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**A Research Mapping
of Dropout Phenomena at Universities:
What is Dropout? Why does Dropout Occur? What Can
be Done at Universities to Prevent or Reduce it?**

Technical Report

by

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**Danish Clearinghouse
for Educational Research**



DANISH CLEARINGHOUSE
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DANISH SCHOOL OF EDUCATION
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A Research Mapping of Dropout Phenomena at Universities:

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

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Foreword

This is the full technical report of a research mapping 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 causes for dropout or effects of measures undertaken by universities to prevent or reduce dropout.

The project was commissioned by The Swiss Council for Educational Research (CORECHED). Work on the project was carried out in the period 01.03.2012-29.10.2012.

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 obtainment 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 October 2012.

Michael Søgaard Larsen

Copenhagen, October, 2012

Contents

1	Introduction	11
1.1	Background	11
1.2	General background and problem area.....	11
1.3	Aims	14
1.4	Review group.....	14
1.5	The structure of this report	15
2	Methods used in the research mapping.....	17
2.1	Design and method	17
2.2	Conceptual scope	17
2.3	Searches.....	20
2.4	Screening	23
2.4.1	Phase 1: Screening of references	24
2.4.2	Phase 2: Full text screening	24
2.4.3	Phase 3: Iteration, the setting of the final scope.	25
2.5	Coding and data extraction	27
2.6	Summary of the review process	29
3	Dropout phenomena at universities: concepts and theories	31
3.1	Conceptualising university dropout	31
3.2	Consequences of university dropout - what consequences does it have and who is affected when university dropout occurs?	34
3.3	The political and economic context of university dropout	36
3.4	Theoretical models of university dropout.....	38
3.5	Summary	42
4	Research mapping and assessment	45

4.1	Context of the studies	45
4.2	Content of the studies	47
4.2.1	Curriculum area(s) covered	47
4.2.2	Operationalisation of dropout	49
4.2.3	Enquired aspects of dropout	51
4.2.4	Studies investigating causes of dropout.....	53
4.2.5	Studies investigating effects of dropout reducing measures at institutional level	54
4.3	Design of the studies	55
4.3.1	Overall study design	55
4.3.2	Study timing.....	56
4.3.3	Data sources.....	57
4.3.4	Sample sizes.....	58
4.3.5	Methods of data analysis	59
4.4	Identification of a ‘British’ and ‘German’ research approach	60
4.4.1	Strengths and weaknesses of the two research approaches and the kind of evidence to be obtained from each	64
4.5	Quality of the studies	66
4.6	Summary	73
5	Prospects for a synthesis.....	77
5.1	Introduction	77
5.1.1	Aspects of dropout in focus in the studies.....	77
5.2	Empirical contributions to an understanding of what dropout is	78
5.2.1	Theoretical foundation of the studies.....	78
5.2.2	Definitions of dropout	79
5.2.3	Unfolding the dropout term	80

5.3	Empirical examinations of why dropout occurs	80
5.3.1	Aim of the studies addressing causes for dropout	81
5.3.2	Causes for dropout	81
5.3.3	Which subject areas are covered?	82
5.3.4	Analytical levels in the dropout phenomena	83
5.3.5	Overall designs and data collection in the studies covering causes of dropout 84	
5.3.6	University cultures/countries included in the study	88
5.4	Empirical examinations of what can be done to reduce dropout.....	89
5.4.1	Which interventions are used to reduce dropout?.....	90
5.4.2	Reflections on a synthesis partly based on non-European reviews.....	90
5.4.3	Four non-European systematic reviews on dropout	91
5.4.4	The relevance and usefulness of the reviews	92
5.5	Quality base of the synthesis: the 44 studies.....	92
5.6	The prospects of a synthesis	94
5.7	Conclusion on possibilities for a synthesis	95
6	Appendix 1: Search profiles	97
7	Appendix 2.....	101
7.1	EPPI-Centre tool for education studies V2.0 - editable version	101
7.2	Keywording tool.....	123
8	References to the Chapter 5 studies.....	125
9	Complete overview of references included in the research mapping.....	149
10	References to textual commentary	155

Tables

Table 2.3.1 Searched databases, ressources and search hits	21
Table 2.4.1 Screening: result of all phases.....	27
Table 4.1.1 Country of conduct	46
Table 4.1.2 Publication type	47
Table 4.2.1 Curriculum area(s) investigated	48
Table 4.2.2 Operationalisation of university dropout.....	50
Table 4.2.3 Enquired aspects of university dropout	52
Table 4.2.4 Investigated dropout causes	53
Table 4.3.1 Overall study design.....	56
Table 4.3.2 Study timing	57
Table 4.3.3 Data sources.....	57
Table 4.3.4 Achieved sample sizes	58
Table 4.3.6 Method of data analysis.....	59
Table 4.4.2 Study timing, ‘British’ vs. ‘German’ research approach.....	64
Table 4.5.1 Adequacy of description	67
Table 4.5.2 Are ethical concerns/problems raised.....	68
Table 4.5.3 Does ethical concerns/problems exist.....	68
Table 4.5.4 Sufficient justification of the conduct of study	68
Table 4.5.5 Appropriateness of research design for addressing research questions posed	69
Table 4.5.6 Sufficient attempts to establish repeatability/reliability and validity/trustworthiness in the data collection and data analysis process	69
Table 4.5.7 Extent to which research design and methods are able to rule out sources of error/bias	69
Table 4.5.8 Whether and how the generalisability of the study is addressed.....	70

Table 4.5.9 Reviewers and authors differ over the study findings.....	71
Table 4.5.10 Sufficient attempts to justify the conclusions making them trustworthy....	71
Table 4.5.11 Weight of evidence	72
Table 5.1.1 Aspect of dropout in focus of the study.....	78
Table 5.2.1 Educational level at which the study investigates dropout	79
Table 5.2.2 Analytical level of dropout analyses. The level of sample selection.....	80
Table 5.3.1. Investigated dropout causes.	81
Table 5.3.2 Curriculum areas covered by the included studies.	83
Table 5.3.3. Study timing.	84
Table 5.3.4 Achieved sample sizes	85
Table 5.3.5 What is the design used in the study?	86
Table 5.3.6 Methods of data collection	87
Table 5.3.7 Methods of data analysis	87
Table 5.3.8 Research traditions.....	88
Table 5.3.9 In which country or countries was the study carried out?	89
Table 5.5.1 Trustworthiness of conclusion	93
Table 4.5.11 Weight of evidence	94

Figures

Figure 1.2.1 Actual and expected rates of graduates of Upper-SecondarySchool	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 systematic research mapping	30
Figure 3.1.1 Institutional levels university dropout can occur at	33
Figure 3.2.1 The ‘consequences’ of university dropout: consequence levels and areas possibly affected when university dropout occurs	35
Figure 3.4.1 Tinto’s model of university student dropout	41
Figure 4.4.3 Data sources, ‘British’ vs. ‘German’ research approach.....	63
Figure 4.4.4 Causes of university dropout investigated, ‘British’ vs. ‘German’ research approach	63
Figure 4.4.5 Achieved sample sizes, ‘British’ vs. ‘German’ research approach	64

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 kantonalen 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).

The Danish Clearinghouse for Educational Research, a unit at the Department of Education at Aarhus University has since it was established in 2006 worked with evidence in educational research. 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 research mapping presented in the present report consists of a mapping of research that addresses dropout phenomena at universities.

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

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).

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

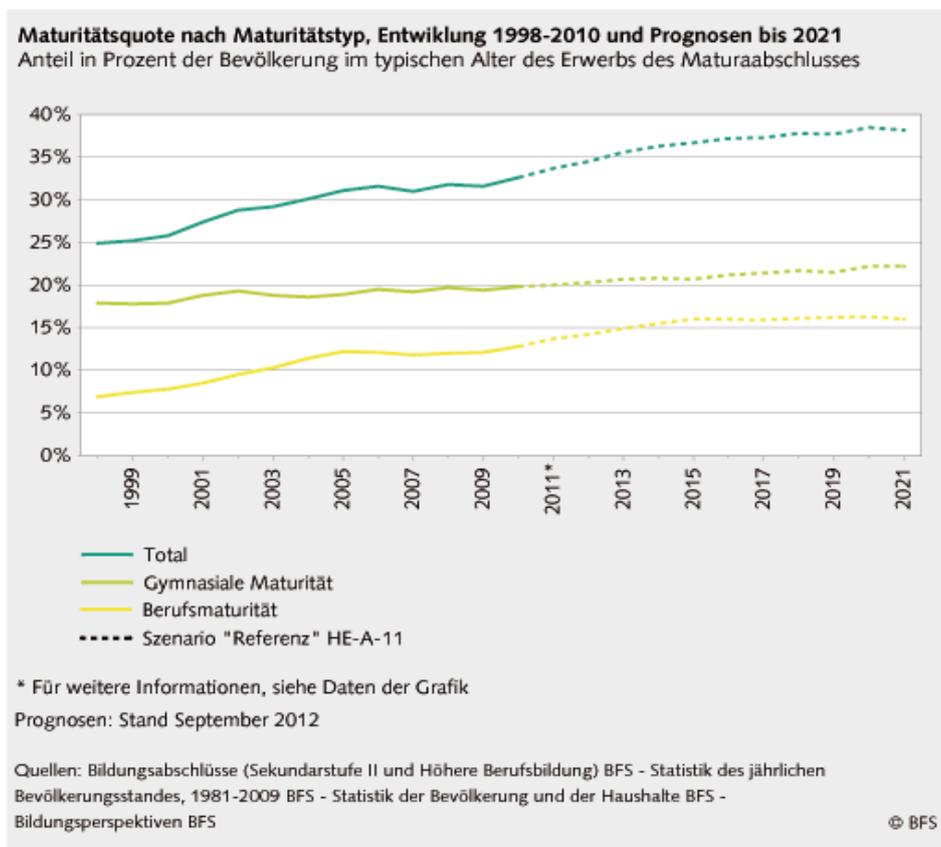


Figure 1.2.1 Actual and expected rates of graduates of Upper-Secondary School in Switzerland by type of baccalaureate.
 Source: Statistik Schweiz (2012b).

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 seen 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.

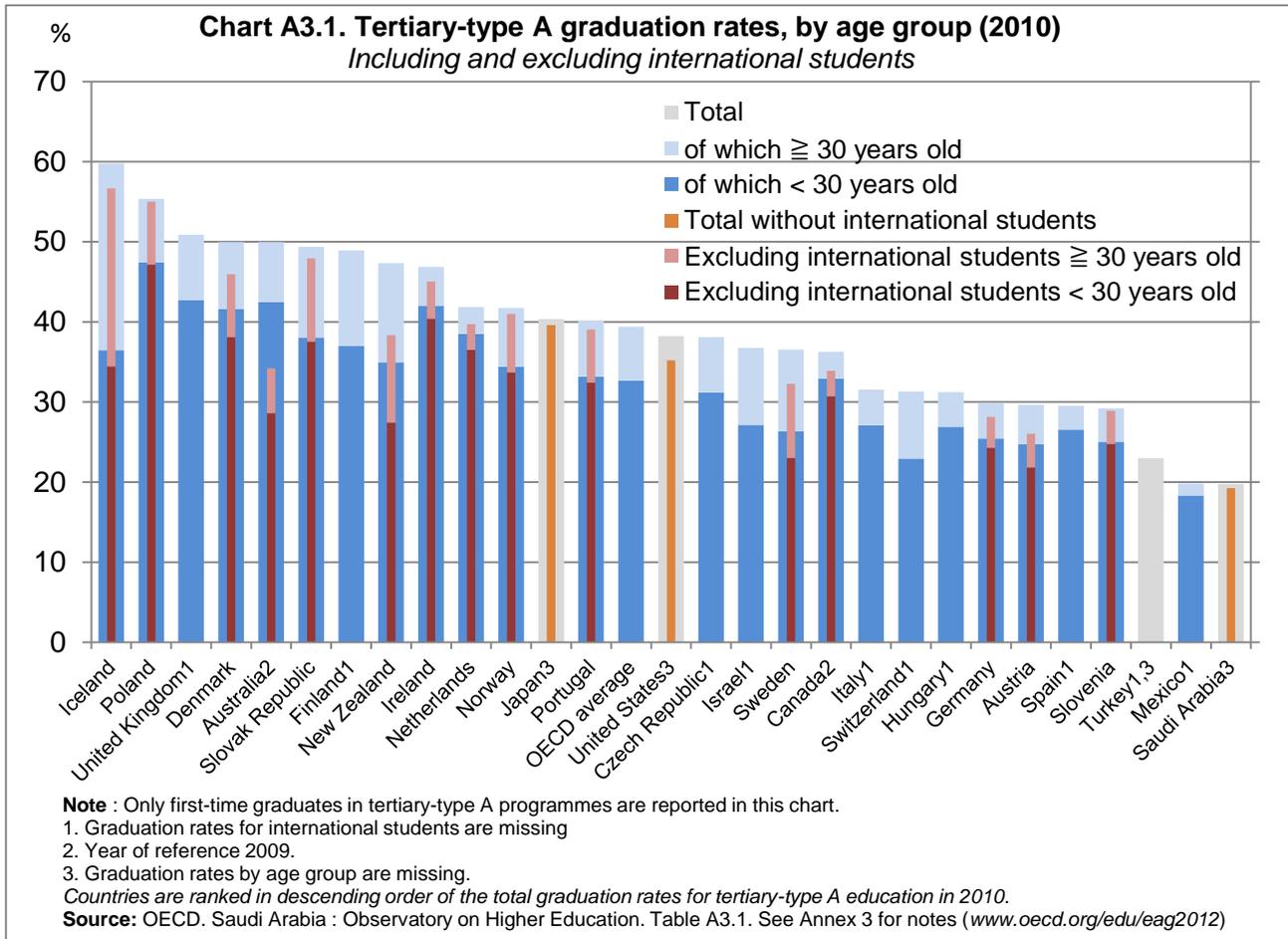


Figure 1.2.2 Tertiary-type A graduation rates (2010)
Source: OECD (2012: 60).

Taking this into consideration it is not surprising, as seen in Figure 1.2.3 below, that the difference in the ‘tertiary education attainment rate’⁵ 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 Switzerland among the age cohort of 55-64 year olds are observed to have a higher ‘tertiary education attainment

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).

rate' than Switzerland among the younger age cohort of 25-34 year olds, cf. Figure 1.2.3.

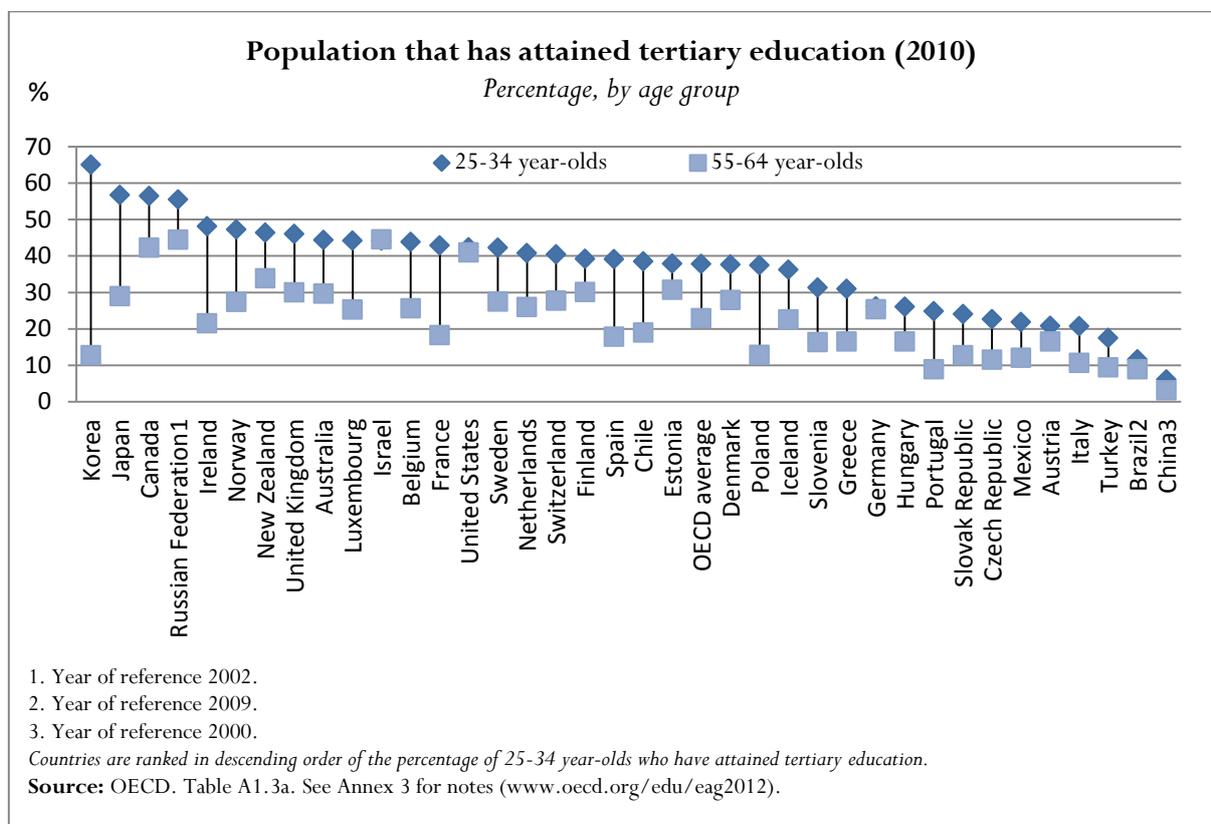


Figure 1.2.3 Population that has attained tertiary education (2010).
 Source: OECD (2012: 26).

1.3 Aims

The aims of this research mapping can be summarised as this:

What research has been carried out to examine these questions:

- What is dropout from university studies?*
- Why do such dropout phenomena occur at universities?*
- What can be done by the universities to reduce dropout phenomena?*

In the research mapping the relevant empirical research will be characterised with focus on aim, content, design, results and quality.

1.4 Review group

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

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

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

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

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.

The review group carried out quality assessment of the relevant research in cooperation with Danish Clearinghouse. The review group also functioned as reviewers of the overall process from scoping, searching, screening, redescription and data extraction to the research mapping. Finally the review group has reviewed the present report. There have been no conflicts of interest for any member of the review group during their work with this research mapping. I.e. close relationships between authors of research studies 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 methodology applied in the research mapping. 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 'the dropout phenomena' and the theories associated with it. The consequences of dropout phenomena and the political and economic context of it are analysed according to the scope for this research mapping.

Chapter 4 gives a general characterisation of all included relevant studies. Both a general description of all relevant research studies and an assessment of research quality of included studies can be found here.

In chapter 5 the prospects for a possible synthesis is considered. The chapter gives answers to these questions: Is a research synthesis possible based on the present research mapping? What can be expected from such a synthesis? Which kind of methodological approach is it possible to apply in such a synthesis?

The report has several appendixes: Chapter 6 describes all search profiles applied for searches of databases and resources. In chapter 7 is offered an example of a full redescription of one of the studies in the research mapping.

Chapter 8 lists all references and abstracts of the 44 studies with medium or high evidence weight which are analysed in chapter 5.

Chapter 9 offers the list of all references of relevant research for this research mapping. These are all the studies analysed in chapter 4.

Chapter 10 is a list of references applied in the commentary text of this report.

2 Methods used in the research mapping

2.1 Design and method

The present research mapping is the result of following standardised procedures described in two documents developed by *Danish Clearinghouse for Educational Research: 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 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 research mapping the procedure was adapted to the conceptual universe of the research in question (cf. section 2.5).

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

2.2 Conceptual scope

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 causes for 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 research mapping has as a point of departure applied these concepts:

Dropout: Withdrawal from a university degree program before it is completed.⁸ Temporary withdrawal due to illness pregnancy etc. is not considered to be cases of dropout.

Students' intentions to withdraw, e.g. as stated in a survey, are not considered to qualify as dropout. 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 dropout concept presupposes that students have actually been active in their university studies. It is however not all universities which keep records of students' study activities prior to examinations. This phenomenon, 'no attendance', presents a challenge for the research on dropout. Also the phenomena 'change of study' where students have started to study one subject and after a shorter or longer period of time change to another, must be taken into consideration when analysing dropout phenomena at universities.

Dropout could be based on the student being either:

- Pushed out by features within, the chosen study program and their relations to the student's interests and competencies (drop-out) 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 (opt-out).

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

In order to be relevant in the present analysis, studies must analyse direct causes of dropout phenomena or effects of programs directly aimed at reducing dropout. In the first case: Studies which only give information on completion are not relevant. In the second case: Studies must be of interventions directed at all students or at risk (for dropout) students. For these studies completion rate could be a relevant effect.

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

This was the conceptual scope from the beginning of the systematic review process which governed the searching for and screening of studies. A more complete analysis of the concept of dropout phenomena is offered in Chapter 3.

Effects: That something has an effect means that a causal relation exists, i. e. if we know that B follows from A, we can state that A is the cause of B. In the present review the following effects will be considered when measures and interventions directed at reducing dropout are researched:⁹

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

Students: mean full-time students at universities. Both students with special needs and students without such needs are included. PhD-students and students who study abroad are not in the scope of the analysis. Therefore studies which only address such groups of students are excluded.

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

Dropout-causes: Causes which have been demonstrated through relevant research to explain occurrences of dropout phenomena at universities.

University is understood as a public or private institution which does research and offers study-programs with public accreditation at bachelor, master, and doctoral level. Thus several tertiary education institutions are not in the scope of the present analysis (e.g. Community Colleges, Teacher Training Colleges in some countries).

The scope has also been delimited in time: All over the world recruitment to the universities are 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 ways to handle it differently today. With a view to this, it has been decided to set the time limits of studies which can be included in the review to 2000-ff. Originally the mapping was set out to include research published 1990-ff. A reduction in the period of publishing has been necessary, though, due to two factors: 1) more than 500 references of heterogeneous studies within the original period of publishing was considered too many to create a systematic review from and 2) a couple of research overviews have been found that are considered to be able to cover the period from 1990 to 2000

Geographically the scope is set like this: Included studies will come from European nations: EU member states, Norway and Switzerland. Moreover, these studies will be in-

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

formed by (secondary) research from USA, Canada, New Zealand and Australia to the extent that such research is able to support and/or complement the findings from within the European context. Originally the scope was geographically set wider to the industrialised nations: EU member states, Norway, Switzerland, USA, Canada, New Zealand, Australia and some countries in Southeast Asia. The reason for the reduction in geographical setting is twofold: 1) Many studies would be included in the review and 2) a couple of recent systematic reviews, which are to be included in this systematic review, of research from USA, Canada, New Zealand and Australia on causes of dropout as well as dropout reducing effects of university programs/interventions will be able to cover the primary research from these countries. Studies dealing with university education in Third World Countries will not be included because it is estimated beforehand that the context and content of such studies will be very difficult to generalise to industrialised nations.

The language universe of the review is set as: Included studies will be reported in English, German, French, and Scandinavian languages (Danish, Swedish and Norwegian). This is based on the expectation that the majority of the studies within the geographical setting of the review and in this field in general will be published in these languages. It is also based on the pragmatic point of view, that competence in dealing with these languages, are available in the review process.

2.3 *Searches*

Searches were carried out by the National Library of Education in cooperation with Danish Clearinghouse. The review group has 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 review group was also encouraged to suggest additional references. During the project, 3 such proposals were made by the review group.

The fields covered in this research mapping include education, psychology, economics and sociology. Therefore the search universe is set broadly. Also the decisions taken on delimitations of language and geography have been taken into consideration in the selection of databases and resources.

The core content of the research mapping exercise has been 'dropout phenomena from 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 from 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 in 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.

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.

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.

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 2.2.¹¹

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.

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

¹¹ As can be seen from the description below of different phases of the screening, criterias were gradually narrowed in: the geographical scope, publication year, kind of university study (distance study) and research design.

the included studies did in fact research 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 research mapping 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 this present systematic research mapping with results from previous reviews on the Non-European research.

During this phase additional scoping on research design was also considered. To demonstrate causes 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. Merely descriptive studies cannot demonstrate causes. Therefore studies which only analyse data on dropouts, without distinguishing between different types of dropouts (e.g. formal dropouts vs. transfer students, voluntary withdrawals vs. dropouts because of academic dismissal, early vs. late dropouts) *and* 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 reduce dropout are considered appropriate: one-group pre-post test and multiple baseline designs are not appropriate for demonstrating effects on interventions to 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 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 phenomenon, including reviews focusing on interventions to 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 research mapping. 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 research mapping. This can be seen in Appendix 2.

All the included studies were distributed to the research assistants at Danish Clearinghouse and to members of the review group in such a way that one research assistant at Clearinghouse and one member of the review group were responsible for the same specific studies. The research assistants from Clearinghouse answered all question while the review group members 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 staff member from 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.

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.

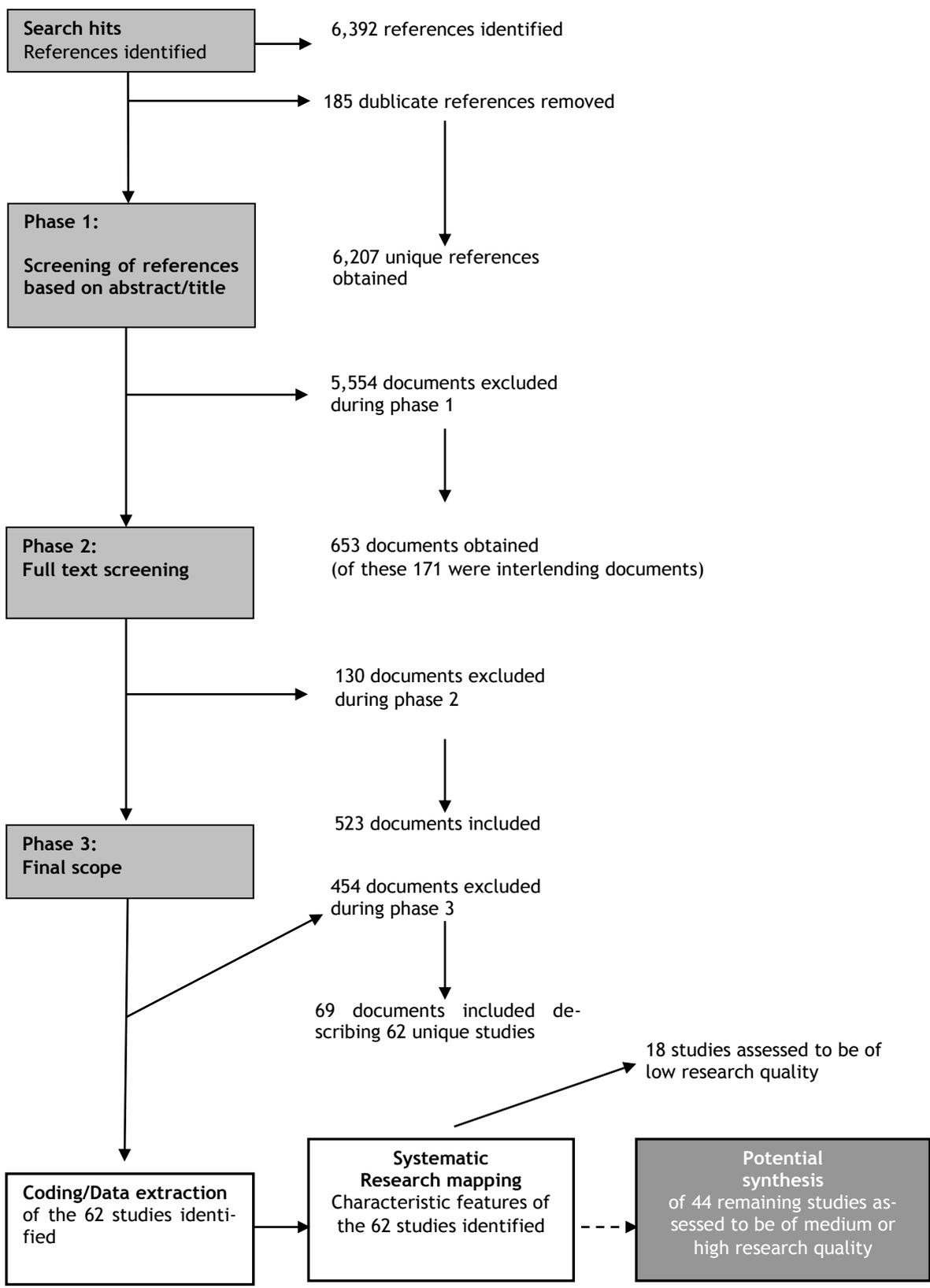


Figure 2.6.1 Filtering of references from search results to systematic research mapping

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 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 research mapping, 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 causes of and interventions to reduce university 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/rationale 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. To describe the opposite of dropout from a student perspective the following terms are often applied: persistence, continuance, success, completion. Within an institutional and governmental perspective positive terms as retention and graduation 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) behind it. A student can drop out due to failure to meet the academic demands within the university. In this case dropout should be viewed as involuntary in character (i.e. the student has been pushed out). Furthermore, a student can decide to drop out for reasons more voluntary in character (i.e. withdrawal is a better term in this case, because it is a case of opting-out/the student being pulled out), e.g. due to financial difficulties, family related or personal problems outside the university setting. The decision to leave in these 'externally provoked' dropout cases is taken by the student himself/herself, however, the decision might have been taken reluctantly due to the external factor(s) in question. It could also be due to discontent/dissatisfaction with the subject of study or university institution concerning content, structure etc. or perhaps due to better outside opportunities, such as good job prospects. 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 he/she drops out of university.

The first case of voluntary dropout might be followed by a transfer of the student to another study area 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 dropout due to outside opportunities might be termed a 'de-selection' of study or what Tinto has called an educational 'system departure' (Ibid.: 36). This leads to the notion that not all university dropout can be characterised as involuntary. Dropout is therefore not automatically experienced as a negative 'event' or process, at least, not from the student's own point of view, as will be discussed in section 3.2. This also goes for involuntary dropout due to academic failure, which, as discussed in section 3.2, might not always be viewed negatively from the point of view of the academia.

Furthermore, a specific dropout case is contingent on 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) a course of study (i.e. where the student transfers to another course of study within the same department at the same university), 2) a department (i.e. where the student transfers to another department within the same faculty at the same university), 3) a faculty (i.e. where the student transfers to another faculty within the same university), 4) a university (where the student transfers to another university) and 5) the university system (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 e.g. 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 he/she has not dropped out of that specific faculty or university, only from that specific department. A dropout from the university system altogether (a 'system departure'), to the contrary, will always be viewed as a dropout by all institutional levels of the university system including the student himself/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.

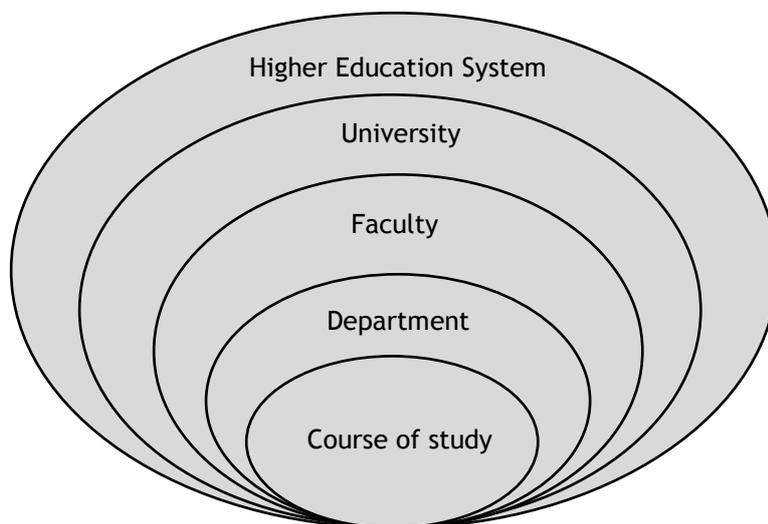


Figure 3.1.1 Institutional levels university dropout can occur at
Source: Revised version of a similar figure in DMA/Research (2002: 10).

Besides characterising university dropout on whether it is more or less voluntary in character (A) and at what institutional level it occurs combined with the analytical level at which it is evaluated (B), dropout can in theory be characterised on a number of other parameters. E.g. the timing of dropout (early vs. late dropout) (C) and 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 area of study or to be used subsequently on the job market (D).

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 primary literature included in the present systematic research mapping 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.

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 university transfers) purely negative in an economic sense for the individual university. Furthermore, within a university pedagogical perspective where a goal is to get as many students to complete their studies as successfully as possible, dropout is therefore viewed negatively. Dropout can from the point of view of the academia, however, be viewed as having positive consequences as well 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 with their own internal rules, values, interests and positioning competition (Bourdieu, 1990, 1998)), dropout is a consequence of a student not being able to create or maintain a position in the academic field of university. This movement out of the academic field is due to the student having the wrong amount/composition of social capital (networks and relations) and cultural capital (incl. certain dispositions and formalised educational qualifications) and thereby an inappropriate habitus for that field (Ulriksen, 2010: 216-217). As Ulriksen et al. formulates 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 weakest 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 socio-economic 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 individual dropout represents significant opportunity costs because every individual dropout (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 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 are more often struggling with unemployment and more frequently end up on early retirement or welfare benefit (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 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 causes of dropout must first

be sought as a way to subsequently seek out potentially relevant remedies and interventions to 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 allocation requirements, e.g. in the form of value added grants to universities, has 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 such issues as quality-assurance, effectiveness and evidence-based policy making (Gaebel et al., 2012: 8; El-Khawas, 2006; Sporn, 2006; Keller, 2006).

To counter the possible 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

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.

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.

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 reducing dropout rates at the level of the individual university (Ibid.: 10-11, 36-38) to the benefit of both the individual university, thus dampening the 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)

To better understand these trends in public policy making leading to student monitoring instruments increasingly put in 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 Higher Educational System 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 Educational 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 e.g.

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.

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' young people (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', 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 lead 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 steps 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

¹⁶ Unless academic standards are relaxed of course.

and/or academic integration within university/adaptation to university life, iix) 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 mentioned and examined as potential contributors to/direct causes 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 into college (Tinto, 1975, 1985, 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 literature on the basis of which the present systematic research mapping is conducted, cf. Chapter 4. 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 university dropout as compared to the earlier research, that focused almost entirely of personal characteristics and abilities of the individual student before university entry, is the adaptation of institutional influences as part of the 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 factors like the student's intentions, educational goals and commitments towards the educational institution as well as the student's academic and social integration, cf. Figure 3.4.1 (Tinto, 1987).

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

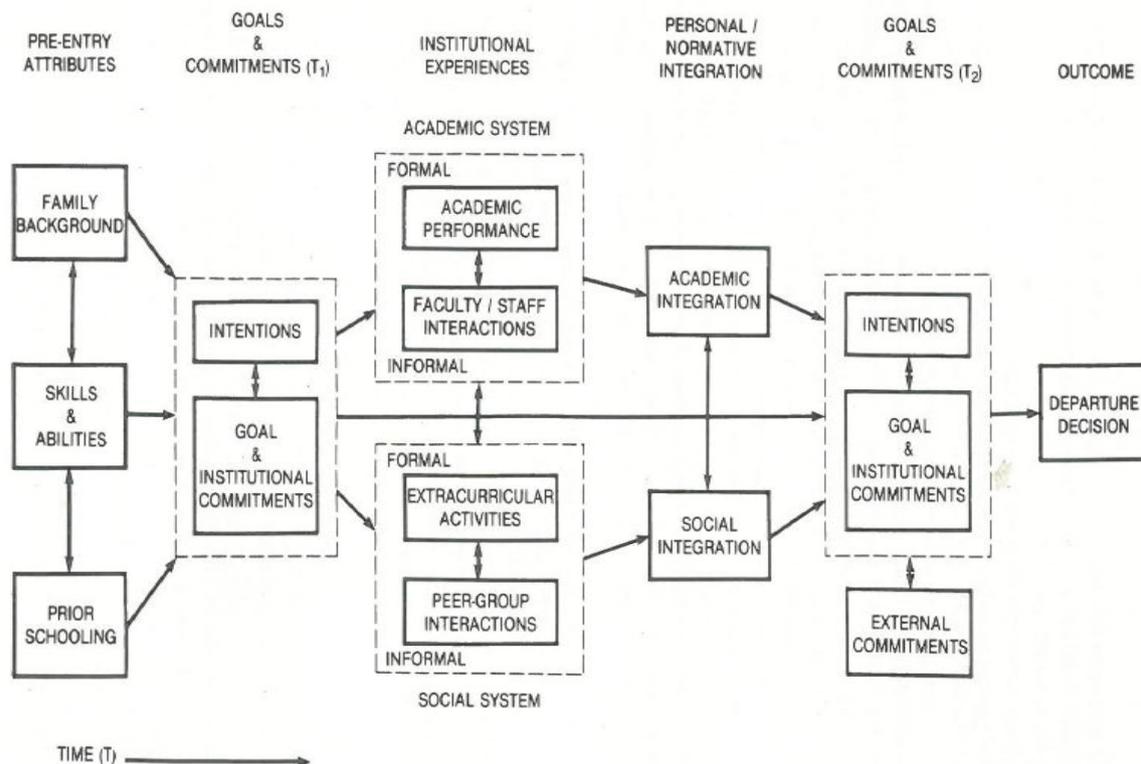


Figure 3.4.1 Tinto's model of university student dropout
 Source: Tinto (1987: 114).

Following Figure 3.4.1, the process possibly leading to university dropout can be described the following way: before entry into university each student possesses some attributes (family background, individual skills and abilities and type of prior schooling). These attributes are assumed to shape the student's intentions, educational goals and commitments towards the educational institution (university). When entering university the educational goals and commitments towards the educational institution held by each student are then met by the student's institutional experiences within university. The institutional experiences are divided into two distinct, but intertwined, 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 this/her interactions with the faculty/staff (informal activity), the social system is comprised of the extracurricular activities by the student (formal activity) as well as his/her peer group interactions (informal activity). The student's institutional experiences lead to a certain level of academic and social integration of the student within university. These levels of integration then subsequently lead the student to either engage further in university and thus to strengthen his/her educational goals and commitments towards the educational institution or, alternatively, lead to a weakening of his/her educational goals and commitments towards the educational institution and thus possibly lead the student to depart (dropout)¹⁸. Hence, Tinto's model emphasises the process based interactions be-

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

tween the individual student attributes and institutional structures within university. In a later version of his model, Tinto acknowledges 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). This leaves room for concurrent factors outside university to influence the dropout decision besides the within-university factors of the institutional integration, the educational goals and commitments towards the educational institution alone.

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 psychological 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*' (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 depends 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 the present systematic research mapping *What is dropout from university studies?* cannot at all be trivial since the concept of university dropout is quite unequivocal. Hence, it benefits from being termed dropout phenomena (in plural) at universities when the potential causes and contrib-

uting 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 multi-factorial since various factors could in theory cause 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 causes 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 reduce the dropout phenomena?* is likewise dependent on the answers to both question 1 and 2.

4 Research mapping and assessment

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 causes of university dropout and/or measures undertaken to 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 from each country of conduct
UK	19
Germany	8
Netherlands	7
France, Denmark, Italy	5
Spain	4
Finland	3
Norway	2
Sweden, Belgium, Austria, Switzerland, Portugal	1

Table 4.1.1 Country of conduct

N = 62. As one study was conducted in both Finland and the UK, there are 63 answers.

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	4
Book	4
Chapter in a dissertation	2
Short web publication	1

Table 4.1.2 Publication type
N = 69.

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 causes of university dropout or measures undertaken to 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. As some studies cover more curriculum areas, there are 70 answers. 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 focus 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 causes 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 research mapping, 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 reducing measures in which case the outcome measure (i.e. the effect studies) can also concern completion or retention rate.

Operationalisation of university dropout				
Institutional level \ Educational level	1-3 courses	1 -3 faculties	1 -3 universities	National/regional level
	Course(s)	6(3)*		
Semester(s) or academic year(s)		4	8(4)	5(1)
Specific degree		3	6	17(9)
Any degree			1	2
Not stated/ Other (e.g. ECTS points)	1	2	1	2(1)

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.

*Studies that distinguish between different types of dropouts are put in (). The number in () is also included in the total number of studies in a specific cell.

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 specific degree dropout 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 different types of university dropout, typically between formal dropouts and transfer students or between students who dropped out voluntarily vs. students who dropped out due to academic failure.

As pointed out in Chapter 3, it is of pivotal importance for a study that is concerned with university dropout as outcome measure to be able to distinguish between the different types of university dropout. Different motivations lie behind each type of dropout, hence different factors are assumed to different types of university dropout, which is why such a distinction is important to make when analysing possible causes of dropout.²⁰

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 higher educational system altogether or whether he/she 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 research mapping, 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 reduce the dropout phenomena?* (cf. Section 1.3). Table 4.2.3 below shows the distribution of investigated aspects of dropout in the 62 studies in relation to these two review questions.

²⁰ 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 study transfer after e.g. the first semester are limited, while dropping out of the higher educational system all together after years of study represents a substantial, not least economic, waste of resources at both societal, institutional and the personal level.

University dropout aspect in focus	Number of studies
Causes of dropout	53
Effects of dropout reducing measures at institutional level	11

Table 4.2.3 Enquired aspects of university dropout

N = 62. There are 64 answers as 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 causes of dropout (53 studies(85 %)), whereas only 11 studies (18 %) were found to investigate possible effects of dropout reducing interventions. It should be noted here that four of the studies which have been included in Table 4.2.3 as studies which investigate possible causes of dropout could alternatively be interpreted as investigating effects of dropout reducing interventions, this is because e.g. a national level reform (not specifically concerned with reducing university dropout) has actually been found to form a natural experiment for investigating such possible effects. The choice for including these four studies in first-mentioned category will be elaborated on in Section 5.4.

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 consequences²¹. Nine studies (15 %) were considered to be able to provide a possible answer to what happens to university dropouts after they dropout.

²¹ 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 causes of dropout

Table 4.2.4 shows the number of studies which address each of the categories of dropout causes (cf. Section 3.4 concerning the various factors theoretically available to explain university dropout).²²

University dropout causes addressed	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 Investigated dropout causes

N = 53, as 53 studies were found to investigate possible causes of dropout. The table contains 190 answers as most studies embrace more of these categories of causes of university dropout. The studies often enquire more variables in the same category. Hence, the list cannot be used for calculating the number of specific variables used in the studies to investigate causes of dropout.

The three most frequently examined categories of causes 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 causes are all embedded within the

²² 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 reducing measures (cf. Beaupère et al., 2007), hence, this study is also included in the 11 studies which investigate the possible effects of dropout reducing measures.

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).²³

4.2.5 *Studies investigating effects of dropout 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 reducing university dropout, are presented separately according to their content because of their fundamental difference to the studies which investigate causes 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 able to be included in this 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; Gensch & 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 Vincent Tinto (cf. Section 3.4) seems to have influenced the majority of interventions being examined by the 11 intervention studies in this 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 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

²³ Percentages are calculated on basis of N = 53.

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,²⁴ the European evidence on the possible effects of dropout reducing measures at university level must be considered rather limited. A possible subsequent research synthesis will therefore be informed by four systematic reviews on intervention studies conducted in a Non-European setting. These are not part of the 62 studies included in the research mapping. Their role will be to inform and enter dialogically in an eventual research synthesis. Therefore they are merely mentioned here briefly and will be elaborated on in Chapter 5.

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 of overall study design, study timing, achieved sample size, data collection methods and methods of data analysis. This section of the research mapping 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.

²⁴ 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	18
Cohort study	16
Experiment with non-random allocation to groups	8
Longitudinal study	8
Secondary data analysis	8
Systematic review	4
Views study	4
Randomized experiment with random allocation to groups	1
Action research	1

Table 4.3.1 Overall study design
N = 62. There are 68 answers as some studies apply more designs.

A cross-sectional or a cohort study design is applied in more than half of the studies, that is, in 18 (29 %) and 16 (26 %) studies, respectively.²⁵ 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. The category ‘Longitudinal study’ (8 studies (13 %)) covers all studies, that is prospective as well as retrospective, where data have been gathered over time.

4.3.2 Study timing

The 62 studies have, moreover, been categorised in relation to their study timing to be understood in an analytical perspective, i.e. whether the sample used in a study was analysed in relation to a development in time. A study might be prospective or retrospective on an analytical dimension even though data are collected cross-sectionally (i.e. at only one point in time).²⁶

²⁵ No study is categorized as both a cross-sectional and a cohort study.

²⁶ Prospective study timing, thus, means that the study examines one or more samples as they have changed over time provided that the interest is in starting at one point in time and looking forward in time. Retrospective study timing, on the other hand, refers to a study which examines one or more samples but as they have changed over time provided that the interest is in starting at 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	28
Prospective	25
Retrospective	7
Not stated/unclear	2

Table 4.3.2 Study timing
N = 62.

A large proportion of studies use either a cross-sectional or a prospective study timing, that is, 28 (45 %) and 25 (40 %) studies, respectively.

4.3.3 Data sources

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

Data sources	Number of studies
Register data	45
Survey data	39
Other data sources	20

Table 4.3.3 Data sources

N = 62. There are 104 answers as more studies make use of more than one data source. The term '*Other data sources*' covers a broad array of quantitative and qualitative data sources such as tests, examinations and focus-group interviews.

Register data come from either student level university records or from national level register data. Survey data are collected either through questionnaires or through structured interviews. The category '*Other data sources*' covers data obtained from tests, examinations, qualitative interviews and ethnographic observations etc.

and looking backwards over time. A cross-sectional study timing occurs when one or more samples are examined at only one point in time.

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
500-1000	5
1000-10,000	27
10,000-50,000	4
50,000-100,000	6
100,000 or more	2
Other sample unit	1
Review	4
Not stated	5

Table 4.3.4 Achieved sample sizes

N = 62. There are 69 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 university dropout causes, 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 4.3.6 operates with three overall, and mutually exclusive, categories.²⁷

Method of data analysis	Number of studies
Multivariate regression analysis	41
Bivariate correlations and descriptive statistics	17
Systematic review	4

Table 4.3.6 Method of data analysis
N = 62.

As seen from Table 4.3.7, 41 studies (66 %) have been found to apply multivariate regression models, mostly binomial logit or probit (duration) models when analysing the outcome measure, 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.

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.

Nine studies (15 %) 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.

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, data sources, sample size, study timing and causes of dropout investigated, 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 this 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 causes 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

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).

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 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 questionnaire 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 5 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 this 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 4.4.2 and Table 4.4.1 serve to illustrate the characteristics of each of the two research approaches as well as to illustrate their contrasting characteristics.

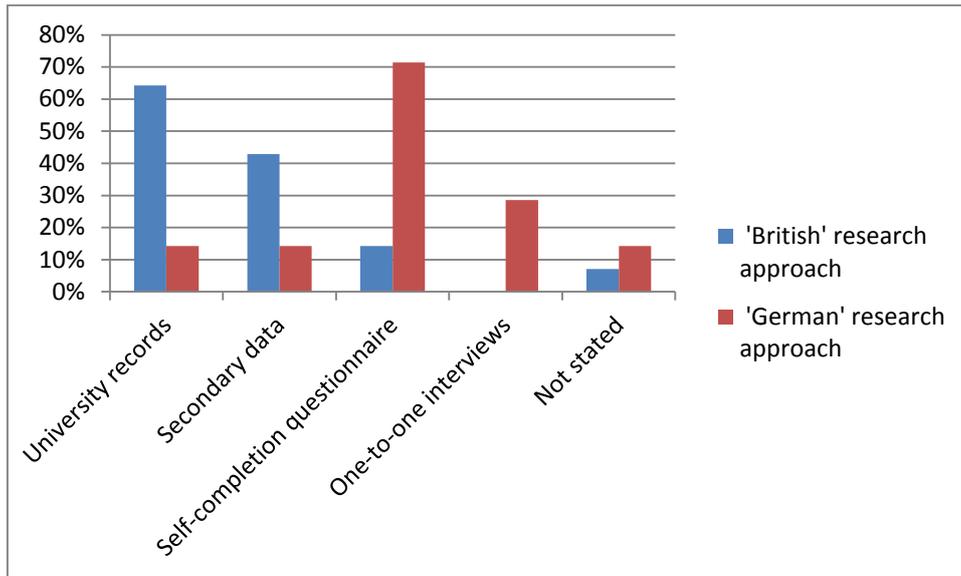


Figure 4.4.3 Data sources, 'British' vs. 'German' research approach

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.

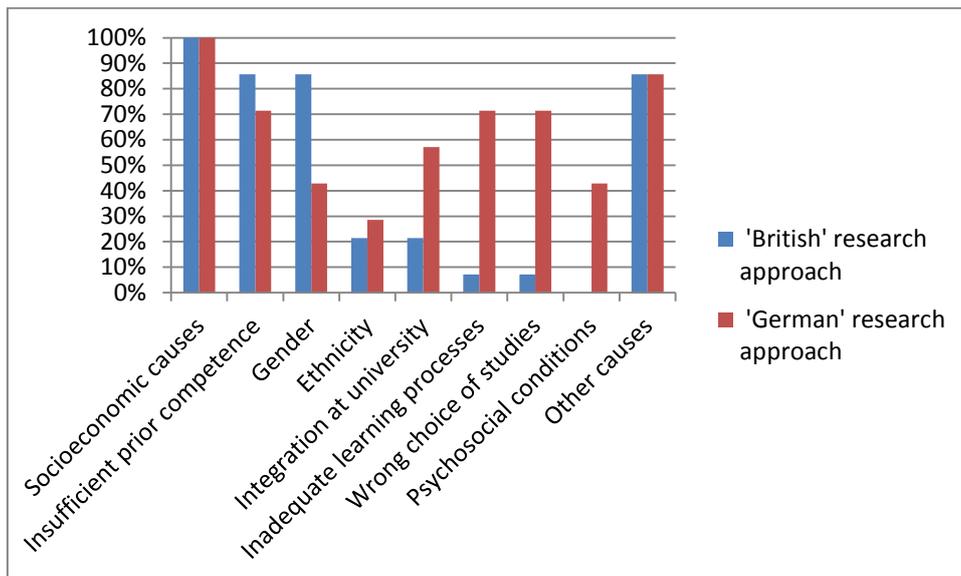


Figure 4.4.4 Causes of university dropout investigated, 'British' vs. 'German' research approach

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.

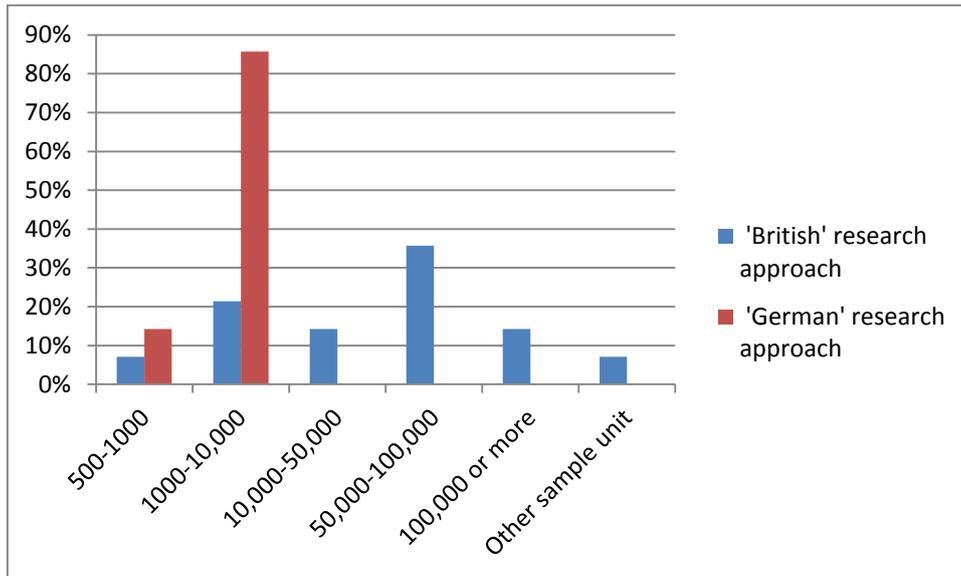


Figure 4.4.5 Achieved sample sizes, 'British' vs. 'German' research approach
 Percentages are calculated from N = 14 ('British' research approach) and N = 7 studies ('German' research approach). The term '*Other sample unit*' refers to one study (Soo, 2009) which operates with 'study-year-subject' as the sample unit.

Study timing	'British' research approach	'German' research approach
Cross-sectional	6	2
Prospective	8	1
Retrospective	0	4

Table 4.4.2 Study timing, 'British' vs. 'German' research approach
 N = 21.

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.

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 causes on dropout and effect sizes of these causes, as long as these causes 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

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.

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 reduce dropout phenomena?* None of these studies investigate effects of dropout 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 this systematic 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 this systematic 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 Does 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 of 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 as-

essed 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 addressed in 23 studies (37 %) reported on in this systematic research mapping, the generalisability of the remaining 39 studies (63 %) reported on 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 authors and review group members of this systematic research mapping 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 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 review group members 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 authors and review group members of this systematic research mapping. 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 analysis methods applied by the individual study was appropriate for providing an answer to the systematic review question(s) on which this systematic research mapping is based. 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 phenomena and context. *Weight of evidence C* addresses the relevance of each study's focus with respect to the systematic review question(s) on which this systematic research mapping is based. 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 causes of dropout compared to the small group of studies which investigate effects of dropout 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 causes 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 causes of dropout, Section 4.4 showed that clearly there is an association between possible causes 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 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 actual causes of university dropout (or possible effects of dropout 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 causes 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 socio-demographic 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 causes 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 adminis-

trative 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 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. The four non-European systematic reviews of intervention studies which were brought in to inform the weak European basis are considered to be able to give some insight, although not solid evidence, on the effectiveness of various interventions aimed at reducing university dropout (this will be elaborated on in section 5.6).

With regard to the large heterogeneity observed in the research included in the present systematic 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 Prospects for a synthesis

5.1 Introduction

This chapter will discuss the possibilities in establishing a systematic research synthesis on the basis of the studies mapped in Chapter 4. The chapter will discuss what characterises a synthesis and which expectations can be set for the findings and conclusions of a synthesis. Finally it will be discussed whether a synthesis is relevant in light of the scope of the review as it is set.

The present chapter will only be dealing with the 44 studies³⁰ considered relevant to include in a synthesis on the basis of the research mapping; that is studies providing enough evidence for their findings and conclusions and which have relevance for the scope of the review, defined as those studies that have been assigned an overall weight of evidence at the level of medium or high in the quality assessment, cf. *Danish Clearinghouse for Educational Research: Concept Note* (an overview of these 44 studies is offered in Chapter 8). Included in this chapter will be considerations on how these features in the studies can assist in providing answers to the review questions asked in Chapter 1. Considerations will be made about content of the studies and their design, methodology and context. The chapter also discusses how a synthesis can be informed by other systematic reviews of non-European studies and the possible character of a synthesis. The chapter concludes with considerations about what information can be expected from a synthesis and whether a sufficient number of studies are available to draw trustworthy conclusions.

As stated in Chapter 1 the purpose of this research mapping is to identify what empirical research has been carried out to examine: *Why do dropout phenomena occur at universities? What can be done by the universities to reduce dropout phenomena?* And while giving answers to these two questions also addresses the question: *What is dropout from university studies?*

5.1.1 Aspects of dropout in focus in the studies

The studies that are found to be of sufficient quality and relevance to be included in a synthesis focus on the different aspects of the dropout phenomena that is in focus of this research mapping.

³⁰ As stated in Section 2.4.3 it is also the intention to inform a synthesis with research from systematic reviews based on non-European research. Therefore four systematic reviews will be included in a synthesis, but these are not part of the 44 studies mapped and hence not described in the general presentation of the conditions on which a synthesis could be made.

Dropout aspect in focus	Number of studies
Causes of dropout	42
Effects of dropout reducing measures at institutional level	3

Table 5.1.1 Aspect of dropout in focus of the study
More than one option per study.
N=44.

As seen in Table 5.1.1 almost all of the studies focus on causes of dropout, 42 studies, while three studies focus on effects of dropout reducing measures. Further it should be noted, that eight of the 44 studies address the question “What is dropout?”

Before digging into the main questions about why dropout occurs and what can be done to reduce it, we will consider how the present studies can contribute to an understanding of what dropout is.

5.2 Empirical contributions to an understanding of what dropout is

Due to the scope of this research mapping, studies included are empirically founded, only discussing the theoretical character of the concept to the degree that is found necessary to conduct the empirical study; that is, the theoretical foundation of the concept is not directly derived in the studies, but they are to different degrees informed by theory.³¹

Based on the 44 studies found eligible to be included in a synthesis, there are however three ways to approach an understanding of what dropout is from an empirical point of view, their foundation in theory, their definitions of dropout and their unfolding of the dropout term.

5.2.1 Theoretical foundation of the studies

The studies are in general related to relevant theory, as 43 of the 44 studies are found to be explicitly “informed by, or linked to, an existing body of empirical and/or theoretical research”³² while the last study is indirectly related to previous empirical research in the field. As the studies are produced within very different fields of interest (cf. chapter 3.4) some variation can be expected among what major theoretical traditions the studies enroll themselves in. A synthesis can be expected to give an in-depth insight into which theoretical frameworks that are used in different areas of dropout research, and as will later be discussed, to some extent provide empirical support or falsification

³¹ In Section 3.4 of this report, the most common theoretical positions within research in dropout are outlined.

³² As asked in question B3 in the EPPI-Centre data extraction and coding tool for education studies V2.0, see eventually Appendix 2.

for some of the assumptions stressed in the theoretical foundation of the field, see section 5.3.

5.2.2 Definitions of dropout

There is a large span in the degree to which the 44 studies define the object of interest - the outcome measure dropout. All included studies operationalise dropout, and directly (by defining the outcome measure) or indirectly subscribes an empirical substance to the term. There are, however, profound differences between the studies regarding how much they discuss or elaborate on the content of the term.

To be included in the research mapping, a study needs to operationalise an outcome measure of dropout. As described in Section 4.4 different national policies for data registry and handling have influenced how the term can be operationalised if or when existing registry data are included in the study or for instance when studies need to use university registers to locate participants in the study. In line with this a synthesis will be able to discover strengths and weaknesses in the different forms of operationalisation.

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 5.2.1 Educational level at which the study investigates dropout

N=43 (One systematic review is left out from the table). Whether the student drops out from a given course, drops out at a specific semester, the study enrolled at or from university studies in general.

As shown in Table 5.2.1, four of the studies operationalise dropout as not completing a specific course (which is the course in focus of the specific study), 12 (27 %) studies investigate whether a specific semester or number of semesters are completed or whether the students are still enrolled after a specific range of time. 21 studies (48 %) operationalise dropout as students not having completed the degree in which they enrolled, and three studies (7 %) investigate whether the students completed a university degree at all (the study enrolled in or another degree). Three studies (7 %) are either unclear or use definitions not covered by the four main groups (e.g. number of ECTS-points gained).

One study is conducted as a systematic review. This systematic review included studies with different operationalisation of dropout.

5.2.3 Unfolding the dropout term

Of the 44 studies with sufficient weight of evidence to be included in a synthesis, 14 studies differentiate between different types of dropout. It is clear from the elaboration of the term dropout in section 3.1 that there can be different reasons for students dropping out. These 14 studies can help to provide empirical elaborations of the term in form of providing knowledge about, what reasons are actually found for dropout and which practice the phenomena covers. Such differentiations are necessary to address the proper causes of dropout.

Further, as the studies analyse dropout at different levels of the university system, a synthesis will be able to analyse differences in the understanding of dropout at different levels, cf. Table 5.2.2.

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

Table 5.2.2 Analytical level of dropout analyses. The level of sample selection N=43 (A systematic review is not included in the table).

On this basis, the mapped studies provide a broad basis for evaluating from an empirical point of view, what dropout is in light of the theoretical presentation of the concept as this is presented in Section 3.1 and a basis for an overview over what dropout is, when it has to be operationalised as a phenomenon in practice, and what the consequences are of different forms of operationalisation.

5.3 Empirical examinations of why dropout occurs

As stated in Table 5.1.1, 42 of the studies deal with causes of dropout. The large amount of studies provide good possibilities for digging into the question of why dropout occurs at universities, cf. the scope of the review as it is set in Section 2.4.3. This section will shortly describe the purposes of the 42 studies and afterwards present the content of the studies that can provide information about causes of dropout. Finally the section will present information about the methods and design used in the studies examining causes of dropout.

5.3.1 Aim of the studies addressing causes for dropout

Almost all of the studies exploring causes of dropout, 40 of the 42, are characterised as exploring relationships in the data material analysed. Two studies are characterised as descriptive, as they mostly present descriptive statistics about dropout.³³

Hence, all the 42 studies explore relationships between the factors under investigation and dropout as this is operationalised in the respective studies.

5.3.2 Causes for dropout

During data extraction eight different causes of dropout have been used to code the studies as seen from Table 5.3.1.

University dropout causes addressed	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 5.3.1. Investigated dropout causes.
N = 42. More than one focus is possible.

The different categories range from seven to 26 studies coded in each category (a study can elaborate on the effect on more than one cause). Further, a category for 'other causes' has been used (29 studies are coded as researching the effects of other causes). It should here be noticed, that the coding 'Other causes' can cover more than one cause. The category 'Other causes' cover a whole range of aspects such as university intern causes (e.g. quality of teaching); student intern causes (e.g. motivation, earlier

³³ However, both these studies carry out regression analyses of how the elements presented in the descriptive sections correlates with dropout rates while their main purpose are descriptive.

grades and study habits); student characteristics (e.g. being from urban vs. rural areas, family circumstances); funding with possibilities of being elaborated on in a synthesis, but no single cause in this category is covering a large number of studies compared to the other causes.

In general, classical background variables such as socio-economic background (26 studies, 62 %), gender (23 studies, 55 %) and ethnicity (8 studies, 19 %) have been included as an independent variable or controlled for in many analyses, but also variables of a more influential character, and variables that can be formed during or prior to university studies are included, (psychosocial conditions (7 studies, 17 %), entrance qualifications (25 studies, 60 %), integration of new students (13 studies, 31 %), choice of studies (10 studies, 24 %) and learning processes (12 studies, 29 %)), see Table 5.3.1.

Based on this research mapping, a systematic review will be able to dig into causes that are both external and internal to the university, and hence address causes that could be influenced by the university, influenced at other institutional levels, or are hardly susceptible, cf. section 3.1.

5.3.3 Which subject areas are covered?

In general, the studies cover broad areas of university education, as 27 studies cover whole universities (or close to) or national samples in the samples included. Five studies cover medicine, while three studies cover subjects within business and economics and two studies cover subjects within science. The last five studies cover different subjects within the field of social science and the humanities (Educational Science, ICT, Law, Psychology and Social Science).

The 27 studies covering a broad range of subjects differ in character, and hence for some studies, findings are reported at faculty or subject level, for other of these, only general findings across the area of subjects are reported, mostly at university level.

Curriculum areas covered	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 5.3.2 Curriculum areas covered by the included studies.
N=42.

5.3.4 Analytical levels in the dropout phenomena

Different analytical levels can be taken in the analysis of the dropout phenomena. This section will briefly describe how the mapped research assigned high or medium weight of evidence and covering causes of dropout can be grouped on the characteristics presented in Section 3.1, which were: A) voluntary vs. involuntary dropout; B) at what institutional level it occurs combined with the analytical level at which it is evaluated; C) timing of dropout (early vs. late in the study); and D) whether the student has obtained useful skills before dropout occurs.

- A) Voluntary vs. involuntary dropout: 14 of the studies investigate more than one type of dropout. These studies combined with the six studies investigating what happens to dropouts after withdrawing gives room for investigating the dimension between voluntary and involuntary dropout, and hence the degree of freedom in taking the decision.
- B) Institutional and analytical level at which dropout is evaluated: As described in Table 5.3.2, the studies cover the whole range of institutional levels that could be considered when studying dropout at university level, cf. Figure 3.1.1 in Section 3.1. To the degree the studies operationalise the definition of dropout at their respective level of analysis, it is possible to compare dropout at these different institutional levels and hence in a synthesis approach the dropout phenomena in relation to the different levels from where it can be analysed.

- C) Timing of dropout: As it is stated in Section 5.3.5 below, there is a time perspective in 25 of the 42 studies investigating causes of dropout. Hence there is room for elaborating upon this analytical perspective in a synthesis.
- D) Useful skills obtained: Six of the studies investigate what happened to drop outs after withdrawing. All look at whether students who dropped out re-enrolled in another education. Further, most of the studies investigate whether students who are not enrolled in another education are employed, and a few studies investigate whether there are differences in employment levels later in life between students who dropped out of university and those who did not. A few studies also investigate whether students are satisfied with the choice of dropping out. These studies hence draw a broad picture of whether the dropouts have obtained relevant qualifications before leaving university prior to obtaining a degree.

This preliminary analysis of the four analytical perspectives on dropout that were outlined in Section 3.1 indicates that all can be elaborated upon in a synthesis, although it is necessary to go further into an analysis of the studies to specify exactly what outcome of such an analysis will result in.

5.3.5 Overall designs and data collection in the studies covering causes of dropout

The 42 studies investigating causes of dropout use a range of different methodological elements.

Study timing	Number of studies
Cross-sectional	16
Prospective	19
Retrospective	6
Not stated/Unclear	1

Table 5.3.3. Study timing.

N=42 The study coded as Not stated/Unclear uses a longitudinal timing in the study of persisters while students who were registered as dropouts were only dealt with in a cross-sectional perspective.

Table 5.3.3 describes the study timing in the 42 studies covering causes of dropout. As it is seen from the table, more than half of the studies are carried out in a way providing room for analysis of the time perspective in the decision to drop out. Not necessarily all studies have covered this in their analyses although they are carried out with a longitudinal perspective. However it indicates that the timing of drop out could be elaborated upon in a synthesis.

Achieved sample size	Number of studies
50-250	5
250-500	2
500-1000	5
1000-10,000	17
10,000-50,000	3
50,000-100,000	5
100,000 or more	2
Other sample unit	1
Review	1
Not stated	2

Table 5.3.4 Achieved sample sizes

N = 42. There are 43 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*' covers studies that are too poorly reported to either explicitly or implicitly determine the sample size.

Table 5.3.4 addresses the sizes of the achieved samples in the studies with a weight of evidence of high or medium. The studies differ in relation to the attrition in the different studies, as these fluctuate according to the applied research methods, among these the data collection tools.³⁴

If the table is compared to Table 4.3.4 in Chapter 4 presenting the achieved samples of all 62 studies in the research mapping, it is evident that it is mainly studies with low sample sizes (<500: eight studies) and studies with sample sizes covering a faculty or university (1,000-10,000: ten studies) that are considered to have a low weight of evidence.

³⁴ Different attrition rates are in general found between the two main data sources used in the studies mapped, as higher proportions are expected in questionnaires than in register data such as school/college records, cf. Table 5.3.6

What is the design used in the study?	Number of studies
Cross-sectional study	14
Cohort study	12
Secondary data analysis	8
Longitudinal study	6
Experiment with non-random allocation to groups	2
Views study	2
Random experiment with random allocation to groups	1
Systematic review	1

Table 5.3.5 What is the design used in the study?
N=42. Main design is coded, though more than one design option is possible.

As already indicated in Table 5.3.3 a little more than half of the studies use a time perspective in their analyses, while 15 of the studies are cross-sectional in their timing, 24 studies used a longitudinal perspective in their analyses and one study used one of the perspectives for different groups of students. The studies use a range of designs as it is seen in Table 5.3.5.³⁵

As seen from table 5.3.6 the studies use a range of data collection methods, though with the two elements school/college records and self-completion questionnaire as the most frequent.

³⁵ It should be noticed here, that one study is coded as a random experiment. This study (Oosterbeek & van Ewijk, 2010) manipulated the gender balances in workgroups for students in a first year economics and business study, and hence covers how the share of girls in the study influence dropout.

Methods of data collection	Number of studies
School/ college records (e.g attendance records etc)	22
Self-completion questionnaire	20
Secondary data such as publicly available statistics	10
One-to-one interview (face to face or by phone)	6
Curriculum-based assessment	2
Clinical test	1
Examinations	1
Focus group interview	1
Observation	1
Other documentation	1
Not stated/ unclear (please specify)	3

Table 5.3.6 Methods of data collection
N=42. More than one coding is possible.

The most common used tool for data collection is school or college records which are used in 22 studies (52 %) and self-completion questionnaires which are used in 20 of the studies (48 %). Secondary data, mostly national statistics, are used in 10 of the studies (24 %) and six studies (14 %) have used a form of interviews. Other methods for data collection were only used in a few studies.

Methods of data analyses	Number of studies
Multivariate regression models	37
Bivariate correlation models and descriptive statistics	4
Not relevant (systematic reviews)	1

Table 5.3.7 Methods of data analysis
N=42.

As it is seen in Table 5.3.7, the studies in general use strong statistical methods to demonstrate the causes under investigation. However, one should bear in mind, that whatever method is used, the study is not better than the limits of the data used.

It is questionable to what extent the Bivariate correlation models and descriptive statistics studies can actually identify causal relationships on this background. This is also the case for some of the multivariate regression models, especially those that include only few covariates and control variables. This is then due to a possible lack of other relevant variables which might be both correlated with the already included variables that the study grants explanatory power as well as with the outcome measure (dependent variable) itself. If this is the case, bias in the study findings might be the consequence of not having taken such additional variables into account. Of course, the validity and reliability of the variables included within any given data analysis also have a bearing on whether it is possible to identify trustworthy relationships, but these are issues to be dealt with in an actual analysis of the findings of the included studies.

Research tradition	Number of studies
'British' research approach	14
'German' research approach	7

Table 5.3.8 Research traditions
N=21.

Table 5.3.8 demonstrates that the 'German' and 'British' research traditions (introduced in Chapter 4) are representatives of strong research traditions. It can be noted, that half of the studies strong enough to be considered included in a synthesis are conducted within one of these traditions.

5.3.6 University cultures/countries included in the study

The studies considered having sufficient weight of evidence to be included in a synthesis covers a broad spectrum of European countries, as shown in Table 5.3.9.

Country of conduct	Number of studies from each country of conduct
British Isles	11
Germany	7
The Netherlands	6
Denmark, Italy	4
Finland, Norway, Spain	2
Austria, Belgium, France, Sweden	1

Table 5.3.9 In which country or countries was the study carried out?

N=42. Note that one study is marked as collecting data in both The British Isles and Finland, as it compares the effects on dropout of changes in a course of study in these two countries. A systematic review is left out of the table.

Especially the British Isles, Germany and The Netherlands are represented with a broad range of studies covering the drop out phenomenon in their university systems, but also Spain, Italy and the Scandinavian countries are represented with more than one study.

The broad range of countries included opens up for possible comparative analyses of differences in characteristics of university systems such as funding, living conditions, differences in study structure and basis of recruitment and admission to university by comparing study findings to knowledge about differences in the education systems in the respective countries.

5.4 Empirical examinations of what can be done to reduce dropout

Of the 11 studies originally included in this research mapping described in Chapter 4 as studying interventions only three studies have been found to hold a weight of evidence that is strong enough to be included in a synthesis.

This should be viewed in the light of the fact that this is a field where real experimental research is poorly represented. None of the 11 studies investigating effects of dropout reducing measures have used a randomised allocation to intervention and control groups. Hence, the three studies assigned a weight of evidence high enough to be included in a synthesis use a non-random allocation to the intervention under investigation.

Garces & Sanchez-Barba (2011) investigated through a non-random experiment how two different teaching and examination strategies in a chemistry course affected dropout rates. Qualter, Whiteley, Morley, & Dudiak (2009) investigated whether an intervention teaching students Emotional Intelligence (EI) at a summer school prior to university en-

trance lowered dropout using a convenient sampling method. Urlings-Stroop et al. (2011) investigated whether admission to the study of medicine through a selection procedure influenced dropout patterns compared to students who were admitted through a lottery system based on GPA-rates.

In addition to this, four more studies can be considered included in the part of a synthesis considering what can be done to reduce drop out, although they have not been coded as studying an intervention directly addressing the reduction of dropout, but instead solely are coded as studies investigating causes of dropout.³⁶ Two studies have used university reforms as natural experiments to see whether the changes they have given have been followed by decreases in dropout rates, namely Hovdhaugen (2011) and DiPietro & Cutillo (2008). Oosterbeek & van Ewijk (2010) manipulated the gender composition in workgroups for first year economics and business students and measured the effects on later dropout rates. The last study by O'Neill, Hartvigsen, Wallstedt, Korsholm & Eika (2011) measured differences in dropout rates between students entering the medicine study at one university on two different conditions, entrance through GPA-rates or entrance through an admission test. In other words, seven studies could be viewed as investigating possible effects of dropout reducing measures.

5.4.1 Which interventions are used to reduce dropout?

The seven studies that can be viewed as investigating the effects of dropout reducing measures can be grouped in five different types of interventions:

Two studies measure the effects of admission based on GPA-rates vs. entrance through an admission test. Two studies investigate the effects of university reforms on decreases in dropout rates. One study addresses the effect of a transition programme in form of a summer school. One study looks at the learning communities created and the last study looks at the teaching methods deployed by the academic staff.

As it appears in section 5.4.3 below, the three last topics with only one study addressing them fall within the scopes of the four non-European reviews, that a research synthesis can be reflected within.

5.4.2 Reflections on a synthesis partly based on non-European reviews

As stated in Chapter 1, there is a large amount of literature on the dropout phenomena, which is necessary to bring the amount of studies included in this research mapping to a level where it is possible to make a meaningful synthesis. As a consequence, the scope of the review was set to studies covering research in drop out at European universities.

³⁶ The four studies can be interpreted as handling both the question of causes of dropout and of dropout reducing measures in line with the study by Qualter, Whiteley, Morley, & Dudiak (2009). However, in the coding process a choice was made to use the coding solely for studies providing an intervention in strict terms that could be repeated and implemented at university level if requested by a university, so in the analysis only malleable measures from a practical university point of view have been dealt with as interventions.

To inform a synthesis covering European universities, previously conducted systematic reviews can be included as a basis to reflect the findings of a synthesis in.

This section will therefore briefly describe the four systematic reviews that have been found with relevance for the review question: What can be done by the universities to reduce dropout phenomena? The reviews will briefly be introduced, then it will be specified what information they can contribute with and finally it is discussed how they can be included in the process of creating a synthesis answering the review question.

5.4.3 Four non-European systematic reviews on dropout

During the searches for this research mapping, four systematic reviews have been located with relevance for the scope of this review, covering the review question of what can be done by universities. They are all non-European, covering intervention research to reduce dropout at universities.

Three of the four reviews include studies outside the scope of this research mapping, but are conducted in a way where conclusions can be extracted with relevance for the focus of this research mapping.

The four reviews are:

Valentine et al. (2011). Keeping At-Risk Students in School: A Systematic Review of College Retention Programs. *Educational Evaluation and Policy Analysis*, 33(2), 214-234 with the secondary source Valentine et al. (2009). *Systematic Reviews of Research: Postsecondary Transitions - Identifying Effective Models and Practices*. Louisville: National Research Center for Career and Technical Education, University of Louisville.

This systematic review is reported as a journal article supplemented with a technical report. The scope of the review is transition programs to help disadvantaged populations to move into and through post-secondary education. It is based on 19 intervention studies, of which 13 are of relevance for this research mapping. The synthesis is conducted as a meta-analysis of effect sizes.

Andrade, M. S. (2007). Learning Communities: Examining Positive Outcomes. *Journal of College Student Retention*, 9(1), 1-20.

The scope of this systematic review is on how learning communities affect involvement, satisfaction, achievement and persistence, and further it seeks to identify the characteristics that produce positive results. It is based on 16 studies, of which 12 are considered to be of relevance to the scope of this research mapping. The studies included in the review are peer-reviewed journal articles that cover intervention studies of effects of learning communities on first year students.

Patton et al. (2006). Campus-Based Retention Initiatives: Does the Emperor Have Clothes? *New Directions for Institutional Research*, 2006, 9-24.

The scope of this review is to examine the existing published research on college student retention in order to determine the extent to which the assertions about enhancing student persistence have been confirmed through rigorous analysis and program evaluation.

The study is based on 16 peer-reviewed journal articles all considered to have some relevance for the scope of this research mapping. All included studies provide a direct link between institutional programming and retention.

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.

The scope of this review is the impact on student support services and academic staff development programmes with focus on successful study outcomes for undergraduate students. The review is based on approximately 49 studies, of which 32 is judged to be relevant in the analyses of causes of dropout, while 17 studies are judged to be relevant in analyses of interventions to reduce dropout.

5.4.4 The relevance and usefulness of the reviews

Three of the four reviews are carried out in an American context, while the last one is conducted in New Zealand. The four reviews cover a body of literature outside the European scope of this review and contribute with knowledge to the review question about what can be done at universities to reduce dropout as they cover different possible areas of interventions.

The studies in this research mapping with sufficient quality to be included in a systematic review are qualified for inclusion in a narrative synthesis from two perspectives, from the inside and from the outside, which are both relevant for a narrative synthesis.

From the inside of the synthesis the reviews can be included as primary studies to be used directly in a synthesis. From the outside of the synthesis they can be used in the process of evaluating and minimising bias in the analyses carried out, (cf. Popay, 2006).

The four reviews provide knowledge at a high level of generalisation which both internally and externally can substantiate a synthesis of the European research.

5.5 Quality base of the synthesis: the 44 studies

Research in the area of education is often of an erratic quality, where some areas are represented with high levels of quality, others are characterised with lower levels of quality which can be due to both traditions in the specific field and to the character of the field under research (cf. Walters et al., 2009).

For the purpose of conducting a synthesis, the quality assessment of the included studies plays an important role, as these are the foundation for the trustworthiness of the conclusion. When making the synthesis in a systematic review, the quality assessment of the studies plays a role in the control for bias in the synthesis, as studies with high weight of evidence are used to control for bias in the final product (Popay, 2006).

Therefore, the following section will present features of the main quality aspects in the 44 studies found eligible to be included in a synthesis.

For all the studies with sufficient weight of evidence to be included in a synthesis, the conclusion is judged to be of medium (23) or high (18) trustworthiness, though there are three of the studies in which conclusions and findings are considered to be inseparable, cf. table 5.5.1.

<i>Have sufficient attempts been made to justify the conclusions drawn from the findings, so that the conclusions are trustworthy?</i>	Number of studies
High trustworthiness	18
Medium trustworthiness	23
Not applicable (results and conclusions inseparable)	3

Table 5.5.1 Trustworthiness of conclusion
N=44

On the three weights of evidence summarising up to the total weight of evidence, one or two studies are assigned the weight “low” according to Table 5.5.2 below. It should be noted, that none of these studies being assigned “low” in one of the weights of evidence have been assigned “high” as overall weight of evidence.

The study by Argentin & Traventi (2011) is weighted “low” on the weight of evidence A, as it is the opinion of the reviewers, that the study does not answer its own research questions due to methodological problems in the study, which the authors are aware of when they draw their conclusion. However, the study is conducted in a transparent and reliable manner, and provides other reliable information on dropout than intended in the research questions, why the reviewers have found it reasonable to give the study an overall evidence weight of “medium” based on the relevance and methods used in the study.

	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	

Table 4.5.11 Weight of evidence
N = 44 for each row.

On basis of the different evidence weights, 19 of the studies are assigned an overall weight of evidence of “high” while 25 studies are assigned an overall evidence weight of “medium”. Compared to other research mappings carried out by Danish Clearinghouse, this is a high proportion of studies assigned the overall weight of evidence “high”.

On this basis it can be concluded, that the studies are judged to represent a high quality of educational research and can therefore be a solid basis for a synthesis, as the studies with a high weight of evidence will ensure an internal quality of the synthesis and found a secure ground for validating the synthesis afterwards (Popay, 2006, Gough et al., 2012).

5.6 The prospects of a synthesis

This chapter has described the foundation for conducting a systematic research synthesis based on the research mapping conducted in this report with focus on the review questions:

- *What is dropout from university studies?*
- *Why do dropout phenomena occur at universities?*
- *What can be done by the universities to reduce dropout phenomena?*

The research described in this chapter in general applies elaborate quantitative methods (cf. table 5.3.3, 5.3.4 & 5.3.6), but is highly diversified regarding content and focus in the studies. Further, as described in the sections above, the studies provide a basis for answering the three review questions although they have a very heterogenic character.

The first question can be answered from a theoretical or philosophical point of view, but the studies in the research mapping provide some different ways to approach an answer from an empirical point of view. The second question is addressed by a large number of studies (of relatively high quality) that covers a range of relevant causes for the phenomena to occur. These studies though have a variety in methodological approaches and in content regarding subject areas covered and level of analysis. The last question about what can be done to reduce dropout is only addressed directly with a handful of different kinds of intervention studies differing in content of intervention and field of interest.

On the basis of the research presented, it must be concluded that it is not possible to conduct a meta-analysis as the formal requirements for this are not met. The research mapping has not found two (or more) studies measuring the effects of the same intervention which are necessary prerequisite for a meta-analysis (Borenstein et al., 2009).

The aim of Clearinghouse is to produce the best possible synthesis on basis of available research.

As shown above, it will be possible to conduct a synthesis on basis of the research mapping addressing all three questions of interest, although the thoroughness to which the different questions can be answered on the basis of the available base of studies is diverse. As indicated through the exposition of the theoretical concept of dropout made in Chapter 3, the review questions asked cover an area with complex constructs and nexuses.

A narrative synthesis will be able to embrace this issue and further, with the research mapped here, be able to test the strength of theories presented in the field and the power of relations in these.

As indicated earlier it will be possible to substantiate a synthesis with four non-European reviews. This will give added value to the generalisations which can be expected from a narrative synthesis.

To describe the more precise form of such a synthesis, more detailed analyses of the variables in the studies included are of course necessary.

5.7 Conclusion on possibilities for a synthesis

It is clear from the description of studies assigned the evidence weight medium or high that is given above, that the field of dropout in higher education is diverse with a differentiated level of quality in the research carried out.

It is further clear, that the research covered in this research mapping is strong and extensive enough to conduct a narrative synthesis, providing answers to all three review questions raised, though with differences in the evidence base supporting answers to the different questions.

A narrative synthesis will be able to build a model of dropout phenomenon at university level based on empirical knowledge related to existing theory in the field. Based on the

studies mapped in this report, it is clear that a synthesis will be strong in the fields of causes for dropout and less strong in relation to what can be done to reduce dropout.

However, the strong focus on causes in the research mapped indicates that a synthesis will be able to point to malleable factors where interventions to reduce dropout can be expected to have a huge effect, and at the same time address what the elements in such interventions should be. With empirically validated theoretical concepts of dropout phenomena and process, the conditions for effective interventions will be further improved.

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

Characteristics" 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:udpbn 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 (frafald? 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 from 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

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</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 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 estab-</i></p>

	<p>lished 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).</p>
<p>B.4 What are the study research questions and/or hypotheses?</p>	<p>Explicitly stated (please specify)</p> <p>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, <i>ceteris paribus</i>. 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 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</p>

	<i>be stronger at less highly regarded universities. Accordingly, we draw a distinction between highly and lowly regarded universities." (p. 255).</i>
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Section C: Study Policy or Practice Focus

C.1 What is the curriculum area, if any?	<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>
C.2 In which country or countries was the study carried out?	<p>British Isles. <i>British Isles (United Kingdom).</i></p>

Section D: Actual sample

D.1 Who or what is/ are the sample in the study?	<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>
D.2 What was the total number of participants in the study (the selected sample)?	<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>
D.3 What is the proportion of those selected for the study who actually participated in the study?	<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, calculate 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 = $40242/40257 \times 100 = 99,96\%$, Females:</i></p>

	28529/28520*100 = 100,00 %. For the cohort 1992/1993: Males = 54723/54725*100= 100,00 %, Females: 47017/47020*100 = 99,99 %.
D.4 What ages are covered by the actual sample?	17 to 20 Age category: < 20 21 and over Age categories: 20, 21-28 and 28<
D.5 What is the sex of participants?	Mixed sex (please specify) Mixed sex.
D.6 What is the socio-economic status of the individuals within the actual sample?	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.
D.7 What is the ethnicity of the individuals within the actual sample?	Not stated (please specify) Not stated
D.8 Please specify any other important information about the study participants, which cannot be given in the sections above.	No further details No further details.

Section E: Programme or Intervention description

E.1 If a programme or intervention is being studied, does it have a formal name?	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.
E.2 Theory of change	Details 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.
E.3 Aim(s) of the intervention	Not stated 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.
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 significant 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 percentagepoints in 1993) of dropping out for students from parental backgrounds with a lower social class (skilled, semi-skilled or unskilled) relative to those</i></p>
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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 in-class 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 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

	<p>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).</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 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'</i></p>

	<p>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>
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Section G: Study Design

G.1 Study Timing	<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?	<p>Secondary data analysis <i>Secondary data analysis. University student records for different entry cohorts of university students are used.</i></p>

Section H: Comparison groups

H.1 Method groups	<p>No comparison groups <i>No comparison groups. This article does not report on an experimental study.</i></p>
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Section I: Sampling strategy

I.1 What is the sampling frame (if any) from which the participants are chosen?	<p>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></p>
I.2 Which methods/criteria do the study use to select people, or groups of people (from the sampling frame)?	<p>Explicitly stated (please specify) <i>Every student within the sampling frame is selected for study. (p. 252).</i></p>
I.3 Planned sample size	<p>Explicitly stated (please specify)</p>

	<p><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></p>
<p>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?</p>	<p>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:</i> <i>The proportion selected for the study who actually participated in the study is for cohort 1984/1985:</i> <i>Males = $40242/40257 \times 100 = 99,96 \%$,</i> <i>Females: $28529/28520 \times 100 = 100,00 \%$.</i> <i>For the cohort 1992/1993:</i> <i>Males = $54723/54725 \times 100 = 100,00 \%$,</i> <i>Females: $47017/47020 \times 100 = 99,99 \%$.</i></p> <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 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.</i></p>
<p>J.2 What covariates and control variables are reported in the study?</p>	<p>Explicitly stated (please specify) <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</i></p>

	<p>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).</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.
<p>J.3 Which methods were used to collect the data?</p>	<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>
<p>J.4 Details of data collection instruments or tools.</p>	<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>
<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>	<p>Not applicable (please say why)</p> <p><i>Not applicable. No intervention was carried out.</i></p>

Section K: Methods - Data Analysis

<p>K.1 What rationale do the authors give for the methods of analysis for the study?</p>	<p>Not stated or unclear <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 (withdrawal vs. continuance), this method is a standard method.</i></p>
<p>K.2 Which methods were used to analyse the data?</p>	<p>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></p>
<p>K.3 Do the authors describe strategies used in the analysis to control for bias from confounding variables?</p>	<p>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></p>
<p>K.4 For studies that use prospective allocation, please specify the basis on which data analysis was carried out.</p>	<p>Not applicable (not a study with prospective allocation) <i>Not applicable. This article does not report on a a study with prospective allocation.</i></p>
<p>K.5 If the study uses qualitative methods, how well has diversity of perspective and content been explored?</p>	<p>Details <i>Not applicable. This article does not report on a study that uses qualitative methods.</i></p>
<p>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?</p>	<p>Details <i>Not applicable. This article does not report on a study that uses qualitative methods.</i></p>

K.7 If the study uses qualitative methods, has analysis been conducted such that context is preserved?	<p>Details</p> <p><i>Not applicable. This article does not report on a study that uses qualitative methods.</i></p>
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Section L: Quality of the study – Reporting

L.1 Was the study sufficiently informed by relevant theory and research?	<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>
L.2 Are the aims of the study clearly re-	<p>Yes (please specify)</p>

<p>ported?</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 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 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 be-</i></p>

cause 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).

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 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. 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 score and rank, other covariates and control variables included in the final analyses are mentioned without

	<p>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 authors are aware that individual-level student data must be dealt with anonymously.</i></p>
M.2 Are there any ethical concerns/problems about the way the study	<p>No (please specify)</p> <p><i>No. The individual student level data in the dataset</i></p>

<p>was conducted?</p>	<p><i>SN:3456 of the Universities' Statistical Records have been anonymized before retrieval from the UK Data Archive (p. 252).</i></p>
<p>M.3 Is there sufficient justification for why the study was done the way it was?</p>	<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 dropout 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 drop-out 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 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)</i></p>

	<p>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 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 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 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).</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</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</i></p>

study?)	<i>answering the question of student dropout in the UK. Also the covariates and control variables included in the final analyses seem appropriate.</i>
M.5 Have sufficient attempts been made to establish repeatability/reliability in the data collection and data analysis process?	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>
M.6 Have sufficient attempts been made to establish validity/trustworthiness in the data collection and data analysis process?	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>
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?	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>
M.8 Does the author address the generalisability of the study?	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 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 strat-</i>

	<p><i>egies—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></p>
<p>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)?</p>	<p>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></p>
<p>M.12 Weight of evidence B: Appropriateness of research design and analysis for addressing the question, or sub-questions, of this specific systematic review.</p>	<p>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></p>
<p>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.</p>	<p>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 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.</i></p>
<p>M.14 Weight of evidence D: Overall weight of evidence</p>	<p>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</i></p>

	<i>methods.</i>
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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 <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 <i>Socioeconomic causes as operationalized by different social class-categories.</i></p> <p>Sexrole/gender <i>Gender.</i></p> <p>Insufficient prior competence <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 <i>Accommodation (base: university accommodation).</i></p> <p>Other causes (please specify) <i>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: - 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>A.4 If the study addresses dropout reducing measures: Which effects are researched?</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>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 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 References to the Chapter 5 studies

Listed below are all references including abstract to studies in Chapter 5, i.e. studies which can be part of a possible subsequent research synthesis as they 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. (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.

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. (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.

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 observ-

able 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., & Slijnter, T. A. W. (2009). 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., & Slijnter, T. A. W. (2009). 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 "echec 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 percent 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 ob-

servations. 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 influence 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 Tinto's 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 conducted 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 dif-

ferences 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 drop-out 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 drop-out 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.

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 engineering 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 dropout. *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 es-

timisation 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 introduction 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 descendancy 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., & Behon, 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. (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.

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. (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.

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 observations 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 Higher Education system as a whole, if UK universities increase the attractiveness to skilled students from abroad. Assessed Weight of Evidence: High.

Studenterrådet ved Aarhus Universitet (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.

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 differences 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. (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.

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 inter-

est 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. (2011). 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.

9 Complete overview of references included in the research mapping

The following contains the total list of the 69 references which refer to the 62 studies included in the present 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 (*).

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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.

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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

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