as well as the negative (economic) consequences of university dropout are experienced at both societal (national)¹³ and university (institutional) level, cf. Figure 3.2.1, initiatives have been put into place at both levels to counteract these negative consequences.

At governmental level this has been witnessed by increasing the economic incentives of universities to raise graduation rates, e.g. by the means of performance-based funding as introduced in many European countries within the past decade (Gaebel et al., 2012: 17). That is, funding alloca-

¹³ Because the European countries operate with different legislative/administrative set-ups (i.e. the responsibility of policy decisions and policy implementation in the area of higher education being placed at more or less decentralized levels depending on the specific country in question), the national level, when referred to in this chapter, may for some European countries be understood as the regional level. This is the case in e.g. Belgium, Germany, Switzerland and Spain.

tion requirements, e.g. in the form of value added grants to universities, have increasingly made universities within many European countries partly economically dependent on the graduation rates and graduation time of its students (cf. e.g. Gaebel et al., 2012: 9-10, 23, 25; Troelsen, 2011: 37) or even, as witnessed in a Danish context, dependent on the number of exams taken at the level of the individual student (Larsen, 2000: 13). These efforts can also be viewed as part of wider 'New Public Management' trends in public policy making, governance and management containing new requirements for transparency and accountability in relation to issues such as quality-assurance, effectiveness and evidence-based policy making (Gaebel et al., 2012: 8; El-Khawas, 2006; Sporn, 2006; Keller, 2006).

To counter the economic consequences of such public policy making and to comply with legal requirements, individual universities and national bodies within many European countries have started to introduce data based information management instruments with the aim of 'tracking' students throughout the university lifecycle (Gaebel et al., 2012).¹⁴ By doing so the universities are assumed to gain in two ways: On the one hand the 'tracking' process is supposed to give the university authorities useful new insights which can be used to improve the university experience concerning teaching and learning of their future students (e.g. through improvements in curricula and student services). In addition, and in relation to these quality assurance efforts, the tracking process is in many cases initiated to help reduce dropout rates at the level of the individual university (Ibid.: 10-11, 36-38) to the benefit of both the university, thus dampening the negative economic consequences of the public policy funding allocation initiatives (Ibid.: 36, 51), and to the benefit of society as a whole.

As can be seen from the following extract obtained from the EUA website concerning the international conference "*Tracking the Higher Education Student Lifecycle*" hosted by University of Aarhus (Copenhagen Campus), Denmark, on the 5th-6th of June 2012, the reduction in dropout rates is only one part of the aim of the national/institutional level tracking initiatives. The improvement of labour market outcomes of university graduates is also part of the focus:

"Tracking is often undertaken in order to improve the student's experience and the university services and support mechanisms at a HEI with the view to increase the successful completion rate of university studies but also to ensure that the feedback received from the graduates and their experience on the labour market is then integrated into the university strategy adapting, if necessary, the curriculum in order to enhance the chances of future graduates on the labour market" (EUA, 2012).

¹⁴ The European University Association (EUA) has recently published a first report '*Tracking Learners' and Graduates' Progression Paths. TRACKIT*' containing knowledge about 'student and graduate tracking' initiatives in 31 European countries (27 EU member states and four candidate and EEA countries) including a description of specific 'student tracking' processes obtained from site visits to 23 higher education Institutions and other relevant organizations within 11 European countries (Gaebel et al., 2012). For an overview of the various 'tracking' initiatives within each of the 31 European countries investigated, cf. Ibid.: 59-61; 62-95.

To better understand these trends in public policy making which have led to student monitoring instruments increasingly being put into place at the level of the individual university and by national bodies, one must further recognise and understand the broader economic and political context that have surrounded the system of higher education within the past decades. Within this context, two factors are especially worth mentioning because of their scope and importance for the university dropout challenges, that is, each are assumed, *ceteris paribus*, to exacerbate the challenges of reducing the level of university dropout within a European context.

First, a national public policy focus on ‘widening access to Higher Education’ has been witnessed in quite a few European countries over the past decades (cf. e.g. Gaebel et al., 2012: 6, 8, 15; Jones, 2008: 1; Trow, 2006).¹⁵ Behind this focus lies political goals of increasing the educational level of the population in order to increase economic competitiveness and growth (cf. e.g. Gaebel et al., 2012: 6; Bound & Turner, 2011: 574; 577). In line with this the OECD-report ‘*Education at a Glance 2012*’ reports on a marked expansion of the European Higher Education System on the basis of a comparison of entry rates into tertiary-type A and B education between 1995 and 2009 (OECD, 2012: 31; 349). The implementation of the ‘widening access to Higher Education’ paradigm, however, has not occurred without costs to academia (Enders, 2006) or the universities by increasing the challenges of university dropout. This is due to the fact that giving access to university to a wider group of young people, including new ‘university foreign’ students (transforming universities to what some people term ‘mass access’ or ‘universal access’ universities, cf. e.g. Trow, 2006), inevitably means giving access to university to groups of young people with inferior skills and competencies or otherwise disadvantaged students as compared to the ‘traditional’ university student. Though what is a desirable goal from a national policy perspective, namely ‘widening access to Higher Education’ is not necessarily desirable from an institutional/academic perspective.

Adaptation to university life including adaptation to the ‘rules of the game’ in a Bourdieu sense of the word (Bourdieu, 1998, cf. section 3.2) is assumed to be harder for a ‘university foreign’ student than for the ‘traditional’ university student, cf. section 3.2, making the ‘university foreign’ student more prone to academic failure¹⁶ and/or integration difficulties (Tinto, 1994, cf. section 3.4), hence increasing his/her chances of dropout. More students also mean more competition within the academic field *ceteris paribus*. The situation following the ‘widening access to higher education’ paradigm can also be described as a situation in which more open access structures to university give rise to greater possibilities for (negative) self-selection into university studies. Hence more instances occur of what Ulrich Heublein et al. (2003: 142) have termed ‘delayed selection’,

¹⁵ In line with the stability observed in Figure 1.2.1 and a comparison of entry rates into tertiary-type A and B education between 1995 and 2009 for each of the OECD countries (OECD, 2012: 350, chart C3.2), this ‘widening access to higher education’ paradigm pertains to Switzerland to a lesser extent than many other countries within Europe.

¹⁶ Unless academic standards are relaxed of course.

i.e. dropout due to non-identification with the subject or university setting or due to lack of study skills.

Second, the present financial crisis faced more or less severely by most European countries has within the past few years led to policies of increased self-financing in the form of user charges and higher tuition fees within many European national higher education systems. Such trends can, however, be dated back to at least the middle of the 1990's (OECD, 2012: 272-285) and can likewise be recognised as a consequence of the growing mismatch between resources needed for the greater number of enrollments into higher education due to the implementation of the 'widening access to higher education' paradigm and public or private resources available to fund this growth (Hauptman, 2006). The effects of such financial trends are inevitably to change the incentive structures on the individual student level with obvious negative effects for the dropout rate at the aggregate level (cf. section 3.4).

3.4 Theoretical models of university dropout

Potentially there are many factors available to explain university dropout: i) sociodemographic background ('social heritage') of students (i.e. parental educational level, occupation and income level during the student's childhood and youth), ii) academic competencies/pre-requisites for studying, iii) preparation for studying including guidance, choice of study, expectations for studying, iv) motivation for studying, v) learning strategies, vi) study conditions including design and structure of study programs and exams, academic content, academic demands, workload, teacher quality, support services (mentoring, etc.), facilities within university, physical and mental climate, vii) social and/or academic integration within university/adaptation to university life, viii) overall evaluation of university life, ix) outside opportunities for dropouts (e.g. favourable business cycles), x) economic situation of students including study costs and tuition fees, possibility of loans and grants, xi) living conditions including housing, family and personal situation or support and student job.

Despite the many factors often suggested and examined as potential contributors to/direct determinants of university dropout, the research field on university dropout may be characterised by the lack of a rich theoretical tradition, not least in a European setting. Much previous European based empirical research on university dropout has been data driven more than theory driven, hence lacking a solid theoretical foundation (Larsen, 2000: 14-15), and the theory driven part of the European empirical research has primarily built upon American and other international theoretical foundations.

However, there are now different theories available to organise knowledge on the dropout phenomena at universities. These can roughly be grouped into economically, psychologically, organisationally and sociologically grounded or inspired theories.

The economically grounded/inspired theories share the belief that dropout is basically a rational decision taken by the individual student on the basis of the relationship between his/her estimated investment in education and estimated returns to education dependent on the his/her abilities and circumstances (cf. e.g. St. John et al., 2000). Bound & Turner (2011) specifically look to the supply side of the higher education market in combination with student demand and public support when investigating college degree completion. A subgroup of the economically grounded or inspired theories includes Human Capital theory. Here the stock of knowledge and academic competences (i.e. human capital) which the student brings with him/her into university from home via the transmission of knowledge, skills, values and expectations from parents to child are assumed to reduce the risk of dropout.

The psychologically grounded/inspired theories have often tried to draw a profile of the typical dropout student and focusing on factors such as study behaviour, perception of and attitude towards studying (cf. e.g. Bean & Eaton, 2000). Somewhat related to this is the Australian educational researchers Paul Ramsden's and John Biggs's notion of the role played by learning quality (Ramsden, 2003; Biggs, 2003). Furthermore, Saljö and Marton have introduced the distinction between deep learning and surface learning. In surface learning the student accepts new facts and ideas uncritically and isolated without connecting them to a coherent understanding. In deep learning the student examines new input critically and reflective, and integrates them into existing cognitive structures. Universities can encourage deep learning and thereby, it is theorised, reduce dropout by creating a constructive alignment between learning outcomes, learning activities and assessment criteria (Marton et al., 1976).

The organisationally grounded or inspired theories focus more on participation, communication and membership in academic communities within university when trying to explain university dropout (cf. Metzner & Bean, 1987).

Lastly, the sociologically grounded or inspired theories regard social and institutional structures to be central to an understanding of university dropout (besides the seminal works of Vincent Tinto cf. Berger, 2000, Edwards & Cangemi, 1990).

Notwithstanding the other theoretical point of departures, Vincent Tinto's social-anthropological approach to American college student dropout which focuses on the student's social and academic integration in college (Tinto, 1975, 1987, 1993, 1998) is still almost paradigmatic within the research field of university dropout, in the U.S. as well as within a broader international research setting. This is exemplified in the European based empirical research on the basis of which the present systematic review is conducted, cf. Chapter 4 and 5. Examples of Tinto inspired theoretical models include a study by Larsen (2000) carried out in a Danish context and German research conducted by Heublein et al. (2003, 2010). The theoretical model(s) on dropout developed by Tinto will, thus, be elaborated and discussed in the following subsection, which gives a brief outline of theoretical models of university dropout within a historical perspective.

As pointed out by Larsen (Ibid.: 14-15), in the early stages of research on university dropout, studies were often data driven, that is, simple atheoretical or descriptive models were developed based on available register and administrative data on pre-university characteristic of the student. Research findings were accordingly marked by these models' focus on the socioeconomic and academic background of the student. This quite deterministic perspective on university student dropout was gradually replaced by a more theory driven and process based perspective on university dropout, beginning in the middle of the 1970's and lead by a group of mostly sociologists who came to take interest in the research field.¹⁷

More thorough theoretical models on dropout were developed including concepts like student motivation, integration and mobility, concepts that were brought into the field from psychology, socialanthropology and sociology. Of these, the '*Student Integration Model*' by Vincent Tinto has been most influential, and as stated above, almost paradigmatic within the field since the first version of the model was described in an article in 1975 (Tinto, 1975). What is new in Tinto's model of college student dropout, as compared to the earlier research that focused almost entirely of personal characteristics and abilities of the individual student prior to university entry, is the adaptation of institutional influences as part of a longitudinal process possibly leading to dropout. Tinto incorporates these pre-university characteristics/attributes into his model too, however, their influence on dropout are merely seen to be working indirectly through intermediate within university factors like the student's initial intentions, educational goals and institutional commitments, the student's academic and social integration at university and, from this following, the (possibly changed) intentions, educational goals and institutional commitments held by the student at a later stage in the course of study, cf. Figure 3.4.1 (Tinto, 1987).

¹⁷ However, as will be evident in Chapter 4, some empirical studies on university dropout take this more data driven point of departure. This is the case concerning much UK based research.

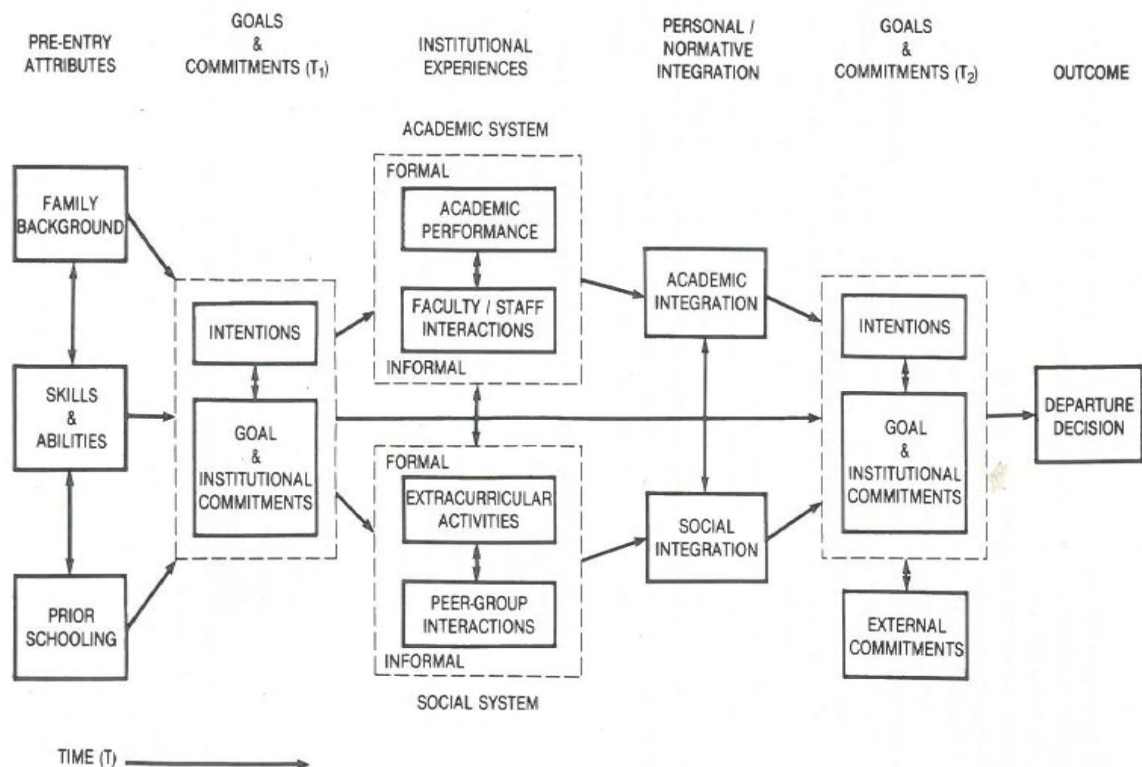


Figure 3.4.1 Tinto's model of college student dropout
 Source: Tinto (1987: 114).

Following Figure 3.4.1, the process possibly leading to university dropout can be described the following way: upon entry into university each student possesses some attributes with regard to family background, personal characteristics and prior schooling, which altogether result in the individual student possessing certain abilities/skills and prerequisites for studying. These attributes are, directly and/or indirectly, assumed to shape the student's initial intentions, educational goals and institutional commitments upon university enrollment. When entering university the initial educational goals and institutional commitments held by each student are then met by the student's institutional experiences within university, which in themselves are divided into two distinct, but interwoven, systems – an academic and a social system. Whereas the academic system is comprised of the academic performance of the student within university (formal activity) and his/her interactions with the faculty/staff (informal activity), the social system is comprised of the extracurricular activities held by the student (formal activity) as well as his/her peer group interactions (informal activity). The student's institutional experiences are then supposed to lead the student to develop and uphold a certain level of academic and social integration at university. These levels of integration are then subsequently perceived to lead the student to either engage further in his/her university studies and thus to strengthen his/her educational goals and institutional commitments or, alternatively, to make the student be less engaged and, thus, to lead to a weakening of his/her educational goals and institutional commitments. These later held educational goals and institutional commitments are, lastly, thought to lead the student to the 'decision' of

either staying or leaving university. In the first case the student is assumed to stay and in the latter to leave/dropout¹⁸. Hence, Tinto's model emphasises the process based interactions between the individual student attributes and the institutional structures within university.

Tinto acknowledges that factors external to university might play a certain role for dropout as well, but their effects are merely treated indirectly as being observable through changes in the student's educational goals and institutional commitments.: *"though it is recognized that a person may withdraw from college for reasons that have little to do with his interaction within the college systems, it is suggested that those impacts will be best observed through the person's changing evaluations of his commitments to the goal of college completion and to the institution in which he is registered"* (Tinto, 1975: 97-98). In a later version of the model, Tinto has stated that the process at university is *"nested in an external environment comprised of external communities with their own set of values and behavioural requirements"* (Tinto, 1993: 115).

Just as well as Tinto emphasises dropout as being the result of a longitudinal process of interactions between the individual student and his/her institution, he makes clear that it is essential to distinguish between different dropout behaviours, because they are related to/the results of different institutional interactive processes. The aims of his original 1975 article on college student dropout are as such twofold: *"This paper attempts to formulate a theoretical model that explains the processes of interaction between the individual and the institution that lead differing individuals to drop out from institutions of higher education, and that also distinguishes between those processes that result in definably different forms of dropout behavior"* (Tinto, 1975: 90). As written in 1975, Tinto believes that past empirical research have mostly ignored/failed to recognise this distinction between different dropout behaviours when analysing university dropout with detrimental consequences for the study findings and, as such, for the decisions taken by university authorities/politicians on the basis of the study findings:

"With regard to the former, inadequate attention given to definition has often led researchers to lump together, under the rubric of dropout, forms of leaving behavior that are very different in character. It is not uncommon to find, for instance, research on dropout that fails to distinguish dropout resulting from academic failure from that which is the outcome of voluntary withdrawal. Nor is it uncommon to find permanent dropouts placed together with persons whose leaving may be temporary in nature or may lead to transfer to other institutions of higher education. Because of the failure to make such distinctions, past research has often produced findings contradictory in character and/or misleading in implication. Failure to distinguish academic failure from voluntary withdrawal, for instance, has very frequently led to seemingly contradictory findings that indicate ability to be inversely related to dropout, unrelated to dropout, and directly related to dropout. In other cases, failure to separate permanent dropout from temporary and/or transfer behaviors has

¹⁸ As stated above, the dropout can either take the form of an 'institutional departure' or a 'system departure' (Tinto, 1993: 36).

often led institutional and state planners to overestimate substantially the extent of dropout from higher education” (Ibid.: 89-90).

Different types of dropout, e.g. involuntary dropout (i.e. dropout due to academic failure) and voluntary withdrawal, are thought not only to involve different persons, but also to result from different patterns of interaction within university. Involuntary dropout is assumed to be more the result of a lack of academic integration, whereas lack of social integration is assumed more frequently to lead to voluntary withdrawal: *“Thus, although academic dismissal is most closely associated with grade performance, dropout in the form of voluntary withdrawal is not. Such withdrawal, instead, appears to relate to the lack of congruency between the individual and both the intellectual climate of the institution and the social system composed of his peers” (Ibid.: 115).* This is why Tinto recognises that bad grade performance at university is a good predictor of involuntary dropout, but not so when it comes to voluntary withdrawal. Where the latter group often score higher on measures of ability and/or grade performance than even persisters do, the former group, to the contrary, in general scores lower than persisters (Ibid.: 104).

Tinto finds support for this distinction in Vaughan (1968): *“Vaughan (1968) correctly pointed out, however, the need to distinguish carefully between dropouts who are academic failures and those who are voluntary withdrawals. In this respect, college withdrawals tend to manifest greater oversensitivity and egotism than any other group, factors which, in this model, seem to relate more to social integration than to academic integration. On other measures of personality, however, voluntary withdrawals tend to be more like persisters than do academic dismissals” (Tinto, 1975: 101).*

In addition to the two types of integration within university and their interrelationship being assumed to result in different types of dropout behaviour (involuntary dropout vs. voluntary withdrawal), the ‘stock’ of educational goals and institutional commitments and their interrelationship, as held by the individual student, is thought to serve as a further distinction between transfer students and formal dropouts as subgroups of involuntary dropout and voluntary withdrawal.

“As suggested by Hackman and Dysinger (1970) and as argued here, the distinction between voluntary withdrawal and academic dismissal, as well as between permanent dropout and transfer, can be more effectively analyzed by taking account of the interplay between the individual’s educational commitments (goal commitment) and his commitment to the institution in which he is registered. It is the levels of goal and institutional commitment, in periods of stable market conditions, as they are affected and modified by the individual’s experiences in the academic and social systems of the college, that determine his decision to remain in college. Given sufficiently low goal commitment, individuals tend to withdraw not so much because of poor grade performance as because of insufficient rewards gained in the social system of the college. As a result, low levels of commitment to the institution and to the goal of college completion distinguish the voluntary withdrawal from the person who is an academic dismissal” (Ibid.: 117) and further “For both dismissals and voluntary withdrawals, levels of goal and institutional commitment can also be utilized

to distinguish between dropouts who transfer from those who leave the system of higher education altogether. Presumably, among dismissals, high goal commitment will lead to transfer to institutions having lower standards of academic performance (i.e., downward transfer). Among voluntary withdrawals, sufficiently high goal commitment may lead to transfer to institutions perceived to be more matched to the person's intellectual and/or social needs and wants (i.e., horizontal or upward transfer). In both instances, sufficiently low goal commitment will tend to lead to permanent dropout from the system of higher education" (Ibid.: 117).

Inspired by Émile Durkheim's theory of the lack of societal integration leading to suicide as well as Arnold Van Gennep's social-anthropological theory of transition from one culture into a new culture by a number of rites of passage (i.e. separation, transition and integration), Tinto's model of dropout contains a built-in critique of psychologically grounded theories of university dropout, because these primarily focus on the characteristics and attributes of the individual student and thus regard dropout as a 'student failure' (Ulriksen, 2010: 212). Tinto's work, though, has not stood uncontested either. This pertains to both its theoretical foundation and its empirical applications. At the theoretical level critiques have been addressed concerning lack of attention to sub- and minority cultures within universities. At the empirical level empirical tests of Tinto's model have shown mixed support, cf. Ulriksen (2010: 214-217). Notwithstanding this, its seminal character within the research field of university dropout is still a fact.

Other significant process models of university dropout developed following Tinto's '*Student Integration Model*' are Ernest T. Pascarella's '*Student-Faculty Informal Contact Model*' (Pascarella, 1980) and John P. Bean's '*Student Attrition Model*' (Bean, 1982). They are both developed in an American context like Tinto's model. Focus in Pascarella's model is on the influence of informal contacts between the student and faculty, whereas the focus in Bean's model is on how the interaction between the student's background, personal beliefs and the institutional aspects within and outside university altogether make an impact on the student's attitudes towards studying leading to his/her possible intentions to dropout followed by a likely decision to formally drop out. Cabrera et al. (1992, 1993) among others have found that these three models of university dropout could possibly be integrated into one common model, because they share some common features, e.g. they all include the influence of institutional factors as a focal point for university dropout.

3.5 Summary

The above sections have intended to make clear that university dropout has consequences in different areas and at different levels, and that these consequences and their severity depend on how university dropout is characterised on a number of parameters. Furthermore, a reduction in university dropout must be desirable due to the often many negative consequences that are associated with university dropout – at the individual level as well as on an aggregate level.

It is also clear that the answer to the first question of this systematic review '*What is dropout from university studies?*' cannot at all be trivial since the concept of university dropout is quite unequivocal.

ocal. Hence, it benefits from being termed dropout phenomena (in plural) at universities when the potential determinants of and contributing factors to university dropout are to be investigated. Also, the answer to the second question '*Why do such phenomena occur at universities?*' is in itself complex and multifactorial since various factors could in theory determine university dropout. The ambiguity of the university dropout concept, however, makes this complexity even greater.

For one thing, because of the ambiguity of the concept when analysing the potential determinants of and contributing factors to university dropout, it is of pivotal importance to distinguish between the different types of university dropout. As previously stated, different motivations lie behind each type of dropout, and thus different factors are assumed to give rise to each type of university dropout. Treating each dropout case alike should thus be warranted.

Secondly, it is important to be aware of the possibly diverging perspectives held at the different analytical levels affected when university dropout occurs: the individual student level, the university level (including different institutional within as well as the whole of academia) and the societal level. This includes the possibly conflicting views of the consequences of dropout and its severity as evaluated from the point of view of, for example, the individual student, the university management level and the academia within that same university.

The possible answers to the third and final question '*What can be done by the universities to prevent or reduce such dropout phenomena?*' is likewise dependent on the answers to both question 1 and 2.

4 Research mapping

This chapter draws a detailed map of the 62 studies that were found to comply with the scope of this systematic review. The 62 studies are represented by 69 documents (a full bibliographic record for each document can be found in Chapter 9). All studies are described in mutual and different categories and evaluated in the light of the research assessment so as to create a combined picture of current research contained within the scope of this review concerning its character on a number of parameters and its quality.

The chapter is structured in four parts. In Section 4.1 the 62 studies are accounted for bibliographically and according to their actual study context. It is described where the studies were conducted, how they were published and in which language they were written. This is followed by an account in Section 4.2 of their content, i.e. the curriculum area(s) studied in connection to university dropout, the operationalisation of university dropout and the investigated possible determinants of university dropout and/or measures undertaken to prevent or reduce university dropout. Section 4.3 describes the design of the studies covering overall study design, study timing, sample size, data collection and data analysis methods applied.

Finally, Section 4.4 gives an account of the quality assessment of the 62 studies applying a 'weight of evidence' concept. Each study was assigned a weight of evidence of either high, medium or low. Only studies with an assessed overall weight of evidence of medium or high can be included in a possible subsequent research synthesis. Section 4.5 summarises the findings of the previous sections.

4.1 *Context of the studies*

This section offers an account of the actual study context as well as bibliographic characteristics of the 62 studies on such parameters as the country of conduct, publication language and publication type.

Given the European setting of the scope, all 62 studies have been conducted in a European context. As Table 4.1.1 shows, the 62 studies have been conducted in several Western European countries.

Country of conduct	Number of studies
UK	19
Germany	8
Netherlands	7
Denmark, France, Italy	5
Spain	4
Finland	3
Norway	2
Austria, Belgium, Portugal, Sweden, Switzerland	1

Table 4.1.1 Country of conduct

N = 62. There as 63 answers since one study has been conducted in both Finland and the UK.

However, from Table 4.1.1 it is also evident that the study distribution is uneven on this parameter. Almost a third of the studies, that is 19 studies (31%), have been conducted in the UK, while eight studies have been conducted in Germany (13%) and seven studies have been conducted in the Netherlands (11%). With another 11 countries represented, the aim of conducting a systematic review within a European context is considered fulfilled.

Concerning the publication language the studies are found to be less diverse. 48 studies (77%) have been published in English, seven studies have been published in German (11%) and five studies have been published in French (8%). According to the linguistic setting of the scope of this systematic review, studies published in the Scandinavian languages could also be taken into account. However, Danish language is the only one represented by the 62 studies with three studies (5%).

Table 4.1.2 below characterises the 62 studies in relation to their publication type. As stated above, since the 62 studies have been reported on in 69 documents, the distribution of publication types are listed for both primary and secondary documents.

Publication type	Number of documents
Journal article	46
Report	12
Working paper	5
Book	4
Chapter in a dissertation	2

Table 4.1.2 Publication type
N = 69. There are 62 primary documents and 7 secondary documents.

With 46 documents published in article format (67%) and 12 documents published as research reports (17%), these categories make up the large majority of the 69 documents which report on the 62 studies. The books included could be characterised as elaborated research reports, as they are all based on surveys (one survey each) which they are analysing and reporting on. They were categorised as books as they were published as such. The working papers are mostly written in article form, but have not (yet) been published in scientific journals.

4.2 *Content of the studies*

This section aims to characterise the 62 studies according to the curriculum area(s) covered by each study, as well as on how university dropout is operationalised, the aspect(s) of dropout phenomena in focus in each study and what possible determinants of university dropout or measures undertaken to prevent or reduce university dropout have been investigated.

4.2.1 *Curriculum area(s) covered*

The 62 studies investigate university dropout within a great diversity of curriculum areas. Table 4.2.1 below shows how many studies cover each curriculum area.

Curriculum areas	Number of studies
All/close to all (e.g. entire cohorts of high school graduates, or an entire university)	34
Business Studies and Economics	6
Information and communication technology (ICT)	6
Medicine	6
Science	5
Psychology	3
Arts/Humanities	2
Science, Technology, Engineering and Mathematics (STEM)	1
Law	1
Maths	1
Chemistry	1
Educational Sciences	1
Social Sciences	1
Design & Technology	1
Not stated	1

Table 4.2.1 Curriculum area(s) investigated

N= 62. There are 70 answers since some studies cover more curriculum areas. The studies coded *All/close to all* are coded in one category only. The study concerned with STEM is only coded as such as it focuses in particular on these curriculum areas as a common field of study.

As seen from Table 4.2.1, 34 studies (55%) cover all or close to all curriculum areas. This large proportion is partly due to the widespread use of nationwide studies investigating possible determinants of dropout, especially in Germany and the UK, a matter to be elaborated later in this section (cf. Table 4.2.2). The curriculum areas most frequently enquired on a curriculum specific level are Business and Economics, ICT and Medicine each investigated in six studies (10% each), followed by Science investigated in five studies (8%), Psychology investigated in three studies (5%) and the entire humanistic area investigated in two studies (3%). The large majority of those studies which

do *not* cover all or nearly all curriculum areas only cover one subject, that is, the remaining 28 studies. These are typically small scale studies which investigate university dropout within a single course or faculty. In other words, even though the majority of the 62 studies were found to cover nearly all curriculum areas, in several cases the opposite is also true, namely, that a narrow curriculum area is studied.

Table 4.2.1 might give rise to the impression that a majority of the 62 studies investigate university dropout from a broad angle. Concerning curriculum areas covered, this is true, however, as will be evident in the next paragraph (cf. Table 4.2.2), the studies also vary according to the number of institutional entities (i.e. number of courses, faculties or universities) in which they investigate the curriculum area(s) in question. That is, even though 34 studies were found to embrace all or close to all curriculum areas when investigating university dropout, this does not mean that they at the same time covered all institutional entities within a certain national setting. Some of these studies e.g. covered all or close to all curriculum areas within a single university. Hence, broadness in curriculum areas covered is not necessarily tantamount to broadness in institutional context as well.

4.2.2 Operationalisation of dropout

To be included in this systematic review, the outcome measure must be university dropout.¹⁹ As discussed in Chapter 3, university dropout is not at all an unambiguous concept, why it can be defined and thus also operationalised in various ways. This is acknowledged in Table 4.2.2 below that characterises how the 62 studies operationalise university dropout on the parameters institutional level and educational level.

¹⁹ That is, unless a study is concerned with investigating the effects of dropout preventing or reducing measures in which case the outcome measure (i.e. the effect studies) can also concern completion or retention rate.

Operationalisation of university dropout				
Educational level \ Institutional level	1-3 courses	1 -3 faculties	1 -3 universities	National/regional level
	Course(s)	6		
Semester(s) or academic year(s)		4	8	5
Specific degree		3	6	17
Any degree			1	2
Not stated/ Other (e.g. ECTS points)	1	2	1	2

Table 4.2.2 Operationalisation of university dropout

N = 58. The four systematic reviews do not figure in this table since their samples do not consist of students but studies, and each of them include primary studies with various ways of operationalising university dropout.

Institutional level refers to the institutional level as well as the number of institutional entities investigated for each study. *Educational level* refers to the educational level of dropout investigated for each study, that is, whether dropout is investigated as a student who does not complete a specific course, a student who does not re-enrol in a subsequent semester or academic year or as a student who does not graduate from a certain degree. The term '*Any Degree*' refers to studies that investigate whether students who drop out from one education end up graduating from another.

According to Table 4.2.2, the operationalisations of university dropout most commonly applied when looked at on these two parameters combined, are the following: university dropout investigated on a national level as dropout before the obtainment of a university degree (17 studies (27%)). This is followed by eight studies which investigate university dropout in one or a few universities as dropout after a semester or after one or more academic years (13%). Six university specific studies (10%) investigate dropout from the specific degree and six course specific studies investigate dropout from the specific course. Only three studies (5%) investigate whether dropouts end up completing another degree than the one they originally enrolled for.

While most studies use a binary outcome measure (dropout: yes/no), 18 of the 58 studies in Table 4.2.2 (29%) distinguish between persisters and two types of dropouts, that is, either between involuntary dropouts (i.e. dropout due to academic failure) and voluntary withdrawals or, and most typically, between transfer students and formal dropouts.²⁰

²⁰ Not all of these 18 studies do, however, uphold such a distinction throughout to their final quantitative analyses, which makes the initial distinction of less value.

As pointed out in Chapter 3, it is of pivotal importance for a study that is concerned with investigating the influential factors on university dropout to be able to distinguish between the different types of university dropout behaviour in its outcome measure. Different motivations lie behind each type of dropout, hence various factors are assumed to affect the different types of university dropout differently, which is why such a distinction is important to make when analysing possible determinants of dropout.²¹

According to Table 4.2-2, half of the studies which distinguish between different types of dropout are found in the category of national level studies investigating dropout at university degree completion (9 of the 18 studies (50%)). Another four of these 18 studies (22%) are found in the category of studies which investigate university dropout in one or a few universities as dropout after a semester or after one or more academic years. Three of the 18 studies (17%) investigate university dropout as dropout from a single course.

That about two thirds of the 58 studies in Table 4.2.2 are not found to make such a distinction on the type of university dropout is probably partly a consequence of limitations in the data available for study. In some cases, the administrative register data (e.g. university records) applied for study simply do not contain such a distinction on different types of dropout, i.e. it has not been registered whether a certain student dropped out of the system of higher education altogether or whether (s)he has made a university internal or external transfer. In other cases, the obtainment of administrative data which might have been able to distinguish these cases is not allowed due to national data protection laws (cf. Chapter 3). Studies conducted on the basis of survey data could in principle obtain data from each participant on the type of dropout. However, because a transfer from one university study to another does not always happen without a time gap, such transfers are often hard to track if the survey is conducted within a limited time after the withdrawal. In few countries, social security-numbers are available to track students' whereabouts after an extended period of time, and again, the latter can be inhibited by legislation.

4.2.3 *Enquired aspects of dropout*

Besides providing an outcome measure of university dropout, to be included in this systematic review, studies also had to provide answers to at least one of the following review questions: *'Why do such dropout phenomena occur at universities?' and 'What can be done by the universities to prevent or reduce such dropout phenomena?'* (cf. Section 1.3). Table 4.2.3 below shows the distri-

²¹ What is more, there are also assumed to be different consequences connected to the different types of dropout (cf. Section 3.2). The negative consequences of a student transfer after e.g. the first semester are limited, while dropping out of the system of higher education altogether after years of study represents a substantial, not least economic, waste of resources at both societal, institutional and the personal level.

bution of investigated aspects of dropout in the 62 studies in relation to these two review questions.

Review question addressed	Number of studies
'Why do such dropout phenomena occur at universities?'	53
'What can be done by the universities to prevent or reduce such dropout phenomena?'	11

Table 4.2.3 Review question addressed

N = 62. There are 64 answers since two studies (Beaupère et al., 2007; Qualter et al., 2009) were found to address both aspects.

As seen in Table 4.2.3 above, the 62 studies are primarily concerned with investigating possible determinants of dropout (53 studies, 85%), whereas only 11 studies (18%) were found to investigate possible effects of dropout preventing or reducing interventions.

Additionally, the 62 studies were examined according to whether they could provide an answer to the third review question: *What is dropout from university studies?* (cf. Section 1.3). To be categorised as such, a study had to deal more intensively with the nature/concept of university dropout, e.g. by developing theoretical concepts of the dropout process, or by investigating the motivations for university dropout vs. persistence. Generally speaking, the 62 studies only to a minor degree (some not at all) consider this matter. 10 studies (16%) were considered to be able to provide a possible answer to this question.

The 62 studies were further examined according to whether they inquire on what happens to university dropouts. Such information will be valuable to acquire evidence on in order to deepen the understanding of the dropout phenomena and their societal and personal consequences²². Nine studies (15%) were considered to be able to provide a possible answer to what happens to university dropouts after they dropout.

²² Generally, the 62 studies do not focus explicitly on the consequences of university dropout. It is often stated in an introductory chapter that university dropout is an urgent matter to examine because it poses societal, institutional and personal problems and waste of resources, but these consequences are not subject of the scientific enquiry. To further investigate the consequences of university dropout would have required a different scope of this systematic review.

4.2.4 Studies investigating the possible determinants of dropout

Table 4.2.4 shows the number of studies which address each of the categories of possible dropout determinants (cf. Section 3.4 concerning the various factors theoretically available to explain university dropout).²³

Possible determinants of dropout investigated	Number of studies
Socioeconomic causes	33
Gender	29
Insufficient prior competence	28
Unsuccessful integration of new student in university life	18
Inadequate learning processes at university	16
Wrong choice of studies/flaws in the information or guidance system	15
Ethnicity	10
Psychosocial conditions	8
Other causes	33

Table 4.2.4 Possible determinants of dropout investigated
 N = 53, since 53 studies were found to investigate possible determinants of dropout.
 There are 190 answers since all studies address more determinants of dropout.
 Since the studies often enquire on more variables within each of the categories in the table, the list cannot be used for calculating the number of specific variables used in the studies to investigate the possible determinants of dropout.

The three most frequently examined categories of determinants are the following: ‘Socioeconomic causes’, the category has been examined by 33 studies included in Table 4.2-4 (62%), ‘Gender’, which has been examined by 29 studies (55%), and ‘Lack of prior knowledge’, which has been examined by 28 studies (53%). As should be evident, all three categories contain factors which are found outside the university setting. The three next most frequently examined categories of de-

²³ It should be noted that all four systematic reviews are found to investigate possible causes of dropout. As such, they are included within the 53 studies. One systematic review was found to address the possible effects of dropout preventing or reducing measures (cf. Beaupère et al., 2007), hence, this study is also included in the 11 studies which investigate the possible effects of dropout preventing or reducing measures.

terminants are all embedded within the university setting, that is, 'Unsuccessful integration at university', which is examined by 18 studies (34%), 'Inadequate learning processes at university', which is examined by 16 studies (30%) and 'Wrong choice of studies', which is examined by 15 studies (28%). 'Ethnicity', which is examined by 10 studies (19%) can be regarded as a university external background factor or as a factor embedded in the exclusion mechanisms of university life (cf. Section 3.4).²⁴

4.2.5 *Studies investigating effects of dropout preventing or reducing measures at institutional level*

Studies, which have been found to investigate the possible effects of interventions undertaken at institutional level with the intention of preventing or reducing university dropout, are presented separately according to their content because of their fundamental difference to the studies which investigate possible determinants of university dropout.

Such intervention studies are found to be infrequent in Europe. Cf. Table 4.2.3 only 11 such studies were found to be relevant for inclusion in the research mapping. As stated in the list below, the interventions undertaken within these 11 studies cover diverse areas:

- Introductory courses (Beaupère et al., 2007; Knox, 2005; Qualter et al., 2009; Walker, 2000).
- Didactic interventions at course level (Garces & Sanchez-Barba, 2011; Lopez-Perez et al., 2011; Moura & Van Hattum-Janssen, 2011; Nikula et al., 2007).
- Various interventions at institutional level, some aimed at enhancing academic integration, others at enhancing social integration (Beaupère et al., 2007; Gensh & Kliegl, 2011).
- Improved selection processes at admission (Urlings-Strop et al., 2011).
- Personal conversations (Lowis, 2008).
- Counselling on possible reorientations when students have made a wrong choice of study (Beaupère et al., 2007).

An intervention will always, at least to some extent, be based on a theory of change, either explicitly or implicitly. The now paradigmatic model of dropout developed by Tinto (cf. Section 3.4) seems to have influenced the majority of interventions being examined by the 11 intervention studies in the research mapping (for an explicit use of Tinto in an intervention study, see Qualter et al., 2009). The two main concepts from Tinto's model applied by these 11 studies are 'academic integration' and 'social integration'. E.g. introductory courses can improve the academic integration of students by helping them acquire the learning tools necessary for academic success. These courses can also support social integration in that students get to know university teachers better

²⁴ Percentages are calculated on basis of N = 53.

and they get better opportunities to form social relations to fellow students. Some of the interventions described by Gensch & Kliegl (2011) are mainly aimed at enhancing the academic integration. That is, study groups and drop-in academic support makes it easier to get feedback on academic issues when help is needed. This study also examines purely social initiatives such as common breakfast for students and staff. The improved selection processes at admission studied by Urlings-Strop et al. (2011) are not a pedagogical, but an organisational intervention; by selecting students better suited for academic life, university dropout is assumed to be reduced.

As only three of these 11 studies were considered trustworthy enough to be included in a subsequent research synthesis on the basis of their quality assessment,²⁵ the European evidence on the possible effects of dropout preventing or reducing measures at university level must be considered rather limited.

4.3 Design of the studies

Concerning the design of the 62 studies, they can overall be characterised as quite heterogeneous. They contain a variety of categories including overall study design, study timing, achieved sample size, data collection and methods of data analysis. This section aims to characterise the 62 studies on these parameters.

4.3.1 Overall study design

A variety of overall study designs were applied in the 62 studies. Table 4.3.1 shows the distribution of studies according their overall study design.

²⁵ Cf. Section 4.5, only three of the 11 intervention studies have been assigned the overall weight of evidence high or medium (Garces & Sanchez-Barba, 2011; Qualter, 2009; Urlings-Strop, 2011) (cf. section 4.5).

Overall study design	Number of studies
Cross-sectional study	36
Experiment with non-random allocation to groups	8
Secondary data analysis	8
Cohort study	3
Longitudinal study	2
Views study	2
Randomized experiment with random allocation to groups	1
Action research	1

Table 4.3.1 Overall study design

N = 58, since four systematic reviews are not included in the table. There are 61 answers since three studies have applied more than one overall study design.

The overall study design most frequently used is a cross-sectional design which is applied in two-thirds of the 58 studies, that is, in 36 (67%) studies. There are a total of nine studies which have applied an experimental design (15%), but only one of these has used randomisation in the allocation to groups. A cohort study or longitudinal design have been used in only five studies (9%).

4.3.2 Study timing

The 62 studies have, moreover, been categorised in relation to the timing and time perspective of the data collection procedure, i.e. whether the sample used in a study was collected with a view to preserve or capture a particular time dimension. Also a study might be longitudinal, and thus have specific time dimension even though data are collected cross-sectionally (i.e. at only one point in time).²⁶

²⁶ Prospective data collection refers to a study where data were collected more than once, from a starting point onwards. Retrospective timing, on the other hand, refers to a study where data were collected more than once, from a starting point and going backward in time. A cross-sectional study timing occurs when data are collected only one point in time.

Table 4.3.2 below shows the study timing applied in the 62 studies.

Study timing	Number of studies
Cross-sectional	34
Prospective	21
Retrospective	8
Not stated/unclear	1

Table 4.3.2 Study timing
N = 62. There are 64 answers since two studies have applied more than one study timing.

A large proportion of studies use either a cross-sectional or a prospective study timing, that is, 34 (55%) and 21 (34%) studies, respectively.

4.3.3 Data sources

Data have been gathered from various sources. Table 4.3.3 lists the main categories of data sources used in the 62 studies (plus the category 'Other data sources').

Data collection	Number of studies
Self-completion questionnaire	32
University administrative student level data	30
Secondary data (publicly available statistics or individual level register data)	14
One-to-one interview	10
Examinations	4
Curriculum-based assessments	2
Clinical test	1
Focus group interview	1
Observation	1
Other documentation	1

Table 4.3.3 Data collection

N = 58, since four systematic reviews are not included in the table.

There are 96 answers, since some studies have applied more than one type of data collection.

From Table 4.3.3 it appears that data collection by the use of self-completion questionnaires is the most frequently applied data collection method, that is, 32 studies have applied a self-completion questionnaire to collect their data (55%). Secondly, student level data from university administrative records are applied in 30 of the 58 studies (52%) and, third, secondary data in the form of either publicly available statistics or individual level register data have been applied in 14 studies (26%).

4.3.4 Sample sizes

As demonstrated in Section 4.2, samples vary from consisting of students that follow a certain course at one specific faculty and university at a certain time, to one or more cohorts of students within a specific university or within a whole country. Partly due to this variation of context, the samples also vary in size (cf. Table 4.3.1), but they all consist of university students. The only exception is one study (Soo, 2009) which operates with university-subject-year observations as the analytical entity, and the four systematic reviews where the sample sizes are the number of primary studies included in each review.

Table 4.3.4 shows the sizes of the *achieved* sample sizes, i.e. the number of students who actually participated in the analyses of each study.

Achieved sample size	Number of studies
50-250	10
250-500	5
500-1,000	5
1,000-10,000	27
10,000-50,000	4
50,000-100,000	6
100,000 or more	2
Other sample unit	1
Not stated	5

Table 4.3.4 Achieved sample sizes

N = 58, since four systematic reviews are not included in the table.

There are 65 answers, as seven studies investigate two samples.

The term '*Other sample unit*' refers to one study (Soo, 2009) which operates with a sample of 'study-year-subjects'. The term '*Not stated*' covers studies that are too poorly reported to either explicitly or implicitly determine the sample size analysed in the study.

The 62 studies mainly analyse samples of less than 10,000 students (cf. Table 4.3-5). 20 studies (32%) analyse samples up to 1,000 students, while 27 studies (44%) are based on achieved samples consisting of 1,000-10,000 students. The latter is a common sample size for studies typically conducted on one or more student cohorts at university level or survey studies at national level. The 12 of the 62 studies (19%) that investigate samples of 10,000 students or more were all conducted at national level. Except for 3 of these 12 studies which made use of secondary data from already undertaken national surveys (Argentin & Triventi, 2011; Di Pietro & Cutillo, 2008; Soo, 2009), the remaining 9 studies within this category made use of national level register data.

Three of the four reviews were found not to report explicitly on the total number of included primary studies (Beaupère et al., 2007; Dept. for Children, Education, Lifelong Learning and Skills, 2009; Hall, 2001). The fourth systematic review was based on 13 studies the medical field (O'Neill, Wallstedt et al., 2011).

The seven studies that were found to analyse two samples typically consist of a part based on register data of a larger sample, from which a smaller sample participated in a survey (Østervig Larsen & Mogensen, 2008; Bodin et al., 2011; Observatoire de la Vie Étudiante, 2005; Baars et al., 2009; Galley et al., 2002). Alternatively two samples have been analysed, one in relation to an investigation of possible determinants of university dropout, and the other in relation to a subsequent intervention study (Lowis, 2008; Qualter et al., 2009). Studies that use a small sample for pilot testing, and studies which apply qualitative interviews to complement or exemplify quantitative findings (see e.g. Kolland, 2002) are not categorised as having more than one sample.

4.3.5 Methods of data analysis

The 62 studies have been found to apply various methods of data analysis. For reasons of clarity, Table 4.3. operates with three overall, and mutually exclusive, categories.²⁷

Main method of data analysis	Number of studies
Multivariate analysis	41
Bivariate correlations and descriptive statistics	17

Table 4.3.5 Main method of data analysis
N = 58, since four systematic reviews are not included in the table.

As seen from Table 4.3.5, 41 studies (66%) have been found to apply multivariate analyses, mostly in the form of binomial logit or probit models when analysing the outcome measure, which is due to the often binary outcome measure (dropout: yes/no, cf. Section 4.2). Another 17 studies (27%) apply more simple quantitative methods such as bivariate correlations often combined with descriptive statistics when analysing the data.

Nine of these studies (15%) also included the use of qualitative data, either by coding and quantifying these data, or in separate analyses to inform and put into perspective the quantitative findings, as stated above. Qualitative data were mainly gathered through semi structured interviews or open ended survey questions.

One of the four systematic reviews (O'Neill, Wallstedt et al., 2011) conducted a statistic meta-analysis of effect sizes, while the other three applied more descriptive, qualitative approaches.

²⁷ To create an overview, the three categories are applied as being mutually exclusive. In reality, many studies which conduct multivariate regression analyses also make use of bivariate analyses and descriptive statistics.

4.4 Identification of a 'British' and 'German' research approach

The previous sections have served to characterize the 62 studies on a number of separate parameters. This section goes beyond this separateness and aims to describe two research approaches which seem to emerge when a number of the separate parameters are juxtaposed. The research approaches identified are first outlined and contrasted, subsequently are their strengths and weaknesses discussed, including a view on the kind of evidence which could be obtained from each approach in relation to the systematic review questions.

While the 62 studies were conducted in many different Western European countries, Germany and the United Kingdom deliver a substantial share of these studies (cf. Section 4.1). A closer look at the studies on parameters such as theoretical underpinning of study, determinants of dropout investigated, overall study design, study timing, data collection and sample size reveals that a 'British' and a 'German' research approach can be identified. 14 studies (23%) belong to the 'British' research approach and seven studies (11%) to the 'German'. With a total of 21 studies (34%) being found to comply with these two research approaches, they cover just above one third of the 62 studies.²⁸

The term 'research approach' does not mean that all studies conducted in the United Kingdom or Germany are automatically included within the respective research approaches, or that studies conducted outside the United Kingdom or Germany cannot be included in one of these research approaches. The term research approach is a pragmatic tool applied in the research mapping for bundling the studies according to the pattern that was found on the basis of the above mentioned parameters and which will be elaborated on below. The name for each research approach is given based on the fact that most studies included in each research approach were conducted in the United Kingdom and Germany.

A common feature of the 14 studies included in the 'British' research approach is that they in general seem to be more data, than theory, driven. What is more, they most often investigate possible determinants of dropout by the use of administrative register data, e.g. in the form of university records, or alternatively secondary data sources. The studies can also be characterised as being large-N studies and almost always apply a prospective or a cross-sectional study timing. Moreover, these studies were generally found to apply strong multivariate regression analyses. However, they are often limited by the lack of variables concerning intrinsic factors such as motivational issues or other personal perspectives and of within-university factors such as learning processes at and study conditions. Sociodemographic background variables, funding issues and a diverse set of pre-university characteristics, e.g. prior school achievement, are more frequently in focus. This

²⁸ However, all of the studies from both research approaches were assigned the weight of evidence medium or high, and thus cover close to half of the studies that can be used in an eventual synthesis (cf. section 4.5).

quite specific pre-university focus can, at least partly, be considered a consequence of the administrative register data often used.

The studies identified using this approach are: Araque, Róldan & Salguero (2009); Argentin & Triventi (2011); Arulampalam, Naylor, & Smith (2004); Arulampalam, Naylor & Smith (2005) Arulampalam, Naylor & Smith (2007); Belloc, Maruotti, & Petrella (2009); Di Pietro & Cutillo (2008); Glocker (2011) Johnes & McNabb (2004); Lassibille & Gómez (2008); Smith & Naylor (2001); Smith & Naylor (2001); Soo (2009) and Vignoles & Powdthavee (2009).

The seven studies included in the 'German' research approach apply more elaborated theoretical models of the dropout process as the basis for their analyses. In contrast to the studies in the 'British' research approach they rely heavily on (extensive) questionnaire surveys as their primary data source. They often include a vast amount of variables and investigate intrinsic factors such as motivational issues or other personal perspectives and experiences at university. These are factors that the 'British' research approach seldom examines. This heavy reliance on survey data is probably due to data protection legislation. Researchers who wish to use German data are inhibited in tracking students and dropouts from administrative registers (Gaebel et al., 2012: 52-53). They are only allowed to send out questionnaires to the address which the student last gave to his/her university (Heublein, 2010: 2). Such questionnaires were either distributed by mail or completed through structured interviews, typically developed applying an explicit theoretical concept and validated through pilot studies using qualitative interviews. One study also uses qualitative interviews as part of the study itself (Kolland et al., 2002). Since the studies most often rely on extensive questionnaires surveys, studies included in the 'German' research approach are forced to limit the sample size for reasons of economic and temporal resources. Hence, all seven studies investigate samples of less than 10,000, which should be contrasted with the fact that half of the 14 studies in the 'British' research approach studies were found to operate with sample sizes above 50,000. Relying on university records and secondary data sources as well as on purely quantitative methods, such sample sizes can be managed within the 'British' approach.

The survey data in the 'German' research approach often contain problems with relatively low response rates of 20 - 50% and, thus, reliability concerns are an important issue to address. However, such response rates are typical of surveys administered by mail or online. Another interesting finding is that the studies in the 'German' research approach apply a retrospective study timing in four of the seven cases. Those samples are typically established by choosing a representative sample of (already known) dropouts and a smaller control group of persisters, i.e. retrospectively. Whereas researchers within the 'British' research approach cannot control the relative composition of the sample in relation to persisters and dropouts, the researchers within the 'German' research approach often choose how they will compose the sample. The studies in the 'British' research approach, therefore, often contain samples which are mainly composed of persisters, whereas the studies in the 'German' research approach contain samples mainly composed of dropouts. There are some common characteristics between the two research approaches as to how

dropout is operationalised. 11 out of 14 'British' research approach studies and all of the 7 studies within the 'German' research approach, are conducted at National or regional level. This strengthens their generalisability as the impact of institutional factors is diminished.

While examining a national or regional sample, nine of the 'British' research approach studies and five of the 'German' define dropout as non-completion of the chosen degree. One of the 'German' research approach studies further investigates whether dropouts end up completing another degree. To investigate degree completion is considered a strength in the research mapping. From a point of view focused on possible policy informing value, it is of greater interest to know whether students actually end up getting a degree than whether they re-enrol after the first year at university.

Lastly, it shall be noticed that seven of the 'British' research approach studies and six of the 'German' ones distinguish between different types of dropouts. The most common distinction in the 'British' research approach studies is between transfer students and formal dropouts. Other distinctions are hard to make when students are tracked via administrative register data or secondary data are analysed which were collected with another purpose in mind. Being privileged by the use of self-conducted surveys, studies in the 'German' research approach are better able to enquire on the situation of dropouts at some point in time after they dropped out. This includes topics such as their current job situation, whether the dropouts have acquired usable skills during their abandoned study to be used in a current job and their level of satisfaction concerning their current situation.

The 'German' research approach is represented by Ulrich Heublein from the HIS (Hochschul Informations System GmbH), but other researchers have followed this tradition. The studies identified in this tradition are: Glaesser (2006); Heublein, Hutzsch, Schreiber, Sommer & Besuch (2010); Heublein, Spangenberg & Sommer (2003); Hovdhaugen & Aamodt (2009); Kolland (2002); Pohlenz, Seyfried & Tinsner (2007) and Studenterrådet ved Aarhus Universitet (2000).

Figure 4.4.1 - Figure 4.4.5 serve to illustrate the characteristics of each of the two research approaches as well as to illustrate their contrasting characteristics.

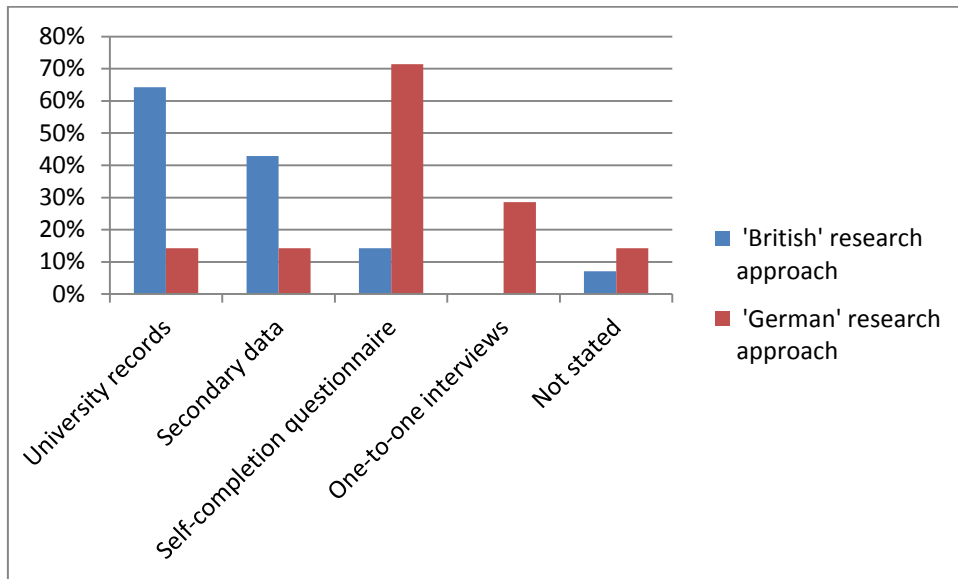


Figure 4.4.1 Data sources, 'British' vs. 'German' research approach
 Percentages are calculated from N = 14 ('British' research approach) and N = 7 studies ('German' research approach). The sum of the percentages are in both cases for both approaches above 100, as more studies make use of more than one data source.

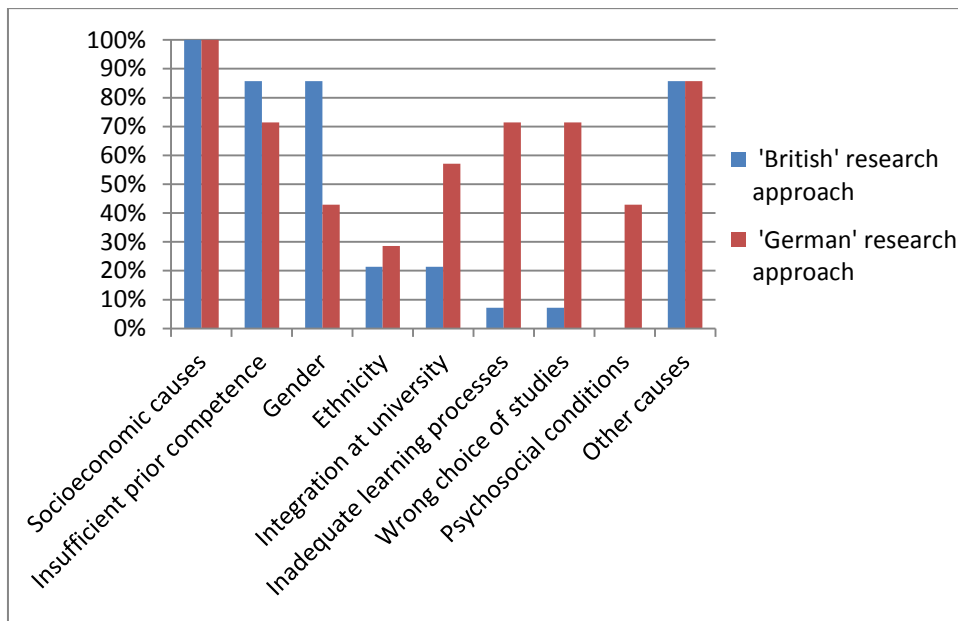


Figure 4.4.2 Possible determinants of university dropout investigated, 'British' vs. 'German' research approach
 Percentages are calculated from N = 14 ('British' research approach) and N = 7 studies ('German' research approach).
 The sum of the percentages are in both cases for both approaches above 100, as more studies make use of more than one data source.

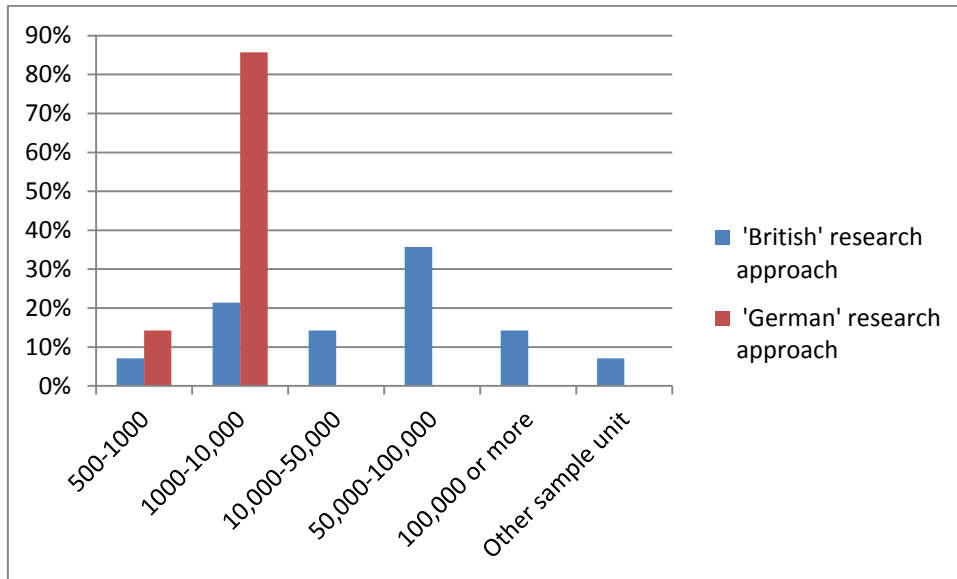


Figure 4.4.3 Achieved sample sizes, 'British' vs. 'German' research approach
 Percentages are calculated from N = 14 ('British' research approach) and N = 7 studies ('German' research approach). The term 'Other sample unit' refers to one study (Soo, 2009) which operates with 'study-year-subject' as the sample unit.

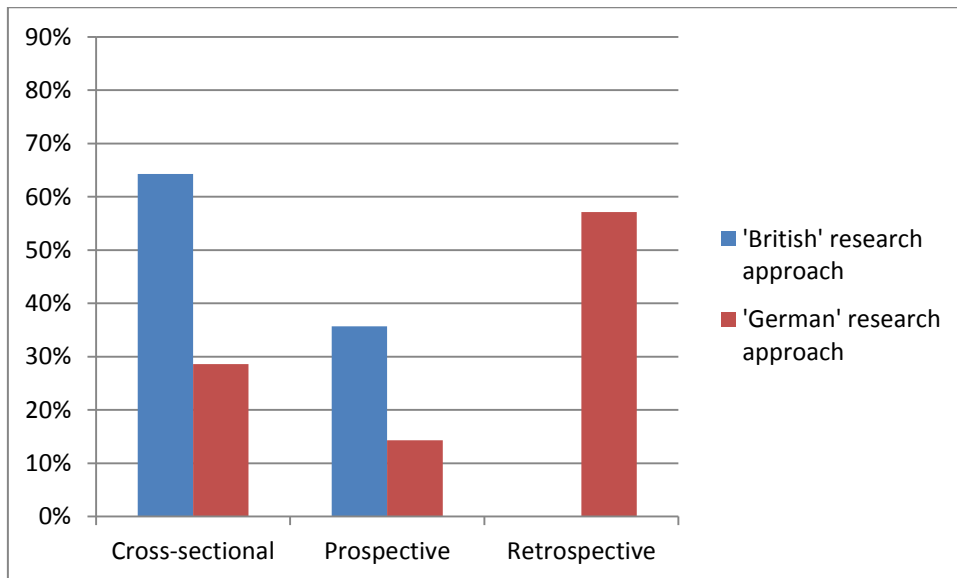


Figure 4.4.4 Study timing, 'British' vs. 'German' research approach
 Percentages are calculated from N = 14 ('British' research approach) and N = 7 studies ('German' research approach).

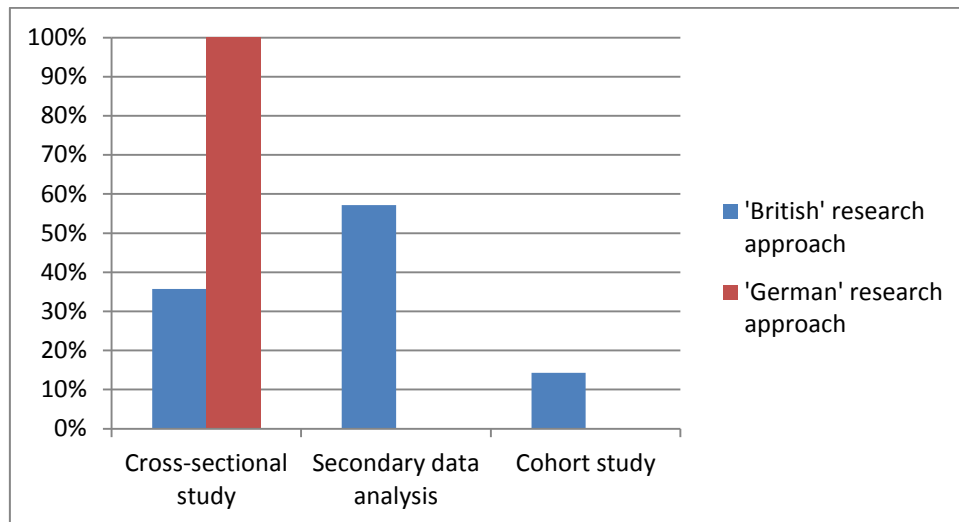


Figure 4.4.5 Overall study design, 'British' vs. 'German' research approach
 Percentages are calculated from N = 14 ('British' research approach) and N = 7 studies ('German' research approach). NB: one study within the 'British' research approach have applied two overall study designs

4.4.1 Strengths and weaknesses of the two research approaches and the kind of evidence to be obtained from each

The previous paragraphs have already touched upon both strengths and weaknesses of each of the two research approaches. This, as well as the kind of evidence to be obtained from each approach in relation to the systematic review questions, on the basis of these strengths and weaknesses will be elaborated upon below.

As evident from the overall characterisation, studies in the 'British' research approach are characterised by their large sample sizes and their strong multivariate regression analyses. As data are most frequently gathered from administrative registers, study findings should not suffer from the problems of possible bias caused by sample attrition that studies in the 'German' research approach sometimes suffer from. As samples are contextually often very broad, both rural and urban areas are investigated as well as both universities with famous traditions and less prestigious 'post-92' universities²⁹. This diminishes sample bias as much as it is possible within a national context. Also, as such data often contain 'hard' facts about student characteristics, the variables used in the analyses are not assumed to suffer from validity and reliability problems to the same extent as other types of variables.

²⁹ The term refers to any of the former polytechnics, central institutions or colleges of higher education which were given university status in the UK in 1992 through the 'Further and Higher Education Act 1992', as well as UK colleges that have been granted university status since then.

Studies in the 'British' research approach are therefore considered powerful in answering the review question *'Why do such dropout phenomena occur at universities?' (cf. Section 1.3)*. They can provide answers to the possible determinants of dropout and their effect sizes, as long as these determinants are contained within administrative register data. An inherent weakness in the 'British' research approach is the lack of variables concerning intrinsic factors such as motivational issues or other personal perspectives or experiences at university, e.g. satisfaction with curriculum and study conditions, or the feeling of social connectedness and other within-university factors such as learning processes at university. There are studies contained within the 'British' research approach that apply data from national surveys (e.g. Soo, 2009) but they are the exception. Even these data are not very detailed on issues related to student experiences. What is mainly examined in the 'British' research approach, are the effects of sociodemographic background variables, funding issues and a diverse set of pre-university characteristics, e.g. prior school achievement. The studies in the 'British' research approach can to a lesser extent provide answers to the review question *What is dropout from university studies?*

Due to the deeper theoretical foundation and thoroughness of questionnaire survey design and content, the studies in the 'German' research approach are stronger in investigating the dropout process. E.g., Heublein works with a model that distinguishes between background factors, within-university factors including reasons for dropping out such as poor social integration, and the trigger of dropout, i.e. the reason that finally led the student to decide to drop out. This allows identifying some common processes leading to drop out. The extensive questionnaire surveys allow asking numerous related questions on the same topic. This enables more elaborated understandings on the complex phenomena of dropout. As the questionnaire surveys are typically developed through pilot tests applying qualitative methods and draw on theoretical research, they are elaborated, well-structured and suited for the target group. The studies in the 'German' research approach are therefore considered better at answering the review question *What is dropout from university studies?*

On the other hand, the studies in the 'German' research approach are in general considered to be less good at establishing evidence on the review question *'Why do such dropout phenomena occur at universities?' This is due to considerations concerning both achieved sample and methods of data analysis applied. Even though they generally rely on nationwide samples established with representativity concerns in mind, a common weakness of the studies in the 'German' research approach concerns the relatively low response rates obtained from the surveys (20 - 50%, however typical), the achieved samples might therefore be biased. This might pertain to the fact that when asked to answer more than 100 questions and sub-questions (e.g. Kolland, 2002), there may be notable differences between those who complete the questionnaire survey and those who do not. Another type of bias might pertain to the fact, stated above, that questionnaires are only allowed to be sent out to the address which the student last gave to his/her university (Heublein, 2010: 2). Also, compared to the studies in the 'British' research approach, the studies in the 'German' research approach rely less consistently on strong multivariate regression analyses.*

Neither the studies in the ‘British’ nor the ‘German’ research approach can provide answers to the review question ‘*What can be done by the universities to prevent or reduce such dropout phenomena?*’ None of these studies investigate effects of dropout preventing or reducing measures undertaken at institutional level.

4.5 Quality of the studies

A quality assessment of research is a necessary step in the process of establishing an overview of what the research within a given field actually shows. Only studies carried out with a sufficiently high standard can be trusted and thus their results used with confidence. For this reason, all 62 studies included in the research mapping were coded according to their assessed quality concerning reporting and a weight of evidence-concept (cf. Chapter 7, Appendix 2). Each of these parameters includes a number of questions to be answered (see Table 4.5.1). At the end of coding each of the 62 studies included was given a weight of evidence of either high, medium or low on three pivotal parameters. As described in section 2.5, a peer review principle was applied throughout this quality assessment process for each study. As stated above, the studies which were finally designated low on the overall weight of evidence should not be trusted, therefore only studies which were given an overall weight of evidence of medium or high will be included in a possible research synthesis.

The present section aims to give a characterisation of the 62 studies on these quality parameters. Table 4.5.1 displays how a number of relevant parameters were evaluated concerning the adequacy of the description of each study that was reported on in the research mapping.

	Yes	No
Was the study sufficiently informed by relevant theory and research?	55	7
Are the aims of the study clearly reported?	59	3
Is there an adequate description of the sample used in the study and how the sample was identified and recruited?	43	19
Is there an adequate description of the dependent variable, covariates and control variables in the study?	58	4
Is there an adequate description of the methods used in the study to collect data?	48	14
Is there an adequate description of the methods of data analysis?	51	11
Do the authors explicitly state where the full, original data are stored?	35	27
Do the authors avoid selective reporting bias?	55	7

Table 4.5.1 Adequacy of description
N = 62 for each row.

What should be evident from Table 4.5.1 is that the studies tend to be adequately described on all of the relevant parameters. The great amount of studies coded to be sufficiently informed by theory and research (55 out of the 62 studies, that is 89%, are coded ‘Yes’) is, partly due to a pragmatic assessment since most of the studies that have been published as articles were not expected to give an extended review of the theoretical foundations underlying their analysis given their article format (a shorter outline of their theoretical foundations was, however, to be expected to be coded ‘Yes’).

As shown in the table, most weaknesses are found in the description of the study sample and methods of data collection (i.e. the questions: *‘Is there an adequate description of the sample used in the study and how the sample was identified and recruited?’* and *‘Is there an adequate description of the methods used in the study to collect data?’*. 43 and 48 out of 62 studies, that is, 31% and 23%, respectively, were coded ‘No’ on these questions). Such weaknesses are expected to reduce the repeatability/reliability of the studies concerned. The question: *‘Do the authors explicitly state where the full, original data are stored?’* has the lowest rate of positive answers (35 out of 62 studies, that is 44%, were coded ‘No’ on this question). This is assumed to be the result of the question containing a high amount of subjectivity as to what counts as sufficient information about where the full, original data are stored.

The next tables, Table 4.5.2 to Table 4.5.10, indicate the distributions of answers to a number of core assessments of the quality of the individual studies, besides the adequacy of description as assessed through the above questions, cf. Table 4.5.1. These assessments, together with the assessments in Table 4.5.1, serve as the basis for different weights of evidence assigned to the individual studies in the end of each coding (cf. Table 4.5.11).

	Yes	No
Are ethical concerns/problems raised by the author about the way the study was done?	1	61

Table 4.5.2 Are ethical concerns/problems raised?
N = 62.

Table 4.5.2 indicates that in only one of the 62 studies (less than 2%) have ethical concerns/problems been raised by the author(s) about the way the study was conducted.

This should be compared to the fact that problems of a research ethical nature have been found to exist in 11 of the 62 studies (18%), cf. Table 4.5.3 below. This means that in most of the studies where problems of a research ethical nature have been found to exist, the author(s) has/have failed to mention this.

	Yes, a lot	Yes, a little	No
Are there any ethical concerns/problems about the way the study was conducted?	1	10	51

Table 4.5.3 Do ethical concerns/problems exist?
N = 62.

Another quality assessment question concerns the justification for the conduct of the study. As can be seen from Table 4.5.4, the main part of the studies, that is, 49 out of the 62 studies (79%), contains a satisfactory justification for the conduct of the study. This, on the other hand, means that a little above a fifth of the studies have not been found to contain a satisfactorily justification concerning the way they have been done.

	Yes	No
Is there sufficient justification for why the study was done the way it was?	49	13

Table 4.5.4 Sufficient justification for the conduct of study
N = 62.

Moving on to the appropriateness of the research design used for addressing the research question(s) posed in each individual study, the distribution of 'Yes' and 'No' answers is about the same as above, cf. Table 4.5.5 below. 51 out of the 62 studies (82%) have been assessed to apply a research design appropriate for addressing their own research question(s), whereas 13 out of the 62 studies (18%) have not.

	Yes	No
Was the choice of research design appropriate for addressing the research question(s) posed?	51	11

Table 4.5.5 Appropriateness of research design for addressing research questions posed
N = 62.

The attempts made in the studies to ensure repeatability/reliability as well as validity/trustworthiness in the data collection and data analysis process under one common heading have also been assessed, cf. Table 4.5.6.

	Yes, good	Yes, some attempt	No, none
Have sufficient attempts been made to establish repeatability/reliability in the data collection and data analysis process?	27	31	4
Have sufficient attempts been made to establish validity/trustworthiness in the data collection and data analysis process?	23	33	6

Table 4.5.6 Sufficient attempts to establish repeatability/reliability and validity/trustworthiness in the data collection and data analysis process
N = 62 for each row.

From Table 4.5.6 it can be seen that very few studies were found to make no attempt to address these two matters - 4 and 6 out of the 62 studies, that is, 6% and 10%, respectively. Most studies were found to make some attempt on these matters - 31 and 33 out of 62 studies, that is, 50% and 53%, respectively. Good attempts have been made to establish repeatability/reliability in 27 out of the 62 studies (44%) and to establish validity/trustworthiness in 23 out of the 62 studies (37%).

For each study, a choice has been made by the researchers conducting the study as to what research design and methodology to apply for answering the research question(s) of the study in question.

	A lot	A little	Not at all
To what extent are the research design and methods employed able to rule out any other sources of error/bias which would lead to alternative explanations for the findings of the study?	25	26	11

Table 4.5.7 Extent to which research design and methods are able to rule out sources of error/bias
N = 62.

Eleven out of the 62 studies (18%) were found not to be able to rule out any sources of error/bias, which would lead to alternative explanations of the findings of the study, cf. Table 4.5.7 above. In other words, the researchers conducting the study have been assessed to have made a wrong choice concerning the specific research design and/or methodology used. In 25 out of the 62 studies (42 %) the research design and methods applied were assessed to be capable of ruling out other explanations than the one arrived at in the study to a minor extent, whereas the research design and methods applied were assessed to be able to do that to a major extent in 26 out of the 62 studies (40 %).

Each individual study was also evaluated according to whether and how the generalisability of it has been addressed by the author(s) reporting on it, cf. Table 4.5.8 below.

	Yes, the study results are generalisable to the population	Yes, the study results are generalisable to other groups with the similar characteristics	Yes, the study results are generalisable in a contextual or conceptual way	Yes, and the author concludes that this study is not generalisable	No, the author does not address the generalisability of the study
Does the author address the generalisability of the study?	11	16	10	2	23

Table 4.5.8 Whether and how the generalisability of the study is addressed
N = 62.

Table 4.5.8 indicates that the distribution of the available answers is spread out quite a bit. Whereas the generalisability of the study has not been explicitly addressed in 23 of the studies (37 %) in the research mapping, the generalisability of the remaining 39 studies (63 %) has been addressed in one way or another. In 2 studies (3 %), the authors conclude that the study is not generalisable. In 10 studies (16 %), the authors conclude that the study is generalisable in a contextual or conceptual way. In 16 studies (26 %), the authors conclude that the study is generalisable to other groups with the similar characteristics and finally, in 11 studies (18 %), the authors conclude that the study findings are generalisable to the population under study.

Table 4.5.9 below examines whether the reviewers arrived at different findings from the author(s) of the studies in question.

	Yes	No
In light of the above, do the reviewers differ from the authors over the findings of the study?	6	56

Table 4.5.9 Whether reviewers and authors differ over the study findings
N = 62.

This was found to be the case in 6 studies, that is, in every tenth of the studies, cf. Table 4.5.9. In nine out of every 10 studies the authors and reviewers did not disagree with the findings of the

study as reported by the author(s). Generally such studies might possibly be assumed to be assessed 'low' on the subsequent question (cf. Table 4.5.10): *'Have sufficient attempts been made to justify the conclusions drawn from the findings, so that the conclusions are trustworthy?'* and should necessarily be set to low on the question: *'Weight of evidence D: Overall weight of evidence'*, because their findings have been assessed not to be trustworthy by the researcher from Danish Clearinghouse and the members of the review group in question. This is also found to be the case for both questions, i.e. all six studies have been assessed to be low on both questions.

As just stated above, Table 4.5.10 below is concerned with the trustworthiness of the conclusions of each individual study.

	High	Medium	Low	Not applicable
Have sufficient attempts been made to justify the conclusions drawn from the findings, so that the conclusions are trustworthy?	18	26	11	7

Table 4.5.10 Sufficient attempts to justify the conclusions making them trustworthy
N = 62 for each row. Not applicable: The results and conclusions are inseparable.

Eleven studies (18 %) were found to have a low trustworthiness on this matter, whereas 44 studies (71 %) were assessed to contain either high or medium trustworthiness on this matter. In seven of the studies, the results and conclusions were found to be inseparable.

In the final part of the quality assessment coding, each of the 62 studies were assessed according to three weight of evidence parameters (Weight of evidence A-C) plus an overall weight of evidence (Weight of evidence D). The distribution of high, medium and low assessments for each of these weight of evidence-questions are given in Table 4.5.11 below.

	High	Medium	Low
11. Weight of evidence A: Taking account of all quality assessment issues, can the study findings be trusted in answering the study question(s)?	22	24	16
12. Weight of evidence B: Appropriateness of research design and analysis for addressing the question, or sub-questions, of this specific systematic review	22	22	18
13. Weight of evidence C: Relevance of particular focus of the study (including conceptual focus, context, sample and measures) for addressing the question, or sub-questions, of this specific systematic review.	22	31	9
14. Weight of evidence D: Overall weight of evidence	19	25	18

Table 4.5.11 Weight of evidence
N = 62 for each row.

Weight of evidence A-D contains the following:

Weight of Evidence A indicates whether the individual study was carried out in good accordance with its own declared aims, design, methods and results, i.e. an assessment of the study as evaluated on the basis of its own premises. It is a combined result based on how the study in question has been evaluated in all the assessments presented in Table 4.5.2 to Table 4.5.10. The distribution of weight of evidence A turns out to be quite positive, cf. Table 4.5.11, with 22 of the studies (35 %) having been assessed as high, 24 of the studies (39 %) having been assessed as medium and 16 of the studies (26 %) having been assessed as low.

Weight of evidence B indicates whether the design and methods of analysis applied by the individual study was appropriate for providing an answer to the systematic review question(s). Here the 62 studies are seen to be distributed almost in the same way as weight of evidence A, cf. Table 4.5.11, with 22 studies (35 %) having been assessed as high, 22 studies (35 %) having been assessed as medium and 18 studies (29 %) having been assessed as low.

Every study has its own focus and its own way of viewing dropout phenomena and context. *Weight of evidence C* addresses the relevance of each study's focus with respect to the systematic review question(s). 53 out of the 62 studies (85 %) were found to have a weight of evidence C of either high or medium (35 % high and 50 % medium) and 9 out of the 62 studies (15 %) to have a weight of evidence C of low, cf. Table 4.5.11. This high share of positive answers is possibly due to the preceding screening process.

The overall study assessment, *weight of evidence D*, which is the combined weight of evidence, decides whether a study should be included in a possible research synthesis covering the results that have emerged from the research within this specific field of study. The fact that a great number of the included studies were assessed to be either medium or high on weight of evidence A-C, this lead to the following distribution of the weight of evidence D: 19 out of the 62 studies (31 %)

were assessed high, 25 out of the 62 studies (40 %) assessed to be medium and 18 out of the 62 studies (29 %) assessed to be low. A possible research synthesis will include 71 % of the total of studies (44 out of 62 studies. A full bibliographic record with abstract for each of these 44 studies is available in Chapter 8).

What is not evident from Table 4.5.11 is the fact that there are clear differences in the quality of the research conducted concerning the group of studies which investigate possible determinants of dropout compared to the small group of studies which investigate effects of dropout preventing or reducing measures. Of the 11 studies included in the last-mentioned group, only three studies (27 %) are considered to be of sufficient quality to be included in a possible subsequent research synthesis. In other words, eight of these intervention studies have been assigned an overall weight of evidence of low. From this it can be calculated that of the total of 18 studies assigned an overall weight of evidence of low, cf. Table 4.9.11, 44 % are intervention studies.

It is not evident from Table 4.5.11, but equally interesting, the fact that the studies included within the 'German' and 'British' research approaches in general are considered to be of a higher research quality than the 62 studies taken as a whole. As such, these studies make up a larger share of the studies that qualify for the subsequent research synthesis (21 out of 44, that is 48 %) than they make up of the total number of included studies (21 out of 62, that is 34 %). From these numbers (in parentheses) it can be inferred that none of 21 studies included within the 'German' and 'British' research tradition have been assigned an overall weight of evidence of low.

4.6 Summary

The previous sections in this chapter have served to map, i.e. give a characterisation of, the 62 studies that were found to comply with the criteria of the final scope of this systematic review, with regard to the following mapping parameters: study context, content, design (incl. data sources and methods of data analysis) as well as quality.

From the previous section in this chapter it should be evident that the 62 studies generally can be characterised as being quite heterogeneous on each of these parameters.

According to section 4.1, the 62 studies were conducted in various Western European countries. Some countries contribute with a larger share of the studies than others (United Kingdom and Germany are the countries having contributed with most studies, 19 and 8, respectively). Studies range from small-scale studies which investigate university dropout within a very specific context, e.g. within a specific course (i.e. a specific curriculum area) within one specific university. Other studies can be characterized as large-scale studies where a whole cohort of university students are examined cross-curricularly within (almost) all universities in a given national setting. Other studies lie somewhere in between these two ends of the continuum, e.g. some studies use one or more student cohorts within one specific university as the sample frame. Only one study examines university dropout cross-nationally (between two countries).

From section 4.2 it was clear that the studies cover a broad range of operationalizations of university dropout which might well be a consequence of both the ambiguity of the university dropout concept (cf. Chapter 3) as well the constraints in the data available for study. This diversity of operationalizations of the outcome measure makes a comparison of the findings across the studies more complex. It is also evident that a broad range of curriculum areas and possible determinants of dropout were seen to be covered by the included research. Some curriculum areas have, however, been examined more frequently than others and more than half of the studies were found to examine dropout cross-curricularly. Concerning possible determinants of dropout, Section 4.4 showed that clearly there is an association between possible determinants of dropout examined and the data sources used/having been available in a given study.

Section 4.3 showed that overall study design, study timing used and sample size achieved all vary from study to study as well as the data sources used/available and the methods of data analysis applied. Although all studies, which aimed to examine factors affecting university dropout (or possible effects of dropout preventing or reducing interventions), collected a variety of different variables for this matter. Nevertheless, not all studies were found to be equally successful in establishing a model of university dropout and/or apply methods of data analysis appropriate for examining possible determinants of university dropout (or possible effects of dropout preventing or reducing measures).

Despite this fairly large heterogeneity of the 62 studies for each mapping parameter examined separately, when one juxtaposes the parameters into an overall characterisation of the 62 studies, interestingly, a broader pattern emerges. As described in section 4.4 there seems to be empirical support for extracting a so-called 'German' and 'British' research approach from the 52 studies which investigate possible determinants of dropout. This was based on taking a combined look at parameters such as theoretical underpinning, context, content and design (incl. data sources and methods of data analysis) of the studies. When doing this, the two research approaches were seen to stand out containing profound differences. According to section 4.4., each was found to contain strengths and weaknesses when compared to the other. The studies contained within the 'British' research approach are considered to be able to give solid evidence on the effects of sociodemographic background and other pre-university characteristics of the individual student on his/her tendency to drop out of university. The studies included in the 'German' research approach are considered to do a better job at establishing evidence on the post-entry into university/within-university processes which might lead to dropout. As such, the 'German' research approach can be said to complement, and be complemented, by the 'British' research approach when it comes to studies, which look for possible determinants of university dropout.

The difference found between the two approaches probably lies in a practical issue of data possibilities and constraints. That the studies contained within the 'German' research approach were found to rely on surveys, often with a relatively low, however typical, response rate and the achieved sample (quite heavily) biased, is to a large extent due to the fact that other data sources

have not been available due to data protection laws etc.. This is not the case in the studies contained within the 'British' research approach, they most often were found to rely on alternative data sources such as administrative register data/ university records (as seen from section 4.4, the use of such data contain strengths as well as weaknesses).

The studies investigating effects of dropout preventing or reducing measures (the intervention studies) within the European setting of the scope were found to be few, narrow in context and quite diverse from each other. Moreover, eight out of these 11 studies were given an overall weight of evidence of low.

With regard to the large heterogeneity observed in the research included in the research mapping, it is no surprise that the quality of research was found in section 4.5 to vary as well. It is comforting, that at no more than 44 out of the 62 included studies, that is, 71 %, have obtained an overall weight of evidence which qualify them to be used in a systematic research synthesis.

5 Narrative synthesis

The previous chapter identified 44 studies which were found eligible to form part of a systematic synthesis on dropout phenomena from universities. These 44 studies were all assigned an overall weight of evidence of ‘high’ or ‘medium’ in the quality appraisal in the systematic research mapping, cf. Section 4.5.³⁰ In this chapter the synthesis of the research findings will be presented (Section 5.3) followed by an appraisal of its robustness (Section 5.4) that focuses on which elements of the synthesis itself and the foundations of it make its conclusions trustworthy. First, however, the methods of the synthesis will be outlined in Section 5.1 followed by a description of the theoretical model for the synthesis (Section 5.2).

5.1 Method of the synthesis

Gough et al. (2012) describe the systematic synthesis as the specific part of the systematic review process where one “*need[s] to understand the results of individual studies and ascertain what they mean as a collective body of knowledge*” (ibid.: 180). Gough et al. (2012) further state: “*The outcome of the synthesis is a narrative that tells a trustworthy story (see Popay et al., 2006) answering the review question and also telling the reader what the findings mean.*” (ibid.: 185, our underlining) Different types of systematic syntheses exist which can be said to relate to different kinds of review questions and to the way the studies have been conducted.

The present systematic review comprises three review questions of which one is more descriptive in character (*‘What is dropout from university studies?’*) and the other two can be characterized as being more explorative in nature (*‘Why do such dropout phenomena occur at universities?’* and *‘What can be done by the universities to prevent or reduce dropout?’*). As such, the two latter questions “*aim to explore a range of possible answers and approaches within a given theoretical framework [...]*” (ibid.: 181). An aggregative mode of synthesis, in the sense of statistically combining the findings across the studies available for the synthesis, will often be a fruitful way to approach the possible answers to such explorative questions. An aggregative mode of synthesis requires, however, a certain degree of homogeneity between the studies, for example that they apply the same designs, methods of analysis, and that they work within commensurate conceptual frameworks etc. (ibid.: 182). As will be outlined below, the studies available for this synthesis are quite heterogeneous when it comes to both definition/operationalisation of the dropout phenomena investigated, the possible determinants for dropout investigated as well as the design and methods of analysis applied across the studies. No (randomized) controlled experiments have, for example, been carried out of the exact same dropout phenomenon or by investigating the same possible interventions with the aim of reducing dropout. In fact, the studies available for this synthesis can be characterized by a very limited use of experimental research design. That is, only five

³⁰ For a further characterisation of these 44 studies, consult Appendix 3.

of the studies make use of an experimental research design when investigating dropout. This means that the foundations for working within an aggregative mode of synthesis are not fulfilled and a meta-analysis should, therefore, not be undertaken. Instead, the present synthesis will consist of a so-called 'narrative synthesis' (cf. Gough et al., 2012; Popay et al., 2006). Although we will not be working within an aggregative mode of synthesis, the aim of a narrative synthesis is still to combine the findings across the available studies in a systematic way and to analyse how differences between the studies might possibly be explored and explained by working on a higher level than the individual study.

On the basis of Popay et al. (2006), the narrative synthesis analytically consists of four distinct elements/phases that are conducted in a sequence. In practice, however, the synthesis process will involve iterative movements between these different elements. The present synthesis is no exception. The four elements of the narrative synthesis can briefly be described as follows:

The first element consists of developing a theoretical model of how the effect(s) that are the object of study come about, why they do so and for whom. At times, there is talk of establishing a 'theory of change' (see Weiss, 1998: 55; Wholey, 1987: 78). The theoretical model can be used to interpret the synthesis findings and can be useful in an assessment of how broad the applicability of these findings is. The theoretical model is presented in Section 5.2.

The second element aims at developing a preliminary synthesis of the findings of the studies available for the synthesis. The means for doing so will be to organise the findings of the studies so as to be able to develop an initial description of the studies, look for possible patterns in the findings across the studies and on that basis to further be able to determine the significance/insignificance, direction and possibly also the size of the effect on university dropout of each of the investigated factors.

The third element goes a step further and makes the emerging patterns in the findings, which have been obtained across the studies, subject to interrogation in order to:

- a) identify any (contextual) factors, which might explain the possible differences found with regard to the significance and direction of each of the investigated factors across the studies
- b) understand how and why certain investigated factors are found to have/not to have an effect on university dropout, cf. Popay et al. (2006: 14).

Section 5.3 comprises an integrated account of the second and third element of the narrative synthesis.

The fourth element comprises an assessment of the robustness of the synthesis. This is a complex task which, somewhat simplified, can be said to consist of four different aspects relating to the internal and external validity of the synthesis. Contained herein are aspects on the level of both the synthesis itself as well as on the level of the 44 studies, which form the basis of/set the premises for the synthesis in the first place. The assessment of the robustness of the synthesis will be given in Section 5.4.

5.2 *The theoretical model behind the narrative synthesis*

As described in Section 3.4, Tinto's model of college student dropout, which focuses on the student's social and academic integration into college, is still almost paradigmatic within the research field of university dropout in the U.S. as well as within a broader international research setting.

To repeat from Section 3.4, according to Tinto, college student dropout is, among other things, related to family background characteristics and socio-economic status. According to other U.S. research findings it is evident that students who graduate from college are more likely to come from urbane families in which the parents are more educated (Tinto, 1975: 100). However, other factors associated with family background, apart from parents' education and socio-economic status, are also found to be important to performance and attendance in college. For instance, most importantly is the quality of the relationships within the family and the parents' interest in and expectations of their children's education. Tinto writes: *"In this respect, it appears that parental levels of expectations may have as much influence upon the child's persistence in college as the child's own expectations for himself (Hackman and Dysinger, 1970)."* (ibid.: 100) Secondly, the student's personal characteristics are of importance. Tinto concludes in his 1975 article that a student's ability is even more important for dropout than his/her family background.

Additionally, significant personality and attitudinal differences have been noted between dropouts and persisters. *"Vaughan (1968) suggested that dropouts tend to be more impulsive than persisters, lacking in any deep emotional commitment to education and unable to profit as much from their past experiences."* (ibid.: 101) Tinto further states that the ability to be flexible and capable of dealing with new and changing circumstances is an important factor related to dropout. Dropouts are described as being *"more unstable, more anxious, and overly active and restless relative to their successful college counterparts (Grace, 1957; Grande & Simmons, 1967; Vaughan, 1968)."* (Tinto, 1975: 101) Tinto, however, distinguishes between different types of dropout behaviour (cf. Section 3.4 for an elaboration), e.g. between voluntary withdrawals and academic dismissals, and states that *"college withdrawals tend to manifest greater oversensitivity and egotism than any other group, factors which, in this model, seem to relate more to social integration than to academic integration. On other measures of personality, however, voluntary withdrawals tend to be more like persisters than do academic dismissals."* (ibid.: 101)

Likewise, academic achievement prior to college enrolment, such as high school grade performance, tends *"to be the better predictor of success in college [e.g. lowering the risk of dropout] if only because it corresponds more closely to the individual's ability to achieve within an educational setting with social and academic requirements not too different from that of the college (Astin, 1972)"* (ibid.: 101). Other aspects of prior schooling are suggested to be important for dropout as they directly or indirectly influence the student's aspirations, expectations and motivations for college education. Tinto states: *"[...]the ability level of students in the school and the social status composition of the school affect not only the individual's perception of his own ability, but also his*

expectations for future college education; in this sense, they affect his commitment to the goal of college completion.” (ibid.: 102)

Tinto divides academic integration at college into grade performance and intellectual development during college. Both contain structural and normative components. Grade performance relates more to certain standards at the university, while intellectual development pertains more to the student’s ability to identify the norms of the academic system. According to Tinto, grade performance has been identified by many earlier studies to be the single most important factor in predicting persistence in college. Again, the importance of distinguishing between different types of dropout behaviour is pointed out. Hackman and Dysinger (1970) conclude (in Tinto, 1975) that the relationship between academic performance and commitment is essential to whether the student persists, withdraws voluntarily or drops out due to academic dismissal (cf. Section 3.4 and below for an elaboration). Intellectual development has also been found to be related to college dropout. Intellectual development is an integral part of the student’s personality development and a reflection of his/her intellectual integration into the academic system. Persisters are more likely than dropouts to value their college education as a process of gaining knowledge and of appreciating ideas than as a process of vocational development. *“Summerskill (1962) further suggested that it is not simply the absence of or presence of intellectual development that is important in persistence, but the degree of congruency between the intellectual development of the individual and the prevailing intellectual climate of the institutions.” (ibid.: 106)*

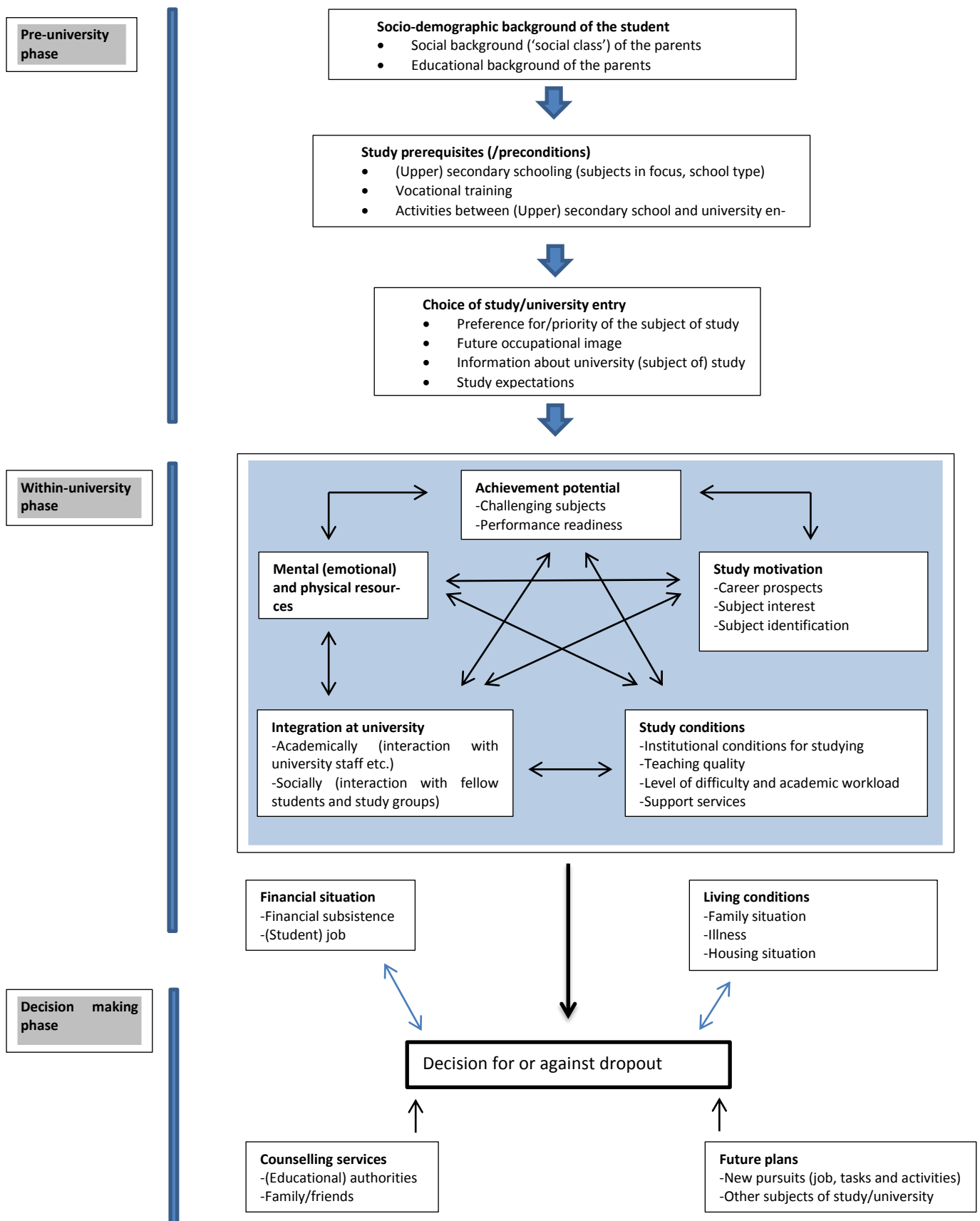
Social integration at university is also of importance when investigating why dropout occurs: *“[S]een as the interaction between the individual with given sets of characteristics (backgrounds, values, commitments, etc.) and other persons of varying characteristics within the college, social integration, like academic integration, involves notions of both levels of integration and of degrees of congruency between the individual and his social environment: In this instance, social integration occurs primarily through informal peer group associations, semi-formal extracurricular activities, and interaction with faculty and administrative personnel within the college.(...) Other things being equal, social integration should increase the likelihood that the person will remain in college.” (ibid.: 107)*

A student’s efforts and motivations for studying, including his/her expectations, educational goals (goal commitment) and institutional commitment, are anticipated to be directly related and highly influential in determining college persistence or dropout. According to Tinto, as suggested by a number of researchers, once the student’s ability is taken into account, it is his/her commitment to the goal of college completion that is most influential in determining college persistence. *“Hackman and Dysinger (1970), for instance, were able to distinguish between persisters, transfers, voluntary withdrawals, and academic dismissals in terms of the interaction between an individual’s level of commitment to the goal of college completion and his level of academic performance (as measured by grade-point average).” (ibid.: 105)*

Tinto's model has later served as inspiration for and has been refined by Ulrich Heublein et al. (2003, 2010) to work in a European university context within the scope of this systematic review. Like Tinto, Heublein et al. include both pre-university and within-university factors in the theoretical model of university dropout. More explicitly than was the case for Tinto, Heublein et al. point at specific factors which influence dropout and are at work during the course of study, but which are external to the university setting. These comprise the student's financial situation including whether or not (s)he has a (study relevant) job, living conditions including family and housing situation, advice/support from friends/family and other opportunities for counselling as well as the student's own future plans. The refined model by Heublein et al. is illustrated in Figure 5.2.1 below.

These theoretical models function as the theoretical frame of the review question *'Why do such dropout phenomena occur at universities?'* and they indirectly inform the review question of *'What can be done by the universities to prevent or reduce such dropout phenomena?'*, because answers to the first question serves as a good basis for the design of interventions to effectively reduce dropout. Since the studies that focus on *'What can be done by the universities to prevent or reduce such dropout phenomena?'* are found to take their point of departure in elements of the theoretical models mentioned above, these models will serve as theoretical basis for those studies as well.

MODEL OF THE DROPOUT PROCESS



On the basis of the theoretical models by Tinto and Heublein et al. and the factors having been found to be investigated empirically in the studies available for this synthesis, the model by Heublein et al. has been operationalised as seen in Figure 5.2.2. Figure 5.2.2 shows that a wide range of factors/variables have been investigated in the studies available for the synthesis, because they are all thought to influence university dropout. The narrative synthesis in Section 5.3 builds upon a classification of these various factors/variables into the nine overall categories shown in Figure 5.2.2. In chronological order, these are (1) Sociodemographic background of the student, (2) Personal characteristics of the student, (3) Prior schooling/prior academic achievement, (4) Pre-university institutional procedures, (5) Study conditions at university, (6) Academic integration at university, (7) Social integration at university, (8) Personal efforts and motivations for studying and (9) Conditions external to university. Figure 5.2.2 further shows which of the studies have investigated one or more aspects underlying each of these nine overall categories. For a list of study references associated with the item numbers (ITT...) in Figure 5.2.2³¹, consult Chapter 9 ‘References for the studies available for the synthesis’.

<p>(1) Socio-demographic background of the student:</p> <ul style="list-style-type: none"> - <i>Parental educational attainment</i> - <i>Parental occupational level</i> <p>Hoff et al., 2009; Ortiz et al., 2011; Argentin et al., 2011; Di Pietro et al., 2008; [⌘]Johnes et al., 2004; Bodin et al., 2011; Araque et al., 2009; Glaesser, 2006; Di Pietro, 2004; Kolland, 2002; Hovdhaugen, 2011; [⌘]Hovdhaugen, 2009; [⌘]Lassibille et al., 2009; Glocker, 2011; O'Neill, 2011; Larsen, 2000; Arulampalam et al., 2005; Smith et al., 2001a; Vignoles et al., 2009; Smith et al., 2001b; Arulampalam et al., 2007 + Arulampalam et al., 2004b</p>	<p>(2) Personal characteristics of the student:</p> <ul style="list-style-type: none"> - <i>Personal background characteristics (age and gender)</i> - <i>Personal traits/dispositions</i> <p>[⌘]Hovdhaugen et al., 2009 + [⌘]Hovdhaugen, 2009; Araque et al., 2009; [⌘]Arulampalam et al., 2004a; Arulampalam et al., 2005; Arulampalam et al., 2007 + Arulampalam et al., 2004b; Di Pietro et al., 2008; Di Pietro, 2004; Smith et al., 2001a; Smith et al., 2001b; Hoff et al., 2009; Hovdhaugen, 2011; May et al., 2004; O'Neill, 2011; Lassibille et al., 2008 + [⌘]Lassibille et al., 2009; [⌘]Johnes et al., 2004; Baars et al., 2009a + Baars et al., 2009b; Glocker, 2011; Larsen, 2000; Kolland, 2002; Van Bragt et al., 2011; Ortiz et al., 2011; Oosterbeek et al., 2010; Nelson, 2008; Glaesser, 2006; Belloc et al., 2009; Loyens et al., 2007; Van Bragt et al., 2011b; Kinnunen et al., 2008; Qualter et al., 2009</p>
<p>(3) Prior schooling/prior academic achievement:</p> <ul style="list-style-type: none"> - <i>(Upper) secondary school achievement</i> - <i>(Upper) secondary school subject focus</i> - <i>(Upper) secondary school type</i> <p>[⌘]Hovdhaugen, 2009; Kolland, 2002; Larsen, 2000; [⌘]Arulampalam et al., 2004a; Arulampalam et al., 2005; Arulampalam et al., 2007 + Arulampalam et al., 2004b; Di Pietro et al., 2008; Di Pietro 2004; [⌘]Johnes et al., 2004; Lassibille et al., 2008 + [⌘]Lassibille et al., 2009; Smith et al., 2001a; Smith et al., 2001b; Vignoles et al., 2009; Albrecht et al., 2001; Bodin et al., 2011; Baars et al., 2009a + Baars et al., 2009b; Hailikari et al., 2010; Hovdhaugen, 2011; Nelson, 2008; O'Neill, 2011; Ortiz et al., 2011; Suhre et al., 2007; Glaesser, 2006; Belloc et al., 2009; Hoff et al., 2009; May et al., 2004; Soo, 2009</p>	

³¹ As will be explained in Section 5.3.1.4 below, the symbol ⌘ attached to some of the references refers to the so-called ‘core’ studies which are given a special role in the synthesis.

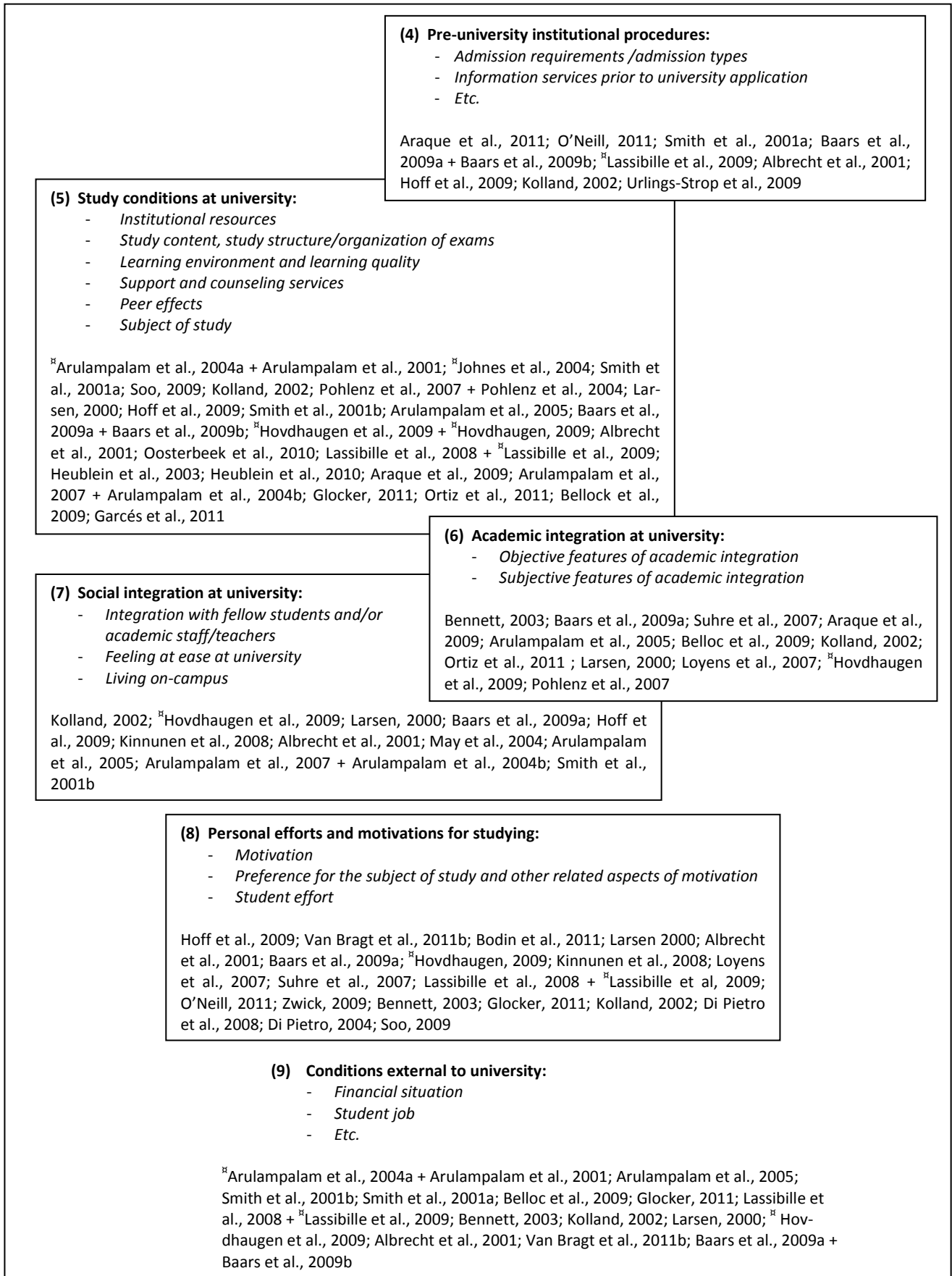


Figure 5.2.2 Operationalised model of university dropout (please notice that references with a '+' between refer to the same study)

The nine overall categories address both so-called university malleable factors, pre-university malleable factors and university non-malleable factors. Even though all nine categories are taken into consideration in the following synthesis, special attention is given to the university malleable factors. This is because university malleable factors, also including the pedagogical instruments at work within university, are factors capable of being altered or controlled by university authorities and/or politicians to a great extent. It must be taken into account, however, that some of the university malleable factors, for example a student's academic and social integration at university and motivations for studying, also cover aspects that are characterised by personal traits or personal efforts and, hence, are in fact less malleable. In line with this, a student's social integration at university depends not solely upon the effort to interact with his/her fellow students and the room for physical interaction set up by the university, but also upon the student's own effort. The so-called pre-university malleable factors, however, are factors capable of being altered or controlled primarily by authorities working at lower educational levels than university, but in some cases also by university authorities, e.g. in terms of restricted admission ('*numerus clausus*') into certain university subjects of study. Both of these categories should be contrasted to, for example, a student's sociodemographic background ('*social heritage*') and a student's personal characteristics which are factors primarily non-malleable to university or other educational authorities and/or politicians. As will be given examples of later in Section 5.3, university authorities and/or politicians are, however, not totally without influence on these matters either. They might be able to change a student's otherwise dispositions/patterns of behaviour through academic and/or economic incentives.

5.2.1 Characteristics of the research field of university dropout

As observed from the above, the research field on university dropout is quite versatile concerning what factors are investigated as possibly leading to university dropout. As will become clear in Section 5.3, however, some factors have been investigated more thoroughly than others. This mostly pertains to hard facts about each student concerning university non-malleable and pre-university malleable factors within the overall categories 'socio-demographic background of the student', 'personal characteristics of the student' and 'prior schooling/prior academic achievement', whereas the factors in focus of the synthesis, that is, the university malleable factors e.g. included in the overall categories 'Social integration at university' and 'Personal efforts and motivations for studying', are found to be investigated somewhat more sporadically. This skewness in the focus of empirical investigation between hard facts concerning university non-malleable and pre-university malleable factors and the often times 'softer' university malleable factors cannot directly be led back to a similar skewness in theoretical focus and must, therefore, be found in one of the conditions underlying the research field of university dropout, namely the kind of data available for quantitative analyses of university dropout. As is evident in Table 4.3.3 in Section 4.3.3 (see also Appendix 3), together university administrative data in the form of individual level college/school records and secondary data in the form of individual level national register data are the most frequently used types of data when investigating university dropout quantitatively. Such

data are often quite restricted in their content, however. University administrative data, for instance, primarily contain pre-university data, that is, information on a student's personal characteristics such as age, gender, etc., type of (upper) secondary school and (upper) secondary school achievement and sometimes also socio-demographic background characteristics such as the parents' educational and occupational level. Alternatively, such background characteristics have been added to the analyses from national register data via a personal security code if this is not restricted by data protection laws. Apart from individual level information on the chosen subject of study along with the student's progression and exam results, university administrative data (as well as national register data) are most often stripped of information about specific institutional characteristics and study conditions including what goes on in the classroom. This also regards information on the student's social integration as well as his/her motivations for studying, study effort and satisfaction with studying. Also, many conditions that are external to university are non-existent in university administrative records including factors such as the financial situation of the student, information about student job, favourable business cycle (i.e. alternative job opportunities) etc. Such information must instead be obtained via surveys of whatever kind including more qualitative methods of data collection if not available through national register data.³² In some countries, for instance in Germany, surveys are actually the only available instrument for obtaining individual level information in larger scale, because consent must be given from each participant due to data protection laws (cf. Chapter 3). In other countries, for instance in United Kingdom and Denmark, individual level university administrative data and national register data is better available and less expensive compared to conducting large scale surveys, why such types of data have not surprisingly been found to be the most frequently used when investigating university dropout quantitatively within these countries.

Another reason for the skewness in the focus of empirical investigation might well have to do with the fact that university malleable factors quite simply are harder to measure both validly and/or reliably because often times there are more ways to measure such factors. For example, measuring a student's social integration and motivations for studying is not as straightforward and unambiguous a task as measuring a student's age, gender, (upper) secondary school marks etc., wherefore more resources must be put into measuring such factors. Yet, even if they *are* measured, the findings obtained should be considered less certain because of the ambiguity of the concepts.

These basic characteristics of the research field on university dropout are important to bear in mind as they represent a general complication for the following synthesis. Because of the more sporadic focus on university 'malleable' factors, it will be more difficult to obtain the pedagogic perspective when addressing the review questions than it will be to obtain e.g. its sociological counterpart.

³² This skewness in empirical focus of the studies available for this synthesis can be considered to be partly a consequence of the scope set for this systematic review. It sets as a criterion for inclusion of a study a purely quantitative or a mixed-methods design, thereby excluding purely qualitative studies.

5.3 *The narrative synthesis based on the theoretical model of university dropout*

Having advanced a theoretical model for the synthesis, we now turn to the next task – developing the actual synthesis. This section comprises both the second and third element of the synthesis process; that is, the task of establishing the synthesis by organising the findings of the studies available for the synthesis to develop an initial description of the studies and to look for possible patterns in the findings across the studies. If possible, (contextual) factors which might explain differences found with regard to the direction and significance/insignificance of each of the investigated factors across the studies will also be identified. It is reserved for a later stage to determine how robust this synthesis actually is.

5.3.1 *Premises for reading the synthesis*

Before presenting the synthesis itself a couple of things need to be pointed out, because they serve as important premises for reading the synthesis.

5.3.1.1 *How the evidence on the three review questions is presented*

The narrative synthesis comprises the evidence found for each of the three review questions. First, the evidence on ‘*What is dropout from university studies?*’ will be outlined in Section 5.3.2. Some, but not all, of the studies available for the synthesis have been found to address one or more aspects of this review question more or less thoroughly. Next, the evidence on ‘*Why do such dropout phenomena occur at universities?*’ follows in Section 5.3.3, this section includes 42 of the 44 studies available for the synthesis. Because only three³³ of the 44 studies investigate the third review question ‘*What can be done by the universities to prevent or reduce such dropout phenomena?*’, the synthesis will take as its point of departure the evidence for the second review question ‘*Why do such dropout phenomena occur at universities?*’ and the three studies investigating the third review question will, thus, be included in this guiding ‘story’ where they are found to fit in the best.

After thorough consideration we have chosen not to include in the synthesis four non-European systematic reviews found during the research mapping. They were originally intended to be used to inform the European findings. Several factors lie behind this decision about not to address these non-European reviews. First, there are some contextual differences between European and e.g. American or Australian cultures and the different cultures are certainly reflected in the structure of the higher education systems of each of these countries. One of the most notable differences between higher education in European countries and in the U.S. is the economic costs of attending higher education. While a current trend towards increasing the tuition fees for university studies is clearly present in some European countries, the fees, as they stand, are significantly lower on av-

³³ As such, one study has been found to investigate both the second and third review question.

erage than the average tuition fee for a university student in the U.S. (Erasmus EU³⁴). Furthermore, due to structural and organisational differences between the European and non-European system of higher education, it is assessed not to be straightforward to generalise findings concerning university dropout across these contexts. Having this in mind strengthens the argument of leaving the non-European reviews out of this synthesis in line with leaving out the non-European primary studies. It is worth stressing, though, that all relevant European-based studies, which have been found in one or more of these four non-European reviews, have been included in the research mapping and could therefore in principle also be available for the synthesis.

5.3.1.2 *Direction and significance/insignificance of the investigated factors*

As mentioned in Section 5.1, to establish the narrative synthesis it is necessary to organise the findings of the studies available for the synthesis in such a way that the direction — and if possible the strength — of their findings can be investigated individually and compared across the studies. As stated in this section, because of the great heterogeneity found between the studies, for instance the fact that often very different factors are investigated in relation to dropout, and because they are investigated in various ways across the studies, the present synthesis will not focus on determining the effect *sizes* on dropout of each factor investigated across the studies. The synthesis will focus on the significance/insignificance and the *direction* of the investigated factors on university dropout alone. At the same time, a pattern is sought that also takes into account factors that in various ways might prove to have had an influence on the effects found in each study and might explain possible differences in significance and direction of the investigated factors found across the studies available for the synthesis.

5.3.1.3 *Vote counting*

Furthermore, as stated in Section 5.1, because the studies available for the synthesis investigate so many different factors on university dropout, each factor has been grouped into one of nine overall categories (e.g. students' socio-demographic background, students' prior schooling, study conditions within university, students' academic and social integration within university etc.). To evaluate the evidence for each of these overall categories and their underlying aspects of university dropout, a sort of 'vote counting' is utilized. That is, where meaningful, an assessment will be made for each of the overall categories of how many studies report significant positive or negative effects and how many studies report insignificant effects in relation to how many studies have actually investigated the different aspects of each overall category. This will lead to a first tentative assessment of which aspects are influential on university dropout/on different types of university dropout behaviour and which aspects are found to be less convincing in their influence on university dropout. A couple of pitfalls should be noted in relation to vote counting, cf. Gough et al. (2012: 190). One of these pitfalls concerns the fact that vote counting does not take into ac-

³⁴ <http://www.erasmuscu.com/the-difference-between-studying-in-europe-and-the-usa.php>.

count the effect sizes, but merely the direction of the factors investigated across the studies. Since the heterogeneity of the studies available for the synthesis cannot justify such a level of accuracy across studies in the first place, cf. Section 5.3.2, it is not a problem in this particular case. Other pitfalls concern the notion that vote counting normally treats studies of different size and quality alike. These pitfalls have been sought circumvented by giving a special role to the so-called ‘core’ studies, see the following section.

5.3.1.4 Core studies

Lastly, as was pointed out in Section 3.4, in relation to Tinto’s theoretical model of college student dropout and as will become clear in the next section concerning ‘*What is dropout from university studies?*’ (cf. Section 5.3.2 below), it is essential to distinguish between different types of dropout behaviour when investigating the review question ‘*Why do such dropout phenomena occur at universities?*’ and the related ‘*What can be done by the universities to prevent or reduce dropout?*’. To quote Tinto once again: “[...] it is, as noted, important to distinguish between the varying types of dropout behaviors, especially between academic dismissal and voluntary withdrawal. This is so not only because these behaviors involve different persons but also because they result from different patterns of interaction within the college setting.” (Tinto, 1975: 116) As noted in Section 3.4, a failure to distinguish between these different dropout behaviours when investigating the possible effect of different factors on dropout might at best lead to insecure findings and at worst to misleading/contradictory findings across the studies (ibid.: 90). Whereas most of the studies available for this synthesis unfortunately have been found not to make such an analytic distinction, a smaller number of studies have been identified to do so. None of the studies do in their quantitative analyses differentiate between all five groups of university students: persisters, involuntary dropouts (i.e. dropout due to academic failure), voluntary withdrawals, transfer students and permanent/formal dropouts (i.e. transfer students and formal dropouts should be viewed as subgroups of involuntary dropouts and voluntary withdrawals). However, five studies have been found to compare possible determinants of dropout directly across persisters, involuntary dropouts and voluntary withdrawals ([Ⓜ]ITT2762111)³⁵ or directly across persisters, transfer students and formal dropouts in their quantitative analyses, by the means of e.g. a ‘competing risk’-framework ([Ⓜ]ITT2763715; [Ⓜ]ITT2777620; [Ⓜ]ITT2770888 + [Ⓜ]ITT2770886; ITT2770887).³⁶ Of these five studies, four of them ([Ⓜ]ITT2762111; [Ⓜ]ITT2763715; [Ⓜ]ITT2777620; [Ⓜ]ITT2770888 + [Ⓜ]ITT2770886) have additionally

³⁵ As above stated, for a list of references associated with the item numbers (ITT...), Chapter 9 ‘References for the studies available for the synthesis’.

³⁶ A few other studies have been found to distinguish between persisters, transfer students and dropouts for reasons other than transfer. These studies, however, do not compare the possible determinants of dropout directly across these groups in their quantitative analyses.

been assessed in the research mapping to be broadly generalisable³⁷ and given an overall 'high' weight of evidence. These four studies thus comprise a relatively greater complexity, and their findings are therefore considered to contain a greater validity and precision than the findings of the other studies available for this synthesis, while at the same time being broadly generalisable. On those grounds, these four studies are termed the core studies and will be given a special role in the synthesis as their findings will be highlighted and used to inform the findings of the other studies in case they are divergent, cf. Section 5.3.3. When referred to in the subsequent sections of this chapter, the core studies will be marked with this symbol [Ⓚ]. Another five studies (ITT2777714 + ITT2777715; ITT2758964; ITT2762308; ITT2773000 + ITT2773001; ITT2770695) explicitly distinguish between either involuntary dropouts and voluntary withdrawals or transfer students and formal dropouts by excluding one of the two groups, respectively, from at least some of the analyses. Thereby, the analyses include as dependent variable a dichotomy between persisters and one specific type of dropout. The findings of these five studies have all been assessed to be less generalisable, and each of the studies has been given an overall 'medium' weight of evidence, which is why they are not included in the core studies.

5.3.2 Evidence on 'What is dropout from university studies?'³⁸

This section encompasses the empirical evidence from the 44 studies available for this synthesis concerning the first review question 'What is dropout from university studies?' Establishing evidence on this question calls for an empirically based elaboration of the dropout concept, if possible on all the parameters put forward in Section 3.1. This includes a dissection of university dropout by the different types of dropout behaviour and dropout timings. It also encompasses possible evidence on what happens to dropouts after dropping out and comprises possible evidence on whether the dropouts have acquired useful skills before leaving their university subject of study to be used subsequently on the labour market. This might include students who drop out before they graduate because they are directly recruited into the labour market.

5.3.2.1 Different processes leading to different types of dropout behaviour?

Evidence on whether or not different processes lead to different types of dropout behaviour can be obtained from the studies available for this synthesis that can compare the possible determinants of dropout directly across different types of dropout behaviour within their quantitative analyses. In other words, this section will juxtapose and synthesise evidence from the core studies

³⁷ In this systematic review, a study's generalisability is assessed by the study's applicability in relation to the findings it presents. Studies considered to be broadly generalisable are studies with findings that are assessed to be generalisable on a national level; that is, none of the studies available to the synthesis have been assessed to be generalisable beyond a national context.

³⁸ It should be recalled that Ph.D. students are not included as university students in the scope of this systematic review (cf. Section 2.2).

to find out if there is empirical evidence within a European context that different within-university processes lead to different types of dropout, as suggested by Tinto in his original 1975-article on college student dropout. Thus, this section will seek to give a more cohesive profile of those students who involuntarily drop out (i.e. due to academic failure) or voluntarily withdraw and subsequently either transfer or formally drop out of higher education, respectively.

Before looking into and interpreting the findings of the core studies, we should first recall the theoretical underpinnings behind the expectations of different processes within university leading to different types of dropout behaviour from university. In Section 3.4, it was suggested that a distinguishing factor among the different groups of university students (i.e. persisters, involuntary dropouts, voluntary withdrawals and from there following, transfer students and formal dropouts) pertains to, firstly, the individual student's academic and social integration within university and the interrelationship between these two, and secondly, from there following, the individual student's stock of educational goal commitment and institutional commitment, including the interrelationship between these two. Persisters are assumed to be well integrated at university, both socially and academically, and to possess a good deal of both educational goal commitment and institutional commitment. Alternatively, some persisters merely 'stick it out', that is, they stay even in the presence of a lower institutional commitment, because they have a high educational goal commitment. Voluntary withdrawal is, in contrast to involuntary dropout, assumed to happen more as a consequence of poor social integration than because of poor academic integration at university. Among voluntary withdrawals, it applies that if the institutional commitment drops to a sufficiently low level, but the educational goals are still high, then a transfer to another subject of study/institution at university level might well occur, whereas a lack of both institutional commitment and educational goal commitment is assumed to lead to voluntary withdrawals to permanent/formal dropout from higher education. Relatively speaking, involuntary dropout is assumed primarily to lead to permanent/formal dropout from higher education, because involuntary dropout is the result of failure to meet the academic standards at university level. Involuntary dropouts might well transfer to another study at a lower educational level, though.

So, is there empirical evidence for the above propositions within a European context? As put forward in Section 5.3.1.4 concerning the criteria for identifying the core studies, merely a handful of the studies available for the synthesis has been identified as being core studies ([¶]ITT2762111; [¶]ITT2763715; [¶]ITT2777620; [¶]ITT2770888 + [¶]ITT2770886). One study compares possible determinants of dropout directly across persisters, involuntary dropouts and voluntary withdrawals ([¶]ITT2762111), whereas the other three studies compare possible determinants of dropout directly across persisters, transfer students and formal dropouts ([¶]ITT2777620; [¶]ITT2763715; [¶]ITT2770888 + [¶]ITT2770886). The evidence base on this matter is therefore rather small. In addition, among these four core studies only one of them ([¶]ITT2770888) investigates aspects of academic and social integration within university, see below. The same study ([¶]ITT2770886) further investigates the relationship between aspects of the individual student's stock of educational goals and dropout. None of the other core studies investigate the relationship between dropout and the

individual student's academic integration, social integration or stock of educational goals and institutional commitment (as will become evident in Section 5.3.3.2 – 5.3.3.4, such features have been investigated by some of the non-core studies).

The study 'Learning environment: Relevant or not to students' decision to leave university?' by Hovdhaugen & Aamodt (^{ix}ITT2770888) finds, via a factor analysis, that among formal dropouts, the factor of second most importance for dropout is 'problems related to meeting the academic standards at university'. This factor was not found to be of importance among transfer students for making a transfer, thereby lending support to Tinto's proposition of an academically related difference, at least between transfer students and formal dropouts (a comparison between involuntary dropouts and voluntary withdrawals was not made in this study). With the possible effect of academic integration within university on dropout being so little studied among the core studies, the best substitute is to look to the prior academic achievement of the student to see if this earlier academic factor serves as a similar distinguishing factor for different types of dropout behaviour. It turns out that prior academic achievement actually exerts a divergent effect on formal dropout and student transfer in the two core studies ('A hazard model of the probability of medical school drop-out in the UK' by Arulampalam et al. (^{ix}ITT2777620) and 'Transfer and dropout: Different forms of student departure in Norway' by Hovdhaugen (^{ix}ITT2770886)), as well as the non-core study ('Do structured study programmes lead to lower rates of dropout and student transfer from university?' by Hovdhaugen (ITT2770887)), which compare these two groups directly on prior academic achievement. The three studies all find prior academic achievement to be a better predictor of formal dropout than student transfer, cf. Figure 5.3.2.1 below. Students with a lower prior academic achievement are found to have a significantly higher risk of formal dropout (the alternative would be to persist). No statistically significant relationship is found between prior academic achievement and student transfer, however. In accordance with Tinto's observations (Tinto, 1975), this would indicate that transfer students tend to be more like persisters than formal dropouts when it comes to academic abilities/achievement. The only core study, Johnes & McNabb's 'Never Give Up the Good Times: Student Attrition in the UK' (^{ix}ITT2762111), which directly distinguishes between involuntary dropout and voluntary withdrawal does not find significant differences in the effect of prior academic achievement between these two groups of dropouts, though. It is found that students with a lower prior academic achievement have a significantly higher risk of both involuntary dropout and voluntary withdrawal compared to persisting. Despite of this, a test statistic shows that involuntary dropouts and voluntary withdrawals are sufficiently different from each other on the collective variables investigated in this study, and they should therefore be treated as two separate groups.

As a matter of fact, the core studies show that differences in university dropout behaviour can be led back to factors which operate even prior to academic achievement in (upper) secondary school, namely to the student's socio-demographic background as well as personal characteristics of the student such as age, cf. Figure 5.3.2.1 below. As is the case for prior academic achievement (cf. Section 5.3.3.2 below), a significantly negative effect of the student's socio-demographic back-

ground (especially the parents' educational attainment) is found upon the risk of formal dropout, whereas this issue plays a much weaker role among transfer students, if one at all (cf. Section 5.3.3.8). Concerning student age, there is, again, evidence that age has no statistically significant effect on making a transfer or, alternatively, that higher age leads to a lower likelihood of student transfer, whereas the opposite is found to hold among formal dropouts; that is, higher age leads to a higher risk of dropout (cf. Section 5.3.3.7).

Tinto's proposition that voluntary dropout/student transfer is driven more by lack of social integration in the subject of study/university concerned than other types of dropout behaviour can hardly be evaluated upon because of the very limited investigation of social integration and related aspects in the core studies. The only core study that investigates an aspect of social integration (¹ITT2770888) finds, in support of the proposition, that a greater percentage of transfer students (13.6%) chose the statement 'Did not feel socially suited to university' as a reason of great importance for making a transfer than did formal dropouts for dropping out of higher education altogether (10.7%). Via a factor analysis, the same study finds that, compared to push-factors, pull-factors are more important for transfer students than they are for formal dropouts, which supports Tinto's proposition. Another article based on the same study (¹ITT2770886) finds that two aspects of the student's motivation for entering university, namely the so-called 'career orientation' and 'interest orientation', significantly affect transfer students (i.e. the higher the level of these types of motivation when entering higher education, the less the likelihood of making a transfer, other things being equal), whereas such factors are not found to be of great importance among formal dropouts, cf. Figure 5.3.2.1 below. This is in support of Tinto's proposition that transfer students seem to be more sensitive than formal dropouts to factors not directly related to academic achievement, but to factors more related to the content of the study and its possibilities as well as to the student's motivations for studying; that is, to factors containing a greater element of choice. Another finding in line with this is that, in this study, transfer students are found to be much more sensitive to the level of educational goals than are formal dropouts (educational goals are found to be statistically related to making a transfer within higher education, but not statistically related to formally drop out of higher education).

Figure 5.3.2.1, as obtained from the study by Hovdhaugen (¹ITT2770886: 14), serves to illustrate the difference between transfer students and formal dropouts concerning the determinants of each type of university dropout behaviour. In relation to this figure, the author writes: "*Background characteristics can largely explain dropout, while students' educational goal or motivation has no effect. Conversely, motivation, educational goal and field of study contribute more to explaining why students transfer than background characteristics. A student's own study behaviour is, however, relevant to both events. A high level of student effort reduces the probability of either transfer or dropout.*" Later she summarizes: "*The most important finding is that both types of student departure, dropout and transfer, are related to two almost opposite sets of causal factors, as illustrated in Figure 4. The arrows indicate that the different sets of variables affect transfer and dropout respectively. The broken line indicates that there is some effect, but not of all variables in*

the set. Background characteristics, such as parents' educational level and previous school achievement, have an effect on the probability of dropping out of higher education, but have no effect on transfer. Correspondingly, variables on motives and choice have no effect on dropout, but are important for understanding transfer. This might be because the type of transfer (to a university, university college or abroad) was not specified in the model. But it is still interesting to note that there is no difference between students transferring and staying at university with regard to background variables. Hence, as an institutional strategy, limiting access to liberal arts education may influence the level of dropout, but probably not the level of transfer from university." (ITT2770886: 14)

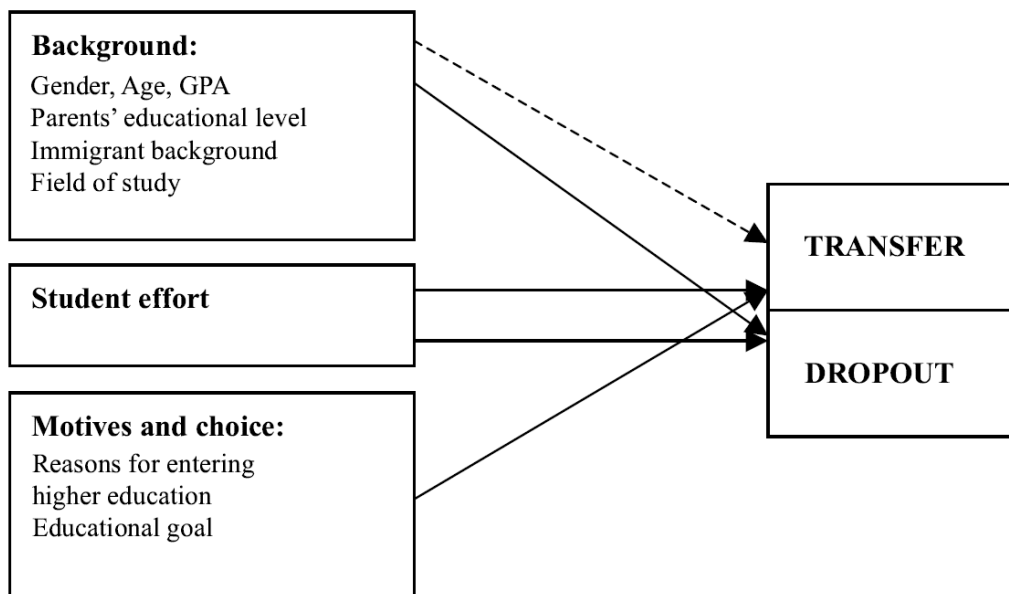


Figure 5.3.2.1 How different variable sets affect transfer and dropout respectively
The figure is obtained from Hovdhaugen (ITT2770886: 14).

The above quotation and Figure 5.3.2.1 serve as a rough summary of the findings from the core studies put together. Despite the lack of empirical investigation of a possible effect of academic integration within university on different types of dropout behaviour, when looked at more broadly (that is, when including a student's prior academic achievement a student's personal characteristics and student's socio-demographic background) there is evidence of transfer students being an academically/socio-economically more resourceful group of students than formal dropouts, not significantly different from persisters, or alternatively, even more resourceful than persisters. Formal dropouts, however, seem to be significantly less academically/socio-economically resourceful than both persisters and transfer students, in line with Tinto (1975). The few within-university findings concerning students' motivation and educational goals are also supportive of Tinto's 1975-proposition.

One must bear in mind the small evidence base on which the above evidence is obtained. That being said, the results obtained in the core studies do show that it is crucial to distinguish between different types of dropout behaviour, because each type of behaviour has different determinants. The few core studies are thus very valuable, because they are able to redress some of the results obtained from the other non-core studies. They will be highlighted throughout the following sections (cf. Section 5.3.3.1-5.3.3.9), which are concerned with the evidence on possible determinants of dropout from university that are investigated separately.

5.3.2.2 *The timing of dropout*

Another way to approach the question ‘*What is dropout from university studies?*’ is to dissect university dropout by timing of dropout. The first, and firm, point to make in relation to timing of dropout (without distinguishing between different types of dropout behaviour) is that university dropout primarily happens during the first couple of semesters/the first year of study. A high number of the studies available for this synthesis are explicit about this point. Some studies further state that first-year dropout is different from later dropout. For example, as stated in Smith & Naylor’s study ‘*Dropping out of university: A statistical analysis of the probability of withdrawal for UK university students*’ (ITT2771760): “*The US literature suggests that first-year withdrawals may be different from others. Tinto (1987) emphasized the transitional difficulties of adjustment into college life and Porter (1990) showed that about half of all student attrition occurs in the first year. This is approximately the proportion that we find in our data: of the 7.1% of females (and 10.3% of males) who withdrew at some point before completion, 56% left during their first year, for both females and males.*” (ITT2771760: 395) Another study ‘*A hazard model of the probability of medical school drop-out in the UK*’ by Arulampalam et al. (ITT2770586) makes a similar point with reference to the British context: “*We concentrated our analysis on Year 1 dropout probability because, as previous work has shown [ITT2777620, see below], the determinants of dropout probability are significantly different for Year 1 students compared with subsequent year students.*” (ITT2770586: 386) Since first-year dropout is found to be both more comprehensive than and different from later dropout, in line with Arulampalam et al. (ITT2770586), quite a few of the studies available for this synthesis actually restrict their analyses to comprise first-year students only.

A few studies ([¶]ITT2763715: 825-826; [¶]ITT2770886: 9; ITT2772971: 66; ITT2773010: 83) investigate the dropout timing of transfer students separately. They all indicate, through the use of simple percentages/frequency tables and without making further analyses of why this is so, that student transfer in general happens early in the course of study. One example is found in the study by Hovdhaugen ([¶]ITT2770886): “*Most of the students transferring from university left early. Forty per cent of them had left within the first year, and 65% by the end of the second year. Early departure among students who transfer seems to be quite common (Tinto 1993; Yorke 1999, 37).*” ([¶]ITT2770886: 9) A few studies furthermore indicate that student transfer, relatively speaking, happens earlier than formal dropout in that the distribution of student transfer is steeper downward sloping throughout the course of study than is the distribution of formal dropout

([¶]ITT2763715: 825-826; ITT2773010: 83). One core study ('Tracking Students' Progress through the Spanish University School Sector' by Lassibille & Gómez) finds that from year 4 of study and later years of study the transfer rate is vanishingly small, whereas the dropout rate for other reasons of dropout than transfer is relatively higher. For both types of dropout behaviour it still applies, though, that first year dropout/transfer is by far the greatest ([¶]ITT2763725: 826). According to Tinto, there is theoretically reason to believe that most of the voluntary withdrawals, which are assumed to comprise a higher degree of student transfer than for involuntary dropout, happen early on: *"Since voluntary withdrawal implies a decision on the part of the individual that the benefits of the degree and of persistence in the institution do not outweigh the costs of attendance, it can be argued that perceived benefits increase with increasing nearness to completion. In a real sense, past costs become an investment once those costs have been borne. As a result, the perceived ratio of benefits to costs, other things being equal, would tend to increase as one proceeds through college. Therefore, one would expect to find both goal and institutional commitment increasing as a function of nearness to the completion of the degree program and proportion of voluntary withdrawals decreasing."* (Tinto, 1975: 118) No such proposition is made concerning involuntary dropout, which is assumed to comprise more formal dropouts from higher education than is the case for voluntary withdrawal. This might well be because this type of dropout is not voluntary. Consequently, the individual student's suggested cost-benefit analysis cannot come into play among the students who have to leave university due to academic failure.

Unfortunately, only a few of the studies that investigate more than just first-year students have investigated dropout through the use of discrete time survival analyses, and they have subsequently presented their analysis results in such a way that the possible time-varying effect on dropout of the different factors can be obtained (ITT2762178; [¶]ITT2777620; (ITT2771760)). These three studies are thus able to qualify an answer to the question of what university dropout is by explicitly taking on a time-varying perspective in their quantitative analyses.

As stated in the study 'Dropping out of university: A statistical analysis of the probability of withdrawal for UK university students' by Smith & Naylor (ITT2771760) such an approach was already pleaded for by Tinto: *"Tinto (1988) argued for a longitudinal approach in which the non-completion behaviour of students is time varying. DesJardins et al. (1999) used an event history model to analyse the temporal aspects of non-completion."* (ITT2771760: 395) As stated in the study 'The Roads to Success: Analyzing Dropout and Degree Completion at University' by Ortiz & Dehon (ITT2762178): *"Yet, in educational research, temporal investigations of dropout and timely graduation have been done only infrequently (DesJardins et al. (2002)). To understand the changing circumstances of students as they proceed through their academic careers, a methodology is required that allows us to study transitions from one state to the next (e.g., from being enrolled to not enrolled); we thus use longitudinal data and temporal analytic techniques to fully capture how factors evolve throughout students' academic paths. [...] The main contribution of this paper is to show that much more can be learned about dropout and graduation by analyzing when the event occurs or how the impact of some factors evolve through time."* (ITT2762178: 2) This study mainly

investigates students' socio-demographic background, personal background characteristics and other pre-university attributes concerning academic preparedness/main entry qualifications (i.e. the intensity of the mathematical profile in upper secondary school, secondary school type and whether the student has started university on time). It leaves possible time-varying effects of different within-university factors largely untouched. The study finds two time-varying effects. One is the mathematical profile obtained by the students in upper secondary school (i.e. the stronger the mathematical profile, the lower the risk of dropping out, other things being equal). The other study has to do with having finished upper secondary school on time (which lowers the risk of dropout, other things being equal). For both factors it applies that the effect on dropout is strongest in the first years of study and it diminishes during the course of study. The authors explain these findings the following way: *"In addition, we have shown that both the effect of having a strong mathematical profile and finishing secondary schooling on time vary across time. Indeed, the impact of these variables on the probability of dropping out is stronger at early ages of enrolment. This could be due to either a selection effect (students with a weak mathematical profile drop out at the beginning, leaving a more homogenous group in subsequent years), or a learning effect (what a student studied during high school has less effect after spending several years at university)."* (ITT2762178: 29)

In a similar vein, the study 'A hazard model of the probability of medical school drop-out in the UK' by Arulampalam et al. (²ITT2777620) mainly investigates students' socio-demographic background, personal background characteristics and other pre-university attributes concerning academic preparedness/main entry qualifications (i.e. upper secondary school subjects and achievement as well as secondary school type). The key finding in relation to the time-varying perspective is that the student's main entry qualifications are of greater importance for dropout within the first three years of study as compared to the fourth and fifth year of study, just as was found in the other study. Unfortunately, since within-university factors such as specific study conditions, academic and social integration etc. have not been investigated directly in these two studies, none of them make it possible to obtain evidence whether the same time-varying effect is true for these factors as well; namely whether their importance for dropout diminishes throughout the course of study or not. Ortiz & Dehon's study does say one thing about a time-varying effect on dropout of academic integration within university, namely that the outcome of the student's first year (whether the student fails or passes the first year) is a good predictor of dropout during almost all the rest of his/her career path at university. However, again, this effect is clearly more pronounced at the end of first year/beginning of second year and diminishes throughout the course of study and at the end approaches the same dropout risk as for those students who succeeded the first year of study (ITT2762178: 14). The third study by Arulampalam et al. (ITT2771760) merely mentions that separate analyses have been undertaken for the probability of dropping out during the first year of study as compared to the incidence of dropping out in any year of study. These separate findings are not shown or directly reported on, however, because they were said to be essentially the same as the findings for dropping out in any year of study. As such, this study does not find any of the

factors investigated to vary significantly throughout the course of study.³⁹ Via simple statistics, the two studies by Heublein et al. (ITT2772961: 51; ITT2772964: 40) investigate the duration of time before dropout caused by different within-university factors and conditions external to university. Their findings show a mutually similar pattern, namely that within-university concerns about the academic demands/workload and doubts about own suitability for studying, motivational failure and dissatisfaction with study conditions on average have the shortest duration of time before dropout, whereas external factors such as e.g. financial problems, problems related to the family and illness as well as problems of passing midway and final exams show the longest duration of time.

This section has pointed to the relevance of treating first-year dropout from university separately from later dropout because first-year dropout is found to be both more comprehensive than and also different from later dropout. The few studies that have analysed the possible determinants of university dropout within a time-varying perspective have thus predominantly found evidence that pre-university academic achievement influence the risk of dropout more strongly in the first stages of study compared to later stages, whereas conditions external to university have been found to be more salient for later dropout. Unfortunately, the time-varying analyses lack investigation of various within-university factors. No evidence is therefore available on whether the effect on dropout of such within-university factors varies over the course of study as was found for different aspects of pre-university academic achievement, for instance whether different within-university factors are more important for dropout at later stages compared to earlier stages, as could be interpreted from the above quotation in Tinto (1975) concerning educational goals and institutional commitment increasing their importance through the course of study.

5.3.2.3 *What happens to dropouts after dropout?*

As stated in the introducing remarks to this section, it is relevant to include possible evidence on what happens to dropouts after dropout. This comprises the important aspect of whether the dropouts have acquired useful skills before leaving their university subject of study to be used subsequently in the labour market. This might include students who formally drop out of higher education because they are being directly recruited into the labour market before graduation, and as such form a special type of formal dropout behaviour. In this case, the consequences of dropout might well be considered to be less harmful, at least from the perspective of this specific group of dropouts.

³⁹ Being one of the core studies, (^HITT2777620) is further able to differentiate between transfer students and formal dropouts on the determinants of transfer/dropout. Unfortunately, the 'competing risk' part of the study, i.e. the part which distinguishes between transfer students and formal dropouts, does not uphold the comparison between 1-3 year dropout/transfer vs. 4-5 year dropout/transfer. This part of the study analyses 1-3 year dropout vs. transfer only (cf. Section 5.3.2.1).

A number of studies (apart from the core studies) present simple descriptive statistics of how big a percentage of the dropouts is actually transfer students and, in a few cases, how big a percentage of these transfer students has transferred to another subject of study within higher education and how many have started another type of education at a lower level measured some time after their dropout. In most cases, such statistics are presented without the studies having directly compared e.g. transfer students and formal dropouts in their quantitative analyses on determinants of dropout (⁴⁰ITT2770888; ITT2758964; ITT2771809; ITT2772931; ITT2762308; ITT2773010; ITT2772964 + ITT2772958; ITT2772971; ITT2773000 + ITT2773001). An often-made point in these studies is merely that because a (varying) percentage of the dropouts are actually found to be transfer students, the dropout problem is often less of an economic and societal problem than first assumed.

Unfortunately, only a minor part of the studies available for the synthesis addresses more thoroughly the question of what actually happens to dropouts after dropping out as a kind of post-university student 'tracking'. Common to these studies is that their analyses build upon thorough questionnaire surveys. Naturally, questions concerning the occupational whereabouts of dropouts after dropout and related issues cannot be obtained from university administrative records. That these statistics/analyses build upon questionnaire surveys of precarious issues, such as occupational activity, occupational position and income, for which the answers are often difficult to verify, should serve as a note of caution of these studies' findings. Hence, in addition to the investigation of how big a percentage of the dropouts transfer to another subject of study/education a while after having dropped out, some of these studies look into the occupational activity of the (formal) dropouts some time after dropout. Again, this is done by the means of simple descriptive statistics, for instance by looking at how big a percentage of the dropouts are employed at the time of measurement often compared to the situation among graduates (ITT2762308; ITT2773010; ITT2772964 + ITT2772958; ITT2772971; ITT2773000 + ITT2773001).

Evidence from a Danish context, 'Dropout among ethnic minorities at the Danish universities'⁴⁰ by Hoff & Demirtas and 'Dropout and study environment'⁴¹ by Larsen, (ITT2762308; ITT2773010) gives the impression that the dropouts are characterised by a rather high activity level after dropout. The occupational profile shows that about half of the dropouts are employed full-time at the time of measurement (45% and 54%, respectively) and another part has either transferred already (15% and 14%, respectively) or are qualifying for a new education (8%) (ITT2762308). Of all the dropouts, as much as 75% plan to take up another education, 16% consider doing so and only 8% are certain that they do not plan to take up another education (ITT2773010). Only a minor part of the dropouts are, as such, found to be unemployed at the time of measurement. These findings are supported by the German study 'Causes of dropout: 2002 analysis'⁴² by Heublein et al.

⁴⁰ Translated from Danish: 'Frafald blandt etniske minoritetsstuderende på universitetsuddannelserne i Danmark'.

⁴¹ Translated from Danish: 'Frafald og studiemiljø'.

⁴² Translated from German: 'Ursachen des Studienabbruchs: Analyse 2002'.

(ITT2772964), which finds that about one third of the dropouts have started a vocational education a short while after dropout, a little more than forty percent (42%) are in some kind of employment and only a minor part of the dropouts (8%) are unemployed at the time of measurement, which at the same time is only a slightly greater percentage compared to the graduates (6%). The same overall picture is found in another German study 'Dropout: causes, problems and reasons'⁴³ by Pohlenz et al. (ITT2773000 + ITT2773001). Whereas a large share of dropouts have begun a vocational education shortly after exmatriculation compared to graduates, there is a less profound difference between dropouts and graduates in the share that has obtained a job. Only a minor share of both groups is unemployed. The numbers on which these statistics are based should be interpreted with caution since they are very small (ITT2773000: 281), making the findings quite insecure. The same pattern is true in the Austrian study 'Dropout: Between continuity and crisis. An empirical study at Austrian universities'⁴⁴ by Kolland (ITT2772971). One year after exmatriculation, the employment rate among dropouts and graduates is obtained separately. Among graduates the employment rate is very high, 90%, whereas it is lower, but still high, (79%) among dropouts. As stated, this finding seems to apply more universally within the OECD countries: *"What the figure illustrates applies then as universally valid empirical findings within most OECD countries: dropout does not lead to unemployment. A comparative study for Germany from 1994, which was based on a survey conducted half a year after exmatriculation, found that three quarters of the dropouts and four fifths of the graduates were employed at the time of measurement (Lewin, 1999). A similar situation was found in Switzerland, where 84% of the graduates and 75% of the dropouts were employed (Diem & Meyer, 1999)."* (ITT2772971: 110, our translation from German)

Two studies by Heublein and Kolland (ITT2772964 + ITT2772958; ITT2772971) investigate further occupational aspects of the formal dropouts who were employed at the time of measurement. These studies shed light on issues such as the subsequent occupational level/position of the dropouts, their income, whether they in their current job make greater or lesser use of the skills they had obtained before dropping out of university etc. The above-mentioned evidence has shown that a clear majority of the dropouts either transfer to another subject of study/education or obtain a job not too long after they dropped out. That being said, the two studies paint a less positive picture of the dropouts when it comes to related occupational aspects. For one thing, the study by Heublein (ITT2772964) shows that the occupational status of the dropouts differs markedly according to the decisive factor given for dropout. The highest percentages of unemployment are found among those dropouts who gave either illness, concerns about the academic demands/workload and doubts about own suitability for studying or problems of passing midway

⁴³ Translated from German: 'Studienabbruch: Ursachen, Probleme, Begründungen.'

⁴⁴ Translated from German: 'Studienabbruch: Zwischen Kontinuität und Krise. Eine empirische Untersuchung an Österreichs Universitäten'.

and final exams as the decisive factor for dropout. More than a third of the dropouts who gave problems related to the family as the decisive factor for dropout are at the time of study in household activities. Such domestic occupation does not account for more than a few percentages of the dropouts who mentioned other decisive factors for their dropout. The labour participation rate is highest among the dropouts who gave either financial problems or professional reorientation as the decisive factor for dropout. This study further observes that dropouts, less frequently than graduates, obtain jobs in study-related areas, more frequently hold lower-position jobs than graduates and, as a result, have a lower income on average than graduates. In relation to this, it is observed that because dropouts more frequently obtain lower-position jobs in areas unrelated to their university subject of study, they are more often dissatisfied, in particular with the work content, their opportunities for career advancements and possibilities for pursuing own interests within their position. This study goes a step further and compares the level of satisfaction with current life situation between dropouts and graduates at the time of measurement. Somewhat surprisingly when bearing the above results in mind, all in all, both groups seem to be quite satisfied, and on most aspects dropouts are no less satisfied than graduates, on a few aspects they are even more satisfied than graduates. Only among the dropouts who are temporarily employed, in household activities or are unemployed is the level of dissatisfaction markedly high. The finding that dropouts more frequently hold lower-position jobs than graduates is not confirmed in the study by Kolland (ITT2772971), which investigate this aspect one year after exmatriculation. The situation among dropouts even looks a little *more* favourable than among graduates e.g. with a higher percentage of dropouts in leading positions (15%) compared to graduates (12%) and a lower percentage of dropouts in non-leading positions (59%) compared graduates (68%). When differentiating by gender, this difference disappears among women and is salient for men only. No linear statistical relationship is found between dropout/graduation and monthly income either. A greater share of dropouts than graduates earn below the lowest income threshold investigated, but at the same time also a greater share of dropouts earn above the highest income threshold investigated. However, when the lowest income categories are put together, a higher percentage of the dropouts (57%) than the graduates (51%) are found to have the lowest income. It is also found that a lower percentage of dropouts work full-time (84%) whereas this applies for 89% of the graduates. This difference is fully due to female dropouts working less than female graduates. In some support of the findings by Heublein et al. (ITT2772964), the study by Kolland (ITT2772971) observes that the evaluation whether or not the subject of study has been useful/helpful for subsequent professional career is more negative among dropouts than among graduates, this especially holds for female dropouts. This is not surprising since female dropouts are found to do less well than male dropouts when it comes to subsequent occupational position, working hours and income etc. All in all, this study finds the consequences of having dropped out to be more mixed for the subsequent occupational profile of the dropouts compared to that of the graduates. However, the author believes this to be partly a result of the inferior design of the study: *“However, foreign longitudinal studies indicate that this concerns a cross sectional effect. In the short run, dropouts manage to synchronise study departure and entry into the labour market better, i.e. they*

drop out when being provided a good job opportunity or because they are already in a good job position. Graduates, after having finished their studies, need more time to position themselves in the job market. Second, empirical studies demonstrate that this concerns a transitional phenomenon since ten years later the graduates have outpaced the dropouts as regards professional status.” (ITT2772971: 168, our translation from German) The studies by Pohlenz (ITT2773000 + ITT2773001) find that a greater percentage of dropouts are in full-time employment shortly after exmatriculation compared to graduates. The number of dropouts and graduates behind these statistics are, however, very small (ITT2773000: 281 + ITT2773001) and hence quite insecure.

When differentiating between early and late dropout (i.e. dropout after completion of the first part of the study), it is found that late dropouts on average obtain higher occupational positions and earn more money than early dropouts (ITT2772971). Hence offhand, it seems to pay out economically to formally drop out of higher education only after the first part of the study has been completed. Yet, the evidence base for this only comprises this one study.

No studies address in depth the issue of active recruitment into the labour market before graduation, including the issue of which factors possibly lie behind this type of dropout apart from the obvious fact that these students have acquired useful and demanded skills before their exit from university. The study by Heublein et al. (ITT2772964) does show, however, that among the dropouts and graduates who were found to be employed at the time of measurement, a relatively small share (7%) of the dropouts had obtained their job due to an employer having addressed them actively during the course of study. This percentage was twice as high (14%) for the graduates (ITT2772964: 127). A somewhat similar statistic is shown in the study by Kolland (ITT2772971). Here it appears that the percentage having found their job via contacts during the course of study is much higher among graduates (23%) than among dropouts (4%). In contrast, compared to graduates, a higher percentage of dropouts have found their job through friends and acquaintances or on the basis of having established their own business.

In sum, these studies tell the story that from the dropouts' own perspective (or, to a lesser extent, the system of higher education) dropping out from higher education should in many cases not be seen as an unconditional defeat. Firstly, this is because an often times not inconsiderable share of dropouts transfer to another subject of study within higher education directly or a while after they have dropped out. Secondly, this is because the employment rate of the dropouts is often quite high and not necessarily much worse than among the graduates. In other words, problems of unemployment among dropouts are not particularly pronounced. However, when one looks deeper into the occupational profile concerning issues such as the occupational level/position of the dropouts, their working hours, income and whether they make good use of the skills they have obtained in their university subject of study before dropping out, the picture is less positive compared to the graduates. Although the evidence is not entirely unequivocal, there is a tendency that dropouts lag behind the group of graduates on these issues.

Besides the evidence base being small, another significant problem with the evidence concerning the above-mentioned issues is the fact that all of these studies build upon cross-sectional questionnaire surveys; that is, they only measure the occupational aspects once and often quite shortly after exmatriculation. As such, evidence on the possible time-varying effects of these aspects and the long-term implications of dropout is missing.

5.3.3 Evidence on ‘Why do such dropout phenomena occur at universities?’ including evidence on ‘What can be done by the universities to prevent or reduce such dropout phenomena?’

This section contains the evidence obtained from the 44 studies available for the synthesis concerning the two review questions ‘Why do such dropout phenomena occur at universities?’ and ‘What can be done by the universities to prevent or reduce such dropout phenomena?’. As stated already in Section 5.3.1.1, because the European based intervention studies of ‘What can be done by the universities to prevent or reduce such dropout phenomena?’ are very few and sporadic, the evidence on the third review question is included in the guiding ‘story’ on ‘Why do such dropout phenomena occur at universities?’ where it best fits in.

Evidence on the nine overall categories identified in Section 5.2 in relation to the review question ‘Why do such dropout phenomena occur at universities?’ will, as stated in Section 5.2, be presented below with a special focus on university malleable factors. This is because the university ‘malleable’ factors comprise the possible effects on dropout of the pedagogical instruments which can be influenced most directly by university authorities/politicians. As such, the synthesis begins by presenting the evidence on the effect of one of the overall categories: (5) Study condition at university. Then comes the following overall categories: (6) Academic integration at university, (7) Social integration at university and (8) Personal efforts and motivations for studying, which are also university malleable factors to a certain extent. Subsequently, evidence on the overall categories and pre-university malleable factors (i.e. (4) Pre-university institutional procedures and (3) Prior schooling/prior academic achievement) will be presented. Lastly, the overall categories and non-malleable factors ((2) Personal characteristics of the student, (1) Socio-demographic background of the student and (9) Conditions external to university) will be evaluated. As the latter overall categories set the framework conditions for the possible influence of the malleable factors identified, they are not unimportant to study.

5.3.3.1 Overall category: (5) Study conditions at university

Crucial among university malleable factors is the overall category termed ‘study conditions at university’. This is because it should be almost purely within the reach of the given university authorities and/or politicians to alter/change the study conditions, if they are thought to be non-optimal concerning, for instance, issues related to dropout. Similar to, or even more so than, other university malleable factors, ‘study conditions at university’ comprise a huge amount of features which in themselves can be defined, operationalised and analysed in various ways, as will become evident in this section. Therefore, the chance that more studies investigate, operationalise and ana-

lyse each of these features in the exact same way is minimal, which will to some extent naturally complicate a synthesis of the findings within this overall category.

Of the 42 studies available for investigating ‘*Why do such dropout phenomena occur at universities?*’, 23 studies include one or more aspects within this category in their quantitative analyses. Of these 23 studies, eight studies find purely significant results for influence of this overall category on dropout, whereas three studies have obtained insignificant results only and 11 studies have obtained mixed results dependent upon what aspect of the overall category has been evaluated. One additional study reports on an intervention where an alternative educational approach is applied.

Institutional resources

As mentioned, this overall category covers a huge amount of features. On this basis, it is not surprising that most of the specific aspects of the overall category have been investigated by no more than a handful of studies. That being said, there seems to be an overweight of findings linking various institutional resources to dropout. This focus on institutional resources have mostly been investigated within a British context ([Ⓜ]ITT2777620 + ITT2761966; [Ⓜ]ITT2762111; ITT2786263; ITT2762212) and to a lesser extent elsewhere (ITT2772971; ITT2773000 + ITT2773001). Such institutional resources include, amongst other things, number of students in lectures, number/composition of the student body (e.g. percentage of research graduates), percentage of staff with a professorship or percentage of staff doing research, staff-student ratio, percentage of university income from research grants, academic expenditure per student, library expenditure per student, staff salaries, etc. The evidence is mixed and in some studies the results vary by gender or by type of dropout behaviour. Some findings indicate no significant relationship, whereas others indicate that more resources spent are reflected in a significantly lower dropout risk. The few studies that investigate the number of students in lectures find, for instance, that this feature is significantly related to a higher dropout risk when that number is perceived to be too high/unsatisfactory by the students themselves (ITT2772971; ITT2773000 + ITT2773001). A few studies investigate and find that higher student and teacher expenditures are significantly related to a lower dropout risk ([Ⓜ]ITT2762111; ITT2786263). Furthermore, being a research intensive institution appears to give rise to a significantly lower dropout risk as well ([Ⓜ]ITT2777620 + ITT2761966; ITT2762212; [Ⓜ]ITT2762111), at least when it comes to involuntary dropout (i.e. dropout due to academic failure; [Ⓜ]ITT2762111). This core study finds the opposite relationship among voluntary dropouts; namely that research-intensive institutions give rise to a *higher* voluntary dropout risk. This finding, which at first glance seems counter-intuitive, is discussed in the paper: “[...] *those institutions that derive a high proportion of their income from research grants do tend to fail fewer of their students and are faced with relatively high quit rates. These findings could conceivably be related to ‘hygiene’ factors that are associated with the extra resources brought in by external funding of research.*” ([Ⓜ]ITT2762111: 37) The same study obtains mixed results when it comes to the staff-student ratio: “*The staff–student ratio is negatively associated with voluntary student*

noncompletion but has a positive effect on the probability of failing. This result contrasts with the counter-intuitive finding of Johnes and Taylor (1990). It suggests that the main benefit of a high staff–student ratio concerns the pastoral, rather than academic, aspect of the work of university faculty. This is an interesting and provocative result which warrants further investigation.” (ITT2762111: 38) As is stated, the result warrants further investigation. Unfortunately, this aspect of institutional resources has not been analysed elsewhere among the available studies. Apart from these latter results, the evidence is overwhelmingly in favour of an increasing amount of institutional resources leading to a lower dropout risk.

Study content, study structure/organization of exams

Other aspects of this overall category, such as the effect of the study content (curriculum), the study structure and the organization of exams, have been investigated mostly within a German context through the use of questionnaire surveys (ITT2772971; ITT2772931; ITT2773000 + ITT2773001). The Austrian study by Kolland (ITT2772971) and the German study by Albrecht & Nordmeier (ITT2772931) do to a certain extent investigate similar features. They obtain concurrent results when it comes to measuring a possible effect on dropout of satisfaction with/approval of the content of the study and the organization of lectures/exams. None of these features are found to exert a statistically significant influence on dropout. The German studies by Pohlenz (ITT2773000 + ITT2773001) find that a satisfactory academic workload and a satisfactory difficulty level in the subject of study significantly lowers the risk of dropout.

In ‘An alternative educational approach for an Inorganic Chemistry laboratory course in Industrial and Chemical Engineering’ by Garcés and Sánchez-Barba (ITT2758942), the program *Experimentation in Chemistry (an Inorganic Chemistry laboratory module)* is being studied. The aim of the program was to improve student performance and satisfaction with a practical module in inorganic chemistry by revising the course by adopting a new educational style in the laboratory. The study finds that changing the way the curriculum is taught and the way it is assessed in a practical chemistry university course directly affects the students in terms of passing their exams or dropping out. In regard to the third review question, this study shows that a teaching and examination method that demands more active students and makes a connection to students’ previous knowledge on the subject content seems to motivate them and result in a higher percentage of students passing examinations and fewer dropouts from the course.

Learning environment and learning quality

The two Danish studies by Hoff & Demirtas and by Larsen (ITT2762308; ITT2773010) both operate with a broad factor termed ‘the academic environment’. This is an overall measure consisting of a greater number of items measuring features such as satisfaction with the physical conditions at university, the teaching and the curriculum. Included herein are also matters of study content, cf. the above section. Neither of these two studies find this overall measure to have a direct signifi-

cant effect on the dropout risk. However, the academic environment seems to have an indirect effect through other factors such as study motivation.

Related aspects of this overall category concern the learning environment, teaching quality and the reputation of the institution. Again, the evidence base is quite small and evidence on the effect on dropout of such features is mainly possible to establish within a British context ([Ⓜ]ITT2762111; ITT2771760; ITT2768140; ITT2762212; ITT2777714; [Ⓜ]ITT2770888; ITT2770600). The three British studies ([Ⓜ]ITT2762111; ITT2771760; ITT2768140) point at a positive relationship between ‘teaching quality assessment’ (TQA) score and ‘research assessment exercise’ (RAE) score (i.e. a proxy for the quality of research at each university) on the one hand and a significantly lower dropout risk on the other. For involuntary dropouts (i.e. dropout due to academic failure, [Ⓜ]ITT2762111), the RAE score has the same direction, but does not prove to be statistically significant, however. The British study ‘Estimating the Production Function of University Students’ by Soo (ITT2762212) measures teaching quality through a question about satisfaction with the teaching quality. The study finds that the significant relationship between a higher learning quality and a lower dropout risk only applies to ‘pre-92’ universities. The study by Baars et al. ‘A model to predict student failure in the first year medical curriculum’ (ITT2777714) finds that, among Dutch medical students, satisfaction with elements of the learning environment does not turn out to be a significant predictor of dropout.

In ‘Effects of in-class variation and student rank on the probability of withdrawal: cross-section and time-series analysis for UK university students’ by Arulampalam et al. (ITT2768140) the risk of dropout is found to be significantly lower among highly ranked students within highly ranked universities compared to other universities. That is, it seems to lower the dropout risk to be an elite student at an elite university compared to being an elite student at a non-elite university. A factor analysis in the core study by Hovdhaugen ([Ⓜ]ITT2770888), which compares formal dropouts and transfer students’ own stated reasons for dropout and transfer, respectively, shows that for both groups the factor with the greatest explanatory power is the learning environment. For formal dropouts it includes statements about unsatisfactory teaching/teachers and tutoring and bad learning environment. For transfer students it includes, among other things, statements such as perception of better teachers in and better reputation of the new institution. On this background, the authors note that pull-factors seem to be more important than push-factors in the decision to transfer to another institution. *“Pull factors are more important than the push factors in the decision to transfer. However, this might also indicate flawed decision-making, which is similar to what Yorke and Longden (2004) argued is one of four main reasons for leaving.”* ([Ⓜ]ITT2770888: 183) The findings from this factor analysis supports findings from another factor analysis comparing dropouts (no distinction made between different types of dropouts) and persisters (‘Why students withdraw or continue their educational careers: A closer look at differences in study approaches and personal reasons’ by van Bragt, ITT2770600). The most important factor for dropout is the perception and experience of educational and organizational aspects of the institution. The learning environment is also of great importance for persisters, however. Among persisters, the second

most important factor is found to be perception and experience of the learning environment quality.

Support and counselling services

No clear pattern arises for the effect of support and counselling services. Four studies have investigated this aspect. The study by Albrecht & Nordmeier (ITT2772931) finds that satisfaction with support and counselling services has the significantly strongest effect on lowering the risk of dropout among the investigated variables. Another study, the study by Kolland (ITT2772971), finds that satisfaction with the support given by the teachers significantly lowers the risk of dropout, while the same study finds an insignificant effect on dropout from counselling services at the institutional level. Contrary to these two studies (ITT2772931; ITT2772971), the study by Hoff & Demirtas (ITT2762308) does not find that support from fellow students and teachers exerts a statistically significant effect on dropout. The studies by Larsen and by Pohlenz et al. (ITT2762308; ITT2773000 + ITT2773001) find such features to be insignificant as well. Neither does the studies by Pohlenz (ITT2773000 + ITT2773001) find a statistically significant influence of counselling/support services given before exams on the risk of dropout. Since there are various ways of measuring satisfaction with support and counselling services, it is of less surprise that the evidence is mixed.

Peer effects

Another small group of studies ([Ⓜ]ITT2762111; ITT2771760; ITT2762175; ITT2768140) address the issue of peer effects. Two of these, the study by Johnes & McNabb and by Smith & Naylor ([Ⓜ]ITT2762111; ITT2771760) address *gender* peer effects. The study by Smith & Naylor (ITT2771760) does not find any statistically significant effect of the percentage of male students in the university department on dropout. In sharp contrast to this, the evidence from the core study by Johnes & McNabb ([Ⓜ]ITT2762111) seems to be that increasing the percentage of male students increases the risk of both voluntary and involuntary dropout (i.e. dropout due to academic failure). Among female students, voluntary dropout is found to be significantly lower, the higher the percentage of male students, whereas involuntary dropout is found to be significantly higher. The Dutch study 'Gender Peer Effects in University: Evidence from a Randomized Experiment' by Oosterbeek & van Ewijk (ITT2762175) finds that a higher percentage of female students makes the male students postpone their decision to dropout, but at the end of the school year the effect of a higher percentage of female students on dropout is no longer present among the male students in question. The study further investigates, but do not find statistical evidence for gender peer effects being either stronger or weaker among those students who obtained the best academic results in secondary school.

The study by Johnes & McNabb further investigates *ability-related* peer-effects. Statistically significant ability-related peer-effects are only found for male students with a secondary school grade point average above the mean. In such cases, risk of voluntary and involuntary dropout is found to be significantly higher (the involuntary dropout risk is, however, significant at the 10% level only).

No such ability-related peer-effect is found for female students or for male students with a secondary school grade point average at or below the mean. The authors conclude that *“a mismatch between the academic abilities of an individual and those of his/her peers increases the likelihood of voluntary non-completion, this appears only to affect people of above average ability”* (ITT2762111: 37). In connection to this, the study by Arulampalam et al. (ITT2768140) addresses the effect of ‘in-class heterogeneity’ with respect to prior qualifications. The dropout risk is significantly higher, the higher the in-class heterogeneity, but again this only regards male students. Judging by this small evidence base, male students appear to be more sensitive to different kinds of peer effects than female students.

Subject of study

Twelve studies analyse higher level variables; that is, whether there are significant differences in dropout risk between different subjects of study or faculties within specific universities (N=10) or between different universities (i.e. medical schools, N=2). Nine of these 12 studies find that there are significant differences in the dropout risk between most of the investigated subjects of study/faculties. For the three studies that do not find significant differences, this actually only concerns part of the population under investigation. To give an example, the core study by Arulampalam et al. (ITT2777620) finds that a smaller number of all of the investigated UK medical schools actually have a significantly higher or lower risk of dropout than the rest. In the study ‘Why do higher education students drop out? Evidence from Spain’ by Lassibille & Gómez (ITT2770663) students at university faculties and students at higher technical schools are analysed separately. While the dropout risk for students in higher technical schools does not differ significantly between different subjects of study, it does for students in university faculties; students in health sciences, for example, have a significantly lower dropout risk. The core study by Hovdhaugen (ITT2770886) finds that among formal dropouts no such significant differences exist, whereas they do among transfer students; students in the natural sciences, for instance, have a significantly lower likelihood of student transfer.

Among the nine studies that found significant differences in dropout risk between different subjects of study/faculties, the overall picture is somewhat mixed regarding from which subject(s) of study/faculty(ies) the students are especially prone to drop out. After all, there seems to be an indication that the risk of dropout is particularly high within the hard sciences. The core study by Johnes & McNabb (ITT2762111), which distinguishes between voluntary and involuntary dropout, finds that students within the so-called hard sciences, that is, mathematics, engineering & technology and the physical sciences, have both a high voluntary and involuntary dropout risk. This finding is in concordance with the finding that the transfer rate is by far the highest within mathematics, physics and chemistry and the formal dropout rate is the second highest within these subjects. That students within the hard sciences have a high involuntary dropout risk (i.e. dropout due to academic failure) is supported by the study by Heublein et al. (ITT2772964: 25-27) which finds that, especially among students within mathematics/the natural sciences and engi-

neering, the two most frequently cited reasons for dropping out and the two most frequently cited *decisive* reasons for dropping out concern academic performance problems and study demands being too high, respectively; that is, factors related to academic failure. A few other German studies (ITT2772931; ITT2772961: 7-8) observe that the problem of high dropout rates is especially pertinent within the hard sciences, without being more specific about what types of dropout are investigated.

That no specific subject of study/faculty is consistently found to be more or less prone to dropout, besides the above indication that dropout is particularly high within the hard sciences, should be seen as a consequence of more factors: a variable measured at the level of the specific subject of study/faculty is naturally dependent upon several other things besides the particular features (i.e. the structure, academic content and demands, etc.) of each of the specific subjects of study/faculties under investigation. These other things include the composition of the student body, the teaching quality, etc. of each of the investigated specific subjects of study/faculties. As pointed out in the study 'Factors influencing university drop out rates' by Araque et al. (ITT2758729): "*[T]he drop out phenomenon is highly subjected dependent. The profiles of the students vary at different faculties in the same university.*" (ITT2758729: 75) In this lies the conception that the specific composition of the student body between different subjects of study/faculties/universities leads to differences in dropout rates. Hence, it is almost impossible to disentangle whether the factors responsible for the differences in dropout risk between different subjects of study/faculties are factors pertaining to differences related to the subjects/faculties themselves or to other less university malleable factors such, for instance as the different composition of the student body across different subjects of study/faculties. Moreover, differences in dropout risk between various subjects of study/faculties are sensitive to specific contexts. Because most of the 12 studies in question are conducted within a narrow context, that is, mostly within one country-specific university institution (together, however, covering a number of European countries), the chance that specific contextual factors have been influential on the findings of each study is not negligible. This represents an issue which will be taken up in later sections in relation to the assessment of the robustness of the synthesis (cf. Section 5.4) and recommendations for future research (cf. Section 5.6). The findings of each study, of course, further depend on which subjects of study/faculties form part of the analyses in the first place, and also which specific subject of study/faculty has been chosen to be the comparison ('reference') category in the multivariate analyses, which is a factor of much variation among the 12 studies.

In sum, the evidence of a possible effect of study conditions at university on dropout is at best blurred. The evidence suggests most firmly that university controlled issues, such as more resources spent on students and teachers and higher quality parameters, have the potential to lower the risk of dropout, other things being equal. Besides the huge amount of features included under the heading of 'study conditions at university' which in themselves are defined, operationalised and analysed in various ways and only few of them are investigated by more than a handful of studies, the mixed evidence is furthermore considered to be a consequence of the contextual nar-

rowness of the studies available for the synthesis. Interestingly, Tinto came to a somewhat similar conclusion in his 1975-article on college student dropout: *“Clearly much more remains to be known about the effects of institutional characteristics upon dropout among individuals of differing characteristics. What we do know is, at present, quite crude; namely, that four-year institutions, private institutions, and high quality institutions have lower dropout rates than do two-year institutions, public institutions, and lower quality institutions. How these differences come about or for which types of persons the differences are greater, smaller, or even reversed is, thus far, beyond our reach.”* (Tinto, 1975: 116)

5.3.3.2 Overall category: (6) Academic integration at university

Academic integration at university comprises another aspect of the university malleable factors. However, because this overall category covers features that are influenced by personal traits and efforts, it is not solely open to influence from university authorities and/or politicians.

Of the 42 studies investigating *‘Why do such dropout phenomena occur at universities?’*, 12 studies include one or more aspects of this overall category in their quantitative analyses. Eleven studies obtain significant findings for influence of this overall category on dropout, whereas four studies obtain insignificant findings. Hence, three studies have obtained both significant and insignificant findings dependent upon what aspect of the overall category has been evaluated. As will become evident below, these aspects comprise both the effect on dropout of objective academic features at university, such as the student’s achieved marks/exam results, including possible failed exams, and the amount of ECTS points earned as well as the effect of subjective factors such as the student’s self-perceived academic/learning progress at university and own evaluation of his/her academic integration at university including his/her perception of interaction with faculty/staff. The first category comprises analyses mostly on the basis of university administrative data, whereas the other category primarily contains analyses of survey data.

Objective features of academic integration

Eight studies (ITT2770592; ITT2777714; ITT2763560; ITT2758729; ITT2768140; ITT2770591; ITT2772971; ITT2762178) can be included in the first category of objective features of academic integration. There is firm evidence of a strong and positive influence on the risk of dropout of the objective measures of academic integration. That is, all eight studies find that the better the academic performance (i.e. the higher the student marks), the lower the risk of dropout, although one study (ITT2777714) obtains mixed findings on the objective features. The study by Ortiz & Dehon (ITT2762178) concludes that the outcome of the student’s first year (whether the student fails or passes the first year) is a good predictor of dropout during almost all the rest of his/her course of study at university. Interestingly, this is in line with Tinto’s observations in his 1975-theoretical synthesis of contemporary research on dropout from higher education. *“With respect to grade performance, many studies have shown it to be the single most important factor in predicting persistence in college (Ammons, 1971; Astin, 1972; Blanchfield, 1971; Coker, 1968; Greive,*

1970; Jaffe & Adams, 1970; Kamens, 1971; Mock & Yonge, 1969).” He further elaborates on this observation by distinguishing between academic dismissals (i.e. involuntary dropouts) and voluntary withdrawals: “It is, however, important to distinguish between dropouts who are academic dismissals and those who are voluntary withdrawals because the latter often score higher on various measures of ability and/or grade performance than do college persisters, whereas the former generally score lower than persisters (Coker, 1968; Hackman & Dysinger, 1970; Hanson & Taylor, 1970; Rossman & Kirk, Note 6; Sexton, 1965; Vaughan, 1968).” (Tinto, 1975: 104 + 117) This is in line with the conclusion drawn from the evidence in Section 5.3.2.1, that transfer students (voluntary dropouts) are more similar to, or even academically more able than, persisters compared to formal dropouts (academic dismissals), who are less similar to/academically less able than persisters.

Subjective features of academic integration

Seven studies (ITT2773010; ITT2770592; ITT2759144; ITT2772971; ^RITT2770888; ITT2763560; ITT2773000) can be included in the second category of subjective features of academic integration. That is, three studies are included in both categories. There is also solid evidence of a significant relationship between academic integration, when measured in subjective terms, and dropout. Only one of these seven studies, Loyens et al.’s ‘The impact of students’ conceptions of constructivist assumptions on academic achievement and drop-out’ (ITT2759144), does not find such a relationship to be significant. This study also finds that the higher the self-perceived inability to learn, the more time is invested in self-study, and, since the path analysis also shows that more self-study time leads to a significantly lower risk of dropout, indirectly self-ability to learn can even be said to have a negative effect on the risk of dropout: “[...] doubts about one’s learning abilities showed a positive relation with self-study time, suggesting that self-perceived abilities in this domain stimulate rather than impede students’ learning processes.” (ITT2759144: 594) . Of the remaining six studies, five of these indicate that a higher self-perceived ability leads to a significantly lower risk of dropout or vice versa. For example, the core study (^RITT2770888) finds that among formal dropouts, the factor of second most importance for dropout is ‘problems related to meeting the academic standards at university’, whereas this factor is not found to be of importance among transfer students, thereby supporting Tinto’s proposition of a difference in the effect of academic integration on dropout between different types of dropout behaviour.

In summary, there is strong evidence that it matters quite a bit how the individual student performs academically at university. The better the actual academic performance and progress, the lower the risk of dropout. The same is true when one looks at how the individual student believes (s)he performs; that is, there is also quite solid evidence that a higher self-perceived academic performance leads to a lower dropout risk.

5.3.3.3 Overall category: (7) Social integration at university

As described in Section 3.4, Tinto distinguishes between social and academic integration at university as two important, but quite different, determinants of dropout. As was the case concerning social integration at university, this overall category belongs to the group of university malleable factors where personal traits or personal efforts might exert a certain influence. Hence, this overall category is less changeable as a direct result of university interventions or policies.

Unfortunately, not many of the 42 available studies, that is, 11 studies, investigate social integration in one way or another (excluding four studies that use living on campus as their operationalisation of social integration). An obvious reason for the lack of an extensive evidence base on social integration is the fact that social integration, somewhat in contrast to (the objective aspect of) academic integration, cannot easily be evaluated via the typical data included in university administrative records. To investigate this concept, data must be obtained by the means of more subjective types of data among current students and dropouts. In accordance with this, all seven studies obtain their data on social integration from questionnaire surveys.

Among the 11 studies, only one of them obtains results that link social integration directly and statistically significantly to dropout. The study by Kolland (ITT2772971) finds that a higher degree of social integration is significantly related to a lower risk of dropout. Moreover, the core study by Hovdhaugen (ITT2770888) finds that the learning environment, which includes an aspect of social well-being (operationalised via the question 'did not feel socially suited to university'), is the most important factor among both formal dropouts and transfer students for their decision to dropout or transfer to another study, respectively. This also indicates that social integration seems to matter to some degree. Five studies (ITT2773010; ITT2777714; ITT2762308; ITT2767942; ITT2772931) all obtain insignificant findings of social integration as operationalised in different ways. Some of these studies create indices on the basis of a number of items in the questionnaire survey to measure social integration as integration with fellow students and integration with academic staff/teachers either separately (ITT2773010; ITT2777714) or collectively in combination with measures of satisfaction with social activities in connection to the subject of study, satisfaction with opportunities for physical interaction with fellow students, having done teamwork with fellow students, etc. (ITT2762308). Others operationalise social integration in a way which can be grouped under the heading 'feeling at ease at the university'/'perception of the study environment' (ITT2773010; ITT2777714; ITT2767942; ITT2762308). As seen, more of these studies investigate both of these aspects of social integration at university. Although the study by Hoff & Demirtas (ITT2762308) does not find a direct significant effect on dropout of social integration, it does find an indirect effect on dropout through motivation, via a path analysis.

A somewhat related aspect of social integration at university can, however, be studied by looking into the students' housing situation. If taking living on campus into account when studying social integration at university four more studies become interesting as they investigate the possible effect on dropout of living on or off campus (ITT2770677; ITT2768140; ITT2770586 + ITT2761965;

ITT2771760). The four studies are all conducted in a British context and they all show that living on campus reduces the risk of dropout. As one study (ITT2770677) finds it is crucial for the students to build peer support networks, not only academically but also socially. Students living in university accommodation do have more contact with peers and are proved to be significantly better retained than those who do not. These findings are supported by the other studies (ITT2768140, ITT2770586, ITT2761965, ITT2771760) which show that relative to a student living on campus, the dropout probability is slightly higher for students living together with their parents and even a bit higher for students living off-campus.

Evidence on an effect on dropout of social integration at university, thus, both rests upon a weak evidence base and the evidence itself is not clear. More studies find social integration to be insignificant upon the dropout risk, than the number of studies which find that a higher level of social integration lowers the risk of dropout. In addition to the small number of studies having investigated social integration, all of these studies, except for one, are all small-scale studies conducted within a narrow context, wherefore their generalisability has been judged to be low.

5.3.3.4 Overall category: (8) Personal efforts and motivations for studying

Among the university malleable factors an important one has to do with personal efforts and motivations for studying, because it is a potential means for reducing university dropout (Tinto, 1975). Maybe even more so than in the case of academic and social integration at university, this overall category contains a certain personal element, wherefore it cannot be influenced fully by university authorities and/or politicians.

Almost all of the 19 studies that investigate this overall category obtain significant findings for the influence of this overall category on dropout, whereas eight studies obtain insignificant findings. This means that, apart from one, all the studies that have investigated this overall category have obtained significant findings, and seven of the studies have obtained both significant and insignificant findings dependent upon what aspect of the overall category has been evaluated.

Motivation

Ten studies investigate motivation as a possible determinant of dropout from university (ITT2762308; ITT2770600; ITT2771809; ITT2773010; ITT2772931; ITT2777714; ⁸ITT2770886; ITT2767942; ITT2759144; ITT2763560). The study by Hoff & Demirtas (ITT2762308) finds that intrinsic motivation significantly reduces dropout, but the same study does not find extrinsic motivation, e.g. job expectations on the basis of attained competencies or exams, to influence dropout significantly. The study 'Why students withdraw or continue their educational careers: a closer look at differences in study approaches and personal reasons' by Van Bragt et al. (ITT2770600) also investigates extrinsic aspects of motivation. Via factor analyses, it is investigated which factors are most important for dropouts and persisters, respectively, when both groups are asked what caused them to either dropout or persist. Among dropouts, the factor termed 'loss of interest in future occupation', an aspect of extrinsic motivation, is the third most important factor for drop-

ping out. Among persisters, however, the factor termed ‘future occupational identity’, another extrinsic aspect of motivation, is the next most important factor for staying within the chosen subject of study. Thus, even though extrinsic motivation seems to be important, it is less applicable for distinguishing between dropouts and persisters. This is in line with the study by Bodin et al. ‘The university as a place for adjustment. Dropout rates during the first semester and the socialization process at university’⁴⁵ (ITT2771809). According to Bodin et al. it cannot be proven statistically that students with clear professional aims drop out less than those without.

The finding that more intrinsic motivation leads to a lower risk of dropout is supported by the study by Larsen (ITT2773010), which also explicitly investigates intrinsic motivation and finds that it reduces the risk of dropout. Also supportive of this is the study by Albrecht & Nordmeier (ITT2772931) which finds that interest in the subject of study significantly lowers the risk of dropout. These findings for intrinsic motivation diverge from the study findings obtained by Baarset al. in ‘Factors related to student achievement in medical school’ (ITT2777714) where no statistically significant relationship between intrinsic motivation and dropout is found. The core study ‘Transfer and dropout: different forms of student departure in Norway’ by Hovdhaugen (ITT2770886) can be used to perspectivate some of the above findings. The study finds that the so-called ‘career orientation’, an aspect of extrinsic motivation, as well as ‘interest orientation’, also an aspect of intrinsic motivation, both significantly reduce the likelihood of student transfer, whereas these factors do not significantly influence the risk of formal dropout. ‘Uncertain orientation’ does not significantly influence either the likelihood of student transfer or the risk of formal dropout. Furthermore, students with clear educational goals are found to be significantly less likely to make a transfer, whereas this feature is of much less importance among formal dropouts.

Three other studies (ITT2767942; ITT2759144; ITT2763560) do not directly distinguish between extrinsic and intrinsic aspects of motivation, but merely measure the possible effect of dropout on a single motivation variable or index. One study, ‘CS minors in a CS1 course’ by Kinnunen & Malmi (ITT2767942), simply measures motivation through the item ‘general study motivation’ (very low/some motivational problems/neutral (not particularly low or high)/very good). Here, motivation is found to be significantly higher among persisters than among dropouts. Another study, ‘The Impact of Students’ Conceptions of Constructivist Assumptions on Academic Achievement and Drop-out’ by Loyens et al. (ITT2759144), finds, through path-analysis, that a higher motivation to learn measured through eight items (one being ‘I easily find the motivation to study’) has an indirect and hampering effect on dropout through self-study time, but an insignificantly indirect effect on dropout through observed learning activities. The study ‘Impact of Degree Program Satisfaction on the Persistence of College Students’ by Suhre et al. (ITT2763560) also finds, via a path analysis, an indirect hampering effect of motivation on dropout. Motivation in this study is encapsulated by

⁴⁵ Translated from French: ‘L’Université, un espace de regulation. L’<<abandon>> dans les 1ers cycles à l’aune de la socialization universitaire’.

nine items in the questionnaire 'Evaluating students' opinions on personally rewarding aspects of the study and the effort students are prepared to give' (ITT2763560: 210).

In most instances, higher motivation results in a significantly lower risk of dropout. Especially intrinsic motivation seems to have a significant effect on lowering dropout and especially on lowering the likelihood of making a transfer. Not surprisingly, no studies find higher motivation to be related to a *higher* dropout risk.

Preference for the subject of study and other related aspect of motivation

Six studies investigate the possible influence on dropout of preference for the subject of study (ITT2770663 + ⁴⁵ITT2763715; ITT2773010; ITT2772931; ITT2770687; ITT2771298; ITT2762308); that is, whether the subject of study in which the student is enrolled is the student's most favoured subject of study or not ('subject preference', for short), and whether this affects the risk of dropout. In five of the six cases (ITT2770663 + ⁴⁵ITT2763715; ITT2773010; ITT2772931; ITT2770687; ITT2771298) a statistically significant relationship has been found between greater subject preference and a lower risk of dropout. For example, the study 'Stuttgart Dropout Study 2009. Study satisfaction and tendency to dropout among undergraduate students in Social Sciences at the University of Stuttgart'⁴⁶ by Zwick (ITT2771298) investigates both whether there is a relationship between preferred institution of study and preferred subject of study, respectively, and dropout. The study finds that the risk of dropout falls significantly if either the institution or the subject of study is the preferred one. In other words, if the institution and study was given first priority by the student before university entry there is a significantly lower risk of that student dropping out compared to a situation where the student had not obtained his/her preferred institution or subject of study. Among the six studies we find one of the core studies, namely 'Tracking students' progress through the Spanish university school sector' by Lassibille & Navarro Gomez (⁴⁵ITT2763715). For both transfer students and formal dropouts such a significant relationship has been found to apply. However, whether not having obtained one's preferred subject of study in the end leads to transfer or to formal dropout is, as became evident in Section 5.3.2.1, dependent upon whether not having obtained one's preferred subject of study is accompanied by for instance poor academic results. In that case, a formal dropout is more likely to occur than a transfer to another institution within the system of higher education. In contrast to the other six studies that investigate subject preference, the study by Hoff & Demirtas (ITT2762308) finds that the priority given to the subject of study by the student before university entry does not affect the risk of dropout significantly.

A few other studies, including two of the above-mentioned, (ITT2773010; ITT2770592; ITT2771298), consider related aspects of motivation. These are quite specific aspects and are thus

⁴⁶ Translated from German: 'Stuttgarter Abbrecherstudie 2009. Zufriedenheit mit dem Studium und Abbruchneigung bei Studierenden des BA-Studiengangs Sozialwissenschaften an der Universität Stuttgart'.

investigated by one study only, wherefore a synthesis of their findings has not been possible to make.

Personal effort

Concerning student effort – ten studies investigate aspects of this factor (^RITT2770886; ITT2762072; ITT2772971; ITT2759144; ITT2777714; ITT2763560; ITT2758885; ITT2762040; ITT2767942; ITT2762212). There is a clear sign of a statistically negative relationship between student effort in the form of self-study time during the semester or before exams (^RITT2770886; ITT2762072; ITT2772971; ITT2759144), attendance at/participation in lectures (ITT2777714; ITT2763560; ITT2758885; ITT2762040) or number of ECTS point planned to be obtained during a semester ('CS minors in a CS1 course' by Kinnunen & Malmi (ITT2767942)) and dropout. That is, nine out of these ten studies find that a high degree of planned self-study time, attendance at/participation in lectures and ECTS points to be obtained significantly lowers the risk of dropout. The core study 'Transfer and dropout: different forms of student departure in Norway' by Hovdhaugen (^RITT2770886) shows that student effort has a similar impact on transfer students and formal dropout – it lowers the risk for both transfer and formal dropout, cf. Figure 5.3.2.1, Section 5.3.2.1. Only one study ('Estimating the Production Function by University Students' by Soo (ITT2762212)) finds such activities (i.e. number of hours devoted to private/self-study, number of teaching hours at university and number of assignments handed in) to be insignificantly related to dropout. When this study looks at English 'pre-92' universities alone, there is even found to be a statistically positive relationship between teaching hours at university and dropout, meaning that more teaching hours at university leads to a *higher* dropout risk. The author himself finds this result to be rather surprising.

To sum up, all of the above-mentioned studies have investigated directly or indirectly one or more aspects of personal efforts and motivations for studying in relation to risk of dropout from university. Even though operationalisations of the different aspects are diverse, the picture is quite clear: the more personal effort and (intrinsic) motivation, the lower the risk of dropout (not least concerning student transfer), all else equal. These findings are supported by earlier research and dropout theory (e.g. Hackman and Dysinger (1970) in Tinto, 1975) which argue that there is a direct relationship between the level of a student's commitment to the goal of completion and persistence in university.

5.3.3.5 Overall category: (4) Pre-university institutional procedures

In contrast to the so far investigated overall categories, the factors contained within the overall category termed 'Pre-university institutional procedures' operate prior to university entrance. This overall category includes actions like setting up admission requirements and experimenting with different admission types as well as making various information services about university/the specific subject of study available to future university students. Since the factors within this overall

category are, to a certain extent, in the hands of university authorities and/or politicians to influence, this overall category is still considered to be a university malleable factor.

Only eight of the 42 studies that investigate ‘*Why do such dropout phenomena occur at universities?*’ address one or more aspects of this overall category as a possible influence on university dropout in their quantitative analyses, and one study addresses ‘*What can be done by the universities to reduce or prevent dropout?*’. Of these, four studies obtain significant results for influence of this overall category on dropout and another six studies obtain insignificant results, this means two studies obtain both significant and insignificant results dependent upon the specific aspect of the overall category in question.

Admission requirements/admission types

A potential instrument to be used by university authorities and/or politicians in relation to affecting university dropout has to do with setting up admission quotas (numerus clausus) and other admission requirements and/or experimenting with different admission types for entering university. Five studies, including one core study (ITT2758729; ITT2770687; ITT2786263; ITT2777714 + ITT2777715; ⁴⁷ITT2763715), investigate such aspects.⁴⁷ Four studies (ITT2758729; ITT2770687; ITT2777714 + ITT2777715) directly investigate the effect of different admission types on dropout. Two of these studies’ findings indicate that compared to other types of admission (i.e. having been admitted on the basis of an undergraduate degree (ITT2758729) or having been admitted via secondary school marks (concerning Danish medical students (ITT2770687)), admission via a ‘non-grade based test’ seems to lower the risk of dropout. In ITT2758729 this relationship is, however, only significant within one of the three faculties investigated, namely within the Faculty of Humanities and not within the Faculty of Software Engineering nor within the Faculty of Economic Sciences. The third study by Baars et al. (ITT2777714 + ITT2777715) does not find the relationship between admission type and dropout to be statistically significant when exclusively analysed among Dutch medical students as they found no statistically significant difference in the risk of dropout between medical students having been admitted directly (via a pre-admission GPA ≥ 8), having been selected by a local procedure at the university under investigation (Erasmus medical school) or having been selected by a national weighted lottery. The effect on dropout of the Dutch admission types into medical school is further investigated through an intervention (ITT2770722), where medical students who had been admitted by selection and medical students who had been admitted by weighted lottery were compared to each other. In this study, pre-admission variables did not differ between the two groups. The relative risk for dropping out of medical school was lower for selected students than for lottery-admitted controls. The researchers conclude that this controlled study shows that assessing applicants’ non-cognitive and cognitive skills makes it possible to select students whose dropout rate will be lower than that of students admitted by lottery.

⁴⁷ None of the studies directly investigate the possible effect on dropout of different admission quotas across various subjects of study, though.

The dropout rate in the overall cohort was 2.6 times lower than in the selected group. Moreover, the study by Smith & Naylor, 'Determinants of degree performance in UK universities: a statistical analysis of the 1993 student cohort' (ITT2786263), obtains insignificant results for a variable termed 'school admission policy' on dropout. The study which found the admission type to be significantly related to dropout among Danish medical students exclusively (ITT2770687) does not find the admission test score in itself to be significantly related to dropout for this same group of students. Yet, the core study (ITT2763715) finds that the admission test score in the 'pre-university exam', when analysed for a broader group of UK university students, in itself exerts a significant influence on dropout: the higher the score, the lower the risk of dropout. This relationship is found to apply for both transfer students and formal dropouts.

Information services prior to university application

Another potential instrument for university authorities and/or politicians to use in relation to university dropout has to do with making information services about each university/each specific subject of study available prior to university application. The two studies (ITT2772931; ITT2762308), which in their quantitative analyses investigate the possible effect on dropout of one or more measures of information prior to university application/entrance, also obtain mixed results. The study by Hoff & Demirtas (ITT2762308) finds that information prior to university application/entrance (i.e. information about study content, study demands and information about the university more generally) does not have an independent direct effect on dropout. This is in contrast to the study by Albrecht & Nordmeier (ITT2772931), where information about study demands is found to exert a statistically significant influence on dropout: the more informed the student felt concerning the study content prior to university entrance, the less the risk of dropout, other things being equal. The relationship between information acquired on learning and working methods at university and information acquired about future job perspectives associated with the specific subject of study, respectively, and dropout is found to be statistically insignificant in that same study.

Other aspects

One study (ITT2772971) investigates a somewhat different aspect of this overall category, namely whether the number of academics in the student's circle of acquaintances in itself can be said to have an impact of university dropout. The study does not find such an effect on dropout, other things being equal.

In summary, this overall category includes as an important aspect of university institutional procedures/set up in relation to the application process into university. The evidence on dropout is mixed concerning this overall category and, unfortunately, the evidence base for each aspect included under this overall category is quite small and most of the studies are very narrow in context.

5.3.3.6 Overall category: (3) Prior schooling/prior academic achievement

The overall category 'Prior schooling/prior academic achievement' is, in contrast to the so far investigated categories, not directly in the hands of university authorities to alter. This category will instead be termed a *pre-university* malleable factor, because lower level educational authorities and/or politicians have some influence on this factor through (upper) secondary school policies. The evidence on prior schooling/prior academic achievement as a possible determinant of university dropout is therefore not uninteresting to assess from an educational policy perspective. This category, however, also contains certain personal elements, such as personal abilities, which reduce outside influences somewhat.

A great amount, 27 of the 42 studies available for investigating '*Why do such dropout phenomena occur at universities?*', investigate one or more aspects which can be included under the heading of 'Prior schooling/prior academic achievement'. This is the overall category which has been studied most extensively.

(Upper) secondary school achievement

Prior schooling/prior academic achievement primarily refers to the type of (upper) secondary schooling and achievement in (upper) secondary school, as this is the educational level that the overwhelming part of the studies is concerned with. With achievement is first of all meant (upper) secondary school marks, because this is the aspect of achievement that is investigated most extensively (and easily). Other aspects included under this heading are the specific subjects studied in (upper) secondary school including specific subject combinations and focus as well as the student's (upper) secondary school rank.

About half (i.e. 22 of the 42 studies available for the synthesis) have investigated the possible effect on university dropout of (upper) secondary school marks. The pattern obtained on the basis of the juxtaposition and synthesis of the 22 studies is clear: the higher the (upper) secondary school marks, the lower the risk of dropout at university. Fourteen of the 22 studies find that higher (upper) secondary school marks significantly lower the risk of dropout at university (ITT2770663 + ^aITT2763715; ^aITT2762111; ITT2772971; ITT2773010; ITT2768140; ITT2770586 + ITT2771965; ITT275885; ITT2762040; ITT2771760; ITT2786263; ITT2762237; ITT2772931; ITT2759206; ITT2763560). Two studies, however, find the opposite to be true, namely that higher (upper) secondary school marks increase the risk of dropout significantly (ITT2770591; ITT2770677). Belloc et al. (ITT2770591) explains this counter-intuitive finding in the following way: "*In particular, on the one hand, contrary to what might be intuitively expected, the higher the secondary school final mark, the higher the probability of university withdrawal, on the other hand, those students who attended general high schools are more likely to drop-out of the university. We interpret this two-fold result as a signal for "consumer-oriented" behavior of well-trained students, that easily withdraw from the university once they have realized that they do not enjoy the subject.*" (ITT2770591: 135) Unfortunately, this study has not been able to distinguish between different types of dropout

behaviour, wherefore it is not known how many of those dropouts are transfer students. From the quotation it might well be that a large amount of the dropouts are actually transfer students as they are being said to have a consumer-oriented behaviour. The second study, 'Investigation of student retention through an analysis of the first-year experience of students at Kingston University' by May & Bousted (ITT2770677), investigates first year dropout. The authors explain their finding of a positive relationship between (upper) secondary school marks and dropout the following way: *"Students with lower A-level point scores tended to be better retained than those with higher point scores in semester one, indicating that such students may be willing to put up with more negative factors because of lower perceived mobility on their part leading them to attribute higher value to their place at Kingston University. They had a slightly worse retention rate after semester 1 suggesting that academic pressures more adversely affect this group."* (ITT2770677: 14) Again, the explanation includes the notion of mobility (consumer-oriented behaviour) on the part of the dropouts. Implicitly the authors link the relationship between higher (upper) secondary school marks and dropout to the observation that students with higher A-level scores have better opportunities for making a transfer by explicitly saying that students with lower A-level scores have fewer opportunities for mobility/choosing another subject of study. This relationship weakens after the first semester, because those students with lower A-level scores start facing the academic pressures at university. Five studies obtain more mixed results concerning (upper) secondary school marks (^RITT2770886; ITT2770887; ^RITT2777620; ITT2777714 + ITT2777715; ITT2762212). Two of the studies analyse medical students only (^RITT2777620; ITT2777714 + ITT2777715). Three of them (^RITT2770886; ITT2770887; ^RITT2777620) distinguish between transfer students and formal dropouts. As described in Section 5.3.2.1, the relationship found above (i.e. that higher (upper) secondary school marks significantly lower the risk of dropout from university) applies to formal dropouts only, whereas this relationship is not statistically significant (or less significant, ITT2770887) among transfer students. The latter study further observes that the group of transfer students have upper secondary school marks above the mean of all students in the analysis (transfer students, formal dropouts and persisters analysed together), whereas formal dropouts have upper secondary school marks below the mean (ITT2770887: 244). Only one study obtains purely insignificant results (ITT2758964).

(Upper) secondary school subject focus

Special attention has been given to the subject mathematics in (upper) secondary school, i.e. the student's achievement in mathematics or his/her focus on mathematics. Eight studies have included mathematics in (upper) secondary school as a variable in their analysis of university dropout (ITT2758964; ITT2762178; ITT2762237; ITT2768140; ITT2770586 + ITT2761965; ITT2772971; ITT2777620; ITT2786263). Five of these studies find that having achieved well in mathematics in (upper) secondary school or having a strong mathematical profile leads to a significantly lower risk of dropout, other things being equal. Three studies find that mathematical achievement in (upper) secondary school does not relate significantly to dropout at university. Of these three studies, two

of them focus on medical students (i.e. ITT2770586 + ITT2761965 and the core study: [¶]ITT2777620).

(Upper) secondary school type

Seventeen studies include (upper) secondary school type as a higher-level variable in their analysis of university dropout ([¶]ITT2777620 + ITT2761966; [¶]ITT2762111; [¶]ITT2763715; ITT2770687; ITT2762178; ITT2758964; ITT2773010; ITT2770591; ITT2762308; ITT2763933; ITT2772971; ITT2768140; ITT2758885; ITT2762040; ITT2771760; ITT2786263; ITT2771809). A juxtaposition and synthesis of the results is not straightforward when it comes to the effect of (upper) secondary school type on dropout. This is a direct consequence of the fact that (upper) secondary school types are difficult to compare across European countries because of the great differences between educational systems even within the European context. This concerns e.g. the types of (upper) secondary school available across European countries, the share of/accessibility of private (upper) secondary schools, the composition of the student body within the different types of (upper) secondary schools, etc. The evidence is therefore not surprisingly blurred for this aspect of prior schooling.

Other aspects of (upper) secondary school achievement and related issues

Other aspects of prior academic achievement have been investigated so sporadically that a juxtaposition and synthesis of their possible effect on dropout cannot be established. These include aspects such as repeating/failing a year in (upper) secondary school (ITT2758885: ITT2772971), verbal intelligence measured in (upper) secondary school (ITT2758964), the feeling of self-efficacy measured in (upper) secondary school (ITT2758964), motivation for learning measured in (upper) secondary school (ITT2758964), different types of prior knowledge obtained in (upper) secondary school (ITT2758994), subject preparedness (i.e. the degree of match between subjects studied in (upper) secondary school and the subject of study enrolled in at university) (ITT2771760), relative (upper) secondary school mark (ITT2771760; ITT2786263), etc.

In summary, there is solid evidence that prior academic achievement, when operationalised as (upper) secondary school marks/grade point average, is a strong predictor of formal dropout from university; that is, the lower the (upper) secondary school marks, the higher the risk of formal dropout from university. As such, the effect of academic achievement on dropout does not only pertain to academic achievement within university, but can be traced back to academic achievement in prior schooling as well. As was pointed to in Section 5.3.2.1, the juxtaposition and synthesis of the findings concerning (upper) secondary school marks have further shown that transfer students and formal dropouts ought to be considered separately when analysing the factors influencing university dropout. In contrast to formal dropouts, (upper) secondary school marks were found to be insignificantly or, at most, less strongly related to the likelihood of student transfer in all three studies which distinguish between transfer students and formal dropouts. When taking action/making policies with the aim of reducing university dropout, it is thus important to

acknowledge that poor (upper) secondary school marks cannot be used to track down students at risk of making a transfer, however, they are a powerful predictor of students at risk of making a formal dropout.

5.3.3.7 Overall category: (2) Personal characteristics of the student

A student's personal characteristics should not be overlooked when one has to look for potential influences on university dropout. As a point of departure, a student's personal characteristics are not malleable to external influences. This overall category is thus considered to be one of the non-malleable factors. It is, however, still interesting and important to make an assessment of the evidence of this factor on university dropout, because such an exercise will give an idea of the framework conditions under which university authorities and/or politicians are able to navigate in the first place. Furthermore, despite of this point of departure, as will be described below, examples exist that university authorities and/or politicians have tried to, and succeeded in, influencing student characteristics and behaviour/dispositions via legislation/economic or academic incentives. This overall category consists of two aspects: the student's personal background characteristics and his/her personal traits/dispositions. The latter is more prone to outside influences than former. This section first gives an appraisal of the evidence of the possible effect of personal background characteristics, such as the student's age and gender, on dropout and next an appraisal of the evidence concerning the effect of the student's personal traits/dispositions on dropout.

Personal background characteristics (age and gender)

Even though a student's personal background characteristics cannot be grouped as direct malleable factors, there are examples of university authorities and/or politicians having acted by the means of legislation/economic or academic incentives with the intent to adjust the age or gender distribution of the student body upon university enrolment. For instance, in 2009 the Danish government implemented a new rule on bonus for early enrolment into higher education (Danish Ministry of Education⁴⁸). The rule impacts students who have completed their secondary education in 2007 or later. The rule means that an applicant with an upper secondary education diploma completed up to two years before the year of application gets his/her grade point average from upper secondary school multiplied by 1.08, thereby increasing his/her chances for getting admitted into certain subjects of study. If the applicant is detained from applying for a subject of study within the two-year period, an extended deadline can be given by up to four years if the applicant can document that the delay is caused by either military service, parental leave, prolonged disease or caring for close relatives being seriously ill or disabled. In Norway, similar incentives have recently been implemented. For some studies, extra points are given to the underrepresented sex. Gender points are given as part of the school score and are taken into account in the secondary education diploma. Concretely, female applicants are given two points when applying for two- and

⁴⁸ http://www.uvm.dk/~media/Publikationer/2010/Tvaergaaende/SU_reform/101119_SU-reform.ashx

three-year engineering courses, maritime college studies and agricultural studies at state colleges. Two extra points are given to male applicants for veterinary and animal nurse studies at the Norwegian School of Veterinary Science (The Norwegian Universities and Colleges Admission Service⁴⁹). The Scandinavian examples illustrate how university authorities and/or politicians can potentially regulate personal characteristics such as age and gender despite these not being malleable in a common sense manner. Besides reducing the socio-economic loss to society by getting university students to graduate and enter the labour market at an earlier age, it will become clear below whether adjusting/lowering the mean age at university enrolment and the number of gap years as well as whether changing the gender composition of the student body are sound ways of reducing university dropout.

Age

Of the 42 studies investigating '*Why do such dropout phenomena occur at universities?*', 19 studies include student age as a variable in the quantitative analyses, either measured as the age of the student when entering university or measured as the age of the student at the time of the data extraction for the specific analysis. Of the 19 studies, 15 obtain significant findings for an effect of student age on dropout. Eight studies obtain insignificant findings. Four studies obtain purely insignificant findings, while four other studies obtain both significant and insignificant findings. For two of these latter studies ([#]ITT2777620; [#]ITT2763715), the fact that both significant and insignificant findings are obtained can be lead back to the fact that the two studies distinguish between different types of dropout behaviour, see below.

Evidence is solid that student age matters for the risk of dropout, even after other factors have been taken into account in the quantitative analyses. As mentioned above, only four of the 19 studies obtain purely insignificant findings for a possible effect of student age on dropout (ITT2772971; ITT2773010; ITT2762072; ITT2777714 + ITT2777715). The other 15 studies obtain significant findings (four of these studies for at least part of the population under investigation). Among these 15 studies, younger students are found to outperform older students when it comes to dropout; that is, relatively younger students are most frequently found to have a significantly lower risk of dropout compared to relatively older students. In only four of these 15 studies, the primary finding is the opposite, namely that a higher age leads to a higher risk of dropout, and in two of these four cases, this pertains to transfer students.

Although the evidence seems to be quite clear that a relatively higher student age leads to a higher risk of dropout, the specific cut-off points made between the age groupings in each study are not without importance for the findings obtained. A few of those studies which specifically include an age group of 30 years and above find a more curvilinear relationship between student age and dropout; students at the age of 30 and above, like the relatively youngest age groups, have a lower

⁴⁹ www.samordnaopptak.no/info/opptak

dropout risk than students in the middle and late twenties. Thus, a U-shaped relationship between student age and dropout risk seems to exist (this is especially true for female students: ITT2768140; ITT2771760).

Interestingly, the four studies (three of them being core studies: [Ⓜ]ITT2770886; ITT2770887; [Ⓜ]ITT2777620; [Ⓜ]ITT2763715) that differentiate between transfer students and formal dropouts when analysing the possible effect of student age on dropout can confirm that a relatively higher student age leads to a higher risk of dropout, but only among formal dropouts. Among transfer students, two of the studies find the opposite relationship to be true; that is, that a relatively higher student age leads to a lower likelihood of making a transfer ([Ⓜ]ITT2770886; ITT2770887). The other two core studies find student age to be insignificant when it comes to the likelihood of making a transfer ([Ⓜ]ITT2777620; [Ⓜ]ITT2763715).

Gender

Twenty-three studies explicitly include gender as a variable in their quantitative analyses. Of the 23 studies, 15 studies obtain significant results for an effect of gender on the risk of dropout, whereas 12 studies obtain insignificant results. Four studies obtain both significant and insignificant results. Of these four studies, the results of two of them can be attributed to differences between transfer students and formal dropouts. The core study by Arulampalam et al. ([Ⓜ]ITT2777620) finds that male students' risk of dropout is only significantly higher among formal dropouts, whereas the likelihood of student transfer is not significantly higher among male students than among female students. This is somewhat in line with the study by Hovdhaugen (ITT2770887), which finds that among formal dropouts the risk of dropout is found to be significantly higher for male students than female students. However, among transfer students the reverse is found to be true, namely that male students are found to have a significantly lower likelihood of student transfer.

Of the 15 studies with significant findings for gender, there is striking evidence of male students being more at risk of dropping out than female students, when other relevant variables are taken into account. Put differently, of the 15 studies, 13 studies find that male students have a higher risk of dropout. This largely applies across the whole range of different subjects of study investigated in the 23 studies. Interestingly, within a UK setting all studies with significant findings for gender find that male students are more prone to dropout than female students, with the exception of students at Oxbridge universities, where male students have a lower risk of dropout than female students (ITT2786263).

In addition to the 23 studies investigating the effect of gender on dropout, four studies (ITT2768140; [Ⓜ]ITT2762111; ITT2771760; ITT2786263, of which two are included in the 23 studies) make separate dropout analyses for each gender. They thereby either explicitly or implicitly suggest that some of the factors which influence dropout are gender specific and thus treat gender as an interacting variable in the analyses. Offhand, such a proposition seems plausible when consult-

ing the theoretical literature (cf. Tinto (1993) in ITT2762111: 35-36). The study 'Effects of in-class variation and student rank on the probability of withdrawal: cross-section and time-series analysis for UK university students' by Arulampalam, Naylor and Smith analyses the extent to which differences between genders in the probability of dropping out can be explained by gender differences in observable characteristics. The researchers conclude that their results imply that gender differences are largely explained by differences in coefficient. The study shows that the changes in predicted probabilities over time are attributable to deteriorating characteristics being only partially offset by changed coefficients in the case of males, but being more than offset in the case of females.

The findings show that for male students, the predicted probability of dropping out is related monotonically to the in-class rank group to which the individual belongs, with the weaker students being more likely to drop out, as predicted. For females, it is also the case that the weaker students are more likely to drop out. However, the probability for stronger students does not differ from that for intermediate students. Moreover, the researchers find that the risk of dropout for male students is significantly affected by the degree of in-class heterogeneity of the students with respect to levels of prior attainment. Belonging to a more heterogeneous group, in terms of prior performance, seems to induce men to be more likely to drop out without there being a similar effect for the behaviour of female students. In the studies 'Dropping out of university: A statistical analysis of withdrawal for UK university students' and 'Determinants of degree performance in UK universities: a statistical analysis of the 1993 student cohort', Smith and Naylor analyse the extent to which gender differences persist into higher education, in order to examine whether gender differences vary by factors such as university attended and subject studied. The first-mentioned study shows that a student's A-level point score from (upper) secondary school has a statistically significant effect on the dropout probability for both male and female students. The finding suggests that, for both male and female students, the risk of dropping out is lower for students who performed well relative to the average of their school peer group. The findings from the second study show that the superior performance of females holds across all sub-samples, with the exception of students at Oxbridge, where males on average perform better than females. However, the researchers conclude that, in general, very little of the gender performance gap can be explained by gender differences in observable characteristics. Johnes and McNabb have also investigated gender effects in their study 'Never give up on the good times: Student attrition in the UK'. They look into gender peer effects and institution quality. Specifically, students are less likely to drop out voluntarily, but more likely to complete or to fail courses where there are a higher proportion of female students. These apparently contradictory results, in fact, reflect important gender differences in the way gender composition affects attrition. The researchers find that more academically able male students have a higher probability of non-completion of degree programmes in which the overall level of ability is relatively low. However, the likelihood of failure or quitting a course is not higher for female students, who are relatively more able than their counterparts. Interestingly, attrition is not higher for students who are less academically able than oth-

er students on the same course. The gender composition of students on a degree course is also found to affect the likelihood of non-completion. The gender composition of students on a degree course is also found to affect the likelihood on non-completion. While female students are more likely to drop out of a course if there is a high proportion of females on the course, the likelihood of non-completion is lower for male students on the same courses.

Personal traits/dispositions

While some personal traits/dispositions are more deep-rooted and, as such, difficult to influence from the outside, some forms of personal behaviour is less deeply rooted and therefore to some extent malleable by outside influences. An example of relevance to the university sphere concerns the observation that a certain amount of potential students wish to delay/delays university enrolment by taking one or more gap years between upper secondary school graduation and enrolment in university, thus representing a socio-economic loss to society. Here, as mentioned in the above section, with the intention to expedite the age of students upon university enrolment, university authorities/politicians may have the opportunity, via legislation, to economically and/or academically punish students that do not enrol in university within a certain period of time from their pre-university graduation.

This section will give an appraisal of the evidence on the effect of a number of the student's personal traits/dispositions and personal behaviour related to learning and studying (e.g. learning style/study approach/orientations to learning/study skills and emotional intelligence) on dropout from university. Included in this overall category will be the effect on dropout of the notion that some students take one or more gap years between upper secondary school and university.

The effect of learning style/study approach/orientations to learning/study skills on dropout is investigated by four studies (ITT2759144; ITT2770600; ITT2763933; ITT2767942). The four studies included under this heading all measure the mentioned features early on in the given courses of study through questionnaire surveys; however, these features should still be treated as pre-university personal traits/dispositions, wherefore they are not included among the university malleable factors. With the reservation in mind that these features are not solely 'non-malleable' and might possibly have been shaped/moulded to some extent by prior schooling, this holds true. Two studies (ITT2770600; ITT2763933) obtain mixed results when it comes to their investigation of the relationship between study approach and dropout. One of these studies (ITT2770600) simply compares, via t-tests, the dropout rate between students with different scores on different types of study approach. The study finds a statistically significant relationship between dropout and one type of study approach: persisters scored significantly higher on the measure called 'Meaningful Integrative Approach' (MIA)⁵⁰ measured at the beginning of the course of study than did dropouts,

⁵⁰ For a description of this concept (variable index) and the other concepts presented in this section, consult the studies concerned.

but they did not score significantly different than dropouts on the measure called 'Superficial Approach' (SUA). This partly stands in contrast to the other study (ITT2763933) by the same authors. Via logistic regression analysis, the study finds no statistically significant effect on the risk of dropout of either study approach (MIA or SUA). This study further investigates the effect on dropout of different measures of so-called 'Orientations on learning'. Whether an effect on dropout is found depends on what type of 'Orientations on learning' is considered. A higher score on 'Ambivalence and lack of regulation' increases the risk of dropout, whereas the score on 'Constructive self-regulation' and 'Reproductive external regulation' is not found to be significantly related to the risk of dropout. The study also considers a couple of personal traits such as 'Conscientiousness', 'Agreeableness', 'Emotional stability' and 'Autonomy'. Only 'Conscientiousness' is found to be significantly related to dropout in that a higher score on this measure lowers the risk of dropout significantly. The study by Loyens et al. (ITT2759144) also obtains mixed results. Via path analysis, the study finds that 'Observed learning activities' has a direct statistically significant medium effect on dropout, the effect is greater than the direct statistically significant effect of 'Self-study time' on dropout. Measures of 'Knowledge construction', 'Cooperative learning', 'Self-regulated learning' and 'Authentic problems' are not directly related to dropout. Indirectly, however, the measure of 'Knowledge construction' has an influence on dropout through 'Observed learning activities'. The last study by Kinnunen & Malmi (ITT2767942) finds study skills, as measured by the following statements "*I usually start doing exercises/preparing for an exam well in time (true/not true)*" and "*I am good at estimating how much time a course takes (true/not true)*" (ITT2767942: 89), to be insignificantly related to dropout via t-tests of possible differences between dropouts and persisters. From the above, no clear picture arises of an effect of personal traits/dispositions and personal behaviour related to learning and studying on dropout.

One intervention study (ITT2770695) investigates the role of emotional intelligence (EI) on different educational outcomes. This study separates and excludes transfer students from the analyses. The study finds, by simple comparison between formal dropouts and persisters, that students who progress to the second year of study score higher on the overall measure of emotional intelligence as well as on each of four separate aspects of EI (i.e. 'Emotion Perception', 'Mood Regulation', 'Regulation of other's emotions' and 'Utilisation of emotions'). The same study subsequently evaluates upon the dropout/retention rate following an EI-intervention. In the study 'The role of Emotional Intelligence in the decision to persist with academic studies in HE', Qualter et al. find that students with higher levels of EI are more likely to progress to the second year of their study. Through an emotional intelligence-based intervention programme, where 640 students participated in an EI intervention during the course of a summer school, they also find that students who show an increase in emotional intelligence are more likely to persist with their studies. However, the study shows that just being part of the intervention group was not sufficient to alter the prospects of withdrawal. Students with high emotional intelligence at baseline were equally likely to persist with their study regardless of taking part in the intervention or not. Those in the average emotional intelligence intervention group were more likely to drop out than their control group

peers, who had only participated in a week-long summer course designed to introduce new students to university life before enrolling on their full time degree course.

Of the three studies that investigate the influence of gap years on dropout from university (ITT2770591; ITT2762178; ITT2770663 + ⁱⁱITT2763715), two of them (ITT2762178; ITT2770663 + ⁱⁱITT2763715) find that not having started university on time ('started university on time' is operationalised as first enrolment in the academic year 17 years after the students' date of birth; ITT2762178) or having delayed enrolment (ITT2770663 + ⁱⁱITT2763715) significantly increases the risk of dropout. In the study by Lassibille & Gómez (ITT2770663), this relationship is found to apply to students in university faculties only and not for students within higher technical schools. The authors explain that the insignificant finding among students in higher technical schools might possibly be a consequence of the fact that very few students (3%) within higher technical schools are delayers (ITT2770663: 98). In another article based on the same study (ⁱⁱITT2763715) Lassibille & Gómez is able to elaborate on this relationship between gap years and dropout. They find that delayed enrolment significantly increases the risk of formal dropout only, whereas it actually significantly lowers the likelihood of student transfer. Furthermore, the study by Ortiz & Dehon (ITT2762178) analyses dropout within a survival analysis framework and is thus able to differentiate between different dropout timings, cf. Section 5.3.2.2. The study finds that the effect of not having started university on time diminishes over the course of university study. In other words, it is found that delayed enrolment is more strongly related to dropout in the first semesters/years of study compared to later semesters/years of study, where the significant effect disappears. In contrast, the study by Belloc et al. (ITT2770591) finds that more gap years lower the risk of dropout. The authors give the following possible explanation for this finding: *"Furthermore, we also find that the higher the number of years between the secondary education diploma and the enrollment in the university, the lower the dropping-out probability. This may indicate that adult students (often workers) have strong motivations to conclude the degree course once they have enrolled [...]."* (ITT2770591: 136-137) Although this explanation does not seem implausible, cf. the section above concerning the effect of student age on dropout, and as has been stated earlier in relation to the effect of (upper) secondary school marks on dropout, this specific study has obtained other results contrary to the general findings of the relevant literature. As explained earlier, this study does not distinguish between transfer students and formal dropouts, and what the authors term 'university withdrawals' may include a greater amount of transfer students which might have affected the results of this study.

In summary, the evidence base is relatively large and the evidence less blurred concerning the effect of a student's personal background characteristics such as student age and gender on dropout from university. Relatively young students have a significantly lower risk of dropout than relatively older students, other things being equal. Furthermore, male students have been found to have a significantly higher risk of dropout than female students across most subjects of study and within many different contextual settings. Why this is so is less clear, however. The core studies also indicate that it is, again, important to distinguish between transfer students and formal drop-

outs. The relationship between higher student age and higher risk of dropout is significant for formal dropouts only. For transfer students, the relationship between student age and risk of dropout is either not significant or the opposite; namely that a higher student age leads to a significantly lower risk of dropout. This has also been found in relation to gap years: delayed enrolment significantly increases the risk of formal dropout, whereas it lowers the likelihood of making a transfer. Data on personal characteristics, such as student age and gender, are both more available for analysis and also more easily measured than most other factors, which might contribute to the relatively clear evidence when it comes to their effect on university dropout. Concerning the possible effect of a student's personal traits/dispositions and personal behaviour related to learning and studying (e.g. learning style/study approach/orientations to learning/study skills and emotional intelligence), the evidence base is correspondingly smaller and the evidence more blurred.

5.3.3.8 Overall category: (1) Socio-demographic background (social heritage) of the student

The effect of socio-demographic background has been studied extensively in the past decades by sociologists within the educational research field, not least when it comes to pupils' educational outcomes in primary and secondary school. Although not the focus of this synthesis, because a student's socio-demographic background is neither a pre-university malleable or a university malleable factor⁵¹, it is still interesting and important to make an assessment of the evidence of this overall category on the risk of dropout from university. As was the case concerning a student's personal characteristics, such an exercise will give an idea of the framework conditions under which university authorities and/or politicians are able to navigate in the first place.

Of the 42 studies investigating '*Why do such dropout phenomena occur at universities?*', about half of them, 21 studies, include a variable measuring parents' educational attainment (N=16) and/or parents' occupational level (social class) (N=9). As such, three of these studies investigate both features. While the studies investigating parents' educational attainment come from a wide range of European countries, the overwhelming part of the studies investigating parents' occupational level (social class) has been conducted within a British context. This is partly a result of the less difficult accessibility of such information in United Kingdom compared to many other European countries.

Parental educational attainment

Although the 16 studies investigating parents' educational attainment apply different operationalisations of this variable, there is evidence that students whose parents' (one or both) have attained a degree at a higher educational level have a significantly lower risk of dropout when compared to students whose parents' (one or both) have attained a degree at a lower educational level as their highest educational degree. At first glance, six studies find that higher educational

⁵¹ An important exception being the widening participation-paradigm.

attainment of the parents leads to lower dropout risk, to be statistically significant (ITT2762308; ITT2762178; ITT2763854; ITT2758885; [Ⓜ]ITT2762111; ITT2771809). The dropout reducing effect is especially strong among students that have a parent with a degree in higher education. Seven studies obtain mixed results (ITT2758729; ITT2758964; ITT2762040; ITT2772971; [Ⓜ]ITT2770886; ITT2770887; [Ⓜ]ITT2763715) and three studies obtain purely insignificant results (ITT2762072; ITT2770687; ITT2773010). Among the seven studies, four of them are able to distinguish between transfer students and formal dropouts, and two of them are core studies (ITT2758964; ITT2770887; [Ⓜ]ITT2763715; [Ⓜ]ITT2770886). When looking at formal dropouts, it applies that higher educational attainment of the parents in three out of the four cases actually leads to a significantly lower dropout risk, which is in line with the above-mentioned five studies that did not distinguish between these two groups of dropouts. The same three studies find the effect of parents' educational attainment to be insignificant for transfer students. In the last of these four studies (ITT2758964), the effect of parents' educational attainment is found to be insignificant for formal dropouts, but even positive for transfer students; that is, parents' educational attainment *increases* the likelihood of making a transfer. Thus, there is firm evidence of a statistically significant negative effect of parents' educational attainment on the risk of formal dropout, whereas this issue plays a much weaker role among transfer students or the relationship being even reversed.

Parental occupational level

Concerning the effect of parents' occupational level (social class), the findings suggest a similar but slightly less firm pattern. Of the nine studies investigating this feature, three studies find a purely statistically negative effect of parents' occupational level on the risk of dropout (ITT2768140; ITT2786263; ITT2762237), and five studies obtain mixed findings (ITT2758729; ITT2771760; ITT2762178; ITT2770586 + ITT2761965; [Ⓜ]ITT2777620). One study does not find an effect at all (ITT2770687). It is interesting to observe that two of the five studies which obtain mixed findings plus the one study that does not find an effect all concentrate their analysis on medical students alone (ITT2770586 + ITT2761965; [Ⓜ]ITT2777620; ITT2770687). Among medical students, parents' educational level (social class), or alternatively having a doctor parent or not, does not have a consistently statistically significant impact on the risk of dropout. The core study ([Ⓜ]ITT2777620) finds that parents' occupational level only matters in relation to student transfer; thus, students are found to have a significantly lower likelihood of student transfer if they have a doctor parent ([Ⓜ]ITT2777620). In relation to this finding the authors write: *"Interestingly, we also find that students coming from a medical background are no more or less likely to withdraw from the medical school but are significantly less likely to transfer course. This result is consistent with the idea that such students have a greater commitment to their chosen course of medical study."* ([Ⓜ]ITT2777620: 175) The insignificant effect of socio-demographic background among medical students is also true for the one study that investigates the influence of parents' educational attainment among medical students (ITT2770687).

In all, there is firm evidence that students' socio-demographic background operationalised as parents' educational attainment or occupational level has a statistically significant influence on university dropout when looking at formal dropout. Put differently, the higher the educational attainment or occupational level of the parents', the lower the risk of formal dropout, other things being equal. This applies even after a number of other intermediate factors, such as students' prior academic achievement, motivations for studying, etc., have been included in the quantitative analyses (although the strength of the relationship weakens), and despite the observation that there is a certain positive self-selection of young people into university making university students a more homogeneous group than pupils at lower levels of education (ITT2762040; ITT2758885; ITT2772971; ITT2770687; ITT2763854; ITT2786263; ITT2771760). Two interesting observations are able to further clarify this picture. First, the juxtaposition and synthesis of the results have shown that it is, once again, important to distinguish between transfer students and formal dropouts when one wants to say something about the effect of parents' educational attainment on the risk of dropout. This factor is a strong statistically negative predictor of the risk of formal dropout, whereas it is, at best, a very weak positive predictor of the likelihood of student transfer ([¶]ITT2770886; ITT2770887; [¶]ITT2763715). It is therefore important to recognise transfer students and formal dropouts as two distinct groups of dropouts. Just as in the case of prior academic achievement and academic integration within university, transfer students should be understood as a more resourceful group than formal dropouts or even persisters (cf. Tinto, 1975: 118). Second, the juxtaposition and synthesis of the findings have also given rise to the observation that, among medical students, the relationship between a student's socio-demographic background and formal dropout is weaker/predominantly insignificant. At first glance, this could indicate that medical students are the only group of students that stand out with regard to a (missing) effect of a student's socio-demographic background on dropout. This might, however, be a consequence of the fact that medical students are the only group of students that has been studied distinctively in more of the available studies (N=5). The missing effect of socio-demographic background among medical students might also be a result of the positive self-selection mechanisms into university operating especially strongly when it comes to medical school. In other words, because medical students make up a particularly homogeneous and resourceful group of students concerning their socio-demographic background this background will play a less important role concerning dropout from medical school compared to other subjects of study.

5.3.3.9 Overall category (9) Conditions external to university

As was stated in Section 5.2, the overall category 'conditions external to university' deals with matters related to student life and situations beyond the university/outside the university campus. As such, this overall category constitutes another university non-malleable factor. In this section, evidence on the possible effect on dropout of three aspects of this overall category (i.e. the student's financial situation, whether or not the student has a (study relevant) job or not and other external conditions) will be sought synthesised. In all, 14 studies have been found to investigate one or more of these aspects on conditions external to university.

Financial situation

A student's financial situation can be affected from the outside both positively by financial support such as scholarships, student loans or contributions from parents/family or negatively in terms of admissions fees. In all, ten studies look deeper into the student's financial situation as a possible determinant of university dropout (¹ITT2777620 + ITT2761966; ITT2768140; ITT2771760; ITT2786263; ITT2770591; ITT2762072; ITT2770663 +¹ITT2763715; ITT2770592; ITT2772971; ITT2773010).

Aralumpalam, Naylor and Smith (¹ITT2777620 + ITT2761966) are among the researchers who have studied the influence of financial situation on dropout in the UK. They find that the likelihood of course transfer is lower among non-UK fee paying students as compared to UK fee paying students. Non-UK fee paying students pay a much higher fee than UK students. However, when it comes to formal dropout, the variable is insignificant; being a non-UK fee paying student as compared to a UK fee paying student does not increase the risk of formal dropout correspondingly. In a second UK study by Aralumpalam, Naylor and Smith (ITT2768140), the researchers find that for male students the dropout risk is lower among non-UK fee-paying students. This is not the case regarding female students for whom the dropout risk is not significantly different between non-UK fee-paying students and UK fee-paying students.

In their two studies (ITT2771760; ITT2786263), Smith and Naylor find that the UK overseas students are more prone to drop out compared to UK students, unless they are self-funded, in which case they drop out less likely than UK students. The researchers state: *"We argue that this may indicate an impact of financial well-being on study effectiveness. A relationship between degree class and parental background has implications for the possible consequences of tuition fees. First, we infer from the results that increasing the financial burden on students is likely to cause degree performance to deteriorate. Second, as graduates' job prospects are linked to degree class, the rate of return to a degree is likely to be lower for students from less privileged backgrounds. The introduction of top-up fees would threaten to exacerbate this problem unless accompanied by appropriate exemptions or other forms of subsidy."* (ITT2786263: 58)

Bennett's study 'Determinants of undergraduate student dropout rates in a university business studies department' (ITT2770592) finds that financial hardship is the factor exerting the strongest influence on dropout in terms of enhanced dropout risk. Moreover, it has a strong influence on the correlation between academic performance, academic commitment and dropout. He concludes: *"Thus, it was indeed the case that the occurrence of financial problems among students whose grades were low and/or whose general commitment to academic life was waning caused them to be much more likely to withdraw."* (ITT2770592: 134)

In the study by Belloc et al. (ITT2770591), the effect of a student's household economic situation on dropout is investigated. The researchers find that students in the highest household income class, compared to the household lowest income class, have a higher risk of dropping out. They write: *"Also the student economic situation seems to affect dropping-out decisions. Being the low-*

est income class the benchmark, having a medium economic status does not have any significant effect, while those students in the highest income class are more likely to drop-out. This result suggests a non-linear relation between economic status and university withdrawal probability." (ITT2770591: 136)

'The effect of student aid on the duration of study' by Daniela Glocker (ITT2762072) shows the effect of different types of financial aid given to students. Glocker compares students receiving federal financial support, parental or other private support, students receiving scholarships and students not receiving any sort of financial aid. The main source of student aid in Germany is based on the Federal Education and Training Assistance Act (BAfoeG), which is an act giving children from low-income families better possibilities for pursuing a degree in higher education according to their abilities. The findings obtained show that students who are financially supported by the BAfoeG are less likely to drop out, compared to students not receiving any support. Moreover, students receiving aid privately are less likely to drop out, though not to the same extent as students being federally supported. Financial support in terms of scholarships is, however, found to be insignificant.

In the study by Lassibille & Gómez (ITT2770663 + ⁵¹ITT2763715) the effect of receiving state grants on dropout is investigated. They find that state grants reduce the risk of dropout, especially for university students. Financial support has the greatest effect in the first years of the course of study. The researchers therefore conclude the following. *"However, supporting students at the beginning of their career increases only slightly the probability of dropping out with respect to a program that aims to support students through their entire period. Depending on the program, the increase varies between four and seven percentage points. This means that, in a context where there is no shortage of qualifications, expanding support to a larger number of students and limiting this support to the beginning of their schooling career could be more effective than a policy supporting a smaller number of students during their entire schooling career."* (ITT2770663: 101) In other words, the researchers conclude that giving financial support to a larger group of students for a shorter period is more effective than supporting fewer students throughout their entire course of study. Lassibille & Gómez conclude that state financial grants decrease the risk of formal dropout from university, but increase the likelihood of student transfer (⁵²ITT2763715).

Two more studies address students' financial situation and both conclude that this is not of major importance for the risk of dropping out from university. Kolland (ITT2772971) finds that financial satisfaction during the study is of insignificance when it comes to dropout, and this finding is supported by Larsen (ITT2773010) who concludes that the student's total income and the feeling of

⁵² This is evident from Table 4 and Table 5 in ITT2763715. In the text (ITT2763715: 835), however, it appears as if receiving state financial support has a similar risk reducing effect on both formal dropout and student transfer. We have unsuccessfully tried to get in email contact with the main author of this study, Gérard Lassibille, to clear up this divergence.

being under financial pressure does not have any significant effect on the student's risk of dropout from university.

All in all, these other aspects of conditions external to university are characterised by a very weak evidence base. As for student job, it is, therefore, not possible to establish any real evidence on university dropout in relation to these matters.

Student job

Somewhat surprisingly, not many studies investigate the effect of having a job alongside studying, in fact only two studies (ITT2772971; ITT2762072) analyse this aspect as a potential determinant of university dropout. The findings of the first study by Kolland show that working 20 hours per week or more largely increases the risk of dropout. The second study, to the contrary, obtains insignificant findings for hours spent on work alongside studying. Neither of the two studies report on whether they distinguish between study relevant jobs and jobs less relevant for the study concerned. This is inexpedient as one would assume that the effect on dropout of work alongside studying depends upon whether or not it is a study relevant job or not. Due to the lack of such a distinction and the negligible evidence base, it is not possible to establish any real evidence for an effect of this aspect on dropout from universities.

Other external conditions

A few related aspects external to university have been investigated somewhat sporadically. To give an example, the Danish study by Larsen (ITT2773010) finds that lack of support from friends and families during the study period increases the risk of dropping out. Within a Norwegian context, Hovdhaugen finds that for students having a family of their own, it affects their risk of formal dropout if they have problems finding suitable day care arrangements for their children (ITT2770888) or, as found by Albrecht & Nordmeier within a German context, if they have difficulties combining their family lives with their study situation (ITT2772931). Personal and pragmatic issues also have an impact on the dropout risk according to the two studies by Bennett and van Bracht et al. (ITT2770592; ITT2770600). However, this seems not to be the case for medical students for whom personal circumstances do not appear to have an impact on the risk of dropout (ITT2777714 + ITT2777715). All in all, the evidence on other aspects of university external conditions is characterised by a weak evidence base and rather vague findings.

5.4 *The robustness of the narrative synthesis*

This section will present an assessment of the robustness of the synthesis. This comprises a complex element of the narrative synthesis process. It is a very important one, because the overall assessment of the robustness of the synthesis has a bearing on the trustworthiness of the conclusions drawn on the basis of the synthesis.

Overall speaking, the robustness assessment consists of four aspects relating to the internal and external validity of the synthesis. Contained herein are aspects on the level of both the synthesis itself and its foundation, namely the research mapping (this concerns the two aspects *methods applied in the completion of the synthesis* and *methods applied in the completion of the research mapping*). It also involves aspects on the level of the individual studies which form the basis of the synthesis (this concerns the two aspects *the quality and quantity of the studies available for the synthesis* and *the generalisability of the studies available for the synthesis within the geographically set scope of the review*). Whereas the first two aspects contain an assessment of the dispositions/conscious choices we, the authors of this systematic review, have made during the research mapping and synthesis creation, the two latter aspects of the individual studies available for the synthesis represent an assessment of, so to speak, the material we had to work with in the first place to establish the synthesis on dropout from universities. This material has been shaped by more factors – by the overall characteristics of the research field of dropout from universities (cf. Section 5.2.1), by the delimitations layed out in the conceptual scope of this systematic review (Section 2.2) and by the conduct of the research mapping (cf. Chapter 4).

The four aspects of the robustness assessment are presented below (cf. Section 5.4.1-5.4.4). As will become evident, the first two aspects are assessed to be highly robust, whereas the last two aspects are assessed to be less robust due to methodical challenges of the individual studies available for the synthesis. Brought together, the four aspects produce an overall assessment of the trustworthiness of the conclusions of the narrative synthesis in Section 5.5.

5.4.1 *Methods applied in the completion of the synthesis*

For one thing, the robustness of the synthesis depends on the *methods applied in the completion of the synthesis*, including, among other things, an evaluation of the precautions that have been taken to minimise bias, for example, by giving a greater weight to studies which differentiate between different types of dropout behaviour in their quantitative analyses (i.e. the core studies) compared to those that do not do so. In this section, we evaluate upon this and a number of other dispositions/conscious choices which we have undertaken during the synthesis process.

Most importantly, we chose not to perform a meta-analysis on the basis of the studies available for the synthesis but to conduct a narrative synthesis instead. This was a consequence of the great heterogeneity found across the studies concerning both definition/operationalisation of the dropout phenomena, the possible determinants of dropout as well as the design and methods of analysis applied across the studies. Furthermore, only a few studies have applied an experimental or

cohort study design. As such, the foundations for working within an aggregative mode of synthesis were not fulfilled in the first place. Making a narrative synthesis is the better alternative under these circumstances. The narrative synthesis has been conducted in accordance with best practice for carrying out a narrative synthesis as described in Popay et al. (2006).

Working within the narrative synthesis framework, the first conscious choice we made concerns the way the evidence on the three review questions has been presented. Due to the small evidence base on the third review question '*What can be done by the universities to prevent or reduce dropout?*' (N=3), we chose to include the three intervention studies in the guiding story of the second review question '*Why do such dropout phenomena occur at universities?*' where they were found to fit in the best. One example is the evidence from the intervention study '*Selection of medical students: a controlled experiment*' by Urlings-Strop et al. (ITT2770722) which investigates the effect of different admission types on dropout. The findings of this study were therefore dealt with in relation to the overall category 'Pre-university institutional procedures'. We assume this way of treating the evidence from the third review question to be a better solution than giving a collective appraisal of the three intervention studies in a separate section, as none of them have investigated the same intervention. This means that a synthesis of the findings of these interventions is not possible, and a simple juxtaposition of the findings will not be very fruitful either.

Another conscious choice we made in the beginning of the synthesis process concerns the choice not to determine the effect sizes on dropout of each factor investigated across the studies in relation to the review questions. Again, this was a consequence of the great heterogeneity found across the studies available for the synthesis as well as the observation that quite a few of the studies were, at best, single-institution studies, wherefore contextual factors might well have influenced the findings of each particular study. In this situation, it was not deemed justifiable to seek evidence on more than the direction and the significance/insignificance of the investigated factors on dropout from universities.

A third conscious choice pertains to the use of vote counting, where meaningful, as a way of establishing a first tentative assessment of which factors are found to be influential and which factors are found to be less convincing in their influence on dropout from universities. This choice seems reasonable especially since some of the pitfalls often mentioned in relation to vote counting, cf. Section 5.3.1.3, have been circumvented in this synthesis. To repeat from Section 5.3.1.3, one of the pitfalls concerns the fact that vote counting does not take into account the effect sizes, but merely the direction, of the factors investigated across the studies. However, as just mentioned above, since the heterogeneity of the studies available for the synthesis cannot justify such a level of accuracy across the studies in the first place, it is not a problem in this particular case. Two other pitfalls concern the notion that vote counting normally treats studies of different size and quality alike. These pitfalls have been sought circumvented by giving a special role to the core studies, cf. Section 5.3.1.4, which are all large-N, high quality studies deemed to be broadly generalisable. This way of counting how many studies report significant positive or negative effects ver-

sus how many studies report insignificant effects in relation to how many studies have actually investigated each overall category and its underlying aspects seems to be a sound way of giving an indication of the principal tendency, for each specific aspect, and how it affects dropout from universities, when a mean effect size for each aspect is not deemed possible to meaningfully obtain across the studies.

Lastly, we must evaluate the choice of ascribing a special role to the core studies (i.e. the studies that were found to compare the possible determinants of dropout directly across different types of dropout behaviour and that had additionally been assessed to be broadly generalisable and given an overall 'high' weight of evidence in the research mapping). Because of the clear evidence in Section 5.3.2.1 that the different types of dropout behaviour are shaped by different factors, it is considered to be a strength of this synthesis that the findings of the cores studies have been given special attention in Section 5.3.2.1 and, in Section 5.3.3, have been used to inform the findings of the other studies in case they were divergent. Compared to treating each study available for the synthesis alike, as assumed in ordinary vote counting, this is thought to be an advancement.

5.4.2 *Methods applied in the completion of the research mapping*

The robustness of the synthesis also depends on the *methods applied in the completion of the research mapping*, because the conduct of the research mapping forms the foundation for the synthesis. Just as was the case concerning the *methods applied in the completion of the synthesis*, a number of dispositions/conscious choices have been made during the completion of the research mapping, and they must now be evaluated upon. This includes the setting of the scope, the search and screening process, the role of the review group, including the degree to which the researcher and the reviewer have had sufficient information to be able to ascertain whether a certain study should be included in or excluded from the synthesis.

As can be observed in Chapter 2 of this systematic review, the research mapping consists of several phases, where setting the scope was among the first ones to be dealt with. This systematic review takes its point of departure in Switzerland, hence a European context was of particular interest from the beginning of the review process. Initially, it was decided to set the geographic scope of the review as follows: studies from industrialised European nations – i.e. EU member states, Norway and Switzerland. Moreover, these studies had to be informed by (secondary) research from USA, Canada, New Zealand and Australia to the extent that such research was able to support and/or complement the findings obtained within the European context. Studies dealing with university education in Third-World countries were not included because it was assumed beforehand that the context and content of such studies would be very difficult to generalise to industrialised nations. Notwithstanding this point of departure, it was later decided to reset the scope to a European context only. This was mainly done as a consequence of contextual/cultural and structural/organisational differences between Europe and other industrialised nations outside Europe regarding the system of higher education (cf. Section 5.3.1.1). This resetting of the scope

was also partly a consequence of pragmatic/resource-related considerations as to the quantity of studies to be worked with in the systematic review.

The system of higher education has undergone some major transformations over the past 25 years, largely because of processes related to globalisation. In countries of the industrialised world, recruitment to universities is much broader today than 25 years ago. Globalisation processes have further intensified the competition among universities substantially when it comes to recruitment. With a view to this, we decided to set the time limit of studies to be included in the review to 2000-ff.

The language universe of the review is considered to be a very strong element of the synthesis as it was set to include not only studies reported in English, but also in German, French, Danish, Swedish or Norwegian. The early hypothesis and expectation that the overriding number of studies within the geographically set scope of this review, and within the research field on dropout from universities in general, is published in one of the mentioned languages proved to be correct. Thirty-five of the studies available for the synthesis are reported in English, whereas six are reported in German, two in Danish and one in French.

During searching and screening of studies and research quality assignment to each of the included studies in the research mapping, a number of fixed concepts were applied (cf. Chapter 2 for a full description and details). For instance, dropout was defined as withdrawal from a university degree program before it is completed. However, whether or not the student transferred to another study was not taken into account in the early phase of the systematic review. That a distinction between different types of dropout behaviour is essential for understanding why dropout occurs, not only theoretically, came to our attention during the coding of the empirical material. This is the reason why the core studies in the synthesis are studies that precisely distinguish between different types of dropout behaviour (cf. Section 5.4.1). During the screening process it was further decided that references to studies that do not apply a research design adequate for the documentation of cause-and-effect or effects of interventions should be excluded from the review. This include studies that apply a purely qualitative design as well as studies that analyse data for one group only with regard to the outcome in question (dropout); that is, studies that analyse data for dropouts only and exclude persisters, without at the same time distinguishing between different types of dropout behaviour.

Having set the scope of the review, the next step was to conduct the search procedure. Here, five channels were applied to detect relevant studies for the systematic review. First and foremost, a thorough search was made through a broad search universe covering research from the fields of education, psychology, economics and sociology. Secondly, handsearch was made of the key-journals in the field in order to make sure we were not missing out on relevant studies that were not yet available in the databases. Thirdly, all studies included in the research mapping were checked for relevant references, and the members of the review group were urged to supply extra relevant references throughout the whole process. Finally, an update search through Google

Scholar was carried out making sure the most recent research, not yet indexed in the professional documentation systems, was found. The search process is assessed as being thoroughly performed and highly 'watertight', and we have subsequently not been made aware of missing out on relevant studies that should have been included in the review.

The screening for relevance of all the studies initially found was based on a set of explicit criteria for inclusion/exclusion (cf. Section 2.4) and researchers from the Danish Clearinghouse for Educational Research accounted for the screening of the studies. In order to secure and strengthen the process a validation was conducted in which different researchers screened the same references taken from a random sample followed by a comparison of the criteria chosen for inclusion/exclusion. The screening process was carried out at two levels, first at study abstract level and second at full-text level. By the end of the screening process we were left with 62 studies to be included in the research mapping, as they complied with all of the criteria for being within the scope of the review. Eighteen of these studies were assigned an overall 'low' weight of evidence in the subsequent quality assessment phase (cf. Section 4.5), hence, they have not been available for the synthesis. The reasons for excluding these 18 studies were many; however, a common denominator is that the quality of the research reporting was found to be poor. This is relevant to bear in mind, as the quality assessments are based on the reporting alone including the information available to the reviewers, and not on the quality of the research (project) itself.

The review has been undertaken in cooperation with a review group which consists of researchers working with higher education as their field of expertise. The review group is deliberately composed in such a way that the members represent different competencies in different traditions of the field surrounding the review questions. This is expected to have a bearing on the overall judgement of the studies included in the research mapping and is considered to strengthen both the process and product. The Danish Clearinghouse for Educational Research has developed a systematic practice of peer review when it comes to assessing the quality of the relevant research. Every study included in the research mapping has been coded and given an overall weight of evidence by both a member of the Clearinghouse staff and by a member of the review group. The process is registered and yields important information on the reliability and transparency of the review process. The review group has served as reviewers throughout the entire review process: that is, the research mapping and the synthesis process. The cooperation has been very useful and has led to fruitful understandings of the primary studies' results and the dropout phenomena from universities as a whole. All in all, this aspect of the robustness assessment is considered to be highly robust.

5.4.3 *The quality and quantity of the studies available for the synthesis*

The robustness of the synthesis further depends on the *quality* as well as on the *quantity of the studies available for the synthesis* (i.e. the evidence base). If studies of poor quality are uncritically included in the synthesis, the trustworthiness of the synthesis will necessarily be affected nega-

tively/reduced. Also, the fewer the studies available for the synthesis (i.e. the smaller the evidence base), the more insecure the conclusions of the synthesis will be, other things being equal.

As a point of departure, the quality of the 44 studies available for the synthesis is, generally speaking, of a fairly high quality, since the studies that were assigned an overall 'low' weight of evidence in the research mapping have been excluded from the synthesis. Hence, only the studies that were assigned an overall 'high' or 'medium' weight of evidence in the research mapping have been made available for the synthesis. The overall weight of evidence assigned to each study was based on an overall assessment/appraisal of each study on the following three aspects, cf. Section 4.5: 1) the credibility of the research findings for answering the study question(s) when taking account of all quality assessment issues, 2) the appropriateness of the chosen study design including the data and methods of analysis for addressing the specific review questions and 3) the relevance of the particular focus of the study (including conceptual focus, context, sample and measures) for addressing the specific review questions. It should be mentioned here that the three individual aspects contained within the overall weight of evidence assignment of each study may have been assessed to be either higher or lower than the overall weight of evidence assigned to each study.

That being said, an overall assessment of the research designs applied in the studies available for the synthesis gives rise to a more critical appraisal. Rieper & Foss Hansen (2007: 79) have developed an evidence typology concerning the relation between the type of review question posed and the research design to be used for addressing that type of question. From there it follows that in so far as the review question is about cause-and-effect or effects of interventions (i.e. 'Effectiveness. Does this work? Does doing this work better than doing that?'), as is primarily the case of this systematic review, studies applying a randomized controlled trial (RCT design) should be given the greatest weight of evidence, other things being equal, followed by cohort studies and quasi-experimental studies.

Overall study design	Number of studies
Cross-sectional study	28
Secondary data analysis	8
Experiment with non-random allocation to groups	4
Cohort study	3
Random experiment with random allocation to groups	1
Systematic review	1
Views study	1

Table 5.4.3.1 Overall study design

N=44. There are 46 answers, as two studies have been coded as having applied more than one study design

Table 5.4.3.1⁵³ shows that, together, the 44 studies available for the synthesis far from live up to such standards. RCT studies and quasi-experimental studies are almost non-existent (N=1 and N=4, respectively). According to Figure 5.4.3.1, even cohort studies are rare (N=3) and other types of longitudinal research designs have not been applied. Both cohort studies and other types of longitudinal research designs are preferable to, for instance, cross-sectional designs because they analyse a development in the data/the population under investigation by involving repeated observations of the same variables over longer periods of time, which are precluded when applying a cross-sectional design. In line with this, as was observed in Section 5.3.2.2, only a few of the studies available for the synthesis actually present their analysis results in such a way that evidence on the sub-question concerning ‘*The timing of dropout*’ (i.e. the possible time-varying effect on dropout of the different factors investigated) can be obtained. This also affects the sub-question ‘*What happens to dropouts after dropout?*’. As mentioned in Section 5.3.2.3, the lack of post-university longitudinal surveys that compare occupational whereabouts and related occupational aspects between graduates and dropouts for a longer period of time after exmatriculation has the implication that evidence on the possible time-varying effect of these aspects and the longer term implications of dropout is lacking. Hence, notwithstanding the evidence typology, the study design most frequently used among the studies available for the synthesis is, as seen in Table 5.4.3.1, a cross-sectional design on the basis of either university administrative data or a questionnaire survey.

⁵³ A similar figure can be found in Appendix 3.

Other aspects of quality on the level of the individual studies available for the synthesis concern the data and the specific methods of analysis applied across the studies.⁵⁴ Ideally, as pointed to in Section 5.2.1, data should not contain a skewness in focus in favour of non-malleable and pre-university malleable factors or hard facts at the expense of many university malleable factors and softer/attitudinally based aspects, including issues such as study approach, student effort, motivation and satisfaction with studying. This skewness is partly considered to be a consequence of the extensive use of university administrative data containing only hard facts about the students. Furthermore, it would have been preferable if more studies had used as their principal method of analysis multivariate (multinomial) logistic regression analysis including the use of instrumental variables as an alternative to estimating relations of cause-and-effect in the absence of controlled experiments/experimental identification. The use of instrumental variables has been found to be very limited among the included studies. Alternatively, as pleaded for by Tinto (1975: 94, footnote 3), evidence on why dropout occurs would have benefitted from more studies applying a path analytic approach in relation to viewing university dropout as a process. Again, the use of path analysis has been found to be very limited.

O'Neill et al. (2011) reach a somewhat similar conclusion concerning study designs and methods of analysis in their literature review on factors associated with dropout in medical education: *“No relevant experimental studies of dropout were found. Experimental designs might yield valuable information that complements the findings of cohort studies, for example on educational interventions and their effect on dropout. Although cohort studies of dropout provide useful knowledge, they must account for confounding in order to be of real value. Dropout is most likely multifactorial in nature [...]; therefore it is probably wise to continue to use designs which allow for subsequent multivariate analyses.”* (ITT2770688: 449)

Notwithstanding the above characterisation of the studies available for the synthesis, they are still of a fairly high quality and, in any event, the best available for the synthesis. The next section (cf. Section 5.4.4) will evaluate upon the issue of generalisability of the synthesis findings.

A second important aspect on the level of the individual studies for assessing the robustness of the synthesis has to do with the quantity of the studies available for the synthesis (the evidence base). The overall point to make concerning this aspect is rather disappointing. As has been mentioned several times during the narrative synthesis in Section 5.3, the evidence base for investigating most of the aspects underlying the three review questions is small.

The evidence for each of the three aspects underlying the first review question ‘*What is dropout from university studies?*’ rests upon, at most, a handful of studies. The evidence on the sub-question ‘*Different processes leading to different types of dropout behaviour?*’ rests upon the four core studies. Apart from the comprehensive evidence that first-year dropout is both more exten-

⁵⁴ For a characterisation of the 44 studies available for the synthesis on these issues, consult Appendix 3.

sive and often different from later dropout, the evidence base for the sub-question concerning *'The timing of dropout'*, including the evidence base on the possible time-varying effects on dropout of the different investigated factors, was found to be rather small. Evidence on the sub-question *'What happens to dropouts after dropout?'* also primarily rests upon a few studies.

Since the evidence on the second review question *'Why do such dropout phenomena occur at universities?'* comprises 42 of the 44 studies available for the synthesis, the potential for robust syntheses of the findings seems very promising at first sight. However, because many different factors have been investigated for a possible effect on university dropout, the evidence base of quite a few of the specific aspects investigated is, nevertheless, rather small. The aspects containing the greatest evidence base (in most cases coinciding with the aspects found to contain the most unequivocal evidence of an effect on university dropout) mostly pertain to hard facts about the students, such as their age, gender and socio-demographic background, as well as to pre-university malleable factors such as prior academic achievement. The evidence base is, to the contrary, predominantly small concerning the possible effect on dropout of the university malleable factors, which have been the focus of this systematic review.

Lastly, as pointed to in Section 5.3.1.1, the evidence on the third review question *'What can be done by the universities to prevent or reduce dropout?'* merely rests upon the findings of three studies.

The evidence base for addressing most of the aspects underlying the three review questions is, therefore, not very robust. What is more, some of the aspects investigated in relation to the three review questions are close to being investigated country-specifically (cf. Section 5.4.4 below). Concerning the first review question *'What is dropout from university studies?'*, the evidence on the aspect *'Different processes leading to different types of dropout behaviour?'* is solely derived within a British, Norwegian and Spanish context, whereas the evidence on post-university student tracking in relation to *'What happens to dropouts after dropout?'* is derived mostly within a Danish and especially a German context. The evidence on the second review question *'Why do such dropout phenomena occur at universities?'* also suffers from such country-specific investigation. While hard facts such as parents' occupational status (social class) and institutional resources as potential determinants of university dropout are primarily investigated within a British context, other more attitudinally based aspects (e.g. issues of a student's study approach, effort, motivation and study satisfaction) are non-existent within the British research and have been obtained elsewhere. This mostly has to do with the different types of data available across the European countries which, among other things, is an effect of different data policies working at the national (or regional) levels across the countries (cf. Section 5.2.1). Concerning the third review question *'What can be done by the universities to prevent or reduce such dropout phenomena?'*, the evidence is also country-specific as the three intervention studies are quite unique and narrow in context.

5.4.4 *The generalisability of the studies available for the synthesis within the geographically set scope of the review (external validity of the synthesis)*

The three aspects outlined above all concern the internal validity of the synthesis. A fourth aspect relates to its external validity. The external validity of the synthesis can be evaluated on the basis of two parameters: the scope of the systematic review (e.g. this review focuses on *European* university students only (cf. Section 5.4.2) and an overall assessment of the generalisability of the studies available for the synthesis within the limits of the scope.

As previously stated, the geographic scope was set early in the research process and, as a consequence of this, only studies conducted within a European context have been available for the synthesis. Hence, all studies available for the synthesis are to a great extent comparable when it comes to contextual/cultural and structural/organisational aspects of higher education. This especially holds true after the commencement of the Bologna Process. In retrospect, however, since the majority of our European based findings have actually been found to be supported by earlier American research despite the contextual/cultural and structural/organisational differences between the systems of Higher Education, we concede that, ideally, it could have been fruitful after all had non-European, at least U.S., studies been included in this systematic review to strengthen the evidence base on some of the aspects investigated. This is an interesting finding in relation to the entire European research in this field. Additionally, the evidence base for the third review question '*What can be done by the universities to prevent or reduce such dropout phenomena?*' was found to be very small and sporadic within the European context alone (cf. Section 5.4.3 below) and the evidence, therefore, unrobust. It would therefore also have benefitted from a broadening of the geographic scope of the review.

The overall assessment of the generalisability of the studies available for the synthesis within the geographically set scope of the review is, at first sight, somewhat disappointing. Apart from a few large-scale studies containing data from more university institutions within the same European country, most of the studies available for the synthesis are single-institution, or even single-faculty or single-course, studies conducted within a narrow context. No transnational studies have been available for the synthesis. This means that it has not been possible to investigate the potential effects on dropout of systemic characteristics of the system of higher education at the national level. Such systemic characteristics have had to be taken for granted in each of the nationally based studies. That being said, because dropout phenomena, in line with most other educational issues, represent complex problems, the context becomes inevitable and important for a deeper understanding of the dropout phenomena. Consequently, a broad generalisation of findings across different contexts becomes difficult no matter what. Hence, this should be to the benefit of those studies that have analysed university dropout within specific contexts.

5.5 Conclusion

This concluding section contains a short summary of the most important of the synthesis findings as they have been presented throughout Section 5.3 and its subsections. This concluding section further puts the synthesis findings into perspective, firstly, in relation to earlier non-European research on dropout from higher education and, second, in relation to the assessment of the robustness of the synthesis as outlined in Section 5.4 above.

The evidence obtained on the three review questions can be summarised as follows:

- *'What is dropout from university studies?'* – First of all, in line with Tinto's observations (Tinto, 1975) the core studies provide clear evidence that different factors are involved concerning the different types of dropout behaviour. In other words, it is essential to distinguish between voluntary dropout (often) leading to transfer to another subject of study/institution within higher education and involuntary dropout which (often) leads to formal dropout from higher education altogether. Whereas formal dropout is largely predicted by pre-university factors such as a student's socio-demographic/socio-economic background and prior academic achievement (the group of formal dropouts being less resourceful on both matters compared to both the group of persisters and the group of transfer students), the likelihood that a student will transfer to another subject of study/institution within the system of higher education is more affected by within-university factors such as the student's motivations for studying and his/her educational goals (these might very well have been formed prior to university enrolment, but are still university malleable to some extent). Transfer students are found to be more like persisters when it comes to socio-demographic/socio-economic and pre-university academic resources, or even more resourceful than persisters on these matters.

As to the issue of the timing of dropout, firm evidence is obtained that first-year dropout is both different from and (much) more extensive than later dropout, which is why a larger number of studies have concentrated their dropout analyses on first-year students only. There is also some evidence that student transfer in general happens earlier in the course of study than other types of dropout. Only a few studies have been able to analyse the possible determinants of university dropout within a time-varying perspective and the evidence is less firm. There is, however, an indication that the influence on dropout of pre-university factors, such as achievement and academic focus in (upper) secondary school, diminishes throughout the course of study, whereas conditions external to university have been found to be more salient for later dropout than for early dropout. Unfortunately, the time-varying analyses lack investigation of various within-university factors. No evidence is therefore available on whether the effect on dropout of such within-university factors varies over the course of study as well.

The relatively small evidence base on what happens to dropouts after dropout indicates that the problem of unemployment is not much more salient among (formal) dropouts than it is among graduates. Detrimental effects of (formal) dropout compared to graduating first become visible when one investigates some further occupational aspects such as the subsequent occu-

pational level/position of the dropouts, their income, whether they in their current job make greater or lesser use of the skills they had obtained prior to dropout. Even then, the evidence that graduates do better than (formal) dropouts is not unequivocal.

- *'Why do such dropout phenomena occur at universities?'* – Although the majority of the 44 studies available for the synthesis do not analyse university dropout directly within a process-based perspective, as pleaded for by Tinto (1975), there is still convincing evidence that dropout from universities comprises a multifaceted and complex phenomenon, or rather phenomena, with factors at different stages – both prior to university and within university – affecting the risk of dropout. Being partly a consequence of the applied study designs and/or the data made available for analysis, the evidence base is greater and the evidence itself strongest in relation to effects on dropout due to a student's sociodemographic background, including his/her parents' educational level and occupational status, a student's personal characteristics, such as age and gender, and his/her (upper) secondary school academic focus and achievement. On the basis of the resources invested in most European countries to even out socio-economic inequalities in educational outcomes during primary and secondary school, it is a little surprising to observe that especially the parents' educational level still has been found to affect the individual risk of (formal) dropout from university, even after a number of intermediate factors have been taken into account. This has been found to apply across most subjects of study (medical students being found to constitute an exception). Another clear finding is that the risk of dropout is greater among male students across almost all of the investigated subjects of study. Evidence on the sources of this gender pattern is not available in the 44 studies, though. The evidence of an effect from within-university factors on the risk of dropout is, generally speaking, less convincing/more blurred. Though, other things being equal, investing in institutional resources on a number of different parameters seems to work as a sound way to reduce the risk of dropout, at least within the British context where it has almost solely been investigated. Improving a student's academic integration at university in terms of his/her academic achievement and progress seems to be another sound way to reduce the risk of dropout and increasing his/her intrinsic motivations for studying and for making greater academic efforts yet two others. However, as mentioned above, issues concerning motivations for studying/educational goals have been found to be better predictors of making a transfer than to formally drop out of the system of higher education altogether.
- *'What can be done by the universities to prevent or reduce such dropout phenomena?'* – This review question has hardly been touched upon across the studies available for the synthesis, European based evidence on this matter, therefore, can hardly be summarised. Addressing and answering this review question is, however, also a question of addressing and answering the review question *'Why do such dropout phenomena occur at universities?'*, because programmes/interventions carried out with the aim of directly preventing or reducing dropout

from universities must, to be successful, build upon knowledge about why dropout occurs in the first place.

It is striking how similar the synthesis findings are to those obtained by Tinto almost 40 years ago within a U.S. college context as presented in his seminal article from 1975 *'Dropout from higher education - a theoretical synthesis of recent research'*. The findings of the present synthesis can, thus, to a large extent be understood within the existing theoretical frameworks developed by Tinto and refined by Heublein et al. With this systematic review the prevailing theories concerning dropout from universities are now systematically grounded. In relation to this matter and as stated earlier, one might well object that the non-European evidence on dropout from universities could then, ideally, have served fruitfully to strengthen the evidence as well as the evidence base on some of the aspects investigated on dropout from universities.

The synthesis findings must additionally be put into perspective on the basis of the robustness assessment as presented in the above section. This is because the trustworthiness of the conclusions rests upon the robustness assessment. First and foremost, as observed, the study designs and methods of analysis applied in the 44 studies are in most cases not found to be optimal for analysing dropout from universities within a process based perspective, as pleaded for by Tinto. Furthermore, the, in many instances, rather small evidence base on which the synthesis findings have been constructed combined with the observation that the available studies often rest upon a narrow context and the fact that some of specific aspects investigated are investigated rather country-specifically all suggest that the synthesis findings should not always be taken to be universally applicable within the European scope of this systematic review. Still, because dropout phenomena, in line with most other educational issues, represent complex problems, the context becomes central and important for a deeper understanding of the phenomena. This should be to the benefit of those studies which have analysed university dropout within specific contexts. Having said that, when evaluated on the basis of the methods applied in the completion of the synthesis and, before that, the methods applied in the completion of the research mapping, the synthesis findings are considered to be fairly robust and, as such, the conclusions drawn upon them considered to be correspondingly trustworthy.

5.6 Recommendations for research, policy and practice

The findings and conclusions of this systematic review will hopefully inspire and be applied by politicians, practitioners and researchers working within the field of higher education, and especially with dropout from universities, in diverse ways and with a focus on the different aspects and parts of the review. In this respect, we encourage politicians, practitioners and researchers to bear the robustness analysis in mind as all synthesis findings and conclusions drawn upon them are to be seen in the light of this analysis. The findings and conclusions of this systematic review further form the foundation for a few recommendations aimed at policy, practice and research concerning dropout from universities. On the basis of the limitations/shortcomings, which have been found in the 44 studies available for the synthesis in relation to addressing the three review ques-

tions, the following recommendations mainly revolve around the question *'On the basis of the narrative synthesis what issues are we not able to say anything about/do we only have little or insecure knowledge about concerning dropout from universities?'*

5.6.1 Research

First and foremost, during the coding of the studies included in the research mapping it became evident to us that the definition and operationalisation of dropout from university studies in many cases tend to be vague and indistinct. In line with Tinto's recommendations, the core studies have shown it to be essential to distinguish between different types of dropout behaviour in order to precisely answer the review question *'Why do such dropout phenomena occur at universities?'* and the related question *'What can be done by the universities to prevent or reduce such dropout phenomena?'*. This is because the occurrence of an involuntary dropout likely followed by a formal dropout from higher education is not (necessarily) based on the same prerequisites and conditions as a voluntary dropout in the form of, for instance, a student transfer to another study programme within higher education. In other words, answers to the question of why dropout occurs might be fundamentally different as to whether a student drops out of the system of higher education altogether or merely drops out from his/her study programme to continue the same study programme at another university for, say, geographical reasons. Furthermore, a formal dropout from the system of higher education and a student transfer to another study programme within higher education might obviously have different academic and economic consequences for the student. We therefore urge future research on this matter to be aware of such distinctions and incorporate them into their data analyses. In those cases where all data or part of the data for such dropout analyses are obtained from student level administrative data recorded by the universities, this calls for an availability of such data at the universities in the first place (cf. Section 5.6.2).

A second recommendation for future research concerns a dissemination of the conduct of transnational studies, for instance, in the form of transnational questionnaire surveys on dropout from university studies. As it is now, we found no transnational studies. Hence, as stated in Section 5.4.4, potential effects on dropout due to national level systemic characteristics of the system of higher education have not been investigated, but have had to be taken for granted in each of the nationally based studies. Even without transnational research on dropout, in a country like Germany, for example, it might be possible to conduct a survey across the Bundesländer in order to investigate the potential effects on dropout of regional (local) differences in institutional characteristics of the system of higher education.

A third recommendation for future research obviously revolves around the issue of a current lack of knowledge on the possible effects of interventions aimed at preventing or reducing dropout from European universities. More European based intervention studies are clearly needed to obtain solid European based knowledge about what can be done by the universities to prevent or reduce such dropout phenomena, since such studies are almost non-existent within the European context. At present we can only speculate whether this lack of intervention studies is perhaps due

to the nature of the interventions done; they are too few or too short-lived or too formal and theory-based to lend themselves to research?

Moreover, as was elucidated in the robustness analysis, some recommendations concerning the study designs, methods of analysis and the data applied in the research field as comprised by the review questions should be put forward. Knowledge/understanding of what dropout from university studies is, why such dropout phenomena occur and what can be done by the universities to prevent or reduce such dropout phenomena would benefit from a greater use of cohort/longitudinal studies which investigate the possible determinants of dropout within a process based and time-varying perspective and from a greater use of experimental designs in relation to studying interventions or, alternatively, by the use of instrumental variable regressions in the absence of experimental designs. Furthermore, to prevent the observed skewness in focus towards pre-university and/or university non-malleable factors the research field would benefit from future research focusing more on within-university and/or university malleable factors, for instance, by conducting more longitudinal surveys and, if possible, coupled with university administrative and other register based data. As Tinto points out in one of his more recent papers, one could also imagine university 'malleable' factors to comprise the effects of classroom practice, including varying student assessment practices upon student learning and persistence and the impact of institutional investment in faculty and staff development programs on those outcomes (Tinto, 2006-2007: 7). Such factors can also be investigated quantitatively in relation to dropout.

5.6.2 Policy and practice

In relation to what was recommended for future research concerned with dropout phenomena at universities, we encourage university authorities to strengthen the availability of relevant student level administrative data including data on the individual reasons for why a student leaves his/her subject of study before it has been completed (e.g. due to academic dismissal vs. other more voluntary circumstances) and, if possible, data on whether or not (s)he subsequently transfers to another subject of study and/or institution within, or at a lower level than, higher education.

In relation to improving the possibilities for tracking student who transfer to another subject of study and/or institution we urge university authorities and/or politicians to improve such opportunities by introducing unique student codes across universities within the same country. Such unique student codes which should apply as a minimum across different institutions of higher education within the same country could also serve to alleviate the problem of a lack/shortage of studies investigating the potential effects on dropout of systemic characteristics of the system of higher education, at least at the regional (local) level.

We furthermore encourage university authorities to be aware of the possibilities for obtaining valuable knowledge about the individual level consequences for students who drop out of the system of higher education altogether by tracking such students by the means of conducting more post-exmatriculation follow up-surveys.

On the basis of the synthesis findings some more substantial recommendations for university authorities and/or politicians concerned with the problem of dropout from universities studies can further be given. According to the synthesis findings and the concluding remarks of Chapter 5 of the technical report, university authorities should first of all realise that most energy must be put into setting up dropout reducing precautions/measures during the early phases of the course of study, because this is where the issues of both dropout and student transfer are most pertinent. Secondly, they should understand that what influences the risk of dropout while students are at university and, as such, what they can do to prevent or reduce dropout, is to a certain extent constrained by pre-university factors such as the sociodemographic background characteristics of the student intake and the prior academic achievements of the students. This applies even in spite of certain selection processes having already been at work at the time of university application and university entrance. As such, university authorities and/or politicians should realise that they do not have unsuspected power to influence dropout by merely changing factors at work within university, because, for example, the parents' educational level, the gender and age of the student as well as the student's prior academic achievement also play important roles in the multifactorial web of determinants which in the end leads a student to drop out from university or not. Trying to recruit academically more able students still seems to be the best a university can do to reduce dropout. In relation hereto, increasing university enrolment rates (without making adjustments that would increase the quality of education) by simply increasing the enrolment rates in upper secondary school does not automatically lead to a higher number of graduates since such an operation would almost certainly lead to increased formal dropout rates.

University authorities and/or politicians should further be aware that they are given more room for influencing the likelihood of a student making a transfer to another subject of study/institution, since student transfer has been found to be more sensitive to aspects having a greater potential of being stimulated after university entrance such as a student's motivations for studying and/or his/her educational goals. Put differently, most transfer students do not transfer due to academic difficulties in their current subject of study or due to inadequate academic prerequisites for studying in general. Rather, they transfer due to having been placed in the wrong study environment or having been placed in the wrong subject of study to begin with, thereby, lowering their motivations for studying and increasing their likelihood of making of transfer. Hence, university authorities and/or politicians could potentially reduce transfer rates, at least by a certain amount, by making available the necessary information services at the time of application to university to prevent some otherwise well-qualified student in making the wrong choice of study in the first place.

For some aspects underlying the within-university and/or university 'malleable' factors the evidence base is, after all, relatively solid and the evidence clear (or, as a matter of fact, only just relatively less inconclusive than some of the other university 'malleable' factors) that they lower the risk of dropout from university studies more or less directly. . University authorities and/or politicians should realise that investing in institutional resources on a number of different parameters, improving a student's academic integration at university in terms of his/her academic achieve-

ment and progress, increasing his/her motivations for studying and encouraging a student to make greater academic efforts all have the potential to lower dropout rates. This is because they have all been found to lower the individual student's risk of dropout from university studies, other things being equal. On the basis of the evidence obtained from a somewhat smaller evidence base of mainly British origin, another sound recommendation seems to be to try to enhance the quality of teaching, as it appears that a higher teaching quality assessment lowers the student's risk of dropout.

6 Appendix 1: Search profiles

BEI (British Education Index)

su.EXACT.EXPLODE("Dropout Attitudes" OR "Dropout Attitudes" OR "Dropout Research" OR "Dropouts" OR "Dropout Characteristics" OR "Dropout Prevention" OR "Dropout Rate" OR "Academic Failure") AND su.EXACT.EXPLODE("Higher Education" OR "Colleges" OR university)

Date: After January 01 1990

AEI (Australian Education Index)

su(EXACT.EXACT.EXPLODE("Dropout characteristics" OR "Dropout programs" OR "Dropout attitudes" OR "Dropout research" OR "Dropouts" OR "Dropout prevention" OR "Dropout characteristics" OR "Academic failure" OR "Academic ability")) AND su(EXACT.EXACT.EXPLODE("Universities" OR "Higher education" OR "Higher education programs"))

Date: After January 01 1990

Psychinfo

su(EXACT.EXACT.EXPLODE("Dropouts" OR "Student Attitudes" OR "College Dropouts" OR "Student Engagement" OR "Academic Achievement Motivation")) AND su(EXACT.EXACT.EXPLODE("Colleges" OR "Higher Education"))

Limited by:

Date: After January 01 1990

Age group: Adolescence (13-17 Yrs), Adulthood (18 Yrs & Older), Young Adulthood (18-29 Yrs)

Methodology: 14 types searched: Empirical Study, Field Study, Focus Group, Followup Study, Interview, Literature Review, Longitudinal Study, Meta Analysis, Prospective Study, Qualitative Study, Quantitative Study, Retrospective Study, Systematic Review, Twin Study

ERIC

su.EXACT("Dropout Rate" OR "Dropout Programs" OR "Dropout Characteristics" OR "Potential Dropouts" OR "Dropouts" OR "Dropout Research" OR "Dropout Attitudes" OR "Dropout Character-

istics" OR "Dropout Prevention" OR "Dropout Programs" OR "Academic Failure" OR "Withdrawal" OR "Organizational Effectiveness")

Limited by:

Date: After January 01 1990

Document type:142 Reports: Evaluative, 143 Reports: Research

Education level: Higher education, Two year colleges

Evidensbasen

universit* dropout* location:udpb collection:udevi

Sociological Abstracts

su.EXACT("Academic Achievement" OR "Dropouts" OR "college student" OR "Student Attitudes") AND su.EXACT("Universities" OR "Higher Education")

Limited by: Date: After January 01 1990

FIS Bildung

Schlagwörter:(STUDIENMOTIVATION oder STUDIENPROBLEM oder ABBRUCH) und (Schlagwörter: UNIVERSITAET oder HOCHSCHULBILDUNG) UND PY=>1990

Canadian Education Index

su.EXACT("Academic failure" OR "Students" OR "At risk students" OR "Academic achievement") AND su.EXACT("Higher education" OR "Colleges & universities")

Limited by: Date: After January 01 1990

Bibliotek.dk

videregående uddannelse? og (fracald? eller afbryd? eller gennemfør?) og sp=dan og år>1990

Libris.se

Studieavbrott* OR dropout* AND universitet* OR videregående opplæring* AND ÅR:1990-2012

Bibsys Forskdok publikasjoner

(emne = Studiegjennomføring? eller emne = studiefrafall? eller emne = studiestabilitet? eller emne = dropout?) og (emne = videregående opplæring? eller emne = høyere utdanning?) og årstall = 1990-2012

Econlit

all(university* OR college*) AND (academic failure* OR dropout*)

Limited by: Date: After January 01 1990

Web of Science

In Databases=SSCI, A&HCI:

Topic=(dropout* OR "academic failure*" OR "Academic Ability*") AND Topic=("higher education*" OR universit* OR college*)

Timespan=1990-2012.

The Higher Education Empirical Research Database

Title/abstract/Full text matches any of: dropout dropouts withdraw withdrawal

AND

Title Any matches of: student, students, studies

Education research Complete

(DE "PREDICTION of dropout behavior" OR DE "SCHOOL dropouts -- Prevention" OR DE "SCHOOL dropouts -- Attitudes" OR DE "SCHOOL dropouts") AND (DE "HIGHER education" OR DE "UNIVERSITIES & colleges")

1990 –

Datenbank der SKBF

dropout

studienabbruch

Francis

all(dropout*) AND all(higher education)

Date: After January 01 1990; Language: French, German

IDS

Jahr : 1990-2012 ; Komb. Feldsuche : Studienabbruch : Ursache (Verknüpft mit UND)

BNF Catalogue

The BNF-staff performed the search based on this:

Votre question:

For a systematic review on dropout phenomena at universities I need a search on: - Primary research reports (articles or research reports) - In French (I am covered in other languages) - Published 1990- ff - On empirical studies which provide answers to: What are the causes of dropout from Universities? OR Which interventions applied at universities can reduce dropout phenomena?

7 Appendix 2: Data extraction and coding tool

7.1 EPPI-Centre tool for education studies V2.0 - editable version

Section A: Administrative details

A.1 Name of the reviewer	Details <i>Malene Rode Larsen & Donald Broady</i>
A.2 Date of the review	Details <i>8th of June 2012</i>
A.3 Please enter the details of each paper which reports on this item/study and which is used to complete this data extraction.	Paper (1) <i>Journal article Not applicable. This study does not address dropout reducing measures.</i> Unique Identifier: <i>2768140</i> Authors: <i>Arulampalam, W., Naylor, R. A., & Smith, J. P.</i> Title: <i>Effects of in-class variation and student rank on the probability of withdrawal: cross-section and time-series analysis for UK university students</i>
A.4 Main paper. Please classify one of the above papers as the 'main' report of the study and enter its unique identifier here.	Unique Identifier: <i>2768140</i>
A.5 Please enter the details of each paper which reports on this study but is NOT being used to complete this data extraction.	Paper (1) <i>Not relevant</i>
A.6 If the study has a broad focus and this data extraction focuses on just one component of the study, please specify this here.	Not applicable (whole study is focus of data extraction) <i>Not applicable (whole study is focus of data extraction)</i>
A.7 Language (please specify)	English language <i>English language</i>

Section B: Study Aims and Rationale

<p>B.1 What are the broad aims of the study?</p>	<p>Implicit (please specify) <i>Implicit. The authors do not say explicitly, what their aims are, but they write the following: "In this paper, we extend the previous analyses in particular directions. First, we concentrate our attention on the nature of the impact of prior qualifications on the individual's probability of withdrawing from their university course. We examine the sensitivity of the student's drop-out probability to their relative position in class: that is, to their prior qualifications relative to those of fellow students on their university degree course. In particular, we investigate how the extent of student in-class heterogeneity with respect to prior qualifications impacts on the probability of dropping out. Second, we analyse the extent to which differences by gender in the probability of dropping out are explained by gender differences in observed characteristics. Third, we assemble the data for nine entry cohorts between 1984–85 and 1992–93 and investigate the time-series robustness and trends exhibited by the estimated cross-section results." (p. 251). And later on: "We address the issue of what determines whether a student will drop out of their university course during their first year." (p. 252). As such, their aims must be to investigate first year dropout from these three perspectives: 1) the sensitivity of the student's drop-out probability to his/her absolute and relative position in class; 2) the extent to which differences by gender in the probability of dropping out are explained by gender differences in observed characteristics and 3) the time-series robustness and trends exhibited by the estimated cross-section results.</i></p>
<p>B.2 What is the purpose of the study?</p>	<p>B: Exploration of relationships <i>Exploration of relationships</i></p>
<p>B.3 Was the study informed by, or linked to, an existing body of empirical and/or theoretical research?</p>	<p>Explicitly stated (please specify) <i>Explicitly stated. The authors state: "Analysis of dropout rates in HE is currently of significant policy interest in many countries, and has been the subject of a sizeable literature in the US. To date, most of the analysis of university attrition in the UK has been based on university-level data (see, for example, Johnes and Taylor, 1989, 1990). Recently, however, researchers have gained access to the full set of individual student-level information stored in the Universities Statistical Records (USR), and have used these data to analyse the issue of student withdrawal. For example, Smith and Naylor (2001a) analyse the determinants of dropping out of a degree programme for students enrolling in the academic year 1989–90, while Arulampalam, Naylor and Smith (2004) focus on medical student withdrawal. Johnes and McNabb (2004) examine the attrition of students leaving university in 1993, focussing on the</i></p>

	<p><i>influence of student-course matching and of peer group effects. [...] The importance of prior qualifications of students as a determinant of their drop-out probabilities is well established in the literature. In the extensive US literature, one of the most influential theoretical explanations of student attrition is the path analysis model of Tinto (1975, 1987, 1997). This model suggests that the student's social and academic integration into university is the major determinant of completion, and identifies a number of key influences on integration, such as the student's family background, previous schooling, prior academic performance and interactions between students and with faculty. For UK university students, Smith and Naylor (2001a) report that the student's prior qualifications have statistically significant effects on both the male and female drop-out probabilities. Smith and Naylor (2001a) also attempt to take account of the effects of subjects studied prior to university as a further dimension of academic preparedness.⁴ Johnes and McNabb (2004) find that the probability of quitting university is higher for students whose prior performance is superior to that of fellow students. This is consistent with the idea that matching is an important element of completion. For the US, Light and Strayer (2000) find that the match between student ability and college quality is a significant determinant of college graduation." (p. 251-252).</i></p>
<p>B.4 What are the study research questions and/or hypotheses?</p>	<p>Explicitly stated (please specify) <i>3 hypotheses are stated explicitly: "In the light of the evidence cited above concerning the importance of both academic preparedness and the closeness of the match between student and course characteristics, our first hypothesis is that stronger students will be less likely—and weaker students will be more likely—to withdraw than will middle-ranked students. Our second hypothesis is that, if matching is important, the greater the degree of heterogeneity in prior qualifications the higher will be the dropout probability, ceteris paribus. This can be interpreted as follows. Relatively weak students might be more likely to drop out the greater is the heterogeneity in prior performance as they are likely to perceive that a greater effort is required of them if they are at the lower end of a wide distribution in terms of prior academic performance. Similarly, students in the upper tail of a wide distribution might perceive that they have an incentive to drop out in order to transfer to other courses and/or institutions with higher average scores and therefore a better academic reputation. Thus, we can see arguments for expecting the dropout probability of both types of student to increase with the degree of in-class heterogeneity. [...] At the suggestion of a referee, we also hypothesise that the effects of the</i></p>

	<p><i>student's prior performance on their dropout probability might vary with the characteristics of the university. The argument is as follows. If it is indeed the case that relatively strong students might drop out of their course in order to transfer to a 'better' course — for example, one with a reputation for taking better students — then this effect should be stronger at less highly regarded universities. Accordingly, we draw a distinction between highly and lowly regarded universities." (p. 255).</i></p>
--	---

Section C: Study Policy or Practice Focus

<p>C.1 What is the curriculum area, if any?</p>	<p>Not applicable (not on a specific curriculum area)</p> <p><i>Not applicable (not a specific curriculum area). The study looks at "the full populations of undergraduate students starting a 3 or 4-year degree course in a UK university between 1984/85 and 1992/93." (p. 252).</i></p> <p>Coding is based on: Authors' description <i>Authors' description</i></p>
<p>C.2 In which country or countries was the study carried out?</p>	<p>British Isles. <i>British Isles (United Kingdom).</i></p>

Section D: Actual sample

<p>D.1 Who or what is/ are the sample in the study?</p>	<p>Other learners</p> <p><i>Other learners. "The full populations of undergraduate students starting a 3 or 4-year degree course in a UK university between 1984/85 and 1992/93." (p. 252).</i></p>
<p>D.2 What was the total number of participants in the study (the selected sample)?</p>	<p>Explicitly stated (please specify)</p> <p><i>Explicitly stated. "The data contain information on approximately 714,000 students." (p. 252). The size of each of the nine cohorts, separately stated for each gender, can be found in table 1 (p. 253).</i></p>
<p>D.3 What is the proportion of those selected for the study who actually participated in the study?</p>	<p>Not stated/unclear (please specify)</p> <p><i>Unclear. Since data come from university student records, every student in the selected cohorts would ideally be taking part in the final analyses. However, we do not learn if some students are taken out because of missing data, and therefore we do not know what proportion of those students selected for the study who actually participated in the final analyses (we can, however, calcu-</i></p>

	<p>late this proportion for the two cohorts 1984/1985 and 1992/1993, see below). All we learn is the number of male and female students in the selected sample for the nine cohorts (cf. table 1), as well as the number of male and female students that actually participated in the final analyses for the two cohorts: 1984/1985 and 1992/1993 (cf. table 5, p. 256). From these numbers the following proportions are found for cohort 1984/1985: Males = $40242/40257 \cdot 100 = 99,96\%$, Females: $28529/28520 \cdot 100 = 100,00\%$. For the cohort 1992/1993: Males = $54723/54725 \cdot 100 = 100,00\%$, Females: $47017/47020 \cdot 100 = 99,99\%$.</p>
D.4 What ages are covered by the actual sample?	<p>17 to 20 Age category: < 20</p> <p>21 and over Age categories: 20, 21-28 and 28<</p>
D.5 What is the sex of participants?	<p>Mixed sex (please specify) Mixed sex.</p>
D.6 What is the socio-economic status of the individuals within the actual sample?	<p>Implicit (please specify) Implicit. A proxy for socioeconomic status is used: Students' social class background (i.e. parents' occupation). A dummy-variable measures it: Social class I and II (professional and managerial) vs. Other (Skilled, semi-skilled, unskilled) (p. 254). Students from all social backgrounds are thus contained in the data.</p>
D.7 What is the ethnicity of the individuals within the actual sample?	<p>Not stated (please specify) Not stated</p>
D.8 Please specify any other important information about the study participants, which cannot be given in the sections above.	<p>No further details No further details.</p>

Section E: Programme or Intervention description

E.1 If a programme or intervention is being studied, does it have a formal name?	<p>Not applicable (no programme or intervention) Not applicable (no programme or intervention). The study does not look at any programme or intervention. Therefore no answers are given to the questions in the section.</p>
E.2 Theory of change	<p>Details</p>

	<i>Not applicable (no programme or intervention). The study does not look at any programme or intervention. Therefore no answers are given to the questions in the section.</i>
E.3 Aim(s) of the intervention	Not stated <i>Not applicable (no programme or intervention). The study does not look at any programme or intervention. Therefore no answers are given to the questions in the section.</i>
E.4 Duration of the intervention	Not applicable <i>Not applicable (no programme or intervention). The study does not look at any programme or intervention. Therefore no answers are given to the questions in the section.</i>
E.5 Person providing the intervention (tick as many as necessary)	Not applicable <i>Not applicable (no programme or intervention). The study does not look at any programme or intervention. Therefore no answers are given to the questions in the section.</i>
E.6 Was special training given to people providing the intervention?	No <i>Not applicable (no programme or intervention). The study does not look at any programme or intervention. Therefore no answers are given to the questions in the section.</i>

Section F: Results and conclusions

F.1 What are the results of the study as reported by the authors?	<p>Details</p> <p><i>Results are presented for the first and last cohort in the study (1984/1985 and 1992/1993). Overall, the authors findings are largely in support of their three hypotheses: "Logit coefficient estimates of the probability of dropping out together with the corresponding marginal effects are presented in Table 5, separately for male and female students. The table presents results for the first and last of our nine cohorts. The estimated equation includes controls for educational background, personal characteristics, degree subject and related attributes, and university attended. For male students, the probability of dropping out of university tends to be increasing in age whereas for women the dropout probability is lowest for students in the highest age category. The effect of fees status also varies by sex, with non-UK fee paying males around 1 percentage-point less likely to drop out than other male students but with no signifi-</i></p>
--	--

cant effects of fees status for women. The effects of accommodation type are similar for men and women. Relative to a student living on campus, the dropout probability is around 1 percentage-point higher for students living at the parental home and slightly higher again for those students living off-campus. This is consistent with Tinto's emphasis on the importance of social integration. For the 1993 cohort—unlike that for the 1985 cohort—students with part-time status do not differ from full-time students in their ceteris paribus dropout probability. However, the student's social class background has a significant effect—for both male and female students—with a significantly higher probability (0.5 percentage-points in 1985 and 0.25 percentage-points in 1993) of dropping out for students from parental backgrounds with a lower social class (skilled, semi-skilled or unskilled) relative to those students whose parents are from Social Class I and II (professional and managerial) backgrounds. School background has significant effects only for male students, with a higher dropout probability of 0.6 percentagepoints for students who had previously attended a private Independent school. In general, these results are in line with those of Smith and Naylor (2001a, b). Table 5 also reports results for the effects on the dropout probability associated with the individual's performance at A-level as measured by (i) the dummy variables indicating the student's in-class rank, (ii) the in-class coefficient of variation, (iii) the individual's own score at A-level (averaged across the subjects taken), (iv) the number of A-levels taken, and (v) a dummy variable to indicate whether the individual had taken Mathematics at A-level. With respect to the effects of the dummy variables indicating the student's in-class rank, we see that for the 1993 cohort compared to a male student in the default group, a higher (lower) ranked student is around 1 percentage-point less (more) likely to drop out. These signs on the in-rank coefficients hold for most of the nine cohorts. For women in 1993 it is also the case that weaker students are 1 percentage-point more likely to drop out, though there is no significant negative effect for stronger female students. The results, then, are largely consistent with our hypothesis that the student's prior performance relative to other students matters in terms of the student's dropout probability, with better prior preparedness associated with a lower probability. Our second hypothesis concerned the effect of in-class heterogeneity on the individual's dropout probability. We suggested that both strong and weak students might have (differing) reasons to be more likely to leave a course the greater the extent of heterogeneity. Indeed, Table 5 reports that the coefficient of variation on in-class prior performance has a positive and significant

estimated effect for both male cohorts, consistent with the hypothesis. The result holds for six of the nine cohorts. For women, the coefficient of variation is statistically significant in only one of the nine cohorts. Belonging to a more heterogeneous group, in terms of prior performance, seems to induce men to be more likely to drop out without having an effect on the behaviour of female students. We also tested whether the effect of in-class heterogeneity itself varied across the in-class rank categories, but found no significant interaction effects. The results on the effects of both in-class rank and inclass heterogeneity on the probability of dropping out are conditional on the absolute prior performance of the student, as we include the average A-level score, Mathematics score and the number of A-levels taken. The coefficient on the individual's average score in their prior qualifications is negative for both men and women in all 9 years and is significant at the 5% level for each of the nine cohorts for men and in 4 of the 9 years for women. Additionally, we find that having an A-level in Mathematics (with the exception of 1985) is typically associated with a significantly lower probability of dropping out, *ceteris paribus*. Finally, we note that students who had taken fewer than the median number of subjects at A-level were more likely to drop out of their course." And later on: "In a piece of supplementary analysis, we include the interaction between the student's in-class prior performance and a dummy variable indicating whether the university itself is highly or lowly ranked. In the results reported in Table 5 for our basic model, we found that stronger students (those with scores more than 0.8 standard deviations above the mean) are less likely to drop out than are students in the median (default) group. Our hypothesis is that this effect is likely to be driven by the behaviour of these students in more highly rated universities, as stronger students are predicted to be much less likely to leave the more highly ranked universities. We find support for this hypothesis for both male and female students. We discuss this in the light of the results presented in Table 6. Table 6 shows the estimated coefficients and the corresponding marginal effects on the in-class rank and the interaction terms for the individual's in-class rank group and a dummy variable indicating whether the university is highly ranked ('Top' university). With the exception of 1985 males, there is a significantly lower probability that the highly ranked student at a top university will drop out. The results for the lower-ranked student at a 'top' university are less significant, but generally imply that these students have a higher probability of dropping out. This result is consistent with the hypotheses stated above.". Lastly, a decomposition analysis is conducted to determine what proportion of the difference

	<p><i>in dropout rate between males and females and between the first and last cohort, respectively, can be traced back to differences in characteristics and to differences in estimated coefficients: "The table shows that the predicted probability of dropping out was 3.80% for females and 5.22% for males. If females are attributed male characteristics, the predicted probability is a little higher at 3.98% and if males are attributed female characteristics the dropout probability falls slightly to 4.86%. Hence, the gender difference in the dropout rate in 1992–93 is not explained by differences in observed characteristics by gender: the difference is attributable to differences in estimated coefficients. The same picture emerges from a gender composition based on the 1984–85 cohort. Consider now the decomposition over time. For males, the results presented in Table 7 suggest that the reason for the rise in the predicted dropout probability from 1984–85 to 1992–93 was attributable to a deterioration in characteristics. For example, if 1984–85 males are assigned 1992–93 male characteristics, the predicted probability of dropping out increases from 4.93% to 5.66%, compared to 5.22% for 1992–93 males with their actual characteristics and estimated coefficients. Thus, changing coefficients acted to reduce the predicted male dropout probability over the period, but not sufficiently to fully offset the deterioration in characteristics. The reverse is true for females: if 1984–85 females are assigned 1992–93 female characteristics, the predicted probability of dropping out increases from 4.09% to 4.64%, compared to 3.80% for 1992–93 females with their actual characteristics and estimated coefficients—hence the effect of a deterioration in characteristics is more than offset by changed coefficients." (p. 258-261).</i></p>
<p>F.2 What do the author(s) conclude about the findings of the study?</p>	<p>Details</p> <p><i>The authors conclude the following: "We conclude that policies aimed at widening participation not through specialisation but through encouraging increased heterogeneity within university courses should be complemented with appropriate strategies—educative, social, financial and pastoral—to minimise the risk that the dropout will rise as a result." (p. 262).</i></p>
<p>F.3 Which answer(s) does the study offer to the review question?</p>	<p>Details (please specify)</p> <p><i>In accordance with their findings, the study offers the following answers to the review question of why dropout phenomena occur at universities: "We have examined the first-year undergraduate university dropout behaviour of UK university students from administrative data for full entry cohorts between 1984–85 and 1992–93. We have focused on the impact of prior qualifications and on differences by gender and over time. With</i></p>

	<p>respect to prior qualifications, we have examined a number of hypotheses. First, we tested the hypothesis that the probability of dropping out is greatest for students with relatively poor levels of prior attainment. Our method for doing this is to rank each individual in each university and in each degree course on the basis of their performance at A-level relative to their fellow students. Each student is then assigned to one of three groups according to this rank. Our results show that, for male students, the predicted probability of dropping out is related monotonically to the in-class rank group to which the individual belongs, with the weaker students more likely to drop out, as predicted. For females, it is also the case that the weaker students are more likely to drop out. However, the probability for stronger students does not differ from that for intermediate students. Second, we have found that the dropout probability of males is significantly affected by the degree of in-class heterogeneity of students with respect to levels of prior attainment. Belonging to a more heterogeneous group, in terms of prior performance, seems to induce men to be more likely to drop out without there being a similar effect for the behaviour of female students. Finally, with respect to prior qualifications, we hypothesized that different students are likely to have differing motivations for dropping out according, for example, to their prior qualifications. For example, as a referee has pointed out, if it is the case that relatively strong students might drop out of their course in order to transfer to a 'better' course, then this effect should be stronger at less highly regarded universities. To analyse this, we included the interaction between the student's in-class prior performance and a dummy variable indicating whether the university itself is highly or lowly ranked, in terms of the average A-level scores of its intake. We found that there are highly significant differences in the probability of dropping out according to the student's in-class rank only in the 'top' universities. This result is consistent with the hypothesis that better prepared students are unlikely to leave highly ranked universities while weaker students at such universities will face pressures to do so." (p. 261).</p>
--	---

Section G: Study Design

<p>G.1 Study Timing</p>	<p>Cross-sectional <i>The study examines different entry cohorts of university students, but each at only one point in time (after their first year of study).</i></p>
--------------------------------	---

G.2 What is the design used in the study?	Secondary data analysis <i>Secondary data analysis. University student records for different entry cohorts of university students are used.</i>
--	--

Section H: Comparison groups

H.1 Method groups	No comparison groups <i>No comparison groups. This article does not report on an experimental study.</i>
--------------------------	---

Section I: Sampling strategy

I.1 What is the sampling frame (if any) from which the participants are chosen?	Explicitly stated (please specify) <i>Explicitly stated. "The data set is based on anonymised individual University Student Records (USR) for the full populations of undergraduate students starting a 3 or 4-year degree course in a UK university between 1984/85 and 1992/93." (p. 252).</i>
I.2 Which methods/criteria do the study use to select people, or groups of people (from the sampling frame)?	Explicitly stated (please specify) <i>Every student within the sampling frame is selected for study. (p. 252).</i>
I.3 Planned sample size	Explicitly stated (please specify) <i>Explicitly stated. Every student within the sampling frame is selected for study. The authors write: "The data contain information on approximately 714,000 students." (p. 252). The size of each of the nine cohorts, separately stated for each gender, can be found in table 1 (p. 253).</i>
I.4 How representative was the achieved sample (as recruited at the start of the study) in relation to the aims of the sampling frame?	High (please specify) <i>High. Concerning the proportion selected for the study (the nine cohorts of UK university students) who actually participated in the final multivariate analyses: we can only calculate this proportion for cohort 1984/1985 and cohort 1992/1993, because analysis results are listed for these two cohorts only in table 5: The proportion selected for the study who actually participated in the study is for cohort 1984/1985: Males = $40242/40257 \times 100 = 99,96 \%$, Females: $28529/28520 \times 100 = 100,00 \%$. For the cohort 1992/1993: Males = $54723/54725 \times 100 = 100,00 \%$, Females: $47017/47020 \times 100 = 99,99 \%$.</i>

	<p><i>In other words, representativity of the achieved sample is very high. For the other cohorts representativity of the achieved sample is unclear, but nothing indicates that data should be less complete for these cohorts compared to the abovementioned two cohorts and as such, the reviewer assumes that representativity is very high for the other cohorts as well.</i></p>
<p>I.5 If the study involves studying samples prospectively over time, what proportion of the sample dropped out over the course of the study?</p>	<p>Not stated <i>Not applicable. This study does not follow samples prospectively over time.</i></p>
<p>I.6 For studies that involve following samples prospectively over time, do the authors provide any information on whether, and/or how, those who dropped out of the study differ from those who remained in the study?</p>	<p>Not applicable (no drop outs) <i>Not applicable. This study does not follow samples prospectively over time.</i></p>
<p>I.7 Are the authors trying to produce findings that are representative of a given population?</p>	<p>Implicit (please specify) <i>Implicit. Data for entire cohorts of students in UK universities are selected for study as a way to analyse determinants of university dropout probability. As such, the authors implicitly try to produce findings that are representative of students in the UK as a whole. Nothing indicates, though, that they should be trying to produce findings that are representative of a wider population of university students from countries outside the UK.</i></p>

Section J: Methods - Data Collection

<p>J.1 Which dependent variable(s)/concept(s) does the study aim to measure or examine?</p>	<p>Explicitly stated (please specify) <i>Explicitly stated. The authors write: "We note that when a student drops out of a course, there are two possible routes the student might take: (i) a transfer (switch) to a different course and (ii) a complete departure (quit) from the HE sector. It would be useful to us if we could make a clear distinction between these two routes for students in our data. However, a satisfactory distinction for the full population of students is not possible. The primary reason for this is that students dropping out of university and subsequently re applying for admission on to a different programme in a following year through the central clearing agency (UCAS) cannot be tracked. This is because each new applicant entering university is</i></p>
--	---

	<p>given a unique student identifier which cannot be matched to a previous identifier for the same student previously in the data set on a different programme. Hence, in the current paper, a dropout is defined as someone who is observed to withdraw from their course irrespective of their subsequent destination." (p. 253). NB: The authors themselves point out the weakness that they are not able to distinguish between formal dropouts and transfer students.</p>
<p>J.2 What covariates and control variables are reported in the study?</p>	<p>Explicitly stated (please specify)</p> <p><i>Explicitly stated. The independent variable in focus in this study is the "in-class heterogeneity" i.e. "the coefficient of variation" within each class concerning students' A-level score obtained in prior education. This variable is based on two other variables, namely each students' A-level rank and each students' class. These three variables are described the following way: "Students with at least three A-levels are ranked—on the basis of the score in their best three A-levels— relative to other students at their university on their degree course. On the basis of this in-class ranking, students are then allocated to one of three rank categories according to their personal A-level score relative to the mean in-class score within their university degree course. The categories are defined according to whether the individual's A-level score is more or less than 0.8 standard deviations (s) away from the mean score (m). We also experimented with alternative classifications and found this choice to dominate in maximising the likelihood values. The reason for the use of the three rank categories defined against the criteria of the mean and the standard, rather than using a simple quantile method, arises from the clustering associated with the discrete nature of the Alevel scores. Such clustering on particular points scores means that it is not always possible to rank students in such a way as to define distinct quantiles by university course. For the construction of in-class rank, a student's 'class' is based on the university they attend and the subject they study. There are 56 universities and 19 broad subject areas, generating a total of about 1000 'classes', with an average of about 100 students per class for the 1992 93 cohort. In Table 3 we report our estimates for s and m for 1984–85 and 1992–93 averaged across universities for eight aggregated subject areas. The table shows substantial variation in both the mean and in the standard deviation both over time and across subject areas. Table 4 shows the proportions of students in each of the three ranked categories, separately for males and females: these proportions are approximately constant over time. This table also shows the average coefficients of variation. The coefficient of variation is the measure we use</i></p>

	<p>to capture the effects of in-class heterogeneity on the dropout probability." (p. 254-255).</p> <p>Besides the in-class heterogeneity/coefficient of variation concerning A-level scores in each class and each students' individual A-level score (averaged across the subjects taken) and each students' A-level rank, other covariates and control variables included in the final analyses are:</p> <ul style="list-style-type: none"> - Gender, - Age, - Non-UK fee student, - Accommodation (base: university accommodation), - Part-time student, - On a 4 year programme, - Social class, - Type of prior school (base: local education authority), - Pre-university qualifications (e.g. A-levels, Highers, Degree already), - Number of A-levels taken, - A-level in maths. Also, in a supplementary analysis the interaction effect between each students' A-level rank and the rank of the student's university is included to test hypothesis number three.
J.3 Which methods were used to collect the data?	<p>School/ college records (e.g attendance records etc)</p> <p><i>School/college records. The authors write: "The data set is based on anonymised individual Universities Student Records (USR) for the full populations of undergraduate students starting a 3 or 4-year degree course in a UK university between 1984/85 and 1992/93." (p. 252).</i></p> <p>Coding is based on: Author's description <i>Author's description</i></p>
J.4 Details of data collection instruments or tools.	<p>Not stated/ unclear (please specify)</p> <p><i>No further details about the data collection process is stated other than mentioning the data sources (p. 252).</i></p>
J.5 Was there a concealment of which group that subjects were assigned to (i.e. the intervention or control) or other key factors from those carrying out measurement of outcome - if relevant?	<p>Not applicable (please say why)</p> <p><i>Not applicable. No intervention was carried out.</i></p>

Section K: Methods - Data Analysis

K.1 What rationale do the authors give for the methods of analysis for the study?	<p>Not stated or unclear</p> <p><i>Not stated. The authors do not explicitly state, why they chose to conduct a binomial logit regression analysis of the probability that an individual withdraws from his/her university degree course during year 1 of study. As the dependent variable has only two categories</i></p>
--	--

	<i>(withdrawal vs. continuance), this method is a standard method.</i>
K.2 Which methods were used to analyse the data?	Explicitly stated (please specify) <i>Explicitly stated. The authors write "We conduct a binomial logit regression analysis of the probability that an individual withdraws from their university degree course during their first year of study in 1992–93. We replicate the analysis for each of the eight earlier cohorts. We conduct separate analyses for male and female students as, from the summary statistics discussed above, it appears that male and female drop-out behaviour is rather different. Indeed, a likelihood ratio test on the equality of the estimated coefficients from our separate models for males and females is rejected (p-value=0.00). In the logit regression analysis, dummy variables are included for the top- and bottom-ranked students, so that the default case is that of an individual with three A-levels and in the middle of the distribution of A-level scores within their university degree course." (p. 255).</i>
K.3 Do the authors describe strategies used in the analysis to control for bias from confounding variables?	No <i>No not explicitly, but the authors include quite a few background variables and other possibly confounding variables into the final analyses as a way to control for bias from confounding factors.</i>
K.4 For studies that use prospective allocation, please specify the basis on which data analysis was carried out.	Not applicable (not a study with prospective allocation) <i>Not applicable. This article does not report on a study with prospective allocation.</i>
K.5 If the study uses qualitative methods, how well has diversity of perspective and content been explored?	Details <i>Not applicable. This article does not report on a study that uses qualitative methods.</i>
K.6 If the study uses qualitative methods, how well has the detail, depth and complexity (i.e. the richness) of the data been conveyed?	Details <i>Not applicable. This article does not report on a study that uses qualitative methods.</i>
K.7 If the study uses qualitative methods, has analysis been conducted such that context is preserved?	Details <i>Not applicable. This article does not report on a study that uses qualitative methods.</i>

Section L: Quality of the study – Reporting

<p>L.1 Was the study sufficiently informed by relevant theory and research?</p>	<p>Yes (please specify)</p> <p><i>Yes. The authors state: "Analysis of dropout rates in HE is currently of significant policy interest in many countries, and has been the subject of a sizeable literature in the US. To date, most of the analysis of university attrition in the UK has been based on university-level data (see, for example, Johnes and Taylor, 1989, 1990). Recently, however, researchers have gained access to the full set of individual student-level information stored in the Universities Statistical Records (USR), and have used these data to analyse the issue of student withdrawal. For example, Smith and Naylor (2001a) analyse the determinants of dropping out of a degree programme for students enrolling in the academic year 1989–90, while Arulampalam, Naylor and Smith (2004) focus on medical student withdrawal. Johnes and McNabb (2004) examine the attrition of students leaving university in 1993, focussing on the influence of student-course matching and of peer group effects. [...] The importance of prior qualifications of students as a determinant of their drop-out probabilities is well established in the literature. In the extensive US literature, one of the most influential theoretical explanations of student attrition is the path analysis model of Tinto (1975, 1987, 1997). This model suggests that the student's social and academic integration into university is the major determinant of completion, and identifies a number of key influences on integration, such as the student's family background, previous schooling, prior academic performance and interactions between students and with faculty. For UK university students, Smith and Naylor (2001a) report that the student's prior qualifications have statistically significant effects on both the male and female drop-out probabilities. Smith and Naylor (2001a) also attempt to take account of the effects of subjects studied prior to university as a further dimension of academic preparedness.⁴ Johnes and McNabb (2004) find that the probability of quitting university is higher for students whose prior performance is superior to that of fellow students. This is consistent with the idea that matching is an important element of completion. For the US, Light and Strayer (2000) find that the match between student ability and college quality is a significant determinant of college graduation." (p. 251-252).</i></p>
<p>L.2 Are the aims of the study clearly reported?</p>	<p>Yes (please specify)</p> <p><i>Yes. The authors write the following: "In this paper, we extend the previous analyses in particular directions. First, we concentrate our attention on the nature of the impact of prior qualifications on the individual's probability of withdrawing from their university course. We examine the sensitivity of the student's drop-out proba-</i></p>

	<p><i>bility to their relative position in class: that is, to their prior qualifications relative to those of fellow students on their university degree course. In particular, we investigate how the extent of student in-class heterogeneity with respect to prior qualifications impacts on the probability of dropping out. Second, we analyse the extent to which differences by gender in the probability of dropping out are explained by gender differences in observed characteristics. Third, we assemble the data for nine entry cohorts between 1984–85 and 1992–93 and investigate the time-series robustness and trends exhibited by the estimated cross-section results." (p. 251). And later on: "We address the issue of what determines whether a student will drop out of their university course during their first year." (p. 252). As such, their aims must be to investigate first year dropout from these three perspectives: 1) the sensitivity of the student's drop-out probability to their relative position in class; 2) the extent to which differences by gender in the probability of dropping out are explained by gender differences in observed characteristics and 3) the time-series robustness and trends exhibited by the estimated cross-section results.</i></p>
<p>L.3 Is there an adequate description of the sample used in the study and how the sample was identified and recruited?</p>	<p>Yes (please specify) <i>For the first and last cohort used in the study (1984/1985 and 1992/1993 cohort) there is a good description of the sample (cf. table 2 on page 254), for the other cohorts no such description is given. Concerning identification and recruitment - these issues are described as well: "The data set is based on anonymised individual Universities Student Records (USR) for the full populations of undergraduate students starting a 3 or 4-year degree course in a UK university between 1984/85 and 1992/93. (p. 252).</i></p>
<p>L.4 Is there an adequate description of the dependent variable, covariates and control variables in the study?</p>	<p>Yes (please specify) <i>Yes. There is a quite detailed description of the dependent variable and the independent variable(s) in focus. The authors write: "We note that when a student drops out of a course, there are two possible routes the student might take: (i) a transfer (switch) to a different course and (ii) a complete departure (quit) from the HE sector. It would be useful to us if we could make a clear distinction between these two routes for students in our data. However, a satisfactory distinction for the full population of students is not possible. The primary reason for this is that students dropping out of university and subsequently re-applying for admission on to a different programme in a following year through the central clearing agency (UCAS) cannot be tracked. This is because each new applicant entering university is given a unique student identifier which cannot be</i></p>

matched to a previous identifier for the same student previously in the data set on a different programme. Hence, in the current paper, a dropout is defined as someone who is observed to withdraw from their course irrespective of their subsequent destination." (p. 253).

The independent variable in focus of this study is the "in-class heterogeneity" i.e. "the coefficient of variation" within each class concerning students' A-level score obtained in prior education. This variable is based on two other variables, namely each students' A-level rank and each students' class. These three variables are described the following way: "Students with at least three A-levels are ranked—on the basis of the score in their best three A-levels— relative to other students at their university on their degree course. On the basis of this in-class ranking, students are then allocated to one of three rank categories according to their personal A-level score relative to the mean in-class score within their university degree course. The categories are defined according to whether the individual's A-level score is more or less than 0.8 standard deviations (s) away from the mean score (m). We also experimented with alternative classifications and found this choice to dominate in maximising the likelihood values. The reason for the use of the three rank categories defined against the criteria of the mean and the standard, rather than using a simple quantile method, arises from the clustering associated with the discrete nature of the Alevel scores. Such clustering on particular points scores means that it is not always possible to rank students in such a way as to define distinct quantiles by university course. For the construction of in-class rank, a student's 'class' is based on the university they attend and the subject they study. There are 56 universities and 19 broad subject areas, generating a total of about 1000 'classes', with an average of about 100 students per class for the 1992-93 cohort. In Table 3 we report our estimates for s and m for 1984-85 and 1992-93 averaged across universities for eight aggregated subject areas. The table shows substantial variation in both the mean and in the standard deviation both over time and across subject areas. Table 4 shows the proportions of students in each of the three ranked categories, separately for males and females: these proportions are approximately constant over time. This table also shows the average coefficients of variation. The coefficient of variation is the measure we use to capture the effects of in-class heterogeneity on the dropout probability." (p. 254-255).

Besides the dependent variable as well as the in-class heterogeneity/coefficient of variation concerning A-level scores in each class and students' individual A-level

	<p>score and rank, other covariates and control variables included in the final analyses are mentioned without being described in greater detail:</p> <p>- Age; - Non-UK fee student, - Accommodation (base: university accommodation), - Part-time student, - On a 4 year programme, Social class, - Type of prior school (base: local education authority), - Pre-university qualifications (e.g. A-levels, Highers, Degree already), - A-level in maths.</p>
L.5 Is there an adequate description of the methods used in the study to collect data?	<p>Yes (please specify)</p> <p><i>Yes. Nothing else than the data source is mentioned. However, since all data is retrieved from a statistical agency, the data collection method is trivial and the description given in the article is adequate.</i></p>
L.6 Is there an adequate description of the methods of data analysis?	<p>Yes (please specify)</p> <p><i>Yes. The authors write: "We conduct a binomial logit regression analysis of the probability that an individual withdraws from their university degree course during their first year of study in 1992–93. We replicate the analysis for each of the eight earlier cohorts. We conduct separate analyses for male and female students as, from the summary statistics discussed above, it appears that male and female drop-out behaviour is rather different. Indeed, a likelihood ratio test on the equality of the estimated coefficients from our separate models for males and females is rejected (p-value=0.00)."</i></p>
L.7 Do the authors explicitly state where the full, original data are stored?	<p>Yes (please specify)</p> <p><i>Yes. The authors state that: "We acknowledge both the USR, as the original depositors, and the UK Data Archive for the use of the data set SN:3456 Universities' Statistical Record." (p. 262).</i></p>
L.8 Do the authors avoid selective reporting bias? (E.g. do they report on all variables they aimed to study, as specified in their aims/research questions?)	<p>Yes (please specify)</p> <p><i>Yes, the authors report on all variables that are specified in their research questions/hypotheses.</i></p>

Section M: Quality of the study - Weight of evidence

M.1 Are ethical concerns/problems raised by the author about the way the study was done?	<p>No (please specify)</p> <p><i>No. However, the authors write: "The data set is based on anonymised individual Universities Student Records (USR) for the full populations of undergraduate students starting a 3 or 4-year degree course in a UK university between 1984/85 and 1992/93." (p. 252). As such, the</i></p>
---	---

	<i>authors are aware that individual-level student data must be dealt with anonymously.</i>
M.2 Are there any ethical concerns/problems about the way the study was conducted?	<p>No (please specify)</p> <p><i>No. The individual student level data in the dataset SN:3456 of the Universities' Statistical Records have been anonymized before retrieval from the UK Data Archive (p. 252).</i></p>
M.3 Is there sufficient justification for why the study was done the way it was?	<p>Yes (please specify)</p> <p><i>Yes. All the way through the article, the authors spend quite some time justifying, why the study was done the way it was. First, they explain why their analyses are of great importance: "Since December 1999, the UK Government has published university performance indicators based on statistics such as drop-out rates from higher education institutions (see HEFCE, 1999). A focus of policy and of analysis on university withdrawal rates reflects widespread concern with evidence of a rising drop-out rate among university students. This has occurred during a period of time in which government policy has succeeded in expanding the size of the university student population in concert with strategies both to shift the financial burden of study on to students and their families (see Dearing, 1997) and yet to widen access into higher education (HE). Both of these strategies have potential impacts on the university student drop-out rate. Analysis of dropout rates in HE is currently of significant policy interest in many countries, and has been the subject of a sizeable literature in the US." (p. 251). Next, they explain their choice of data and their focus of first year dropout: "To date, most of the analysis of university attrition in the UK has been based on university-level data (see, for example, Johnes and Taylor, 1989, 1990). Recently, however, researchers have gained access to the full set of individual student-level information stored in the Universities Statistical Records (USR)." (p. 251-252). And later on: "We focus on first-year dropouts for two reasons. First, previous analysis of student drop-out behaviour both for the US (Tinto, 1987, 1988) and for the UK (Smith and Naylor, 2001a) shows that, typically, half of all student dropouts are firstyear dropouts and also that the determinants of firstyear dropout differ from those on later year dropout. Hence, it follows that it is appropriate to analyse firstyear dropout behaviour separately, as in the current paper. Second, the individual student-level USR data are not available beyond 1993. [...] In the current paper, because we choose to analyse the determinants of dropout probabilities during the first year only, we are able to exploit information for all those cohorts on whom we have first-year information prior to 1993. This includes all cohorts starting between 1984/85 and</i></p>

1992/93. The last of these cohorts would have been expected to complete their degree programme in 1995 (or 1996 in the case of students taking a 4-year programme) and hence the analysis is for more recent cohorts than would otherwise be possible." (p. 252-253). The authors also explain why the dependent variable is measured the way it is: "We note that when a student drops out of a course, there are two possible routes the student might take: (i) a transfer (switch) to a different course and (ii) a complete departure (quit) from the HE sector. It would be useful to us if we could make a clear distinction between these two routes for students in our data. However, a satisfactory distinction for the full population of students is not possible. The primary reason for this is that students dropping out of university and subsequently re-applying for admission on to a different programme in a following year through the central clearing agency (UCAS) cannot be tracked. This is because each new applicant entering university is given a unique student identifier which cannot be matched to a previous identifier for the same student previously in the data set on a different programme. Hence, in the current paper, a dropout is defined as someone who is observed to withdraw from their course irrespective of their subsequent destination." (p. 253). They also explain, why the students' A-level ranking is done the way it is: "Students with at least three A-levels are ranked—on the basis of the score in their best three A-levels— relative to other students at their university on their degree course. On the basis of this in-class ranking, students are then allocated to one of three rank categories according to their personal A-level score relative to the mean in-class score within their university degree course. The categories are defined according to whether the individual's A-level score is more or less than 0.8 standard deviations (s) away from the mean score (m). We also experimented with alternative classifications and found this choice to dominate in maximizing the likelihood values. The reason for the use of the three rank categories defined against the criteria of the mean and the standard, rather than using a simple quantile method, arises from the clustering associated with the discrete nature of the A-level scores. Such clustering on particular points scores means that it is not always possible to rank students in such a way as to define distinct quantiles by university course." (p. 253-254). Additionally, it is explained why separate analyses are conducted for each gender: "We conduct separate analyses for male and female students as, from the summary statistics discussed above, it appears that male and female drop-out behaviour is rather different. Indeed, a likelihood ratio test on the equality of the estimated coefficients from our separate models for

	<p><i>males and females is rejected (p-value=0.00)." (p. 255). Lastly, they mention that their third hypothesis, and as a result their final analysis, is a result of the suggestion of a referee: "At the suggestion of a referee, we also hypothesise that the effects of the student's prior performance on their dropout probability might vary with the characteristics of the university." (p. 255).</i></p>
<p>M.4 Was the choice of research design appropriate for addressing the research question(s) posed? (E.g. were adequate and sufficient variables included in the study?)</p>	<p>Yes (please specify) <i>Yes. The conceptual model behind the statistical analyses as well as the statistical methods used (binomial logit regression analysis) seem to be appropriate for answering the question of student dropout in the UK. Also the covariates and control variables included in the final analyses seem appropriate.</i></p>
<p>M.5 Have sufficient attempts been made to establish repeatability/reliability in the data collection and data analysis process?</p>	<p>Yes, good (please specify) <i>Yes, good. The data collection process is not described in detail, however, since all data are retrieved from a statistical agency, the data collection method is trivial. Since data come from student records and not from individual-level self-completed questionnaires, the problem that different students attribute different meanings to a question is not relevant and hence, common challenges concerning reliability in this area are reduced/not relevant. The data analysis process is described very thoroughly so that transparency is high and repeatability should be high as well.</i></p>
<p>M.6 Have sufficient attempts been made to establish validity/trustworthiness in the data collection and data analysis process?</p>	<p>Yes, good (please specify) <i>Yes, good. Standard procedures are used in the data collection and data analysis process. The variables also seem to be operationalised properly. Most of them are standard variables. As such content validity should be high.</i></p>
<p>M.7 To what extent are the research design and methods employed able to rule out any other sources of error/bias which would lead to alternative explanations for the findings of the study?</p>	<p>A lot (please specify) <i>A lot. Relevant covariates and control variables have been included in the final analyses. Among other things are relevant interaction effects.</i></p>
<p>M.8 Does the author address the generalisability of the study?</p>	<p>No, the author does not address the generalisability of the study <i>No, the authors do not address the generalizability of the study explicitly. The study analyses first-year undergraduate university dropout behaviour of UK university students from administrative data for full entry cohorts between 1984–85 and 1992-93. As such the study looks at population data for nearly a ten-year period of time within a UK context. The study does not address the</i></p>

	<i>issue whether the research findings can be generalized to more recent cohorts or to students in countries outside the UK.</i>
M.9 In light of the above, do the reviewers differ from the authors over the findings of the study?	No (please specify) <i>No.</i>
M.10 Have sufficient attempts been made to justify the conclusions drawn from the findings, so that the conclusions are trustworthy?	Medium trustworthiness <i>Medium trustworthiness. The authors merely conclude that: "We conclude that policies aimed at widening participation not through specialisation but through encouraging increased heterogeneity within university courses should be complemented with appropriate strategies—educative, social, financial and pastoral—to minimise the risk that the dropout will rise as a result." (p. 262). This conclusion is not followed by any justification e.g. on the basis of similar conclusions reached in earlier research or on the basis of empirical findings in other settings. The findings of the study are quite clear, though, and the conclusions drawn do not seem to be 'out of touch' with the findings, i.e. the conclusions seem trustworthy.</i>
M.11 Weight of evidence A: Taking account of all quality assessment issues, can the study findings be trusted in answering the study question(s)?	High trustworthiness <i>High trustworthiness. The study is all the way through very well-done: large-N study using appropriate variables and analysis methods.</i>
M.12 Weight of evidence B: Appropriateness of research design and analysis for addressing the question, or sub-questions, of this specific systematic review.	High <i>High. The focus of the study (the effects of in-class heterogeneity on dropout) is very relevant and the very wide context (the full populations of undergraduate students starting a 3 or 4-year degree course in a UK university between 1984/85 and 1992/93 is examined, thus most/all study areas/subjects are assumed to be represented) is a great strength of the study. Furthermore, the study is all the way through very well-done: A large-N study using appropriate variables and analysis methods.</i>
M.13 Weight of evidence C: Relevance of particular focus of the study (including conceptual focus, context, sample and measures) for addressing the question, or sub-questions, of this specific systematic review.	High <i>High. In light of the past decades' widening access to higher education and in relation to this the intake of a more diverse university student body, the focus on the effect of in-class heterogeneity concerning prior educational achievement seems to be highly relevant. Also, the context is wide (the full populations of undergraduate students starting a 3 or 4-year degree course in a UK university between 1984/85 and 1992/93 is examined, thus most/all study areas/subjects are assumed to be</i>

	<p>represented) and is thus very relevant for addressing the question of this specific systematic review. The sample is very large (714.000 students) and the measures seem relevant as well. However, the data under study (the 1984/85 - 1992/93 entry cohorts) are more than 20 years old, so an updated version of the study seems to be in place.</p>
<p>M.14 Weight of evidence D: Overall weight of evidence</p>	<p>High</p> <p><i>High. The focus of the study (the effects of in-class heterogeneity on dropout) is very relevant and the very wide context (the full populations of undergraduate students starting a 3 or 4-year degree course in a UK university between 1984/85 and 1992/93 is examined, thus most/all study areas/subjects are assumed to be represented) is a great strength of the study. Furthermore, the study is all the way through very well-done: A large-N study using appropriate variables and analysis methods.</i></p>

7.2 Keywording tool

Section A: Dropout focus of research

<p>A.1 Which overall dropout aspect are in focus in the research?</p>	<p>Causes of dropout</p> <p><i>Causes of dropout. The authors write: "Our main focus concerns the effects of in-class rank, based on the student's pre-university qualifications, on their dropout probability." (p. 253).</i></p>
<p>A.2 If the study addresses causes: Which causes are addressed?</p>	<p>Socioeconomic causes</p> <p><i>Socioeconomic causes as operationalized by different social class-categories.</i></p> <p>Sexrole/gender</p> <p><i>Gender.</i></p> <p>Insufficient prior competence</p> <p><i>- Type of school (base: local education authority), , - Prior qualifications (i.e. type of prior qualifications (A-levels etc.), number of A-levels, A-level score, A-level in mathematics).</i></p> <p>Unsuccessful integration of new student in university life</p> <p><i>Accommodation (base: university accommodation).</i></p> <p>Other causes (please specify)</p> <p><i>Besides the in-class heterogeneity/coefficient of variation concerning A-level scores in each class and each stu-</i></p>

	<p><i>dents' individual A-level score (averaged across the subjects taken) and each students' A-level rank, other co-variables and control variables included in the final analyses are: - Gender, - Age, - Non-UK fee student, - Accommodation (base: university accommodation), - Part-time student, - On a 4 year programme, - Social class, - Type of prior school (base: local education authority), - Pre-university qualifications (e.g. A-levels, Highers, Degree already), - The number of A-levels taken, - A-level in maths. Also, in a supplementary analysis the interaction effect between each students' A-level rank and the rank of the student's university is included to test hypothesis number three.</i></p>
<p>A.3 If the study addresses dropout reducing measures: Which measures are evaluated?</p>	<p><i>Not applicable. This study does not address dropout reducing measures.</i></p>
<p>A.4 If the study addresses dropout reducing measures: Which effects are re-searched?</p>	<p><i>Not applicable. This study does not address dropout reducing measures.</i></p>
<p>A.5 If the study addresses what happens to dropouts after leaving university: Give details on the further paths of the dropouts</p>	<p><i>Not applicable. This study does not address what happens to dropouts after leaving university.</i></p>
<p>A.6 Abstract</p>	<p>Please type in an abstract</p> <p>2768140</p> <p><i>Arulampalam, W., Naylor, R. A. & Smith, J. P. (2005). Effects of in-class variation and student rank on the probability of withdrawal: cross-section and time-series analysis for UK university students. Economics of Education Review, 24, 251–262.</i></p> <p><i>From individual-level data for nine entire cohorts of undergraduate students in UK universities, binomial logit regression analyses of the probability that an individual will drop out of university during their first-year are conducted. The authors examine the 1984–85 to 1992–93 cohorts of students enrolling full-time for a 3 or 4-year course. They focus on the sensitivity of the probability of withdrawal to the individual's prior qualifications relative to those of the other students in their university course. It is shown not only that weaker students are more likely to withdraw, but also that the extent of variation in prior qualifications within the student's university degree course also exerts an influence on the individual's probability of withdrawal. It is also found that withdrawal</i></p>

	<p><i>behaviour varies across universities according to a measure of average university student quality.</i></p> <p><i>Assessed Weight of Evidence: High.</i></p>
--	---

8 Appendix 3: Characteristics of the studies available for the synthesis

Country of conduct	Number of studies
UK	11
Germany	7
The Netherlands	7
Italy	4
Denmark, Spain	3
Finland, Norway	2
Austria, Belgium, France, Sweden	1

Table 8.1 Country of conduct
N=43, since one systematic review is not included in the table.

Publication type	Number of documents
Journal article	36
Report	5
Working paper	5
Book	3
Chapter in a dissertation	2

Table 8.2 Publication type
N = 51. There are 44 primary documents and 7 secondary documents.

Curriculum area(s) investigated	Number of studies
All/close to all (e.g. entire cohorts of high school graduates, or an entire university)	27
Medicine	5
Business Studies and Economics	3
Science	2
Educational Science	1
Information and communication technology (ICT)	1
Law	1
Psychology	1
Social sciences	1

Table 8.3 Curriculum area(s) investigated

N= 42, since this table only includes those studies which address the review question 'why do such dropout phenomena occur at universities?'.

Educational level	Number of studies
Degree completion	21
One or more specific semesters	12
Course completion	4
Completed a university degree (independent of degree enrolled in)	3
Other/not stated	3

Table 8.4 Educational level at which dropout is investigated

N=43, since one systematic review is not included in the table.

Level of analysis	Number of studies
System of higher education	21
University	9
Faculty	8
Department/course of study	5

Table 8.5 Analytical level at which dropout is investigated
N=43, since one systematic review is not included in the table.

Review question addressed	Number of studies
'Why do such dropout phenomena occur at universities?'	42
'What can be done by the universities to prevent or reduce such dropout phenomena?'	3

Table 8.6 Review question addressed
N=44. There are 45 answers since one study (Qualter et al., 2009) was found to address both review question.

Possible determinants of dropout investigated	Number of studies
Socioeconomic causes	26
Insufficient prior competence	25
Gender	23
Unsuccessful integration of new student in university life	13
Inadequate learning processes at university	12
Wrong choice of studies/flaws in the information or guidance system	10
Ethnicity	8
Psychosocial conditions	7
Other causes (please specify)	29

Table 8.7 Possible determinants of dropout investigated

N = 42, since 42 studies were found to investigate possible determinants of dropout.

There are 153 answers since all studies address more determinants of dropout.

Since the studies often enquire on more variables within each of the categories in the table, the list cannot be used for calculating the number of specific variables used in the studies to investigate the possible determinants of dropout.

Overall study design	Number of studies
Cross-sectional study	28
Secondary data analysis	8
Experiment with non-random allocation to groups	4
Cohort study	3
Random experiment with random allocation to groups	1
Views study	1

Table 8.8 Overall study design

N=43, since one systematic review is not included in the table.

There are 45 answers, as two studies have been coded as having applied more than one study design.

Study timing	Number of studies
Cross-sectional	24
Prospective	15
Retrospective	7

Table 8.9 Study timing

N=43, since one systematic review is not included in the table. There are 45 answers, as two studies have been coded as having applied more than one study design.

Data collection	Number of studies
Self-completion questionnaire	24
University administrative student level data	23
Secondary data (publicly available statistics or individual level register data)	11
One-to-one interview	6
Curriculum-based assessments	2
Examinations	2
Clinical test	1
Focus group interview	1
Observation	1
Other documentation	1

Table 8.10 Data collection

N = 44. There are 72 answers, as more studies make use of more than one data source.

Achieved sample size	Number of studies
50-250	5
250-500	2
500-1,000	5
1,000-10,000	18
10,000-50,000	3
50,000-100,000	5
100,000 or more	2
Other sample unit	1
Not stated/unclear	3

Table 8.11 Achieved sample sizes

N = 43, since one systematic review is not included in the table.

There are 44 answers, as one study investigates two samples.

The term '*Other sample unit*' refers to one study (Soo, 2009) which operates with a sample of 'study-year-subjects'. The term '*Not stated/Unclear*' covers studies that are too poorly reported to either explicitly or implicitly determine the sample size.

Main method of data analysis	Number of studies
Multivariate analysis	37
Bivariate correlations and descriptive statistics	6

Table 8.12 Main method of data analysis

N = 43, since one systematic review is not included in the table.

	High	Medium	Low
11. Weight of evidence A: Taking account of all quality assessment issues, can the study findings be trusted in answering the study question(s)?	21	22	1
12. Weight of evidence B: Appropriateness of research design and analysis for addressing the question, or sub-questions, of this specific systematic review	21	21	2
13. Weight of evidence C: Relevance of particular focus of the study (including conceptual focus, context, sample and measures) for addressing the question, or sub-questions, of this specific systematic review.	21	22	1
14. Weight of evidence D: Overall weight of evidence	19	25	0

Table 8.13 Weight of evidence
N = 44 for each row.

9 References for the studies available for the synthesis

Listed below are all references to the 44 studies available for the synthesis, that is, studies which in the research mapping were assigned an overall weight of evidence of medium or high.

ITT2772931: Albrecht, A., & Nordmeier, V. (2001). Ursachen des Studienabbruchs in Physik. Eine explorative Studie. *Die hochschule*, 2.

ITT2758729: Araque, F., Róldan, C., & Salguero, A. (2009). Factors influencing university drop out rates. *Computers & Education*, 53, 563–574.

ITT2763854: Argentin, G., & Triventi, M. (2011). Social inequality in higher education and labour market in a period of institutional reforms: Italy, 1992–2007. *Higher Education*, 61(3), 309–323.

^aITT2777620: Arulampalam, W., Naylor, R.A., & Smith, J. P. (2004a). A hazard model of the probability of medical school drop-out in the UK. *Journal of the Royal Statistical Society: Series A*, 167(1), 157–178.

ITT2761966 (secondary reference to ITT2777620): Arulampalam, W., Naylor, R.A., & Smith, J. P. (2001). A hazard model of the probability of medical school dropout in the United Kingdom. IZA Discussion Paper, 133.

ITT2768140: Arulampalam, W., Naylor, R. A., & Smith, J. P. (2005). Effects of in-class variation and student rank on the probability of withdrawal: cross-section and time-series analysis for UK university students. *Economics of Education Review*, 24, 251–262.

ITT2770586: Arulampalam, W., Naylor, R. A., & Smith, J. P. (2007). Dropping out of medical school in the UK: Explaining the changes over ten years. *Medical Education*, 41, 385–394.

ITT2761965 (secondary reference to ITT2770586): Arulampalam, W., Naylor, R. A., & Smith, J. P. (2004b). Factors affecting the probability of first-year medical student dropout in the UK: A logistic analysis for the entry cohorts of 1980-1992. Warwick Economic Research Papers, 618.

ITT2777714: Baars, G. J. A., Stegers-Jager, K. M., Stijnen, T., & Splijnter, T. A. W. (2009a). A model to predict student failure in the first year medical curriculum. In: Baars, G. J. A. (ed.) *Factors related to student achievement in medical school*. Hague: Lemma.

ITT2777715 (secondary reference to ITT2777714): Baars, G. J. A., Stegers-Jager, K. M., Stijnen, T., & Splijnter, T. A. W. (2009b). Exploratory study to improve a model to predict student failure in the first-year medical curriculum. In: Baars, G. J. A. (ed.) *Factors related to student achievement in medical school*. Hague: Lemma.

- ITT2770591: Belloc, F., Maruotti, A., & Petrella, L. (2009). University drop-out: an Italian experience. *Higher Education*, 60(2), 127–138.
- ITT2770592 Bennett, R. (2003). Determinants of Undergraduate Student Drop Out Rates in a University Business Studies Department. *Journal of Further and Higher Education*, 27(2), 123-141.
- ITT2771809: Bodin, R. M & Millet, M. (2011). L'université, un espace de regulation: L'abandon dans les 1ers cycle à l'aune de la socialisation universitaire. *Sociologie*, 3(2), 225-242.
- ITT2762040: Di Pietro, G. (2004). The determinants of university dropout in Italy: A bivariate probit model with sample selection. *Applied Economics Letters*, 11, 187-191.
- ITT2758885: Di Pietro, G., & Cutillo, A. (2008). Degree flexibility and university drop-out: The Italian experience. *Economics of Education Review*, 27(5), 546-555.
- ITT2758942: Garcés, A., & Sánchez-Barba, L. F. (2011). An alternative educational approach for an Inorganic Chemistry laboratory course in Industrial and Chemical Engineering. *Chemistry Education Research and Practice*, 12(1), 101-113.
- ITT2758964: Glaesser, J. (2006). Dropping out of further education: A fresh start? Findings from a German longitudinal study. *Journal of Vocational Education and Training*, 58(1), 83–97.
- ITT2762072: Glocker, D. (2011). The effect of student aid on the duration of study. *Economics of Education Review*, 30, 177–190.
- ITT2758994: Hailikari, T. K., & Nevgi, A. (2010). How to Diagnose At-risk Students in Chemistry: The case of prior knowledge assessment. *International Journal of Science Education*, 32 (15), 2079–2095.
- ITT2772961: Heublein, U., Hutzsch, C., Schreiber, J., Sommer, D., & Besuch, G. (2010). Ursachen des Studienabbruchs in Bachelor- und in herkömmlichen Studiengängen: Ergebnisse einer Bundesweiten Befragung von Exmatrikulierten des Studienjahres 2007/2008. *HIS: Forum Hochschule*, 2. Berlin: HIS GmbH.
- ITT2772964: Heublein, U., Spangenberg, H., & Sommer, D. (2003). Ursachen des Studienabbruchs: Analyse 2002. *Hochschulplanung*, 163. Hannover: HIS GmbH.
- ITT2772958 (secondary reference to ITT2772964): Heublein, U. (2003). Ursachen des Studienabbruchs: Motive für Studienabbrecher. Leibzig: HIS GmbH.
- ITT2762308: Hoff, J., & Demirtas, M. (2009). Frafald blandt etniske minoritetsstuderende på universitetsuddannelserne i Danmark. København: Forlaget Politiske Studier.

- [Ⓜ]ITT2770888: Hovdhaugen, E., & Aamodt, P. O. (2009). Learning environment: Relevant or not to students' decision to leave university? *Quality in Higher Education*, 15(2), 177-789.
- [Ⓜ]ITT2770886 (secondary reference to [Ⓜ]ITT2770888): Hovdhaugen, E. (2009). Transfer and dropout: Different forms of student departure in Norway. *Studies in Higher Education*, 34(1), 1-17.
- ITT2770887: Hovdhaugen, E. (2011). Do structured study programmes lead to lower rates of drop-out and student transfer from university? *Irish Educational Studies*, 30(2), 237-251.
- [Ⓜ]ITT2762111: Johnes, G., & McNabb, R. (2004). Never Give Up the Good Times: Student Attrition in the UK. *Oxford Bulletin of Economics and Statistics*, 66(1), 23-47.
- ITT2767942: Kinnunen, P., & Malmi, L. (2008). CS Minors in a CS1 Course. *ICER '08 Proceedings of the Fourth international Workshop on Computing Education Research*, September 6-7, 2008: Sydney, Australia, 79-90.
- ITT2772971: Kolland, F. (2002). Studienabbruch: Zwischen Kontinuität und Krise. Eine empirische Untersuchung an Österreichs Universitäten. Braumüller.
- ITT2773010: Larsen, U. (2000). Frafald og studiemiljø. Århus: Studenterrådet ved Aarhus Universitet.
- ITT2770663: Lassibille, G., & Gómez, L. N. (2008). Why do higher education students drop out? Evidence from Spain. *Education Economics*, 16(1), 89-105.
- [Ⓜ]ITT2763715 (secondary reference to ITT2770663): Lassibille, G., & Gómez, L. N. (2009). Tracking Students' Progress through the Spanish University School Sector. *Higher Education*, 58, 821-839.
- ITT2759144: Loyens, S. M. M., Rikers, R. M. J. P., & Schmidt, H. G. (2007). The impact of students' conceptions of constructivist assumptions on academic achievement and drop-out. *Studies in Higher Education*, 32(5), 581-602.
- ITT2770677: May, S., & Bousted, M. (2004). Investigation of student retention through an analysis of the first-year experience of students at Kingston University. *Widening participation and lifelong learning*, 6(2), 42-48.
- ITT2759206: Nelson, A. (2008). Looking into one's own practice: A Swedish study on gender in educational sciences. *Journal of Further and Higher Education*, 32(2), 139-149.
- ITT2770687: O'Neill, L. D., Hartvigsen, J., Wallstedt, B., Korsholm, L., & Eika, B. (2011). Medical school dropout - testing at admission versus selection by highest grades as predictors. *Medical Education*, 45, 1111-1120.

- ITT2770688: O'Neill, L. D., Wallstedt, B., Eika, B., & Hartvigsen, J. (2011). Factors associated with dropout in medical education: a literature review. *Medical Education*, 45, 440-454.
- ITT2762175: Oosterbeek, H., & van Ewijk, R. (2010). Gender Peer Effects in University: Evidence from a Randomized Experiment. Tinbergen Institute Discussion Paper. TI 2010-113/3.
- ITT2762178: Ortiz, E. A., & Dehon, C. (2011). The Roads to Success: Analyzing Dropout and Degree Completion at University. Brussels: ECARES Working paper.
- ITT2773000: Pohlenz, P., Seyfried, M., & Tinsner, K. (2007). *Studienabbruch: Ursachen, Probleme, Begründungen*. VDM Verlag Dr. Müller.
- ITT2773001 (secondary reference to ITT2773000): Pohlenz, P., & Tinsner, K. (2004). Bestimmungsgroßen des Studienabbruchs: eine empirische Untersuchung zu Ursachen und Verantwortlichkeiten. *Potsdamer Beiträge zur Lehrevaluation* |1.
- ITT2770695: Qualter, P., Whiteley, H., Morleya, A., & Dudiak, H. (2009). The role of Emotional Intelligence in the decision to persist with academic studies in HE. *Research in Post-Compulsory Education*, 14 (3), 219–231.
- ITT2771760: Smith, J., & Naylor, R. (2001b). Dropping out of university: A statistical analysis of the probability of withdrawal for UK university students. *Journal of the Royal Statistical Society: Series A*, 164(2), 389-405.
- ITT2786263: Smith, J., & Naylor, R. (2001a). Determinants of degree performance in UK universities: a statistical analysis of the 1993 student cohort. *Oxford Bulletin of Economics and Statistics*, 63(1), 29-60.
- ITT2762212: Soo, K. T. (2009). Estimating the Production Function of University Students. Lancaster University Management School Working Paper, 2009/018.
- ITT2763560: Suhre, C. J. M., Jansen, E. W. A., & Harskamp, E. G. (2007). Impact of degree program satisfaction on the persistence of college students. *Higher Education*, 54, 207–226.
- ITT2770722: Urlings-Strop, L. C., Stijnen, T., Themmen, A. P. N., & Splinter, T. A. W. (2009). Selection of medical students: a controlled experiment. *Medical Education*, 43, 175-183.
- ITT2770600: Van Bragt, C. A. C., Bakx, A. W. E. A., Bergen, T. C. M., & Croon, M. A. (2011b). Why students withdraw or continue their educational careers: A closer look at differences in study approaches and personal reasons. *Journal of Vocational Education & Training*, 63(2), 217-233.
- ITT2763933: Van Bragt, C. A. C., Bakx, A. W. E. A., Bergen, T. C. M., & Croon, M. A. (2011a). Looking for students' personal characteristics predicting study outcome. *Higher Education*, 61(1), 59-75.

ITT2762237: Vignoles, A. F., & Powdthavee, N. (2009). The Socioeconomic Gap in University Dropouts. *The B.E. Journal of Economic Analysis & Policy*, 9(1), 1-15.

ITT2771298: Zwick, M. (2009). Stuttgarter Abbrecherstudie 2009. Zufriedenheit mit dem Studium und Abbruchneigung bei Studierenden des BA-Studiengangs Sozialwissenschaften an der Universität Stuttgart. *Stuttgarter Beiträge zur Risiko- und Nachhaltigkeitsforschung*, 14, 1-55.

10 Abstracts for the studies available for the synthesis

Listed below are all references including abstract to the 44 studies available for the synthesis, that is, studies which in the research mapping were assigned an overall weight of evidence of medium or high.

Albrecht, A., & Nordmeier, V. (2001). Ursachen des Studienabbruchs in Physik. Eine explorative Studie. *Die hochschule*, 2.

ITT 2772931

This article describes a study exploring causes of withdrawal of first-year university students within the subject 'Mono-Bachelor Physik' at two universities in Germany. Also, the aim is to look at the motives given for withdrawal as well as the future career plans of the withdrawn students. The study takes its point of departure in a theoretically developed model of study success. Data are obtained from three questionnaires given to the still active students as well as (with additional relevant questions) to withdrawn students. The researchers find the following factors to significantly influence the decision to withdraw: University entry qualifications operationalised as HZB-Note is the next most important predictor of study success. Not having received an approval for ones desired study is negatively related to study success (positively related to withdrawal), whereas subject interest, information about study demands, guidance and support (which is the most important predictor of study success) as well as difficulties with having to unite study and family are all positively related to study success. Assessed Weight of Evidence: Medium.

Araque, F., Róldan, C., & Salguero, A. (2009). Factors influencing university drop out rates. *Computers & Education*, 53, 563–574.

ITT 2758729

This paper develops personalised models for different university degrees to obtain the risk of each student abandoning his/her degree, and analyses the profile for undergraduates that abandon their degree. In this study three faculties located in Granada, South of Spain, were involved. In Software Engineering three university degrees with 10,844 students, in Humanities 19 university degrees with 39,241 students and in Economic Sciences five university degrees with 25,745 students were considered. Data, corresponding to the period 1992 onwards, are used to obtain a model of logistic regression for each faculty which represents them satisfactorily. These models and the framework data show that certain variables appear repeatedly in the explanation of the dropout in all of the faculties. Among these are start age, the father's and mother's studies, academic performance, success, average mark in the degree and the access form and in some cases also, the number of rounds needed to pass. Students with weak educational strategies and without persistence to achieve their aims in life have low academic performance and low success rates

and this implies a high risk of abandoning the degree. The results suggest that each university centre could consider similar models to elaborate a particular action plan to help lower the drop out rate reducing costs and efforts. As concluded in this paper, the profile of the students who tend to abandon their studies is dependent on the subject studied. For this reason, a general methodology based on a Data Warehouse architecture is proposed. This architecture does most of the work automatically and is general enough to be used at any university centre because it only takes into account the usual data the students provide when registered in a course and their grades throughout the years. Assessed Weight of Evidence: Medium.

Argentin, G., & Triventi, M. (2011). Social inequality in higher education and labour market in a period of institutional reforms: Italy, 1992–2007. *Higher Education*, 61(3), 309–323.

ITT 2763854

The aim of this study is to investigate the relationship between social origin and dropout from tertiary education (university) during a recent period of institutional reforms in Italy including the differentiation of higher education following the 'Bologna process'. The first part of the study contains a review of these institutional reforms including a discussion of how they have changed the structure of opportunities and constraints for Italian university students. The second part of the study uses data from four cross-section waves of the national survey, the Upper Secondary Graduates Survey (SGS), from 1998 to 2007, which cover both pre- and post-reform cohorts of Italian university students, to analyse the relationship between social origin and university dropout. Results from logistic regression analyses show first a reduction and then a new increase of inequality in university dropout rates between students of different social origin. However, the most disadvantaged students are significantly more likely to dropout than the most advantaged through the whole period of investigation. On the basis of the findings it is concluded that changes of social inequalities on dropout in higher education are only partly overlapped with the implementation of the university reforms. Also, since the changes over time are only visible when comparing those whose parents have primary education with those from tertiary educated families and not for the intermediate categories, it is concluded that if the 'Bologna process' has produced some changes in social inequality patterns, these seem to be short-term and confined to specific social groups. Assessed Weight of Evidence: Medium.

Arulampalam, W., Naylor, R.A., & Smith, J. P. (2004a). A hazard model of the probability of medical school drop-out in the UK. *Journal of the Royal Statistical Society: Series A*, 167(1), 157–178.

ITT 2777620

Arulampalam, W., Naylor, R.A., & Smith, J. P. (2001). A hazard model of the probability of medical school dropout in the United Kingdom. *IZA Discussion Paper*, 133.

ITT 2761966 (secondary reference)

From individual level longitudinal data for two entire cohorts of medical students in UK universities, the study uses multilevel models to analyse the probability that an individual student will drop out of medical school. The study finds that academic preparedness — both in terms of previous subjects studied and levels of attainment therein — is the major influence on withdrawal by medical students. Additionally, males and more mature students are more likely to withdraw than females or younger students respectively. The study finds that the factors influencing the decision to transfer course differ from those affecting the decision to dropout for other reasons. Assessed Weight of Evidence: High.

Arulampalam, W., Naylor, R. A., & Smith, J. P. (2005). Effects of in-class variation and student rank on the probability of withdrawal: cross-section and time-series analysis for UK university students. *Economics of Education Review*, 24, 251–262.

ITT 2768140

From individual-level data for nine entire cohorts of undergraduate students in UK universities; binomial logit regression analyses of the probability that an individual will drop out of university during their first-year are conducted. The authors examine the 1984–85 to 1992–93 cohorts of students enrolling full-time for a 3 or 4-year course. They focus on the sensitivity of the probability of withdrawal to the individual's prior qualifications relative to those of the other students in their university course. It is shown not only that weaker students are more likely to withdraw but also that the extent of variation in prior qualifications within the student's university degree course also exerts an influence on the individual's probability of withdrawal. It is also found that withdrawal behaviour varies across universities according to a measure of average university student quality. Assessed Weight of Evidence: High.

Arulampalam, W., Naylor, R. A., & Smith, J. P. (2007). Dropping out of medical school in the UK: Explaining the changes over ten years. *Medical Education*, 41, 385–394.

ITT 2770586

Arulampalam, W., Naylor, R. A., & Smith, J. P. (2004b). Factors affecting the probability of first-year medical student dropout in the UK: A logistic analysis for the entry cohorts of 1980-1992. *Warwick Economic Research Papers*, 618.

ITT 2761965 (secondary reference)

In the context of changing admissions criteria and an expanding medical school intake in the UK, the determinants of the medical school dropout probability were analysed. The researchers aimed at analysing the determinants of the probability that a student will drop out of medical school during Year 1 and to compare the results of this analysis over time. Logistic regression analysis for the 6 intake cohorts of 1990–92 and 1998–2000 were performed. Between 1990–92 and 1998–2000, there were substantial increases in both the size of the entry cohort and the proportion of students dropping out of medical school. A logit model for the 1990–92 and 1998–2000 cohorts reveals that the probability of dropping out depended on both the medical school attended and the personal characteristics of the student, including academic preparedness. Almost none of the increase in the dropout rate between the 2 cohort groups can be explained by changes in observable characteristics of the students over this period. Instead, most of the increase in the dropout rate is associated with changes at the level of the institution and in unobserved student characteristics. University effects, rather than changes in observed student characteristics, explain most of the increased dropout rate over the time period considered. Candidate explanations behind these effects include: less effective admissions policies; changing curricula; greater costs of attending medical school, and a growing mismatch between student and school characteristics. Testing between these competing hypotheses is left for future work. Assessed Weight of Evidence: High.

Baars, G. J. A., Stegers-Jager, K. M., Stijnen, T., & Splijnter, T. A. W. (2009a). A model to predict student failure in the first year medical curriculum. In: Baars, G. J. A. (ed.) *Factors related to student achievement in medical school*. Hague: Lemma.

ITT 2777714

Baars, G. J. A., Stegers-Jager, K. M., Stijnen, T., & Splijnter, T. A. W. (2009b). Exploratory study to improve a model to predict student failure in the first-year medical curriculum. In: Baars, G. J. A. (ed.) *Factors related to student achievement in medical school*. Hague: Lemma.

ITT 2777715 (secondary reference)

Based on five consecutive cohorts of students (cohorts 2001-2005) from a Dutch medical school, the authors developed a model to predict whether students would fail to pass the first-year curriculum within two years of study. The prediction with the highest specificity at the earliest stage was at six months in medical school. Pre-admission selection group, age and gender did contribute significantly to the predictive model. The regression equation comprised only one predictive factor, "passed no exam between four and six months". A survey was conducted with 129 students of cohort 2006 who suffered from serious study delay at four months in medical school. Before a voluntary encounter with the study counsellor, they were requested to fill in a questionnaire concerning: 1. Student participation in study-related activities. 2. Aspects of learning competence. 3. Aspects of discipline and time management. 4. Aspects of intrinsic motivation. 5. Aspects of integration. 6. Satisfaction with elements of the learning environment. 7. Personal circumstances. Besides the factors and items of the questionnaire, two other variables were included in this study: Whether students passed no exams out of two between four and six months (independent variable), and whether students failed to pass the first-year curriculum within two years of study (dependent variable). Only the factor 'student attendance at the optional plenary lectures' contributed significantly to the predictive model at 6 months. Assessed Weight of Evidence: Medium.

Belloc, F., Maruotti, A., & Petrella, L. (2009). University drop-out: an Italian experience. *Higher Education*, 60(2), 127–138.

ITT 2770591

University student dropout is a crucial issue for the universities' efficiency evaluation and funding. This study analyses the dropout rate of the Economics and Business Faculty of Sapienza University in Rome. The study makes use of administrative data on 9,725 undergraduate students enrolled in three-years bachelor programs from 2001 to 2007 and performs a Generalized Linear Mixed Model to investigate the factors affecting dropout. The aim is to improve the general understanding of university student dropout focusing on personal characteristics of students rather than on institutional aspects of the university. The empirical analysis unveils the statistically significant effect of

students' characteristics, like citizenship and income, and also the type of high school diploma and latency period, i.e. the number of years between the secondary education diploma and the enrolment in the university, while the main findings relate a high dropout probability to a high secondary school final mark and low individual student performance. Assessed Weight of Evidence: Medium.

Bennett, R. (2003). Determinants of Undergraduate Student Drop Out Rates in a University Business Studies Department. *Journal of Further and Higher Education*, 27(2), 123-141.

ITT 2770592

In this study a model intended to explain students' decisions to withdraw from their degree courses in the Business Studies Department of a 'new' university in Greater London, UK, is developed and tested using the structural equation modelling facility of AMOS 4 on data from 377 first and second year undergraduate students. From the structural equation analyses the study finds that financial hardship exerts a powerful influence on the dropout decision and significantly moderates the impacts on the decision to leave of: (i) academic performance, and (ii) the student's level of commitment to his/her programme. Furthermore, individual self-esteem plays a crucial role in encouraging or discouraging dropout when a student experiences low grades or substantial financial problems. The determinants of academic performance, student motivation, satisfaction and commitment is also explored via the structural equation models. Assessed Weight of Evidence: Medium.

Bodin, R. M & Millet, M. (2011). L'université, un espace de regulation: L'abandon dans les 1ers cycle à l'aune de la socialisation universitaire. *Sociologie*, 3(2), 225-242.

ITT 2771809

The authors aims at challenging what they call the paradigm of "echec scolaire" (educational defeat) and its focus on individual student characteristics as the main trigger of defeat. Their thesis is that the university should be understood as a regulating institution in Durkheimian sense. It is the purpose, or nature, of the university to make some student fail their exams or leave the chosen subjects. To support this view the authors point to the French dropout rates being stable despite societal change and changes in the composition of the student population. Data is composed of university register data of the two entering cohorts at L'académie de Poitiers 2006/7 and 2008/7. These data are complemented with data from the national statistics to provide information on students' social background. Furthermore the authors conducted a survey amongst dropouts (those who didn't reinscribe in second year) with a 1060/1663 response rate, to find out what they were doing after they left the university. Lastly, about 100 qualitative interviews were conducted with dropouts. Students from vocational high schools do worst, those from technical better and

those from classic the best. The subjects where low SES students drop out more are the ones with heavy individual workload and fewer organised lessons, e.g. medicine and law. As these subjects are also the most prestigious, universities thus reproduce societal inequalities, as Durkheimian regulating institutions. With the survey and interview data, the authors challenge the term “*échec scolaire*”. Many students did a year or two at university to prepare themselves for professional schools, others leave for employment. The dropout may well be part of a personal success. Assessed Weight of Evidence: Medium.

Di Pietro, G. (2004). The determinants of university dropout in Italy: A bivariate probit model with sample selection. *Applied Economics Letters*, 11, 187-191.

ITT 2762040

The study aims at finding determinants of university dropout, and attempts to correct for selectivity bias by making the calculation conditional of the enrolment decision. Data come from 20,635 high school graduates of whom 6,380 enrolled at university. The study uses a bivariate probit model to test whether variables predict enrolment at university after graduation from high school, and whether the students conditional of enrolment tends to drop out. The study finds that unaccounted factors driving an individual to enrol at university are highly correlated with drop out risk that cannot be explained by covariates. Further, the study finds that variables with a negative effect on the probability of enrolling at university have a positive effect on the probability of dropping out. Assessed Weight of Evidence: Medium.

Di Pietro, G., & Cutillo, A. (2008). Degree flexibility and university drop-out: The Italian experience. *Economics of Education Review*, 27(5), 546-555.

ITT 2758885

The study seeks to investigate whether the Italian university reform implemented in 2001 has contributed to reducing dropout rates from Italian universities. Data come from three cohorts of high school graduates and were collected three years after graduation (1998, 2001 and 2004). The study applies a bivariate probit model on three cohorts of high school graduates and conducts a decomposition analysis of the results. The study finds that the university reform decreased the probability of dropping out conditioned on the probability of enrolling at university, with four per cent for students enrolling in 2001 compared to students enrolling at university in 1995. Assessed Weight of Evidence: Medium.

Garcés, A., & Sánchez-Barba, L. F. (2011). An alternative educational approach for an Inorganic Chemistry laboratory course in Industrial and Chemical Engineering. *Chemistry Education Research and Practice*, 12(1), 101-113.

ITT 2758942

The study seeks to find effects of an alternative educational approach for teaching a laboratory course inorganic chemistry to students in two different engineering educations whom have traditionally had a large dropout rate from the course and high degrees of students failing to pass examination. Further, the study seeks to measure students' experiences with and opinions about the course. The study report results on examinations and drop out data combined with information on students satisfaction with the laboratory course in inorganic chemistry for five different cohorts of students, two before the teaching and examination methods were changed and three after. The study finds, that the dropout rate from the course is almost eliminated, and that students reports higher satisfaction with the course, both in form of content, examination form and difficulty in the study. Further, a higher percentage of the students' pass the final examination in the course. Assessed Weight of Evidence: Medium.

Glaesser, J. (2006). Dropping out of further education: A fresh start? Findings from a German longitudinal study. *Journal of Vocational Education and Training*, 58(1), 83–97.

ITT 2758964

This longitudinal study is based on the research question "Who are the young adults who are at risk of dropping out and what happens to them?" Both academic and vocational education are investigated. In the first statistic regression, the two groups are investigated separately, in the survival analysis they are not. Thus only the first regression analysis is of use to this review. During the years 1979–1983, adolescents between the ages of 12 and 16 had been examined annually. In 2002, approximately 1500 participated in a follow-up study. The study found that men are more than twice as likely to drop out as women, and students of urban origin three times more than those from rural areas. Parental divorce nearly doubled the dropout rate. Contradicting expectations, the author also found that having well educated parents, as well as being intelligent increased dropout rates. Neither learning motivation, nor self-efficacy had significant effect. Assessed Weight of Evidence: Medium.

Glocker, D. (2011). The effect of student aid on the duration of study. *Economics of Education Review*, 30, 177–190.

ITT 2762072

This study evaluates the effect of BAfoeG (Bundesausbildungsförderungsgesetz, The German national student aid) on the duration of study and the probability of graduation/ probability of dropout. The study is based on the hypothesis that a lack of economic resources will prolong the duration of studies and increase the dropout probability, as students are forced to spend more time working and less time studying. On the other hand, too much money can prolong study time as well, as it decreases the motivation of graduating and getting a full time job. The study contains an empirical analysis of data from the SOEP (Sozio-oekonomische Panel) and a hypothetic prediction of the effects of a BAfoeG increase. Data contain 787 individuals. 240 can be observed from the beginning of their study to the successful completion, 408 haven't finished their studies yet, and 139 are dropouts. Students are observed at the semester, providing a total of 6063 observations. The author applies a duration model in discrete time. The study shows that for students eligible for BAfoeG, dropout probability is over average every semester. Increase in the granted BAfoeG for one semester has a significant effect of 2.6 % decrease in dropout per 1000 € per semester. In contrast to the impact of BAfoeG, private transfers and scholarships significantly decrease the conditional probability to graduate, (i.e. students study longer) and effect on dropout is weaker than for BAfoeG. Neither parental nor individual background has significant impact. Applying effect sizes to predictive scenarios, the author concludes that a more generous BAfoeG rate would decrease the dropout probability per semester, but not increase graduation rate, only prolong the duration of study. The one exception is the case of students from low income families with no aid support. They have the highest dropout rates, and to them, the predicted effect would be an increase in graduation. Assessed Weight of Evidence: High.

Hailikari, T. K., & Nevgi, A. (2010). How to Diagnose At-risk Students in Chemistry: The case of prior knowledge assessment. *International Journal of Science Education*, 32 (15), 2079–2095.

ITT 2758994

This study explores how factors such as university major and gender are related to students' prior knowledge in an introductory chemistry course and how different types of prior knowledge relate to students' tendency to drop out of the course as well as to student achievement. A model of prior knowledge is proposed and on the basis of questionnaire data obtained from 193 students taking an introductory course in chemistry at the University of Helsinki, regression analyses are undertaken. The results of the regression analyses show that significant variation in prior knowledge exists in the introductory chemistry course. They also indicate that the major appears to be a factor that is clearly reflected in prior knowledge performance at the beginning of the studies. The students' major are also related to the final grade, but prior knowledge overrules its influ-

ence when they are both included in the regression model. Gender is found not to have a significant influence on prior knowledge test performance except for the task measuring knowledge of meaning. The quality of prior knowledge is clearly reflected in the pace of completing the course and in the tendency to drop out of the course. Students who have deeper levels of prior knowledge are found to be more likely to complete the course in the pre-scheduled time and to get higher final grades, whereas students who perform lower in the prior knowledge test are found to be more likely to either drop out or to not complete the course in pre-scheduled time. The study implies that making a distinction between different types of prior knowledge is a potential way to identify students who are in need of more support. Assessed Weight of Evidence: Medium.

Heublein, U., Hutzsch, C., Schreiber, J., Sommer, D., & Besuch, G. (2010). Ursachen des Studienabbruchs in Bachelor- und in herkömmlichen Studiengängen: Ergebnisse einer Bundesweiten Befragung von Exmatrikulierten des Studienjahres 2007/2008. HIS: Forum Hochschule, 2. Berlin: HIS GmbH.

ITT 2772961

This is a follow up on "Ursachen des Studienabbruchs: Analyse 2002, applying the same design and the same theoretical conception of dropout. The aim is to uncover the changes in dropout in general, and in relation to the new bachelor educations (the bachelor's degree was not implemented in Germany in 2000 when the former study was conducted). The study finds that dropout is ultimately caused by these trigger causes performance problems (20 %), financial problems (19 %), lack of motivation (18 %), study conditions (12 %), failed exams (11 %), family problems (e.g. parental duties) (7 % and, illness (4 %). These triggers were preceded by various factors such as personal background and study conditions. The authors find that, in relation to 2000, more students drop out due to performance problems (31 % vs. 20 %), and that students entering university with deficient qualifications are worse off than in 2000. In the bachelor educations, exams are more frequent in the first two semesters, leaving little time for weaker students to adapt to the requirements of university, and starting the selection process earlier. The authors conclude that the new structures of the bachelor educations make some students drop out, although they could have graduated if they had had more time before the first exams and if the institutions offered better teaching and tutoring to overcome deficient entry qualifications. Assessed Weight of Evidence: High.

Heublein, U., Spangenberg, H., & Sommer, D. (2003). Ursachen des Studienabbruchs: Analyse 2002. Hochschulplanung, 163. Hannover: HIS GmbH.

ITT 2772964

Heublein, U. (2003). Ursachen des Studienabbruchs: Motive für Studienabbrecher. Leipzig: HIS GmbH.

ITT 2772958 (secondary reference)

This report represents the analytical part of a study based on a representative sample of 3000 dropouts of students de-registered in 2000/2001 from 63 German universities and Fachhochschulen. As control group served a sample of 2,800 graduates and 1000 transfer students. The study finds that dropout is largely caused by professional reorientation (17 %), financial problems (17 %) and lack of motivation (16 %). Other causes are study conditions, academic performance, family problems, failed exams, and illness. Final triggers were increasing amount of labour, attitude towards studying and lack of abilities, performance and personal problems. A broad array of background conditions was found to be influential as well. Comparing these findings with information on the further paths of dropouts, the authors conclude that many of the dropouts should not have started at university in the first place. They should have been better counselled before applying for university. For some other dropouts, university was the right choice, but the subject was wrong, or the external barriers were too hard to overcome. Assessed Weight of Evidence: High.

Hoff, J., & Demirtas, M. (2009). Frafald blandt etniske minoritetsstuderende på universitetsuddannelserne i Danmark. København: Forlaget Politiske Studier.

ITT 2762308

Dropout among university students in Denmark with other ethnic origin than Danish is in other publications documented to be high. The purpose of this study is to research the characteristics of this dropout with the purpose of bringing forward possible solutions to support students with a different ethnic origin than Danish. The study builds on data on students from six Danish university institutions who delivered data on possible ethnic minority students. These students were sent a survey to gather information on student characteristics and variables possible influencing drop out. The study was theoretically informed by Tintos model of dropout from higher education and previously conducted Danish research in the area. Further, the study takes its point of departure in the assumption that academic and study milieu plays an important role. Findings are presented as descriptive statistics and for some parts of the study the use of linear regression models. The study collects survey responses from 997 students with a different ethnic origin than Danish out of 3007 asked to participate located in the records received from the universities. The responses received are assumed to be biased, but the study states that this is a problem with all other previously con-

ducted Danish research in the area, and the findings are therefore reflected in this research. The study finds a net dropout rate of eight percent among the students when transfer students are removed from the study leavers. This is compared to previous research findings of around 24 % dropout rates. The study concludes, that the dropout rate must be considered with a certain amount of uncertainty, as information on what the exact population of students with other ethnic origin than Danish are unknown. The study finds that academically professional circumstances together with a mix of personal and economic circumstances are the main reason for dropping out, whereas the effect of the social environment at the study is mediated of personal conditions. Lastly, the study finds that the students who dropped out are not in higher risk of marginalisation in society as they are having good connections to either the labour market or other parts of the educational system. Assessed Weight of Evidence: Medium.

Hovdhaugen, E., & Aamodt, P. O. (2009). Learning environment: Relevant or not to students' decision to leave university? *Quality in Higher Education*, 15(2), 177-789.

ITT 2770888

Hovdhaugen, E. (2009). Transfer and dropout: Different forms of student departure in Norway. *Studies in Higher Education*, 34(1), 1-17.

ITT 2770886 (secondary reference)

This study investigates to which degree the high proportion of students leaving Norwegian universities before graduation is due to on the one side dropout and on the other due to transfer to other higher education institutions. Further, the study investigates students' reasons for dropping out or transferring to another education. The study is based on a large postal survey to half of the students who commenced at one of the three largest universities in Norway in one of three disciplines (humanities, social science or science) in 1999. 50.2 % of students asked to participate answered the survey, giving information on 25,1 % of the population included. The survey was carried out in the winter of 2004/05. Information from the survey is analysed with binary linear regression and principal axis factor analysis with varimax rotation, with data weighted for differences in response rate between men and women. The study finds that of the about 50 percent of a year group that leaves the university before completion of a degree, most of the students completed another education at a university or university college. Of the university leavers, only 17 % turned out to be real drop outs. Further the study finds that the two types of student departure are related to opposite sets of factors influencing them. Background characteristics have an effect on drop out, while variables indicating motivation and choice of education seem to have an effect on transition to another education. The study concludes that student departure is a larger problem for the institution than for the individual. It further concludes that the institutions only have the possibility to influence some of the students leaving the institution, as it is not possible for the

institution to regulate many of the variables with influence on decisions for departure. Assessed Weight of Evidence: High.

Hovdhaugen, E. (2011). Do structured study programmes lead to lower rates of dropout and student transfer from university? *Irish Educational Studies*, 30(2), 237-251.

ITT 2770887

The aim of the study is to investigate, whether the Norwegian university reform introduced in 2003 led to a decrease in the number of students leaving university studies before completion of a degree, including whether dropout or transfer to other studies decreased, and whether the eventual effect of the university reform influenced students with different background equally. Using data from two cohorts of university students in the humanities, social science and science, the study conducts survival analyses to investigate whether the reform led to changes in students' likelihood of dropping out over time by comparing results of the two cohorts. Further, the study tested whether different background variables had any influence on this. The study finds that drop out rate did not decrease due to changes in study structure caused by the university reform, while transfer rates declined with around five percent each year. The reform did not seem to influence which students that dropped out or transferred, meaning that the reform did not have a positive effect on students who in general could be judged to be more at risk of non-completion. The study concludes, that changing study programme structures can have a small effect on student departure, but it is not the solely intervention to reduce drop out or transfer from universities. Assessed Weight of Evidence: Medium.

Johnes, G., & McNabb, R. (2004). Never Give Up the Good Times: Student Attrition in the UK. *Oxford Bulletin of Economics and Statistics*, 66(1), 23-47.

ITT 2762111

The aim of the study is to investigate the character of the attrition phenomenon in UK universities, including whether there should be differed between voluntary and involuntary drop out. The study is carried out as a large register data study of 94.563 students leaving university in 1993. The study builds on a previously developed data set collected from different registers containing information on students and university variables. Through multinomial logistic analyses, significant differences between different independent variables on students' hazard of dropping out voluntarily or involuntarily are calculated. The study finds, that it is relevant to differ between voluntary and involuntary drop out. Further it finds differences in causes of dropout between male and female students, and different effects of peers, subject and some university variables. The study concludes that as students (in the UK) at the time where the article was written increasingly will bear the costs of going to university this might lead to increasing dropout rates. Assessed Weight of Evidence: High.

Kinnunen, P., & Malmi, L. (2008). CS Minors in a CS1 Course. *ICER '08 Proceedings of the Fourth international Workshop on Computing Education Research, September 6-7, 2008: Sydney, Australia, 79-90.*

ITT 2767942

The aim of this study is to find out why students at a specific course in computer programming at a technical university in Finland for non-computer science students have a high chance of dropping out from the course, including reasons for dropping out, what students find difficult in the course and which strategies are used to accomplish the course. The study is a quantitative follow up of a previously conducted qualitative study of students in the specific course. Through a questionnaire to students who passed and dropped out of the course, the distribution of findings from the qualitative inquiry is researched. Two cohorts of students in the course (spring 2006 and spring 2007) were asked to fill in the questionnaire. Response rates differed between cohorts and whether students had passed or failed examination, with response around or below 50 %. The study finds that students who dropped out of the course had planned to receive less study points in the semester and were less motivated than students passing. Further, the study constructs five factors which seem to influence the decision to drop out of the course. The study concludes with a discussion on how the specific course could be changed at different levels to lower drop out rates. Assessed Weight of Evidence: Medium.

Kolland, F. (2002). *Studienabbruch: Zwischen Kontinuität und Krise. Eine empirische Untersuchung an Österreichs Universitäten.* Braumüller.

ITT 2772971

This book is based on a mixed methods study conducted amongst Austrian university dropouts. The quantitative investigation consists of a thorough questionnaire. 1,503 (52 %) out of 2,890 randomly assigned dropouts responded, a control group of 406 persisters was interviewed as well. 40 students who dropped out were interviewed qualitatively about the reasons for their dropout, and their current situation. Logistic regressions were conducted on the variables. The author investigated background variables such as gender and social background in relation to four main categories of dropout causes: Failed adaptation to university culture, Work, academic performance and institutional factors. The study found that women and students from Technical disciplines drop out earlier, while students in law and medicine more frequently drop out late. Students whose father have only compulsory schooling and the ones whose father have academic degrees show the same dropout rates, while those whose fathers have only a high school diploma drop out three times more. Age has no independent effect when one considers the covariates prior work experience, prior educational experience, rural background and marriage - variables that all correlate positively with increased dropout. The persisters more often matriculated with the aim of getting their dream job (Wunschberuf), while many dropouts have used the time at university to fill out gaps

('Lückenfüller'). Dropouts more often had their studies fully financed by the parents than persisters (40 % vs. 10 %), and more often they receive no parental economic support at all (39 % vs. 18%). Dropouts received student aid less than persisters (16 % vs. 29 % at the end of the study period). Work is found to be the most influential dropout factor, and its significance increases over proportionally from 20 hours per week. Assessed Weight of Evidence: High.

Larsen, U. (2000). Frafald og studiemiljø. Århus: Studenterrådet ved Aarhus Universitet.

ITT 2773010

The aim of this study is to find causes of attrition among students at Aarhus University, Denmark. With point of origin in a theoretical model developed to fit Danish university conditions, the study is carried out as a cross-sectional questionnaire survey. Data are analysed with logistic regression methods to estimate which element of the developed model that have significant influence on drop out. One cohort of students, those enrolled at the university in September 1998, received the questionnaire in May 2000. Of 3,072 students, 2,295 returned the questionnaire giving a response rate of 74.7 %. The study concludes that 23.5 % of the students dropped out. These could be divided into those who had not continued education (9.9 %) and those who continued in another education (13.6 %). Of the latter, 48 % continued at an education at another type of educational institution. The study develops a regression model over factors relating to drop out. This model shows among other things that academic integration plays a role in drop out, while social integration does not seem to be significant. The study concludes that three archetypes of dropouts could be developed from the data. Assessed Weight of Evidence: Medium.

Lassibille, G., & Gómez, L. N. (2008). Why do higher education students drop out? Evidence from Spain. *Education Economics*, 16(1), 89-105.

ITT 2770663

Lassibille, G., & Gómez, L. N. (2009). Tracking Students' Progress through the Spanish University School Sector. *Higher Education*, 58, 821–839

ITT 2763715 (secondary reference).

The aim of the article is to describe and analyse the incidence, timing and determinants of dropping out of higher education in Spain. The study is based on longitudinal data covering eight years of one full cohort of entrants to the University of Málaga, consisting of 28,999 student period records of 6,991 students. Descriptive information on drop out patterns are given and discrete-time hazard analyses are carried out on data. The study finds that drop out patterns are different for different areas of study and types of higher education. Further, the descriptive statistics reveal that drop out primarily takes place during the first year of studies, except for students in engineer-

ing at higher technical schools. The time analysis reveals some effects on drop out that are politically influential, among these financial support and students entrance qualifications. The study concludes that it would not be good for retention rates to lower entrance standards to university to satisfy the demand for higher education from an increasing pool of secondary-school leavers and that financial support to students should primarily be given during the first years of study. Assessed Weight of Evidence: High.

Loyens, S. M. M., Rikers, R. M. J. P., & Schmidt, H. G. (2007). The impact of students' conceptions of constructivist assumptions on academic achievement and drop-out. *Studies in Higher Education*, 32(5), 581-602.

ITT 2759144

The study seeks to test whether students' conceptions of constructivist learning activities influences students drop out rates at a psychology course using a problem-based learning curriculum. Collecting data on 180 first year students at one psychology course at a Dutch university, the study hypothesises a model for how students' conceptions of constructivist assumptions of learning, time used on studying and observed learning activities during course work influences drop out from the course. Maximum likelihood estimation is used to estimate parameters in the model. The study concludes that observed learning activities are highly predictable for dropout and study time predictor for dropout, mediating effects from the constructivist conceptions 'knowledge construction', 'self-perceived inability to learn' and 'motivation to learn'. Assessed Weight of Evidence: High.

May, S., & Bousted, M. (2004). Investigation of student retention through an analysis of the first-year experience of students at Kingston University. *Widening participation and lifelong learning*, 6(2), 42-48.

ITT 2770677

The aim of the study is to investigate reasons for student withdrawal and student experiences at their first year of studies at Kingston University, UK. The study uses a form of triangulation, where register data on students enrolled at the university in September 2001 are combined with phone interviews with students who dropped out and focus group interviews with students who continued their studies. The study builds primarily on categories and methods developed by M. Yorke. Student records of 3854 students were studied, revealing 137 first semester withdrawals and 280 later withdrawals. Of the students who withdrew, only 32 % participated in the phone interviews with the withdrawn students. The study findings are presented under three themes: Students disappointment with what they received for the money spent on enrolling in terms of perceived quality and organisation; lack of support from staff; forming of friendships and networks in the intro-

duction phase. The study concludes that approaches to improve student retention needs to be adapted to the needs of specific courses. Assessed Weight of Evidence: Medium.

Nelson, A. (2008). Looking into one's own practice: A Swedish study on gender in educational sciences. *Journal of Further and Higher Education*, 32(2), 139–149.

ITT 2759206

The aim of this article is to investigate gender differences in the introductory course in educational science at Halmstad University in Sweden. The study is carried out as a cross sectional study, comparing students' own reporting on experiences with the lessons and their own classroom behaviour. This information is combined with information on examination results and records on entrance qualifications. 337 students taking the introductory science course between the 2002 fall term and the 2005 fall term were included in the study. The study finds that there is a difference in entrance qualifications between male and female students, however, this difference is smaller than for university students in general. Further the study finds, that female students in general receive more ECTS credit than male students, but male and female students who pass the course receive grades at the same level. The study concludes that there are gender differences in the study examined in the article, but that these are smaller than expected. Assessed Weight of Evidence: Medium.

O'Neill, L. D., Hartvigsen, J., Wallstedt, B., Korsholm, L., & Eika, B. (2011). Medical school dropout - testing at admission versus selection by highest grades as predictors. *Medical Education*, 45, 1111-1120.

ITT 2770687

The main aim of this study was to evaluate the predictive validity of non-gradebased admission testing versus grade-based admission relative to subsequent dropout. This prospective cohort study followed six cohorts of medical students admitted to the medical school at the University of Southern Denmark during 2002–2007 (n = 1544). Half of the students were admitted based on their prior achievement of highest grades (Strategy 1) and the other half took a composite non-grade-based admission test (Strategy 2). Educational as well as social predictor variables (doctor-parent, origin, parenthood, parents living together, parent on benefit, university-educated parents) were also examined. The outcome of interest was students' dropout status at 2 years after admission. Multivariate logistic regression analysis was used to model dropout. Strategy 2 (admission test) students had a lower relative risk for dropping out of medical school within 2 years of admission (odds ratio 0.56, 95% confidence interval 0.39–0.80). Only the admission strategy, the type of qualifying examination and the priority given to the programme on the national application forms contributed significantly to the dropout model. Social variables did not predict dropout

and neither did Strategy 2 admission test scores. Selection by admission testing appeared to have an independent, protective effect on dropout in this setting. Assessed Weight of Evidence: High.

O'Neill, L. D., Wallstedt, B., Eika, B., & Hartvigsen, J. (2011). Factors associated with dropout in medical education: a literature review. *Medical Education*, 45, 440-454.

ITT 2770688

This review aimed to systematically and critically review studies dealing with factors found to be associated with dropping out of medical school. A systematic critical literature review of the international peer-reviewed research literature on medical education was performed. A primary search was conducted and subsequently supplemented with ancestry and descendency searches. The population of interest was medical students and the outcome was dropout. Abstract / title screening and quality assessment were performed by two independent researchers. Studies were assessed on six domains of quality: study participation; study attrition; predictor measurement; measurement of and accounting for confounders; outcome measurement, and analysis. Only studies that accounted for confounding were included in the final analysis. Of 625 studies found, 48 were quality-assessed and 13 of these were eventually included based on their fulfilment of our quality-related criteria. A range of entry qualifications seemed to be associated with greater chances of a student dropping out (odds ratio [OR] = 1.65–4.00). Struggling academically in medical school may be strongly associated with dropout. By contrast, no specific pattern of demographic variables was particularly important in relation to dropout. The effects of socio-economic, psychological and educational variables on dropout were not well investigated. Assessed Weight of Evidence: High.

Oosterbeek, H., & van Ewijk, R. (2010). Gender Peer Effects in University: Evidence from a Randomized Experiment. Tinbergen Institute Discussion Paper. TI 2010-113/3.

ITT 2762175

This study investigates peer effects of increasing the share of women in workgroups for first year students in Economics and Business at the University of Amsterdam. Students were assigned to workgroups in the order of their time of application, as this was meant to ensure a comparable level of motivation within the groups (highly motivated students are assumed to apply early). Groups were checked for comparability in age and prior education, and randomization was found to be valid. Groups consisted of one sixth to one half female students with alternative shares evenly distributed between these poles, in order to determine the effects of women share. Students were measured on dropout and the timing of dropout (up to one year) as well as on absenteeism and academic performance. At the end of the year, a survey was undertaken. Two subsequent cohorts were examined, 2007/8 (n= 593 students) and 2008/9 (n= 606 students). Analysis of register data showed a small effect on male dropout. The more women in the group, the later men

dropped out. However, at the end of the year, there was no effect on the overall dropout. There is no correlation between student ability and gender peer effect on the student. The survey was conducted based on the assumptions that the explanations from research on school children – that boys are more interruptive, and female dominated classes thus perform better – could not be transposed to university settings. Students were questioned on their own behaviour and the behaviour of their peers, related to distraction, paying attention, helpfulness, talking during class, competitiveness and anxiety to look dumb when asking questions. The respondents were not fully representative, as dropouts were underrepresented, the survey taking place at the end of the year. The authors conclude that men in university work groups do not have a disruptive effect. However the climate improves when women share increases, thanks to a greater helpfulness of women. On the other hand men talk more about irrelevant topics in class and ask fewer questions out of fear of looking dumb, which the authors conclude is a question of wanting to make a good impression on the women, and that the men talk about the women (since women do not report about talking more in class when women share increases). They therefore conclude that men perhaps stay longer at university because of the women, but that this has no positive effect as the dropout after a year remains the same. Assessed Weight of Evidence: High.

Ortiz, E. A., & Dehon, C. (2011). The Roads to Success: Analyzing Dropout and Degree Completion at University. Brussels: ECARES Working paper.

ITT 2762178

This study analyses factors that influence student behaviour throughout the whole path at university, using discrete-time methods for competing risks event history. The model of student departure focuses on the characteristics of students and their socioeconomic background as determinants of dropout and timely graduation using a database of newly enrolled students at the ULB, one of the biggest universities in the Belgian French community. The analysis proved that the result obtained by the student at the end of the first year at university is a very good predictor of the rest of the academic path. The mean student survival time at university is three years in the four-year degree program sample and around four years in the five-year program sample. Belgian students have a higher probability of getting a degree than foreign students, but they do not have a different profile in terms of dropout. Having a mother that holds a higher education degree makes one less likely to dropout and more likely to graduate. The impact of having a strong mathematical profile and finishing secondary schooling on time on the probability of dropping out is stronger at early ages of enrollment. This could be due to either a selection effect or a learning effect (what a student studied during high school has less effect after spending several years at university). Finally certain student characteristics or socioeconomic factors can influence differently the probability of graduating or dropping out. Students with a 'traditionnel' (academically oriented high school) background are less likely to drop out, but they are not more likely to graduate than students from 'rénové' schools. Assessed Weight of Evidence: Medium.

Pohlenz, P., Seyfried, M., & Tinsner, K. (2007). *Studienabbruch: Ursachen, Probleme, Begründungen*. VDM Verlag Dr. Müller.

ITT 2773000

Pohlenz, P., & Tinsner, K. (2004). *Bestimmungsgrößen des Studienabbruchs: eine empirische Untersuchung zu Ursachen und Verantwortlichkeiten. Potsdamer Beiträge zur Lehrevaluation* | 1.

ITT 2773001 (secondary reference)

This book report describes a study which aims at drawing, at the level of an individual university in Germany, a multifaceted picture of the events leading to university dropout. In addition, it is of central concern to illuminate, on the basis of the aspects identified as 'dropout promoting', the university's own room for improvements which should lead to reduced dropout. Using a number of bivariate analysis techniques as well as a multivariate logistic regression analysis on the basis of data obtained from a two-waved retrospective questionnaire survey of 539 exmatriculated students (graduates, dropouts and transfer students) at University of Potsdam in one specific academic year (2001/2002), the study findings can be summarised as follows: such university-based issues as study conditions (e.g. study demands, information and guidance), facilities within and around the university (e.g. computer and laboratory facilities, the library stock, living situation in Potsdam, cultural offerings, student jobs etc.) and organisation/content of learning processes/lectures are only to a minor degree responsible for students' decisions to drop out (the following factors are, however, found to be related significantly to dropout in the multivariate logistic regression analysis: the students' evaluation of the library stock, the living situation of the students, the number of students participating in lectures and the students' evaluation of the level of difficulty and time consumption of the study). In other words, the university cannot be held solely responsible for dropout and its room for improvements to reduce dropout is therefore equivalently somewhat limited. To have an influence on the decision to drop out, the abovementioned factors cannot stand alone and must be set in connection with the degree of unfulfilled expectations of the study and specific subject of study held by the student. Especially unfulfilled expectations of the subject of study held by the student is found to be the reason most frequently given by the dropouts as well as the most frequently given decisive factor for their dropout decision. Furthermore, the social background of the students (e.g. financial abilities, educational background of parents (father) and marital status) are also found to play a certain role in the decision to drop out. Assessed Weight of Evidence: Medium.

Qualter, P., Whiteley, H., Morleya, A., & Dudiak, H. (2009). *The role of Emotional Intelligence in the decision to persist with academic studies in HE. Research in Post-Compulsory Education*, 14 (3), 219–231.

ITT 2770695

This article describes two studies, the first investigating the effect of Emotional Intelligence (EI) on dropout within or right after first year at university. The second is experimental and based on an intervention adding EI training to the voluntary one week introductory course for new students. The sample from Study 1 that was conducted the preceding year, served as control group. In both studies, IE was tested through The Emotional Intelligence Scale, International Personality Item Pool Scale. Multivariate analysis of variance (MANCOVA) was used to control for personality traits. The only background variable was gender. Study 1 found the following no gender differences in EI. Persisters scored higher on each of the four separate aspects of EI emotion perception, mood regulation, regulation of other's emotions and utilisation of emotions. Study 2 found the intervention effective on those who scored low in the EI tests. They improved their EI skills except for mood regulation, and dropped out less. Unexpectedly, more students with an average score dropped out in the intervention year. The authors conclude that the high scoring students persist, regardless of eventual training in IE that they are in no need of. The intervention did not appear to increase the EI capabilities of those with average EI scores. They might respond only to a longer, more in depth Intervention. Further research is needed to explore why students from the low EI group that are brought up to the same level as the average EI group, respond differently in terms of withdrawal. Assessed Weight of Evidence: Medium.

Smith, J., & Naylor, R. (2001b). Dropping out of university: A statistical analysis of the probability of withdrawal for UK university students. *Journal of the Royal Statistical Society: Series A*, 164(2), 389-405.

ITT 2771760

The aim of this study is to identify the influence on individual student dropout of a large number of explanatory variables and to investigate the extent to which differences in these variables across institutions might explain the differences in dropout rates across universities. From individual level data for an entire cohort of undergraduate students in the 'old' universities in the UK, the study uses a binomial probit model to estimate the probability that an individual student will drop out of university before the completion of his/her degree course. The study examines the cohort of students (n=76,258) enrolling full time for a three- or four-year degree in the academic year 1989-1990. The study finds evidence to support both the hypothesis that the completion of courses by students is influenced by the extent of prior academic preparedness and the hypothesis that social integration at university is important. Findings also point to an influence of unemployment in the county of prior residence, especially for poorer male students. Applying the uncovered effect sizes to the ranking of universities, it is shown that the actual effect on dropout of high-ranking universities is not that big. Only the top six and the bottom twelve perform significantly different ($p=0.05$) from the median of the 54 universities. Finally, the study draws conclusions regarding the public policy of constructing university performance indicators in this area. Assessed Weight of Evidence: High.

Smith, J., & Naylor, R. (2001a). Determinants of degree performance in UK universities: a statistical analysis of the 1993 student cohort. *Oxford Bulletin of Economics and Statistics*, 63(1), 29-60.

ITT 2786263

This article reports on a study which examines determinants of degree performance in UK universities. The study focuses on the impact on degree performance of students' personal characteristics and, in particular, social class background, gender and academic background. The study also controls for the effects of degree subject studied and the institutional characteristics of the university attended, amongst other things. In part, the analyses in the study can thus be thought of as providing a statistical basis for the specification of a university performance indicator of student degree outcomes. The study is quantitative in that it examines the abovementioned factors through the use of ordered probit analyses on the basis of individual level university student records matched with data from official statistics on characteristics of the last school attended by each student prior to university entrance, for the 'full' cohort of undergraduate students who left a UK pre-1992 university in 1993. The study finds that university degree performance (including failure/dropout as the lowest category of degree performance) is influenced significantly by personal characteristics such as age and marital status. The study also finds that degree performance (failure/dropout) is influenced positively (negatively) by A-level score, positively (negatively) by occupationally-ranked social class background, and is significantly lower (higher) both for students who previously attended an Independent school prior to university entry and for male students. The study finds that, with few exceptions, the sign and significance of these effects are robust across separate regressions of degree performance on distinct population sub-samples, such as by university type and subject studied. The study also finds that the superior performance of females holds across all sub-samples, with the exception of students at Oxbridge where males perform better than females, on average. In general, very little of the gender performance gap can be explained by gender differences in observed characteristics. Assessed Weight of Evidence: High

Soo, K. T. (2009). Estimating the Production Function of University Students. Lancaster University Management School Working Paper, 2009/018.

ITT 2762212

This paper aims to estimate the production function of students in UK universities. Dependent variables are quality of degree and dropout rate, while entry qualifications, teaching quality measured by student satisfaction and quantity measured as self-reported class attendance, institution (e.g. research intensive or post 92 university) and the student's self-reported effort level serve as covariates. The study builds on secondary data gathered by combining the Higher Education Policy Institute (HEPI) survey 2006 and 2007 with the NSS (National Student Survey) from the same years. This allows establishing the analytical object, a sample of 1,312 university-subject-year ob-

servations from 108 different universities. Data are analysed using a Cobb-Douglas production function known from the economic growth literature. The author finds that entry score is the most important predictor. Student satisfaction also has positive influence, though only significantly so on the degree quality, not on dropout rate. Neither the number of hours attended, nor the amount of private study, has any significant effect. There is a positive institutional effect at research intensive universities. The study concludes that the heavy impact of entry qualifications inhibits the social mobility, as low SES students generally have poorer than average secondary school results. To increase equality in higher education, the government should therefore invest in improvements of secondary education. As universities with good reputation attract better students, improving ones reputation can help a university perform better. This strategy can help the system of higher education as a whole, if UK universities increase the attractiveness to skilled students from abroad. Assessed Weight of Evidence: High.

Suhre, C. J. M., Jansen, E. W. A., & Harskamp, E. G. (2007). Impact of degree program satisfaction on the persistence of college students. *Higher Education*, 54, 207–226.

ITT 2763560

The aim of this study was to investigate the relationship between program satisfaction, study behaviour and academic accomplishment among law students at Groningen University. Survey data were merged with university register data about study progression and dropout. Data were analysed with statistic regression and causal path analysis. Academic ability, satisfaction with the degree program, motivation, regular study habits and tutorial attendance explained about 49 % of the between students variance in the total number of credits students acquired and 31 % of the between student variance in dropout. Assessed Weight of Evidence: Medium.

Urlings-Strop, L. C., Stijnen, T., Themmen, A. P. N., & Splinter, T. A. W. (2009). Selection of medical students: a controlled experiment. *Medical Education*, 43, 175-183.

ITT 2770722

This study aims to discover, through a controlled experiment, whether cognitive and non-cognitive assessment would select higher achieving applicants to medical school than selection by lottery. The study uses a prospective cohort study design to compare 389 medical students who had been admitted by selection and 938 students who had been admitted by weighted lottery, between 2001 and 2004. Main outcome measures are dropout rates, study rate (credits per year) and mean grade per first examination attempt per year. Study rates in the four pre-clinical years of medical school are used to categorise students' performance as average or optimal. The study finds that pre-admission variables did not differ between the two groups. The main outcome of the selection experiment is that relative risk for dropping out of medical school was 2.6 times lower for selected students than for lottery-admitted controls (95% confidence interval 1.59–4.17). Significant differ-

ences between the groups in the percentage of optimally performing students and grade point average for first examination attempts were found only in the 2001 cohort, when results favoured the selected group. The results of the selection process took into account both the assessment procedure involved and the number of students who withdrew voluntarily. This study is the first controlled study to show that assessing applicants' non-cognitive and cognitive abilities makes it possible to select students whose dropout rate will be lower than that of students admitted by lottery. The dropout rate in the overall cohort was 2.6 times lower in the selected group. Assessed Weight of Evidence: High.

Van Bragt, C. A. C., Bakx, A. W. E. A., Bergen, T. C. M., & Croon, M. A. (2011b). Why students withdraw or continue their educational careers: A closer look at differences in study approaches and personal reasons. *Journal of Vocational Education & Training*, 63(2), 217-233.

ITT 2770600

The central goal of this study is to gain insight into students' study approach, their personal reasons and the relations between them regarding students who continue or withdraw from the educational system within one year. A questionnaire on personal reasons for withdrawal revealed three scales: (1) perception and experience of educational and organisational aspects, (2) pragmatic and personal circumstances, and (3) loss of interest in the future occupations. Personal reasons for continuing also produced three scales: 1) perception and experience of learning environment quality, 2) pragmatic and personal orientation, and 3) future occupational identity. Results of a questionnaire study undertaken in a 'Universities of Applied Science'-setting in the Netherlands show that students who continue their educational careers show higher scores on a meaningful integrative study approach when entering higher education, than students who withdraw. Withdrawing students' scores on meaningful integrative study approach are negatively related to perception and experience of educational and organisational aspects, whereas the superficial study approach positively correlates with pragmatic and personal circumstances. With regard to students who continue, high scores on the 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. Assessed Weight of Evidence: Medium.

Van Bragt, C. A. C., Bakx, A. W. E. A., Bergen, T. C. M., & Croon, M. A. (2011a). Looking for students' personal characteristics predicting study outcome. *Higher Education*, 61(1), 59-75.

ITT 2763933

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). Logistic regression analyses of data on 1,471 students from Universities of Applied Sciences in the

Netherlands gathered through questionnaires and student records 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. Assessed Weight of Evidence: Medium.

Vignoles, A. F., & Powdthavee, N. (2009). The Socioeconomic Gap in University Dropouts. The B.E. Journal of Economic Analysis & Policy, 9(1), 1-15.

ITT 2762237

In many countries, including the US and the UK, there is ongoing concern about the extent to which young people from lower-income backgrounds can acquire a university degree. Recent evidence from the UK suggests that for a given level of prior achievement in secondary school a disadvantaged student has as much chance of enrolling in a university as a more advantaged student. However, simply participating in higher education is not sufficient — graduation is important. Therefore, this paper investigates whether students from lower socioeconomic backgrounds have a higher rate of university dropout when compared to their wealthier counterparts, allowing for their differential prior achievement. Using a combination of school and university administrative data sets, the authors show that there is indeed a sizeable and statistically significant gap in the rate of withdrawal after the first year of university between advantaged and disadvantaged English students. This socioeconomic gap in university dropouts remains even after allowing for their personal characteristics, prior achievement in secondary school and university characteristics. In the English context, at least, this implies that retention in university of disadvantaged students is arguably a more important policy issue than barriers to entry for these students. Assessed Weight of Evidence: High.

Zwick, M. (2009). Stuttgarter Abbrecherstudie 2009. Zufriedenheit mit dem Studium und Abbruchneigung bei Studierenden des BA-Studiengangs Sozialwissenschaften an der Universität Stuttgart. Stuttgarter Beiträge zur Risiko- und Nachhaltigkeitsforschung, 14, 1-55.

ITT 2771298

This study aims at answering the question for what reasons a considerable proportion of bachelor students in Social Science at University of Stuttgart, Germany, has been found to withdraw from their study before completion. To answer this question, two cohorts of students who enrolled in the bachelor studies of Social Science in winter semester 2007/2008 and 2008/2009 are examined.

These students (still active or withdrawn) were attempted interviewed during the period December 2008 - May 2009. The data obtained from 111 structured telephone interviews are subsequently analysed quantitatively through the use of bivariate correlations and correspondence analysis. The study finds that the main criticisms given by the students can be grouped into the two categories: the academic content of the bachelor studies as well as the study conditions (i.e. the structure of the study and the study demands). Concerning the part of the study that compares the three groups of students (continuing students, dropouts and students who anticipate/consider dropout) the study finds that interest in the content of the subject/study as well as preferences for the chosen subject/study and institution will most likely lead to continuance. The type of preferred field of study also exerts an influence on the tendency to drop out/anticipation to drop out. Assessed Weight of Evidence: Medium.

11 Complete overview of references included in the systematic review

The following contains the total list of the 69 references which refer to the 62 studies included in the research mapping, i.e. in some cases more than one reference reports on different aspects of the same study. In such cases one of the references is referred to as the primary reference and the other as the secondary reference. Secondary references have been marked with a star (*).

Albrecht, A., & Nordmeier, V. (2001). Ursachen des Studienabbruchs in Physik. Eine explorative Studie. *Die hochschule*, 2.

Araque, F., Róldan, C., & Salguero, A. (2009). Factors influencing university drop out rates. *Computers & Education*, 53, 563–574.

Argentin, G., & Triventi, M. (2011). Social inequality in higher education and labour market in a period of institutional reforms: Italy, 1992–2007. *Higher Education*, 61(3), 309–323.

Arulampalam, W., Naylor, R. A., & Smith, J. P. (2004). A hazard model of the probability of medical school drop-out in the UK. *Journal of the Royal Statistical Society: Series A*, 167(1), 157–178.

*Arulampalam, W., Naylor, R. A., & Smith, J. P. (2001). A hazard model of the probability of medical school dropout in the United Kingdom. IZA Discussion Paper, 133.

Arulampalam, W., Naylor, R. A., & Smith, J. P. (2005). Effects of in-class variation and student rank on the probability of withdrawal: cross-section and time-series analysis for UK university students. *Economics of Education Review*, 24, 251–262.

Arulampalam, W., Naylor, R. A., & Smith, J. P. (2007). Dropping out of medical school in the UK: explaining the changes over ten years. *Medical Education*, 41, 385–394.

*Arulampalam, W., Naylor, R. A., & Smith, J. P. (2004). Factors affecting the probability of first-year medical student dropout in the UK: A logistic analysis for the entry cohorts of 1980-1992. Warwick Economic Research Papers, 618. Available from: <http://wrap.warwick.ac.uk/5/>

*Baars, G. J. A., Stegers-Jager, K. M., Stijnen, T., & Splijnter, T. A. W. (2009). A model to predict student failure in the first-year medical curriculum, 31-46. In: Baars, G. J. A. (ed.) *Factors related to student achievement in medical school*. Hague: Lemma.

Baars, G. J. A., Stegers-Jager, K. M., Stijnen, T., & Splijnter, T. A. W. (2009). Exploratory study to improve a model to predict student failure in the first-year medical curriculum, 47-60. In: Baars, G. J. A. (ed.) *Factors related to student achievement in medical school*. Hague: Lemma.

- Beaupère, N., Chalumeau, L., & Gury, N. (2007). L'abandon Des Études Supérieures: Rapport Réalisé Pour L'Observatoire National De La Vie Étudiante. CREM (UMR CNRS 6211). Dijon: Centre associé - Céreq de Rennes Centre Nantais de Sociologie.
- Belloc, F., Maruotti, A., & Petrella, L. (2009). University drop-out: An Italian experience. *Higher Education*, 60(2), 127–138.
- Bennett, R. (2003). Determinants of Undergraduate Student Drop Out Rates in a University Business Studies Department. *Journal of Further and Higher Education*, 27(2), 123-141.
- Bodin, R. M., & Millet, M. (2011). L'université, un espace de regulation: L'abandon dans les 1ers cycle à l'aune de la socialisation universitaire. *Sociologie*, 3(2), 225-242.
- Brunsdon, V., Davies, M., Shelvin, M., & Bracken, M., (2000). Why do HE Students Drop Out? A test of Tinto's model. *Journal of Further and Higher Education*, 24(3), 301-310.
- Davies, R., & Elias, P. (2003). Dropping Out: A Study of Early Leavers From Higher Education. Department for Education and Skills. Research Report RR386. Available from: <https://www.education.gov.uk/publications/eOrderingDownload/RR386.pdf>
- Department for Children, Education, Lifelong Learning and Skills (2009). Student Withdrawal from Higher Education. Research document No: 042/2009. Available from: <http://wales.gov.uk/docs/dcells/publications/090924studentwithdrawalreporten.pdf>
- Di Pietro, G. (2004). The determinants of university dropout in Italy: A bivariate probit model with sample selection. *Applied Economics Letters*, 11, 187-191.
- Di Pietro, G., & Cutillo, A. (2008). Degree flexibility and university drop-out: The Italian experience. *Economics of Education Review*, 27(5), 546-555.
- Galley, F., de Roten, F. C., & Alvarez, E. (2002). Abandon des études en 1ère année à l'EPFL - Volée 2000-2001. Lausanne: Observatoire EPFL.
- Garcés, A., & Sánchez-Barba, L. F. (2011). An alternative educational approach for an Inorganic Chemistry laboratory course in Industrial and Chemical Engineering. *Chemistry Education Research and Practice*, 12(1), 101-113.
- Gensch, K., & Kliegl, C. (2011). Studienabbruch – was können Hochschulen dagegen tun? Bewertung der Maßnahmen aus der Initiative „Wege zu mehr MINT-Absolventen“. Studien zur Hochschulforschung, 80. München: IHF - Bayerisches Staatsinstitut für Hochschulforschung und Hochschulplanung.
- Glaesser, J. (2006). Dropping out of further education: A fresh start? Findings from a German longitudinal study. *Journal of Vocational Education and Training*, 58(1), 83–97.

- Glocker, D. (2011). The effect of student aid on the duration of study. *Economics of Education Review*, 30, 177–190.
- Hall, J. C. (2001). Retention and Wastage in FE and HE. The Scottish Council for Research in Education, 1-59. Available from: http://www.ulster.ac.uk/star/resources/retention%20and%20wastage_hall.pdf
- Hailikari, T. K., & Nevgi, A. (2010). How to Diagnose At-risk Students in Chemistry: The case of prior knowledge assessment. *International Journal of Science Education*, 32(15), 2079–2095.
- Heublein, U., Hutzsch, C., Schreiber, J., Sommer, D., & Besuch, G. (2010). Ursachen des Studienabbruchs in Bachelor- und in herkömmlichen Studiengängen: Ergebnisse einer Bundesweiten Befragung von Exmatrikulierten des Studienjahres 2007/2008. HIS: Forum Hochschule, 2. Hannover: HIS GmbH.
- Heublein, U., Spangenberg, H., & Sommer, D. (2003). Ursachen des Studienabbruchs: Analyse 2002. *Hochschulplanung*, 163. Hannover: HIS GmbH.
- *Heublein, U. (2003). Ursachen des Studienabbruchs: Motive für Studienabbrecher. Leibzig: HIS GmbH.
- Hoff, J., & Demirtas, M. (2009). Frafald blandt etniske minoritetsstuderende på universitetsuddannelserne i Danmark. København: Politiske Studier.
- Hovdhaugen, E., & Aamodt, P. O. (2009). Learning environment: Relevant or not to students' decision to leave university? *Quality in Higher Education*, 15(2), 177-789.
- *Hovdhaugen, E. (2009). Transfer and dropout: different forms of student departure in Norway. *Studies in Higher Education*, 34(1), 1-17.
- Hovdhaugen, E. (2011). Do structured study programmes lead to lower rates of dropout and student transfer from university? *Irish Educational Studies*, 30(2), 237-251.
- Johnes, G., & McNabb, R. (2004). Never Give Up the Good Times: Student Attrition in the UK. *Oxford Bulletin of Economics and Statistics*, 66(1), 23-47.
- Kinnunen, P., & Malmi, L. (2008). CS Minors in a CS1 Course. *ICER '08 Proceedings of the Fourth international Workshop on Computing Education Research*, September 6-7, 2008: Sydney, Australia, 79-90.
- Knox, H. (2005). Making the transition from further to higher education: the impact of a preparatory module on retention, progression and performance. *Journal of Further and Higher Education*, 29(2), 103–110.

- Kolland, F. (2002). *Studienabbruch: Zwischen Kontinuität und Krise. Eine empirische Untersuchung an Österreichs Universitäten*. Wien: Braumüller.
- Larsen, M. Ø. (2008). Frafald og sabbatår: En minirapport der undersøger sammenhængen mellem frafald på Humaniora og antallet af sabbatår, som den studerende har haft mellem beståelse af den adgangsgivende eksamen og optagelsestidspunktet. Det Humanistiske Fakultet, Aarhus Universitet.
- Larsen, U. (2000). Frafald og studiemiljø. Studenterrådet ved Aarhus Universitet. Available from: <http://sr.au.dk/PDF/frafald/FFrapport.pdf>
- Lassibille, G., & Gómez, L. N. (2008). Why do higher education students drop out? Evidence from Spain. *Education Economics*, 16(1), 89-105.
- *Lassibille, G., & Gómez, L. N. (2009) Tracking Students' Progress through the Spanish University School Sector. *Higher Education*, 58, 821–839
- Lemaire, S. (2000). Les facteurs de réussite dans les deux premières années d'enseignement supérieur. Note d'information Ministère de l'éducation nationale 00.25. Paris: Ministère de l'éducation nationale.
- Leroux, J.-Y. (2010). Student failure in the first year of university in France: current situation and future prospects. *Education, Knowledge & Economy*, 4(3), 157–171
- López-Pérez, M. V., Pérez-López, M. C., & Rodríguez-Ariza, L. (2011). Blended learning in higher education: Students' perceptions and their relation to outcomes. *Computers & Education*, 56, 818-826.
- Lowis, M., & Castley, A. (2008). Factors affecting student progression and achievement: Prediction and intervention. A two-year study. *Innovations in Education and Teaching International*, 45(4), 333-343.
- Loyens, S. M. M., Rikers, R. M. J. P., & Schmidt, H. G. (2007). The impact of students' conceptions of constructivist assumptions on academic achievement and drop-out. *Studies in Higher Education*, 32(5), 581-602.
- May, S., & Bousted, M. (2004). Investigation of student retention through an analysis of the first-year experience of students at Kingston University. *Widening participation and lifelong learning*, 6(2), 42-48.
- Moura, I. C., & van Hattum-Janssen, N. (2011). Teaching a CS introductory course: An active approach. *Computers & Education*, 56, 475-483.

- Nelson, A. (2008). Looking into one's own practice: A Swedish study on gender in educational sciences. *Journal of Further and Higher Education*, 32(2), 139–149.
- Observatoire de la vie étudiante (2005). Après Une Première Année Dans L'enseignement Supérieur - Étude Réalisée Après Des Bacheliers 2002, De Basse Et Haute-Normandie, Entrant Dans L'enseignement Supérieur En 2002-2003 Et Non Réinscrits Dans La Même Formation En 2003-2004. Caen: PUN, Pôle Universitaire Normand.
- O'Neill, L. D., Hartvigsen, J., Wallstedt, B., Korsholm, L., & Eika, B. (2011). Medical school dropout: Testing at admission versus selection by highest grades as predictors. *Medical Education*, 45, 1111-1120.
- O'Neill, L. D., Wallstedt, B., Eika, B., & Hartvigsen, J. (2011). Factors associated with dropout in medical education: a literature review. *Medical Education*, 45, 440-454.
- Oosterbeek, H., van Ewijk, R. (2010). Gender Peer Effects in University: Evidence from a Randomized Experiment. Tinbergen Institute Discussion Paper. TI 2010-113/3. Available from: http://papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID1707465_code_356671.pdf?abstractid=1707465&mirid=3
- Ortiz, E. A., & Dehon, C. (2011). The Roads to Success: Analyzing Dropout and Degree Completion at University. Brussels: ECARES Working paper. Available from: http://www.ecares.org/index.php?option=com_docman&task=doc_details&gid=152&Itemid=204
- Pohlenz, P., Seyfried, M., & Tinsner, K. (2007). *Studienabbruch: Ursachen, Probleme, Begründungen*. VDM Verlag Dr. Müller.
- *Pohlenz, P., & Tinsner, K. (2004). Bestimmungsgrößen des Studienabbruchs: Eine empirische Untersuchung zu Ursachen und Verantwortlichkeiten. Potsdamer Beiträge zur Lehrevaluation|1.
- Qualter, P., Whiteley, H., Morleya, A., & Dudiak, H. (2009). The role of Emotional Intelligence in the decision to persist with academic studies in HE. *Research in Post-Compulsory Education*, 14 (3), 219–231.
- Smith, J., & Naylor, R. (2001). Dropping out of university: A statistical analysis of the probability of withdrawal for UK university students. *Journal of the Royal Statistical Society: Series A*, 164(2), 389-405.
- Smith, J., & Naylor, R. (2001). Determinants of degree performance in UK universities: A statistical analysis of the 1993 student cohort, *Oxford Bulletin of Economics and Statistics*, 63(1), 29-60.

- Soo, K. T. (2009). Estimating the Production Function of University Students. Lancaster University Management School Working Paper, 2009/018. Available from: <http://eprints.lancs.ac.uk/48961/1/Document.pdf>
- Suhre, C. J. M., Jansen, E. W. A., & Harskamp, E. G. (2007). Impact of degree program satisfaction on the persistence of college students. *Higher Education*, 54, 207–226.
- Triventi, M., & Trivellato, P. (2009). Participation, performance and inequality in Italian higher education in the 20th century: Evidence from the Italian Longitudinal Household Survey. *Higher Education*, 57(6), 681–702.
- Uolevi, N., Sajaniemi, J., Tedre, M., & Wray, S. (2007). Python and Roles of Variables in Introductory Programming: Experiences from Three Educational Institutions. *Journal of Information Technology Education*, 6, 199-213.
- Urlings-Strop, L. C., Stijnen, T., Themmen, A. P. N., & Splinter, T. A. W. (2009). Selection of medical students: A controlled experiment. *Medical Education*, 43, 175-183.
- Van Bragt, C. A. C., Bakx, A. W. E. A, Teune, P. J., Bergen, T. C. M., & Croon, M. A. (2011). Why students withdraw or continue their educational careers: A closer look at differences in study approaches and personal reasons. *Journal of Vocational Education & Training*, 63(2), 217-233.
- Van Bragt, C. A. C., Bakx, A. W. E. A., Bergen, T. C. M., & Croon, M. A. (2011). Looking for students' personal characteristics predicting study outcome. *Higher Education*, 61(1), 59-75.
- Vignoles, A. F., & Powdthavee, N. (2009). The Socioeconomic Gap in University Dropouts. The B.E. *Journal of Economic Analysis & Policy*, 9(1), 1-15.
- Walker, L. (2000). Predicting or guessing: The progress of Scottish Wider Access Programme (SWAP) students at the University of Glasgow. *International Journal of Lifelong Education*, 19(4), 342–356.
- Zwick, M. (2009). Stuttgarter Abbrecherstudie 2009. Zufriedenheit mit dem Studium und Abbruchneigung bei Studierenden des BA-Studiengangs Sozialwissenschaften an der Universität Stuttgart. *Stuttgarter Beiträge zur Risiko- und Nachhaltigkeitsforschung*, 14, 1-55.

12 References for textual commentary

- Andrade, M. S. (2008). Learning Communities: Examining Positive Outcomes. *Journal of College Student Retention*, 9(1), 1-20.
- Andrews, R. (2005). The Place of Systematic Reviews in Education Research. *British journal of educational studies*, 53(4), 399-416.
- Bean, J.P. (1982). Conceptual Models of Student Attrition: How Theory Can Help the Institutional Researcher. In: Pascarella, E.T. (Ed.), *Studying Student Attrition*. San Francisco (CA): Jossey-Bass.
- Bean, J. P., & Eaton, S. B. (2000). A Psychological Model of College Student Retention. In: J. M. Braxton (Ed.), *Reworking the Student Departure Puzzle*. Nashville: Vanderbilt University Press, 48-61.
- Berger, J.B., & Braxton, J.M. (1998). Revising Tinto's interactionalist theory of student departure through theory elaboration: Examining the role of organizational attributes in the persistence process. *Research in Higher Education*, 39(2), 103-119.
- Biggs, J. (2003). *Teaching for Quality Learning at University*. Maidenhead: Open University Press.
- Bound, J., & Turner, S. (2011). Chapter 8 - Dropouts and Diplomas: The Divergence in Collegiate Outcomes. In: *Hanushek, E. A., Machin, S., & Woessmann, L. (Eds.), Handbook of the Economics of Education*, Elsevier 2011(4), 573-613. Available at: <http://www.sciencedirect.com/science/article/pii/B9780444534446000080>
- Bourdieu, P. (1990). *Homo Academicus*. Cambridge: Polity Press.
- Bourdieu, P. (1998). *Practical Reason: On the Theory of Action*. Stanford: Stanford University Press.
- Borenstein, M., Hedges, L. V., Higgins, J. P. T., & Rothstein, H. R. (2009). *Introduction to meta-analysis*. Chichester: Wiley.
- Cabrera, A. F., Castaneda, M. B., Nora, A., & Hengstler, D. (1992). The Convergence between Two Theories of College Persistence. *Journal of Higher Education*, 63(2), 143-164.
- Cabrera, A. F., Nora, A., & Castaneda, M. B. (1993). College Persistence: Structural Equations Modeling. Test of an Integrated Model of Student Retention. *Journal of Higher Education*, 64(2), 123-139.
- DMA/Research (2002). *Frafald på lange, videregående uddannelser: Frafaldsårsager*. Aarhus: DMA/Research.

- Edwards, M., & Cangemi, J. P. (1990). The college dropout and institutional responsibility. *Education*, 111(1), 107-117.
- El-Khawas, E. (2006). Chapter 3 – Accountability and Quality Assurance: New Issues for Academic Inquiry. In: Forest, J. J. F., & Altbach, P. G. (Eds.), *International Handbook of Higher Education*. Springer, 23-37.
- Enders, J. (2006). Chapter 2 – The Academic Profession. In: Forest, J. J. F., & Altbach, P. G. (Eds.), *International Handbook of Higher Education*. Springer, 5-21.
- European University Association (2012). *Trackit Conference*. Retrieved on the 25th of September 2012 from: <http://www.eua.be/events/trackit-copenhagen.aspx>
- Gaebel, M., Hauschildt, K., Mühleck, K., & Smidt, H. (2012). Tracking Learners' and Graduates' Progression Paths. TRACKIT. EUA Publications 2012. Available at: <http://www.eua.be/eua-work-and-policy-area/building-the-european-higher-education-area/projects/tracking-learners-and-graduates-progression-paths.aspx>
- Gough, D., Oliver, S., & Thomas, J. (2012). *An introduction to Systematic Reviews*. London: Sage Publications.
- Harvey, L. et al. (2006). The first year experience: A Review of literature for the higher education academy. London: Higher Education Academy.
- Hauptman, A. M. (2006). Chapter 6 – Higher Education Finance: Trends and Issues. In: J. J. F. Forest & P. G. Altbach (Eds.), *International Handbook of Higher Education*. Springer, 83-106.
- Heublein, U., Spangenberg, H., & Sommer, D. (2003). Ursachen des Studienabbruchs. Analyse 2002. Hochschulplanung Band 163. HIS GmbH Hannover 2003.
- Hovdhaugen, E. (2009). Transfer and dropout: Different forms of student departure in Norway. *Studies in Higher Education*, 34(1), 1-17.
- Jones, R. (2008). Student retention and success: a synthesis of research. London: Higher Education Academy. Available at: <http://www.heacademy.ac.uk>
- Keller, G. (2006). Chapter 12 – Higher Education Management: Challenges and Strategies. In: James J. F. Forest & Philip G. Altbach (Eds.), *International Handbook of Higher Education*. Springer, 229-242.
- Larsen, U. (2000). *Frafald og Studiemiljø*. Aarhus: Studenterrådet ved Aarhus Universitet.

- Marton, F., & Saljö, R. (1976). On qualitative differences in learning. *British Journal of Educational Psychology*, 46, 115-27.
- Metzner, B. S., & Bean, J. P. (1987). The Estimation of a Model of Nontraditional Undergraduate Student Attrition. *Research in Higher Education*, 27, 15-38.
- OECD (2012). *Education at a Glance 2012*. OECD Indicators. Paris: OECD.
- Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., et al. (2006). *Guidance on the Conduct of Narrative Synthesis in Systematic Reviews*. ESRC Methods Programme.
- Reay, D. (2010). Fitting in or standing out. Working class student in UK higher education. *British Educational Research Journal*, 36(1), 107 – 124.
- Pascarella, E. T. (1980). Student-Faculty informal Contact and College Outcome. *Review of Educational Research*, 50, 545-595.
- Pascarella, E. T., & Terenzini, P. T. (2005) *How college affects students. Volume 2. A third decade of research*. San Francisco, CA: Jossey-Bass.
- Patton, L. D., Morelon, C., Whitehead, D. M., & Hossler, D. (2006). Campus-Based Retention Initiatives: Does the Emperor Have Clothes? *New Directions for Institutional Research*, 130, 9-24.
- Prebble, T., Hargraves, H. , Leach, L., Naidoo, K., Suddaby, G., & Zepke, N. (2004). Impact of Student Support Services and Academic Development Programmes on Student Outcomes in Undergraduate Tertiary Study: A Synthesis of the Research. Wellington: Ministry of Education, New Zealand.
- Ramsden, P. (2003). *Learning to teach higher education*. London: Taylor & Francis.
- Rieper, O. & Hansen, H. F. (2007). *Metodedebatten om evidens*. AKF Forlaget oktober 2007.
- Sporn, B. (2006). Chapter 9 – Governance and Administration: Organizational and Structural Trends. In: Forest, J. J. F., & Altbach, P. G. (Eds.), *International Handbook of Higher Education*. Springer, 41-57.
- St. John, E. P., Cabrera, A. F., Nora, A., & Asker, E. H. (2000). Economic Influences on Persistence Reconsidered: How Can Finance Research Inform the Reconceptualization of Persistence Models? In: J. M. Braxton (Ed.), *Reworking the Student Departure Puzzle* (pp. 29-47). Nashville: Vanderbilt University Press.

- Statistik Schweiz (2012a). *Das Bildungssystem in der Schweiz*. Website for Statistik Schweiz. Retrieved on the 25th of September 2012 from: <http://www.bfs.admin.ch/bfs/portal/de/index/themen/15/02.html>
- Statistik Schweiz (2012b). *Bildungssystem Schweiz – Indikatoren. Abschlüsse und Kompetenzen – Maturitätsquote*. Website for Statistik Schweiz. Retrieved on the 25th of September 2012 from: <http://www.bfs.admin.ch/bfs/portal/de/index/themen/15/17/blank/01.indicator.405102.4045.html?open=104,9#9>
- Tinto, V. (1975). Dropout from Higher Education: A theoretical synthesis of recent research. *Review of Educational Research*, 45(1), 89-125.
- Tinto, V. (1987). *Leaving College: Rethinking the causes and cures of student attrition*. Chicago: Chicago University Press.
- Tinto, V. (1993). *Leaving College: Rethinking the causes and cures of student attrition*. 2nd ed. Chicago: Chicago University Press.
- Tinto, V., Russo, P., & Kacel, S. (1994). Constructing educational communities: Increasing retention in challenging circumstances. *Community College Journal*, 64(4), 26-29.
- Tinto, V. (1998). Colleges as Communities: Taking Research on Student Persistence Seriously. *The Review of Higher Education*, 21(2), 167-177.
- Tinto, V. (2006-2007). Research and practice of student retention - what's next? *J. College Student Retention*, 8(1), 1-19.
- Torgerson, C. (2003). *Systematic reviews*. London: Continuum International.
- Troelsen, R. (2011). Frafald på de videregående uddannelser. Hvad ved vi om årsagerne? *Dansk Universitetspædagogisk Tidsskrift*, 10, 37-44.
- Trow, M. (2006). Chapter 13 – Reflections on the Transition from Elite to Mass to Universal Access: Forms and Phases of Higher Education in Modern Societies since WWII. In: Forest, J. J. F., & Altbach, P. G. (Eds.), *International Handbook of Higher Education*. Springer, 243-280.
- Ulriksen, L., Madsen, L. M., & Holmegaard, H. T. (2010). What do we know about explanations for drop out/opt out among young people from STM higher education programmes? *Studies in science education*, 46(2), 209-244.
- Valentine, J. C., Hirschy, A. S., Bremer, C. D., Novillo, W., Castellano, M., & Banister, A. (2009). *Systematic Reviews of Research: Postsecondary Transitions - Identifying Effective Models*

and Practices. Louisville: National Research Center for Career and Technical Education, University of Louisville.

Valentine, J. C., Hirschy, A. S., Bremer, C. D., Novillo, W., Castellano, M., & Banister, A. (2011). Keeping At-Risk Students in School: A Systematic Review of College Retention Programs. *Educational Evaluation and Policy Analysis*, 33,(2), 215–229.

Walters, P. B., Lareau, A., & Ranis, S. H. (Eds.). (2009). *Education research on trial: Policy reform and the call for scientific rigor*. New York: Routledge.

Weiss, C. H. (1998). *Evaluation*. Second Edition. Upper Saddle River, New Jersey: Prentice Hall.

Wholey, J.S. (1987) *Organizational excellence: Stimulating quality and communicating value*. Lexington, MA: Lexington Books.